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# Culture and Military Effectiveness: How Societal Traits Influence Battle Outcomes

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**CULTURE AND MILITARY EFFECTIVENESS**  
**HOW SOCIETAL TRAITS INFLUENCE BATTLE OUTCOMES**

by

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## **ABSTRACT**

### **CULTURE AND MILITARY EFFECTIVENESS HOW SOCIETAL TRAITS INFLUENCE BATTLE OUTCOMES**

Eric S. Fowler  
Old Dominion University, 2016  
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What must states do to ensure victory on the field of battle? Conventional scholarship claims that a number of material and institutional factors significantly affect a nation's ability to generate military power. Recent studies suggest that other factors, including levels of education, civil-military relations, and western culture also play an important role. This new line of logic is important because these factors tend to be glaringly absent from rigorous concepts of military power. The principle finding of this study is that culture matters and that it matters more than originally thought. Culture is admittedly complex, intangible, and difficult to count, but empirical evidence shows that culture manifests concrete effects in combat, at times determining battlefield outcomes. Culture's absence from meaningful definitions of military power results in world leaders, military commanders, and learned scholars making important political, operational, and theoretical decisions with only partial information. Put plainly, decision-makers cannot accurately assess the martial capabilities of themselves or others without accounting for culture. Consequently, national leaders likely perceive threats where none exists; ignore threats that truly matter; place great trust in incapable allies, and turn away competent help. Moreover, this ignorance of what truly matters in combat means that much of a state's potential military capability remains untapped and left to happenstance.

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This dissertation is dedicated to my wife and children, and to all the souls who gave their lives in the defense of others.

“Today is NOT the day we fail!” —*E.A. Hanson*

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## CHAPTER I

### INTRODUCTION

“A sword never kills anybody; it is a tool in the killer's hand.” —*Seneca*

#### CENTRAL QUESTION

What must states do to ensure victory on the field of battle? Historically, major academic and military studies on this topic claim that investments in superior material, superior tactics, and superior institutions are the surest ways to improve success on the battlefield.<sup>1</sup> However, recent scholarship suggests promise in another area for investment—superior soldiers. One of the most intriguing arguments made in this literature is that culture, specifically culture associated with western democracies, tends to elicit improved battlefield outcomes.<sup>2</sup> As the field of international relations largely suffers from a scarcity of quantifiable data on culture, early studies in this line of inquiry use nominal comparisons of predominant national religion to proxy for cultural effects. Unfortunately, variations in national religious affiliation prove insufficient to explain the way culture manifests influence on the battlefield and prove even less suited to prescribe changes in national policy. For example, recommending that the King of Saudi Arabia establish a

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<sup>1</sup> William Martel, “Technology and Military Power” 25, no. 2 (2001): 177-; William McNeill, *The Pursuit of Power: Technology, Armed Force, and Society since A.D. 1000* (Chicago, IL: University of Chicago Press, 2013).; Jack Levy, “The Offensive/Defensive Balance of Military Technology: A Theoretical and Historical Analysis” *International Studies Quarterly* 28, no. 2 (1984): 219-238.; Robert Art and Kelly Greenhill, *The Use of Force: Military Power and International Politics* (New York: Rowman & Littlefield, 2015); Gábor Ágoston, *Guns for the Sultan: Military Power and the Weapons Industry in the Ottoman Empire* (Cambridge, UK: Cambridge University Press, 2005).; Robert Art, “To What Ends Military Power?” *International Security*, 4, no. 4 (1980): 3-35.; Paul Hirst, *War and Power in the Twenty-First Century: The State, Military Power and the International System* (New York: John Wiley & Sons, 2014).; Andrew Krepinevich, “Cavalry to Computer: The Pattern of Military Revolutions,” *The National Interest*, 37 (1994): 30-42.; Klaus Knorr, *On the Uses of Military Power in the Nuclear Age* (Princeton, NJ: Princeton University Press, 2015).; Michael Horowitz, *The Diffusion of Military Power: Causes and Consequences for International Politics* (Princeton, NJ: Princeton University Press, 2010).

<sup>2</sup> Stephen Biddle and Stephen Long, “Democracy and Military Effectiveness: A Deeper Look,” *Journal of Conflict Resolution* 48, no. 4 (2004): 526.

constitutional democracy and convert to Christianity to foster the right cultural environment for superior military effectiveness—especially without understanding the underlying behavioral mechanisms—just does not pass the practical policy test.

Despite recognizable limitations, these early methods sufficed as a proof of concept and helped to establish grounds for deeper inquiry. Recent large-*n*, cross-cultural studies in cultural anthropology offer new data and a new opportunity to address previous shortcomings.<sup>3</sup> Specifically, this new data offers a more robust conceptualization of culture, including a more granular view into the ways culture varies from state to state and better insight into how different cultural traits manifest different battlefield behaviors.

In this study, I make use of this new statistical data on culture to establish more definitive evidence in support of its role in military effectiveness. To set conditions for rigorous hypothesis testing, I first outline the extant literature on military power, reviewing the roles of material, institutional, and unit-level factors, before proposing a novel theory on culture. With cogent hypotheses formed for both the experimental and control variables, I describe the existing datasets and the newly available data on culture, informing the approach for variable operationalization used in the subsequent quantitative analysis. As I recognize that not all readers will possess meaningful experience with statistical methodologies, I explain the tools and methods used in a very practical and approachable manner before progressing to testing a series of multiple regression models. With hypotheses tests and preliminary findings in hand, I apply our new understanding of culturally-informed military effectiveness to four distinct historical case studies, demonstrating not just that culture matters in battle, but how it matters as well.

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<sup>3</sup> Robert House et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004).

Finally, I translate the major findings from this critical study on culture into a bevy of implications for military commanders, political leader, and learned scholars.

## **PRINCIPAL FINDING**

The principal finding of this study is that culture matters. Culture is admittedly complex and intangible, making it difficult to measure or quantify. Regardless, empirical evidence shows that culture manifests concrete effects in combat, at times determining battlefield outcomes. In particular, four specific cultural traits—Planning Propensity, Risk Aversion, Collective Deference, and Communication Impedance—explain more about the variance in relative combat casualties than material or institutional factors alone. Perhaps more telling is that although regime type informed these cultural traits, they do not stand in lieu of democracy. In other words, western democratic culture is not optimal for battle. In fact, some of the cultural traits that correlate most highly with democracy work against it in battle. In the broader sense, the point at issue is that although scholars openly acknowledge culture’s influence in social and economic environments, it is glaringly absent in rigorous concepts of military power. This absence is both remarkable and unfortunate, as combat is perhaps the most anti-social of social exchanges, often measuring its toll in transactions of both blood and treasure.

Culture’s absence from meaningful definitions of military power results in world leaders, military commanders, and learned scholars making important political, operational, and theoretical decisions with only partial information. Without accounting for culture in operational definitions of military power, conceptual models are underspecified, exaggerating the effects of those factors commonly included—personnel quantity, equipment quality, economic development, and regime type. Put plainly, decision-makers cannot accurately assess the martial capabilities and capacity of enemy states without accounting for culture. This lack of perspective

means national leaders very likely overestimate the military capability of some states, seeing threats where none exists, while concurrently underestimating the capacity in others, ignoring threats that truly matter.

The inability to assess military power informs not only the way leaders perceive would-be challengers but also how they view allies. Who your friends are matters in battle, and how helpful they can be in a crisis depends largely on accurate measurements of their capacity for and capability in combat. Without culture, appraisals of allied military power suffer from the same overestimation and underestimation errors found in enemy assessments. As before, decision-makers cannot accurately assess the martial capabilities and capacity of allied states without accounting for culture. Consequently, national leaders may be asking too much of some allies, presuming they have capacity beyond their means while concurrently asking too little from others, leaving untapped potential in the offing.

Alliances represent another mechanism through which culture influences military power. This time the effect manifests, not within a culture, but between them. Insofar as cultural traits influence the combative behaviors of individuals in a group, they also influence the cooperative behaviors between groups as well. Dynamic interpersonal relationships tend to benefit from a mixture of similarities and differences among participants. A conceptual equilibrium exists in the place where differences improve divergent thinking without creating dissent and similarities unify purpose without devolving into groupthink. The critical component to finding a balance between difference and similarity, thereby maximizing cultural interoperability, is improved cross-cultural awareness. Such awareness enables national leaders to identify exploitable seams and vulnerabilities in partner relationships, both in allied institutions and in adversary ones as well.

It is important to note that inadequate concepts of military power foster not only poor cultural awareness of others but also poor cultural self-awareness. Without accounting for culture appropriately in self-estimates, national leaders may overestimate their relative military capability, leading to policies based on unfounded optimism—a common precursor to war.<sup>4</sup> More specifically, if policy-makers erroneously assess their military power as their most or only capable element of national power, the then resulting policy will likely reflect an undue burden on the military establishment to exert political will in the international system. For each of these, the opposite also holds true. Without accounting for culture appropriately in self-estimates, states may underestimate their military might, pursuing policies based upon unfounded pessimism. Such policies will likely reflect a reluctance to flex military muscle or support initiatives that require martial contribution.

Considering what is at stake, ignorance regarding the ways cultural traits influence combat essentially represents negligence by national leaders and their military commanders—an overlooked opportunity to enhance the effectiveness of the military enterprise through the cultivation of the military individual. Nations invest incredible amounts of treasure in military training programs during peacetime to avoid paying terrible amounts of blood during war time. Without an appreciation for the role culture plays in combat, these training programs tend to focus on the technical skills required to perform battlefield tasks and the conduct of these tasks in collective exercises. As such, culture remains a largely untapped mechanism through which decision-makers can deliberately enhance military power. Specifically, states might establish initiatives that amplify cultural traits beneficial for combat while muting less-desirable traits. Such cultural programs may enhance existing conditions of superior material resources, but may

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<sup>4</sup> Geoffrey Blainey, *The Causes of War*, 3rd ed. (New York: Free Press 1988), Ch.3.

they may also mitigate risk in areas of the defense enterprise that suffer from inferior material quantity or quality—enabling some to do more with less.

In addition to the very practical ways that culture influences the preparation for and conduct of warfare, it also represents a fundamental contribution to international relations theory. Broadly speaking, nearly all schools describe state behavior as a conditioned response to power. Different theories place lesser or greater emphasis on their preferred power mechanism, but military power tends to appear prominently throughout. The first issue with conventional concepts of military power is that they overlook culture and its influence on warfare as described above. The second issue is a broader level-of-analysis problem; not the system-state-individual levels made famous by Kenneth Waltz, but the strategic-operational-tactical levels made famous by Carl von Clausewitz.<sup>5</sup> The result is that international relations theorists tend to presume that all conflict-related causes manifest effects at all conflict-related levels, implying that variations in strategic activity will automatically permeate all associated operational activities and tactical maneuvers. For this reason, much of the scholarship on the sources of military effectiveness talks past one another, leaving the field awash with unhelpful discussion instead of productive discourse.

This study's findings do not necessarily stand in conflict with the other schools of thought on military power so much as help restore a practical context and logic. For the material-focused scholar, this study suggests that a country's people, not just their military platforms, are an indispensable resource contributing to military success. In other words, military power is still a function of the quantity and quality of your tools, but also the qualities of the people that use

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<sup>5</sup> Kenneth N. Waltz, *Man, the State, and War* (New York: Columbia University Press, 1959).; Carl Von Clausewitz et al., *On War* (Princeton, NJ: Princeton University Press, 1984).



them. Therefore, states with militaries of comparable size and composition may manifest different levels of military prowess because states with increasingly beneficial cultural traits field increasingly effective forces.

For the tactically focused scholar, this study suggests a nation's culture informs the realm of the possible for both commanders and soldiers, governing the complexity of operations available to a given force. In other words, military power is still a function of force employment, but forces cannot successfully execute maneuvers that overwhelm their inherent ability to function as individuals or as a unit. Therefore, culture helps account for both the commanders who snatch defeat from the jaws of otherwise certain victory and the soldiers who snatch victory from the jaws of certain defeat.

For the institutionally focused scholars, this study suggests that military power (at least on the field of battle) is not indicative of a state's economy or political institutions. This is not to say that economic strength or regime type have no influence on international conflict or on national culture—quite to the contrary. Extensive scholarship readily establishes the role both money and politics play in the war initiation and outcomes. It is also intuitive to expect the political and economic environment within which a society exists will simultaneously reflect and reinforce a population's values and beliefs. Instead, these findings do suggest that war and battle, though inexorably linked, are distinct environments whose outcomes have distinctive causal phenomena. Consequently, the state-level factors of economic and political institutions manifest their influence more clearly at the broader level of war, establishing the context within which campaigns and battles exist instead of over-determining their internal actions.

For the people-focused scholars, this study suggests that a country's population, specifically certain aspects of their national culture, represent the greatest influence on, therefore,

the greatest returns on investment for, military success on the battlefield. These conditions do not suggest that other factors are not important—for it is still a bad idea to bring a knife to a gunfight—but culturally advantaged forces tend to exact higher tolls from their enemy than materially or institutionally advantaged ones alone. It is important to note that though the literature on democracy and military effectiveness provided the theoretical underpinnings for this study, western democracy does not represent the ideal cultural profile for battlefield success. Western democracies do tend to possess battle-benefitting cultural qualities more often and to greater degrees than their non-democratic counterparts do, but some cultural traits common to western democracies actually work against them. As such, measures of democracy may stand in proxy if robust measures of culture are not available; but in doing so, scholars lose their conceptual linkage to ways in which battlefield behaviors lead to positive or negative outcomes.

While culture may not be the sole determinant of military power, it does appear to be one of the most influential ones. Perhaps more importantly, accounting for culture effectively reprioritizes other theoretical determinants, favoring influences more proximal to the fight over those more distant. This influence means that when military practitioners, defense policy-makers, and international relations scholars conceptualize military power in battle, they must focus on the state's relative superiority in military platforms and military people—with greater deference to the latter than the former. It also means that we may recognize disagreements over distant political institutions and economic principals as distractions within the context of battle, putting them aside for a different time, place, and purpose—namely discussions of war.

## **IMPLICATIONS**

If culture truly matters in battle, then much of the world's conventional wisdom on what constitutes military power and how to measure it require reconsideration. The three principle

roles that readily employ concepts of military power are the military commander, the national leader, and the scholar. Although culture maintains a common conceptual focal point for each role, differences in their perspectives and tools available produce a broad array of implications.

### **Military Implications**

For the military commander, a recognition that culture plays a pivotal role in combat means that the mechanisms of battlefield calculus and force generation must adapt to include new information. The intelligence apparatus that provides timely and accurate assessments of enemy combat power must develop the skills and methods to discern variations in specific cultural traits and translate those variations into meaningful descriptions of military capability. The operations apparatus that provides assessments of friendly combat power must also develop both an appreciation for how its culture influences capability and measures for detecting impediments to the full use of cultural advantages.

Military commanders also increasingly find themselves operating under conditions of coalition warfare, requiring broader calculations of combat power—similar assessments of allied partners; enemy and friendly. In addition to assessing enemy and friendly allied traits in isolation, military commanders must develop sufficient cross-cultural competency throughout their organizations to discern the seams created when organizations with disparate cultures cooperate. Such seams represent both a force protection issue for friendly forces to guard against and a target of opportunity to exploit in enemy forces.

Recognizing that culture plays a role in combat also means that it plays a part before the first boots ever touch ground in the theater of operations. Military commanders undergoing the force generation process must incorporate cultural factors into their assessments of both organizations and individuals. This newfound role for culture means that military organizations

must develop mechanisms to amplify beneficial cultural traits while concurrently muting detrimental ones. Commanders may use some tools throughout the lifecycle of a soldier's service to accomplish this, including recruitment, training, and retention. Meaningful changes to recruitment procedures would screen military candidates for their possession of beneficial cultural traits in addition to their physical and general technical aptitude. Training programs would likewise incorporate regimens to improve or sustain beneficial cultural traits. Retention programs would likely also include some evaluation of a soldier's cultural content in decisions on whether to retain their services or allow them to transition back into civilian life.

### **Political Implications**

For the national leader, a recognition that culture plays a pivotal role in combat means that the mechanisms of foreign policy and resource allocation must change. National leaders must look at the military posturing that occurs around the world through a new lens. Some of the states boasting premiere military hardware may be demonstrating little more than their penchant for buying expensive toys. Alternatively, some of the most meagerly equipped organizations may prove lethal well beyond their means. Making matters more complex is the speed and perceptibility with which these conditions might change. Culturally advantaged forces who suffer from a paucity of quality military material might rectify their shortcoming with an equipment windfall from the right strategic partner or the fortuitous tactical win, making changes for these states potentially high speed but also highly perceptible. Alternatively, materially advantaged forces who suffer from disadvantageous cultural traits might rectify their shortcomings through quiet and deliberate organizational culture modification, making changes for these states potentially slower but also likely imperceptible—until it is too late.

Beyond identifying who are the right enemies, national leaders must also make hard decisions regarding who are the right friends. Culture's expanded role in what happens on the battlefield requires a reassessment of both allied combat power and cultural interoperability at the national level. Just as military commanders determine how best to work with allies, national leaders determine whether such arrangements ever require consideration. Alliances represent agreements regarding burden sharing, and successful sharing agreements necessarily rely upon accurate appraisals of partners' capacity to shoulder burdens. Therefore, national leaders must reconsider alliances through a cultural lens, reevaluating how culture informs both what is expected of partners and their capacity to meet such expectations. Although review may find many allies are both materially and culturally sufficient to meet treaty obligations, it is just as likely that more alliances either overestimate or underestimate partner capacity in response to their material endowment. Inefficiencies in allied capability assessment create resource gaps, either when an overburdened partner fails to meet expectations or when an amply capable partner fails to identify that they could contribute more.

In addition to the way culture influences the capacity aspect of military power, it also influences the capability aspect, making some states more desirable military allies than others. National leaders face a potential question of priorities when selecting such partnerships—whether to prioritize cultural advantage over cultural interoperability or vice versa. National leaders preferring relationships with culturally advantaged states may increase the likelihood their military adopts beneficial traits from partners, but may also risk inviting friction or vulnerability into the partnership via cultural differences. Alternatively, those preferring relationships with culturally similar states may avoid the friction or vulnerability described

above, but in so doing may forego opportunities for their military to adopt beneficial traits from a culturally advantaged partner.

Besides shaping perceptions of enemies and allies, national leaders must use culture to shape their concepts of self as well. In the same way, concepts of military power that ignore culture produce erroneous estimates of capability in others, they produce dangerously erroneous estimates of capability in oneself as well. National leaders must reconsider what challenges the state is willing or not willing to accept and what role military power should play in addressing such challenges. Conceptually, policy-makers must establish culturally informed mechanisms to evaluate their own military power, avoiding both unfounded military optimism (and its equally unfounded preference for the military element of national power) and unfounded military pessimism (and its unfounded recalcitrance from military commitment).<sup>6</sup> These increasingly accurate self-assessments will likely lead to changes in resource allocation for the military enterprise, but in doing so, will also inform changes to domestic resource allocation as well.

### **Scholarly Implications**

For the scholar, a recognition that culture plays a pivotal role in combat means that the mechanisms of international relations and cultural anthropology must change. The concepts of power and relative power are important to nearly every school of thought in international relations. Although military power may not be the only form of power to shape the behavior of states, it is a central force—both important and influential.<sup>7</sup> Empirical studies show that conventional concepts of military power influence a variety of interactions, including “patterns of international cooperation, trade policy, economic development, identity construction, and, of

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<sup>6</sup> Geoffrey Blainey, *The Causes of War*, 3rd ed. (New York: Free Press 1988), Ch.3.

<sup>7</sup> Kenneth Waltz, *Man, the State, and War* (New York: Columbia University Press, 1959).

course, war causation and termination.”<sup>8</sup> The looming consequences of bloody battles prompt some national leaders to enter into non-aggression treaties, alliances, and even collective security agreements to shift the odds of battle and in battle more towards their favor.<sup>9</sup> Those same leaders who decry violence in others raise standing armies, enforce compulsory military service and invest in military material so as not to be caught ill-prepared.<sup>10</sup> At the systemic level, the concepts of anarchy, self-help, and the security dilemma all speak to an ever-present, pending state of war, while the conditions of multi-polarity, bi-polarity, and unipolarity define themselves largely regarding relative military power.<sup>11</sup> The fact that culture makes a difference in battle means that it has an appreciable empirical effect at least at the tactical level of war. Although logic suggests that the effects of culture extend beyond the battlefield, scholars must do more research to prove whether culture manifests any definitive effect at the operational and strategic levels as well.

As for cultural anthropology, the fact that culture makes a difference on the battlefield means that demand for relevant cultural insight will remain high among military commanders and national leaders. These audiences have life and death decisions to make, meaning that they need the most comprehensive and rigorous scholarship on culture the field can muster. Scholars must do more research to extend the reach of cross-cultural studies to include the full roster of nations and deepen the pool of research on culture and conflict. More important than the research, the cultural anthropology community, and the military must improve their relationship.

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<sup>8</sup> Michael Beckley, “Economic Development and Military Effectiveness,” *The Journal of Strategic Studies* 33, no. 1 (2010): 45.

<sup>9</sup> Robert Axelrod, *The Evolution of Cooperation* (New York: Basic Books, 1984).

<sup>10</sup> Peter Katzenstein, *The Culture of National Security: Norms and Identity in World Politics* (New York: Columbia University Press, 1996), 29.

<sup>11</sup> Kenneth Waltz, *Theory of International Politics* (Boston: Addison-Wesley Press, 1979).

Scholars must not only take part in the discourse but also give direction to it so that national leaders and military commanders make well-informed decisions about military power, based upon rigorous scholarship. Only then, will the world see fewer wars fueled by unfounded optimism and thereby a greater peace.

## **WAY AHEAD**

This study proceeds through seven subsequent chapters. The first chapter reviews the extant literature on the determinants of military power. This review traverses millennia of scholarship on the topic, including treatises on the influence of material quantity and quality, of how tactics shapes outcomes, of the role of government and economy, and how differences manifest at the unit-level too. By considering the wide array of potential influences, we improve our understanding of both the broader conceptual context for culture and highlight its need as well.

The second chapter describes a theory of military power where culture informs military effectiveness, producing several testable hypotheses in the process. In particular, the chapter outlines the conceptual relationship between regime type and culture, followed by a deepening of this logic to highlight specific culturally informed behaviors that should shape battle outcomes. The chapter also provides some explanation of previous models and of how their variables might cooperate or conflict with our new perspective on culture.

The third chapter describes data sources and variable operationalizations used in this study's quantitative analysis. The core data comes, in large part, as-is from the foundational work of Stephen Biddle and Stephen Long.<sup>12</sup> In particular, the data regarding battles, material

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<sup>12</sup> Stephen Biddle and Stephen Long, "Democracy and Military Effectiveness: A Deeper Look," *Journal of Conflict Resolution* 48, no. 4 (2004): 525-546.



factors, regime type, education, and civil-military relations all come from their original inquiry. Information regarding Gross Domestic Product per Capita comes from Michael Beckley's work, which built upon Biddle and Long's original model.<sup>13</sup> The novel addition to this previous work is the addition of cultural data from the GLOBE study of 62 societies, produced by Robert House and an extensive team of social scientists.<sup>14</sup> This chapter also introduces readers to the operationalization of key variables used during quantitative analysis, offering a bridge across the conceptual gap between data and model, as well as observations and the theoretically important concepts we seek to understand better.

The fifth chapter employs the available data in a series of statistically rigorous tests to determine if the proposed theoretical hypotheses hold true. As I recognize that a considerable portion of my intended audience may be unfamiliar with these quantitative methods, I introduce each statistical concept using example data from a more familiar topic before applying it to the battle-related data. I do not undertake this introductory step to belabor the task, but to ensure that all readers understand what the numbers exactly can and cannot tell us. Fundamentally, statistical tests cannot prove that one or a set of factors actually caused an outcome. However, by comparing theoretical expectations to observable outcomes across numerous cases, informative trends tend to highlight and differentiate the significance of some relationships over others. This chapter undergoes such a process, finding that culture stands out as an influential factor in battle outcomes, but also putting into context the role that material, institutional, and unit-level factors still play.

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<sup>13</sup>Michael Beckley, "Economic Development and Military Effectiveness," *The Journal of Strategic Studies* 33, no. 1 (2010): 43-79.

<sup>14</sup>Robert House et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004).

The sixth and seventh chapters put the statistical findings to a different kind of test, considering how the highlighted cultural factors help explain battlefield behavior in actual historical cases. These two chapters review four different battles of the 20th Century whose observable outcome differs greatly from what conventional force ratios would have us expect. Chapter 6 reviews the WWII battles of Salerno, where a 3:1 attacker-to-defender force ratio resulted in seven attackers killed for each defender. It then describes Operation ISKRA, where a 4:1 force ratio produced seven attackers killed for every defender. Chapter 7 reviews the Russo-Japanese Battle of Mukden, where a 1:1 force ratio resulted in only one attacker killed for every two defenders. It then describes the Arab-Israeli Battle of Khan Yunis, where the attacker pressed on with less than a 1:1 force ratio, resulting in only one attacker lost for every 17 defenders killed. Rich narratives and a critical eye allow these historical cases to add life and depth to the statistical work in previous chapters.

The eighth chapter discusses the implications of these findings and opportunities for the future. Before delving too deeply into practical applications, the chapter starts with a brief foray into some important concepts regarding culture to frame both the discussions of underlying practical theory and explicate likely challenges for policy implementation. Following this conceptual discussion is a more practical dialogue on the military, political, and scholarly applications for a culturally informed definition of military power. As no single study can address all areas of potential interest in a given topic at one time, this chapter also highlights some opportunities for future research that this work might well inform.

## CHAPTER II

### CONCEPTS OF MILITARY POWER

Existing literature offers three primary explanations for why some states demonstrate greater military power than do others. The most common explanation (and the one perhaps as old as war itself) is superior military resources—the tools of war. Perhaps less obvious than the first but still very well established in academic circles, the second explanation is superior government and economy—the institutions of war. The most recent addition to this growing list is superior military organizations—the hands of war.

In this chapter, I summarize the literature supporting each of these schools of thought, placing each within their historical context. I discuss the merits and shortcomings of each school from theoretical and practical perspectives to anchor this study within its larger context. I conclude that the literature regarding military power underrepresents the role of culture. Consequently, culture deserves a more robust look than has previously afforded.

#### MATERIAL FACTORS

The narrative claiming primacy of material factors in determining state behavior is pervasive in the study of international relations.<sup>1</sup> Whether it is classical realists describing their influence, or liberals and constructivists refuting it, each school conceptualize military power in

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<sup>1</sup> E.H. Carr, *The Twenty Years' Crisis, 1919–1939: An Introduction to the Study of International Relations* (New York: Harper & Row, 1964), 109–32; Hans J. Morgenthau, *Politics among Nations: The Struggle for Power and Peace*, 4th ed. (New York: Knopf, 1967), 106–44; Kenneth Waltz, *Theory of International Politics* (Boston: Addison-Wesley Press, 1979); John J. Mearsheimer, *The Tragedy of Great Power Politics* (New York: Norton, 2001), Ch.2.

terms of material possession.<sup>2</sup> Studies that focus on the material contributors to military outcomes often attempt to quantify a state's military materiel through measurements of defense budgets or the actual composition of military forces. One of the most prevalent quantitative measurements of military capability, an index comprising six material variables including total population, urban population, military personnel, military expenditure, energy consumption, and iron and steel production called the Composite Indicator of National Capability, exemplifies this approach.<sup>3</sup> The material factor narrative is strong in academic circles, in part because the logic is clear, but also because the topic is clean. Theories that add behavior-related factors be they tactics or human qualities do not offer such a sanitary environment to discuss causal linkages. This inability to get one's hands dirty leaves policy-makers to arrive at consequential decisions about military power largely by intuition.

### **Quantity and Quality**

Variations in the military materials available to a fighting force tend to demonstrate differences in either quantity or quality. For example, Realists emphasize relative material quantity as the principle influence on the balance of power, their chief theoretical determinant in war outcomes.<sup>4</sup> Empirical studies tend to focus on quantities of material resources—often

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<sup>2</sup> Robert Keohane and Joseph Nye, *Power and Interdependence: World Politics in Transition* (Boston, MA: Little Brown, 1977); Alexander Wendt, *Social Theory of International Politics* (New York: Cambridge University Press, 1999).

<sup>3</sup> David J. Singer, "Reconstructing the Correlates of War Dataset on Material Capabilities of States, 1816–1985," *International Interactions* 14, no. 2 (1988): 115–132.

<sup>4</sup> John Mearsheimer, *The Tragedy of Great Power Politics* (New York: Norton, 2001), Ch.2.; Dale C. Copeland, *The Origins of Major War* (Ithaca: Cornell University Press, 2000); Kenneth Waltz, *Theory of International Politics* (Boston: Addison-Wesley Press, 1979)

counting the numbers of people or weapons—as their primary measures of military capability.<sup>5</sup>

The role material quantity plays in war imply an equally powerful role in battle outcomes.

As a corollary to quantity, quality intuitively matters as well. On a conceptual level, offense-defense theorists hold that prevailing weapon technology determines the relative ease of attack and defense.<sup>6</sup> In turn, this relative ease affects a host of political outcomes, ranging from the incidence of war to the formation of alliances, the severity of arms races, the salience of relative gains from international cooperation, or the structure of the international system.<sup>7</sup>

This reverence for the quality of arms also appears in military theory. At the onset of WWII, the German *Blitzkrieg* (lightning war) doctrine focused on highly mobile armored forces supported by heavily armed infantry. The Germans employed higher concentrations of tanks and machine guns in their front-line formations than did the Americans, whose doctrine centered on

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<sup>5</sup> Brian Gibbs and J. David Singer, *Empirical Knowledge on World Politics* (Westport, CT: Greenwood, 1993).; Richard Merritt and Dina Zinnes, “Alternative Indexes of National Power,” in *Power in World Politics*, Richard Stoll and Michael Ward, eds. (Boulder: Lynne Rienner, 1989), 11-28.

<sup>6</sup> Jack Levy, “The Offensive/Defensive Balance of Military Technology: A Theoretical and Historical Analysis” *International Studies Quarterly* 28, no. 2 (1984): 219-238.

<sup>7</sup> Allan Stam, *Win, Lose or Draw* (Ann Arbor: University of Michigan Press, 1996), 94-95.; Paul Huth, *Standing Your Ground* (Ann Arbor: University of Michigan Press, 1996), 258; Stanislaw Andreski, *Military Organization and Society* (Berkeley: University of California Press, 1968).; Lars-Erik Cederman, *Emergent Actors in World Politics* (Princeton: Princeton University Press, 1997).; Thomas Christensen and Jack Snyder, “Chain Gangs and Passed Bucks: Predicting Alliance Patterns in Multipolarity,” *International Organization* 44, no. 2 (1990): 137-168.; James Fearon, “The Offense-Defense Balance and War Since 1648” (paper presented at the annual meeting of the International Studies Association, Chicago, Illinois, February 21, 1995).; Charles Glaser, “Realists as Optimists,” *International Security* 19, no. 3 (1995): 50-90.; Robert Gilpin, *War and Change in World Politics*, (New York: Cambridge University Press, 1981).; Ted Hopf, “Polarity, the Offense-Defense Balance, and War,” *American Political Science Review* 85, no. 2 (1991): 475-494.; Robert Jervis, “Cooperation Under the Security Dilemma,” *World Politics* 30, no. 2 (1978): 167-214.; Barry Nalebuff, “Brinkmanship and Nuclear Deterrence,” *Conflict Management and Peace Science*, 1986, no. 9: 19-30.; Robert Powell, *In the Shadow of Power*. (Princeton: Princeton University Press, 1999).; George Quester, *Offense and Defense in the International System* (New York: Wiley, 1977).; Stephen Van Evera, “Offense, Defense, and the Causes of War,” *International Security* 22, no. 4 (1998): 5-43.; Stephen Van Evera, *Causes of War* (Ithaca: Cornell University Press, 1999).; Kenneth Waltz, “The Origins of War in Neorealist Theory,” in *The Origin and Prevention of Major Wars*, Robert Rotberg and Theodore Rabb, eds. (New York: Cambridge University Press, 1989), 39-52.

the rifleman with machine guns and tanks in supporting roles.<sup>8</sup> This meant that German formations tended to be smaller, better protected, and better armed than the Americans were. For example, German units tended to intersperse the MG-42 machine gun with greater frequency throughout their formation.<sup>9</sup> With its devastating 1200 rounds per minute firing rate and effective range of nearly two kilometers, a six-soldier MG-42 crew possessed greater innate firepower than 30 American soldiers did with their standard issue M1 Garand rifles. Even 5:1 odds, an American unit would have to cross over 1500m of withering fire before it would even be within range of the defending German MG-42 emplacement.

Experiences like this left indelible marks on US military doctrine as it transitioned into the Cold War. Standing nose-to-nose with a Soviet juggernaut, ready to defend the North Atlantic Alliance, the US developed the novel doctrines (Active Defense and Air-Land Battle) and the technological marvels to support it.<sup>10</sup> Military strategists identified a critical point in the anticipated Soviet advance through the narrow German Fulda Gap to be the arrival of the principal assault force for the enormous formation—the Second Echelon. If NATO forces could disrupt the Soviet’s Second Echelon sufficiently before it reached the Gap, then their entire enterprise would grind to a screeching halt. This doctrine relied upon the seamless integration of three revolutionary ground warfare systems: the M1A1 Abrams Main Battle Tank, the AH-64 Apache Longbow Attack Helicopter, and the M270 Multiple Launch Rocket System (MLRS).<sup>11</sup>

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<sup>8</sup> Deputy Assistance Secretary of the Army for Research & Technology, Technology Wargaming Implementation Office (SAAL-ZT), *Envisioning the Deep Future of Small Arms 2022-2042*, SAALZT-TR-2013-03 (Washington, D.C.: United States Government Printing Office, 2013), 3-4.

<sup>9</sup> Eric Tobey, “Tactical Philosophies of the Squad,” *Der Erste Zug*, <http://www.dererstezug.com/TacticalPhilosophies.htm> (accessed January 16, 2016)

<sup>10</sup> Benjamin Jensen, *Forging the Sword: Doctrinal Change in the U.S. Army* (Stanford, CA: Stanford University Press, 2016): 70-79.

<sup>11</sup> David Trybula, “‘Big Five’ Lessons for Today and Tomorrow,” monograph, Institute for Defense Analysis, 2012, 3-4.

As it was with the Germans, these American forces were highly mobile and heavily armed, providing soldiers more protection, better range, and higher rates of fire than did their adversaries. Consequently, the American forces that remained in the European theater, though far smaller than their Soviet foes, were capable of holding their own until follow-on forces arrived.

Although contemporary assessments of foreign militaries suggest a closing capability gap between the US and the rest of the world, technological superiority remains an important part of American military doctrine.<sup>12</sup> In many regards, technological overmatch is the critical component. This poses a serious problem—especially if material factors, be it quantity or quality, are not as influential as decision-makers think they are.

### **Wargaming**

The material school can also be seen heavily influencing the practical managers of military power—foreign policy and military decision-makers—in a direct way.<sup>13</sup> One of the clearest examples of this is the mathematical models and simulation tools used to support of the common practice of wargaming. The wargaming process allows a commander to visualize a hypothetical battle, fighting the enemy conceptually before soldiers fight them physically.

As the decisions military commanders make on the battlefield tend to be consequential in terms of life and death, a strong drive exists among military analysts to ensure commanders have the most timely and accurate information available with which to make their decisions. The underlying logic at work is that a commander should be able to make more insightful decisions

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<sup>12</sup> U.S. Army Training and Doctrine Command, *The U.S. Army Operating Concept: Win in a Complex World 2020-2040*, TRADOC Pamphlet 525-3-1 (Washington, D.C.: U.S. Government Printing Office, 2014):15, 36-41.

<sup>13</sup> Edmund Dubois, Wayne Hughes, and Lawrence Lowe, *A Concise Theory of Combat* (Monterey: US Naval Postgraduate School, 1998), Ch.1.

regarding the effective application of forces available with a greater quantity and quality of information about the enemy.

The three most fundamental pieces of information commanders require to engage in wargaming are enemy composition, enemy disposition, and enemy strength.<sup>14</sup> In this context, the term composition represents an assessment of the types and capabilities of equipment the enemy formation contains. The term disposition, in this context, refers to an understanding of where the enemy is located on the battlefield. The term strength, when discussing enemy forces, represents an assessment of how many personnel and pieces of equipment the enemy has available for the impending battle. In addition to the three principle pieces of information, commanders also seek to determine their enemy's most likely course of action—an approximation of how the enemy commander will choose to employ forces to achieve the enemy's objective. Of the four pieces of information discussed, the fourth is orders of magnitude more difficult to ascertain than the first three.

The practice of wargaming appears throughout history, but advances in the fields of military intelligence collection, operational research and systems analysis (ORSA) during the Second World War ushered in an era of increased rigor and implementation of the Correlation of Forces Matrix (COFM) concept.<sup>15</sup> The Correlation of Forces concept introduced a single calculated value into the commander's wargaming process, representing the assessed military superiority one belligerent maintained over the other, all else being equal. Correlation of Forces

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<sup>14</sup> These three elements, when taken together, are more formally described as the enemy's order of battle.

<sup>15</sup> One of the fathers of this field, Colonel Tevor N. Dupuy, is both responsible for a form of COFM analysis called the Quantified Judgment Method (QJM) and the founder of the Historical Evaluation and Research Organization (HERO). The QJM is a form of formal modeling, applying coefficients to factors relating to the composition, disposition, and strength of the belligerents as well as battlefield conditions. The HERO consortium of scholars produced the original form of the battle-related dataset used in this and many other large-*n* quantitative studies on military effectiveness. COL Dupuy was a brilliant military officer and historian whose intuitive grasp of the nuances of ground combat preceded our ability to test them by decades and still influence our understanding today.



Matrix calculations used an extensive index of combat power values based on the assessed lethality of many different forms and models of military equipment, downplaying less tangible factors like leadership, initiative, or surprise, and ignoring political and social variables completely.<sup>16</sup> While COFM index comprised an army of impressive numerical indicators, each of these numbers was essentially niche multipliers for a tally of material assets. Consequently, military analysts developed a cottage industry of updating tables each time a novel capability appeared in intelligence reports, such as a higher caliber weapon or extended range missile or air-droppable armored vehicle.

During the Cold War, modern military doctrine elevated the Correlation of Forces value to be “the most important calculation that decision making and planning require.”<sup>17</sup> This statement reveals both a strong desire of military commanders to leverage all available tools in support of decision-making, but also an appreciation for the significant weight afforded the role of material factors in battle. Military doctrine historically offers preferred force ratios as thresholds for planning different forms of military operations. For example, 3:1 to attack a prepared position; 5:2 to conduct a hasty attack; 1:1 to counterattack; 2:5 to execute a hasty defense; 1:3 to defend from a prepared position; and 1:6 to delay.<sup>18</sup> Since these are thresholds, conceptually more is always acceptable—if not preferred. The Correlation of Forces concept enhanced the rigor with which the commander understood the what, where, and how many of the

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<sup>16</sup> Risa Brooks and Elizabeth Stanley, *Creating Military Power: The Sources of Military Effectiveness* (Stanford: Stanford University Press, 2007), 5–6; Aaron L. Friedberg, “The Assessment of Military Power: A Review Essay,” *International Security* 12, no. 3 (1987): 192.; Seth Bonder, “Army Operations Research: Historical Perspectives and Lessons Learned,” *Operations Research* 50, no. 1 (2002): 25–34.; Trevor Dupuy, *Numbers, Predictions, and War* (Fairfax: Hero Books, 1985), 141-165.

<sup>17</sup> Department of the Army, *Field Manual 100-61: Armor- and Mechanized-Based Opposing Force Operational Art* (Washington, D.C.: Department of the Army, January 1998), 7-1.

<sup>18</sup> Department of the Army, *Field Manual 5-0: The Operations Process* (Washington, D.C.: Department of the Army, March 2010), B-16; John Mearsheimer, “Assessing the Conventional Balance: The 3:1 Rule and Its Critics,” *International Security* 13, no. 4 (1989): 54–89.

enemy's composition, disposition, and strength. However, it did nothing to enhance the commander's understanding of the fourth war-gaming question, the enemy's most likely course of action—how the enemy's people might affect equipment in terms of their effectiveness, their efficiency, and the complexity of operations they are capable of achieving.

The material school's long conceptual history and approachable econometric methodology elicited a substantial investment in data collection from interested military leaders and policy-makers. As such, studies on material factors leverage both a wealth of data and approachable logic in support of their conclusions. Unfortunately, the powerful insights offered by these studies end with possession of material means; offering no insight into why some states use their military materiel to greater effect, why some fail despite superior quantity and quality of materials, or why some states prowess varies over time. Although the inability of material-based models to explain how an underdog might win against a materially superior foe is problematic, the fact that these models often cannot allow such an event to be possible is even more troubling. In fact, observations in which the materially inferior force wins are not outliers, but instead quite common.<sup>19</sup>

An example of this kind of materially biased representation of military power took place during the 1991 Gulf War. Coalition logisticians had the gruesome, but practical task of estimating the quantity of body bags and coffins to begin ordering so as not to be unprepared when the time came. Before the initiation of the ground offensive, military analysts predicted casualty ratios using the most technologically advanced methods available. Each of these materially focused systems fixated on the Iraqi arsenal of first-rate Soviet equipment, and each

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<sup>19</sup> Malcolm Gladwell, *David and Goliath: Underdogs, Misfits, and the Art of Battling Giants* (New York: Little, Brown and Company, 2013).

system grossly overestimated American losses.<sup>20</sup> None of these models had an appropriate mechanism to account for how the Iraqi army would actually use the military materials they had.

## **INSTITUTIONAL FACTORS**

A second subset of the literature, the institutional school, seeks to expand our understanding of military power by exploring how influential state-level factors affect military outcomes. These theories suggest that the institutional factors of democracy and economy, with their well-established influence on war, should manifest overwhelming influence on battle outcomes as well. The logic is intuitive, proposing that since democracies and strong economies tend to win the wars they fight, then the two should tend to win the battles within those wars as well. Studies that focus on the state-level contributors to victory often attempt to quantify a state's institutional advantage through measurements of polity score and gross domestic product (GDP). Institutional studies leverage a wealth of data and logic in support of their conclusions, benefitting from centuries of qualitative reasoning and decades of highly scrutinized quantitative rigor.

### **Democracy**

In 1992, David Lake was the first scholar to claim a causal relationship between democracy and greater military effectiveness based upon empirical observation; democracies

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<sup>20</sup> See, for example, "Defense Analysts: Limited War to Free Kuwait Could Cut Casualties by Over Half," *Inside the Army*, 10 December 1990, 11.; *Crisis in the Persian Gulf: Sanctions, Diplomacy and War: Hearing Before the Committee on Armed Services, United States House of Representatives, One Hundred First Congress, Second Session, December 13 & 20, 1990*, 101st Cong. 448, 462, 463, 485, 917 (1991); Eric Schmitt, "Air Strike on Iraq, the Favored Strategy, Means Big Risks for Both Sides," *New York Times*, 23 October 1990, A10; Michael Gordon and Bernard Trainor, *The Generals' War* (Boston: Little, Brown, 1995), 132–133, 174; US News & World Report, ed., *Triumph Without Victory* (New York: Random House, 1992), 129, 141; Bob Woodward, *The Commanders* (New York: Simon & Schuster, 1991), 349; Tom Matthews, "The Secret History of the War," *Newsweek*, 18 March 1991, 28ff.

tend to win the wars they fight more often than do non-democracies.<sup>21</sup> Two explanations emerged to account for this observation; enhanced conflict selection and enhanced military effectiveness. Scholars explain improved conflict selection on behalf of democracies by virtue of increased transparency in their institutions and increased the vulnerability of their political leaders to public influence.<sup>22</sup> Institutional transparency likely encourages divergent thinking, improving alternatives generation and consequently decision-making. Political leader vulnerability likely increases electoral sanction under conditions of policy failure, amplifying the consequences of poor decision-making.<sup>23</sup> Combining these two institutional effects should encourage democracies to be more selective in their conflict decision-making process. Put differently, democracies are inherently less prone to start wars they cannot win.

Scholars suggest the same democratic selection effect that occurs in war should apply to battle as well.<sup>24</sup> Conceptually, democratic policy-makers likely recognize each battle lost reduces the likelihood of an overall war win, and each life lost increases negative feeling in the associated electorate when weighing the cost of battle losses in their conflict selection process. As such, one would expect democracies to select to participate disproportionately in wars where they enjoy factors most conducive to victory in battle. Put differently, democracies are inherently

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<sup>21</sup> David Lake, "Powerful Pacifists: Democratic States and War," *American Political Science Review* 86, no. 1 (1992): 24-37.

<sup>22</sup> Dan Reiter and Allan Stam. *Democracies at War* (Princeton: Princeton University Press, 2002).; Bruce Bueno de Mesquita and Randolph M. Siverson, "War and the Survival of Political Leaders: A Comparative Study of Regime Types and Political Accountability," *American Political Science Review* 89, no. 4 (1995): 841-855.; George Downs and David Roake, "Conflict, Agency, and Gambling for Resurrection: The Principal-Agent Problem Goes to War," *American Journal of Political Science* 38 (1994):362-80.

<sup>23</sup> Kurt Taylor Gaubatz, *Elections and War: The Electoral Incentive in the Democratic Politics of War and Peace* (Stanford, CA: Polity Press, 1999), 81-103.

<sup>24</sup> Jack Snyder, *Myths of Empire: Domestic Politics and International Ambition* (Ithaca: Cornell University Press, 1991).; Stephen Van Evera, "Hypotheses on Nationalism and War," *International Security* 18, no.4 (1994): 5-39.; Dan Reiter, "Political Structure and Foreign Policy Learning: Are Democracies More Likely to Act on the Lessons of History?" *International Interactions* 21 (1995):39-62.; H. E. Goemans, *War and Punishment* (Princeton, NJ: Princeton University Press, 2000).

less prone to participate in wars where they cannot win most of the battles. Although this effect manifests most directly in wars with democratic initiators, wars where democracies find themselves as respondents should still exercise sufficient freedom to choose between concession and violent resistance, retaining similar selection bias as when to initiate the conflict.

Beyond an enhanced ability to pick the right fight, scholars also suggest that a number of phenomena concomitant with democracy enable them to enjoy enhanced levels of military effectiveness. One argument suggests that democracies manage the economic engine of production more effectively than non-democracies, essentially overwhelming enemies with superior quantities of military materiel.<sup>25</sup> Along similar lines, logic suggests that democracies possess an enhanced ability to raise capital in finance of long wars, meaning that democracies maintain higher levels of material quantity and quality than their enemies do over time.<sup>26</sup> Another argument is that democracies are more likely to invest in the development and actual application of new technologies, inherently improving the material quality component of the military effectiveness equation.<sup>27</sup> Another explanation for the apparent military effectiveness bonus enjoyed by democracies rests in the greater efficiency with which they garner and direct consent of the governed into unified action on the national scale.<sup>28</sup> This concept has implications for levels of material quantity and quality over time, but more importantly, it also suggests one of the first influences on the force employment element of the military effectiveness question.

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<sup>25</sup> Adam Przeworski, "Chapter 7: Democracy and Economic Development," in *The Evolution of Political Knowledge: Democracy, Autonomy, and Conflict in Comparative and International Politics*, vol. 2, eds. Edward Mansfield and Richard Sisson (Columbus, OH: Ohio State University Press, 2004): 300-324.

<sup>26</sup> Kenneth Schultz and Barry Weingast, "The Democratic Advantage: Institutional Foundations of Financial Power in International Competition," *International Organization* 57, no. 1 (2003): 3-42.

<sup>27</sup> Dan Reiter and Allan Stam, "Democracy, War Initiation, and Victory," *American Political Science Review* 92, no. 2 (1998): 377-89.

<sup>28</sup> Margaret Levi, *Consent, Dissent, and Patriotism* (New York: Cambridge University Press, 1997).

Still another way of looking at regime type, Dan Reiter and Allan Stam address the role regime-type plays, suggesting that the increased transparency of democratic institutions might enhance not only decision-making on war but within war as well.<sup>29</sup> They argue that militaries should exhibit institutionally informed traits, manifesting systematic differences in leadership, individual initiative, popular support, and individual responsibility. These authors also suggest that the militaries of non-democracies likely possess a diminished willingness to fight to the last soldier, especially when facing democracies that tend to treat captives and occupied territories well.

The arguments above attempt to explain the perceived combat bonus associated with democracy; when combined, they paint the picture of a formidable adversary. If true, democracies should field massive military forces with the latest technological advances; maintain these forces at a high state of readiness for extended periods, and demonstrate uncanny strategic insight. All else being equal, these effects should coalesce into superior military effectiveness in battle.

## **Economy**

In 2010, Michael Beckley claimed the principle causal relationship for military effectiveness is not democracy as Lake had found, but economic development.<sup>30</sup> Empirically, states with highly developed economies tend to win the battles they fight more often than do

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<sup>29</sup> Dan Reiter and Allan Stam, "Democracy, War Initiation, and Victory," *American Political Science Review* 92, no. 2 (1998): 377-89.; Dan Reiter and Allan Stam, "The Soldier's Decision to Surrender: Prisoners of War and World Politics" (paper presented at the annual meeting of the American Political Science Association, Washington, D.C., August 28-30, 1997).; Allan Stam, *Win, Lose or Draw* (Ann Arbor: University of Michigan Press, 1996), 94-95.; Dan Reiter and Allan Stam. *Democracies at War* (Princeton: Princeton University Press, 2002), Ch. 3.; Dan Reiter, *Crucible of Beliefs: Learning, Alliances, and World Wars* (Ithaca, NY: Cornell University Press, 1996), 15-40, 193-202.

<sup>30</sup> Michael Beckley, "Economic Development and Military Effectiveness," *The Journal of Strategic Studies* 33, no. 1 (2010): 44.

those with lesser-developed economies. Beckley offers two primary explanations for the increased effectiveness—improved equipment and enhanced skill.<sup>31</sup> Relationships between economic development and advanced equipment are straightforward, drawing bonuses from increased productive power and improved sector integration. Productive power means that developed economies have greater capital to invest in, greater infrastructure to build upon, and more expertise to sustain the technological one-upmanship inherent in the military equipment race.<sup>32</sup>

Improved sector integration means that developed economies have a broader diversity of non-military related sectors whose maturity amplify or extend the effectiveness of combat forces, improving their health, logistics, communications, intelligence, and other support functions.<sup>33</sup> Put simply, highly developed economies tend to have an enhanced capability and extended capacity to produce, maintain, and modernize sophisticated military equipment. These equipment-related economic development factors influence the material quantity and quality elements of the military effectiveness equation, with particular focus on the quality aspect.

Beyond the fielding of enhanced equipment, Beckley also claims that highly developed economies tend to field highly skilled military units. He offers two explanations for increased skill within the military; sustained training and improved management. Sustained training means

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<sup>31</sup> Michael Beckley, “Economic Development and Military Effectiveness,” *The Journal of Strategic Studies* 33, no. 1 (2010): 74.

<sup>32</sup> Malcolm Chalmers and Lutz Unterseher, “Is There a Tank Gap? Comparing NATO and Warsaw Pact Tank Fleets,” *International Security* 13, no.1 (1988): 5–49.; Enzo Bonsignore, “Gulf Experience Raises Tank Survivability Issues,” *Military Technology* 16, no. 2 (1992): 64–70.; Robert Paarlberg, “Knowledge as Power: Science, Military Dominance, and US Security,” *International Security* 29, no. 1 (2004): 123–136.

<sup>33</sup> Paul Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000* (New York: Vintage Books, 1987), 294-295; Angus Maddison, “Historical Statistics, World Population, GDP and Per Capita GDP, 1–2003 AD”; Eliot Cohen, “Distant Battles: Modern War in the Third World,” *International Security* 10, no. 4 (1986), 164–166.; Henry Eccles, *Logistics in the National Defense* (Harrisburg: Stackpole, 1959), 104.; Richard Samuels, *Rich Nation, Strong Army: National Security and the Technological Transformation of Japan* (Ithaca: Cornell University Press. 1994), 26.

that developed economies possess an increased capacity to invest resources in training individual soldier and collective unit skills.<sup>34</sup> Transforming an untrained civilian into a trained and ready soldier represents a considerable investment in terms of material resources, infrastructure, and time. Even more costly is the process of integrating skilled individuals into cohesive collectives, or unit-level training. As such, highly developed economies tend to possess sufficient resources to invest, should they choose to do so, in the production and maintenance of this trained and ready military force.

Improved management means that developed economies have an extended capacity to manage the military power production functions as an enterprise.<sup>35</sup> In addition to the force-generation (i.e. training) functions mentioned above, militaries must also perform administrative and operational functions as well. Beckley claims that developed economies maintain larger pools of skilled organizational leaders and administrators as a whole, increasing the likelihood that these skilled individuals positively influence the defense sector. Put another way, highly developed economies are more likely to have the kinds of experienced leaders military organizations and military operations require.<sup>36</sup> These skill-related economic development factors influence both the tactical and material elements of the military effectiveness equation,

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<sup>34</sup> Stephen Biddle, *Military Power: Explaining Victory and Defeat in Modern Battle* (Princeton: Princeton University Press, 2004), 38–48.; Williamson Murray, “German Response to Victory in Poland: A Case Study in Professionalism,” *Armed Forces and Society* 7, no. 2 (1981), 285–98.; Allan Millett, Williamson Murray, and Kenneth Watman, “The Effectiveness of Military Organizations,” in *Military Effectiveness, Volume I: The First World War*, Allan Millett and Williamson Murray, eds., (Boston: Allen & Unwin, 1988), 14.; Michael Horowitz, “The Diffusion of Military Power: Causes and Consequences for International Politics” (PhD dissertation, Harvard University, 2006), 49–50.; Richard Betts, *Military Readiness: Concepts, Choices, Consequences* (Washington DC: Brookings Institution Press, 1995), 156–9.

<sup>35</sup> Edward Glaeser et al., “Do Institutions Cause Growth?” *Journal of Economic Growth* 9, no. 3 (2004), 271–303.; Eliot Cohen, “Distant Battles: Modern War in the Third World,” *International Security* 10, no. 4 (1986), 162–163.

<sup>36</sup> Michael Beckley, “Economic Development and Military Effectiveness,” *The Journal of Strategic Studies* 33, no. 1 (2010): 74.



with sustained training extending the range of tactical options available to a commander and improved management enhancing the quality of tools available on the battlefield.

## UNIT-LEVEL FACTORS

Recently, a third wave of scholarship on military power emerged—the unit-level school. The defining traits of this new literature are first that the factors contributing to battle outcomes exert the greatest influence on the battlefield, and second, the qualities of military people strongly influence how much the quantity and quality of military materials matters. Scholars offer four explanations for differences in the qualities soldiers display in combat, including regime-type, civil-military relations, human capital, and culture.

### Civil-Military Relations

Civil-military relations refer to the relative levels of stability and harmony demonstrated in the relationship between a nation's military and their political masters. Numerous scholars suggest that stable, harmonious relations between the military the civilian government reduce barriers to military power production.<sup>37</sup> Specifically, an environment of mutual trust should

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<sup>37</sup> General [Kurt Lang, *Military Institutions and the Sociology of War: A Review of the Literature with Annotated Bibliography* (London: Sage Publications, 1972), 105-132; Policy [Paul Kennedy, *Grand Strategies in War and Peace* (New Haven: Yale University Press, 1991), 1-10.; Basil Liddell Hart, *Strategy* (New York: Penguin, 1954).]; Resources [Paul Kennedy, "Britain in the First World War," In *Military Effectiveness*, vol. 1, Allan Millett and Williamson Murray, eds., (Boston: Allen & Unwin, 1988), 31-79.; Peter Feaver, *Armed Servants: Agency, Oversight, and Civil-Military Relations* (Cambridge: Harvard University Press, 2003).; Peter Feaver and Richard Kohn. "Conclusion: The Gap and What It Means for American National Security," in *Soldiers and Civilians: The Civil-Military Gap and American National Security*, eds. Peter Feaver and Richard Kohn. (Cambridge: MIT Press, 2001), 459-74.]; Self Preservation [Samuel Huntington, *The Soldier and the State: The Theory and Politics of Civil-Military Relations* (Cambridge, MA: Harvard University Press, 1957), 82.; Amos Perlmutter and Valerie Plave Bennett, *The Political Influence of the Military* (New Haven: Yale University Press, 1980), 205-208.; Eliot Cohen, "Distant Battles: Modern War in the Third World," *International Security* 10, no. 4 (1986): 168.; Elizabeth Kier, *Imagining War* (Princeton: Princeton University Press, 1997).]; Professionalism [Stephen Biddle and Robert Zirkle, "Technology, Civil-Military Relations, and Warfare in the Developing World," *Journal of Strategic Studies* 19, no. 2 (1996): 171-212.; Risa Brooks, *Political-Military Relations and the Stability of Arab Regimes* (London: International Institute for Strategic Studies, 1998).; Elizabeth Kier, *Imagining War* (Princeton: Princeton University Press, 1997).; Kenneth M. Pollack, "The Influence of Arab Culture on Arab Military Effectiveness" (PhD dissertation, Massachusetts Institute of Technology, 1996) 37–82.]

improve defense policy development, increase resource allocation, reduce regime self-preservation tendencies, and foster a professional military ethos. Although harmonious civil-military relations most readily reduce friction at the defense enterprise level, it should also translate into reduced distraction for soldiers on the battlefield.

### **Human Capital**

Human capital refers to the quality of people available for military service, especially concerning their health, physical strength and endurance, and mental acuity. Scholars assert that states with larger pools of healthy, mentally and physically capable people should tend to field militaries better prepared to operate sophisticated weaponry or implement complex tactics.<sup>38</sup> This argument changes the scale of Beckley's improved management argument, extending it to address the entire population and thereby propagate it all the way into the trenches.

### **Endurance & Cohesion**

Some scholars suggest that the element of the material effectiveness equation commonly attributed to superior tactical acumen is not so much tactics, but endurance—a willingness to continue fighting despite overwhelming odds.<sup>39</sup> Three principal explanations for this phenomenon exist, including small unit loyalties derived from strong interpersonal integration, enhanced purpose imparted by national ideology, or democracy. The earliest military writings on cohesion described it in clumsy terms, describing it as an important contributor to military effectiveness on the battlefield<sup>40</sup> Subsequent academic studies provide a much more nuanced perspective,

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<sup>38</sup> Stephen Biddle and Robert Zirkle, "Technology, Civil-Military Relations, and Warfare in the Developing World," *Journal of Strategic Studies* 19, no. 2 (1996): 171-212.

<sup>39</sup> Sam Sarkesian, ed., *Combat Effectiveness: Cohesion, Stress, and the Volunteer Military* (London: Sage Publications, 1980), 20-56, 154-185; Anthony Kellett, *Combat Motivation: The Behavior of Soldiers in Battle* (Boston: Kluwer Publishing, 1982), 97-163, 319-332

<sup>40</sup> S. L. A. Marshall, *Men Against Fire: The Problem of Battle Command in Future War* (New York: William Morrow, 1947).; Edward Shils and Morris Janowitz, "Cohesion and Disintegration in the Wehrmacht in World War

distinguishing various types of cohesion as lenses to assess the effects of interpersonal dynamics in small organizations. Further evidence suggests that cohesion manifest differently based upon its orientation towards either a task to be accomplished or a social order to maintain.<sup>41</sup>

In 2014, Jasen Castillo established Cohesion Theory, compiling a set of possibility probing case studies in support of his new perspective on endurance.<sup>42</sup> Castillo's findings suggest that states exhibiting high degrees of regime control over their population and high degrees of autonomy in their armed forces enjoy higher degrees of military success. This argument is not so much that military effective units employ more skill in combat; so much as they demonstrate more heart.

## Culture

In the context of this study and the extant literature that informs it, culture refers to the collection of shared values and practices associated with a given population.<sup>43</sup> Scholars offer

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II," *Public Opinion Quarterly* 12 (1948), 280–315.; Samuel Stouffer et al., *The American Soldier: Adjustment During Army Life (Studies in Social Psychology in World War II)* vol. 1 (Oxford: Princeton University Press, 1949).

<sup>41</sup> Daniel Beal et al., "Cohesion and Performance in Groups: A Meta-Analytic Clarification of Construct Relations," *Journal of Applied Psychology* 88, no. 6 (2003): 989–1004.; Sally Carless and Caroline de Paola, "The Measurement of Cohesion in Work Teams," *Small Group Research* 31, no. 1 (2000): 71.; Albert Carron and Lawrence Brawley, "Cohesion: Conceptual and Measurement Issues," *Small Group Research* 31, no. 1 (2000): 89–106.; Milly Casey-Campbell and Martin Martens, "Sticking It All Together: A Critical Assessment of the Group Cohesion–Performance Literature," *International Journal of Management Reviews* 11, no. 2 (2009): 223–246.; Artemis Chang and Prashant Bordia, "A Multidimensional Approach to the Group Cohesion–Group Performance Relationship," *Small Group Research* 32, no. 4 (2001): 379.; François Chiochio and Hélène Essiembre, "Cohesion and Performance: A Meta-Analytic Review of Disparities between Project Teams, Production Teams, and Service Teams," *Small Group Research* 40, no. 4 (2009): 382–420.; Albert Cota et al., "The Structure of Group Cohesion," *Personality and Social Psychology Bulletin* 21, no. 6 (1995): 572–580.; Kenneth Dion, "Group Cohesion: From 'Field of Forces' to Multidimensional Construct," *Group Dynamics: Theory, Research, and Practice* 4, no. 1 (2000): 7–26.; Elizabeth Kier, "Homosexuals in the U.S. Military: Open Integration and Combat Effectiveness," *International Security* 23, no. 2 (1998): 5–39.; Brian Mullen and Carolyn Copper, "The Relation between Group Cohesiveness and Performance: An Integration," *Psychological Bulletin* 115, no. 2 (1994): 210–227.

<sup>42</sup> Jasen Castillo, *Endurance and War: The National Sources of Military Cohesion* (Stanford: Stanford University Press, 2014).

<sup>43</sup> This concept of culture, though simplified, essentially coincides with the definition set forth in the GLOBE study of 62 societies, "shared motives, values, beliefs, identities, and interpretations or meanings of significant events that result from common experiences of members of collectives and are transmitted across age generations." For

many different reasons why and how differences culture should manifest in differences in military effectiveness. For example, some suggest that the character of military organizations, including their structure, leadership, and behavior will mirror that of the society from which they come.<sup>44</sup> Others suggest that the degree to which a military organization isolates itself from its parent society will effectively limit its available support from the population it serves.<sup>45</sup> Still others argue that societal traits influence initiative, risk tolerance, information sharing, and teamwork.<sup>46</sup>

In 2004, Stephen Biddle and Stephen Long put these ideas to the test in a benchmark large-*n* study of conventional battle outcomes in the twentieth century. The authors operationalized human capital through levels of education, civil-military relations through relative propensity for *coup d'état*, and culture via predominant national religion.<sup>47</sup> Remarkably, each of these unit-level variables proved influential and did so largely at the expense of democracies influence in the model.

Now the Biddle and Long position is far from unassailable, with the one barb emanating from their own academic humility and the other, an economic challenge from the institutional school of thought.<sup>48</sup> The authors readily admitted that quantitative measures of culture are hard

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additional information, see Robert House et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004).

<sup>44</sup> Ruth Benedict, *The Chrysanthemum and the Sword: Patterns of Japanese Culture* (Boston: Houghton Mifflin, 1946).

<sup>45</sup> Stephen Biddle and Stephen Long, "Democracy and Military Effectiveness: A Deeper Look," *Journal of Conflict Resolution* 48, no. 4 (2004): 526

<sup>46</sup> Kenneth Pollack, "The Influence of Arab Culture on Arab Military Effectiveness" (PhD dissertation, Massachusetts Institute of Technology, 1996) 37–82.

<sup>47</sup> Stephen Biddle and Stephen Long, "Democracy and Military Effectiveness: A Deeper Look," *Journal of Conflict Resolution* 48, no. 4 (2004): 536.

<sup>48</sup> Michael Beckley, "Economic Development and Military Effectiveness," *The Journal of Strategic Studies* 33, no. 1 (2010): 43-79.

to come by and hoped someone would develop a more robust measure.<sup>49</sup> Until recently, their operationalization of predominant national religion represented the most judicious proxy for culture available, as it is “clearly associated with common intuitive understandings of culture; it is likely to correlate (albeit imperfectly) with more holistic formulations; and it is transparent, objectively measurable, and hence free of subjective coding bias.”<sup>50</sup> Although this early operationalization of culture provide proof of concept that culture mattered, when Michael Beckley recreated the Biddle and Long study in 2010 with a decidedly economic focus, most of the unit-level factors proved insignificant in the face of GDP per capita; as did democracy.<sup>51</sup>

## CHAPTER SUMMARY

It is little wonder that those in military, policy, and academic circles have invested such a quantity and quality of scholarship in the topic of military power. War is consequential in both principle and practice, each battle representing a costly deposit of both blood and treasure. Despite this investment, none of the available answers is sufficient, and all appear necessary. Each factor clamors for attention, representing an unhelpful theoretical discord. No one should fault scholars for plying their trade, but in our willingness to search farther and farther afield for

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<sup>49</sup> Stephen Biddle and Stephen Long, “Democracy and Military Effectiveness: A Deeper Look,” *Journal of Conflict Resolution* 48, no. 4 (2004): 536.

<sup>50</sup> Stephen Biddle and Stephen Long, “Democracy and Military Effectiveness: A Deeper Look,” *Journal of Conflict Resolution* 48, no. 4 (2004): 536.

<sup>51</sup> Jess Benhabib and Adam Przeworski, “The Political Economy of Redistribution under Democracy,” *Economic Theory* 29, no. 2 (2006): 270–291.; Adam Przeworski, Michael Alvarez and Jose Antonio Cheibub, *Democracy and Development: Political Institutions and Material Well-Being in the World* (Cambridge: Cambridge University Press, 2000), 106–117.; Nicholas Sambanis and Havard Hegre, “Sensitivity Analysis of Empirical Results on Civil War Onset,” *Journal of Conflict Resolution* 50, no. 4 (2006): 508–535.; Paul Collier and Anke Hoeffler, “Greed and Grievance in Civil Wars,” *Oxford Economic Papers* 56, no. 4 (2004): 563–595.; James Fearon and David Laitin, “Ethnicity, Insurgency, and Civil War,” *American Political Science Review* 97, no. 1 (2003): 75–90.; Risa Brooks, *Political-Military Relations and the Stability of Arab Regimes* (London: International Institute for Strategic Studies, 1998), 23–29.

answers, we lose sight of an important principle—diminishing relevance.<sup>52</sup> Strategic factors will undoubtedly manifest effects at the tactical level, but we should not let promising prospects at the highest order distract us from the influences most proximal to the fight—the tools of war and the hands that wield them.

Despite what poet, pundit, or professor may say, War is a contest of Wills—and a deadly contest at that. Scholars attempt to understand war more fully by dissecting it, categorizing it, and comparing it. Whether between states or between brothers; for king or for glory; with stone, sword, gun, or bomb—ultimately war ends only with the death of either the body or the spirit. Millennia worth of martial advances lead us to believe that war has changed in some revolutionary or evolutionary manner. Perhaps its outward character has, but its immutable nature has not; for humankind is the prime engine of war, and human resolve is what gives life and purpose to machine. Our culture informs so much of what we do in terms of our individual behavior and collective action, and we carry our culture with us everywhere we go. If we can expect to find the most influential contributors to battle on the battlefield, then we should not only look at the physical things that soldiers carry into battle but the intangible things as well—namely, their culture.

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<sup>52</sup> John Lewis Gaddis, *Landscape of History: How Historians Map the Past* (Oxford: Oxford University Press, 2004), 96.

## **CHAPTER III**

### **FROM CULTURE TO MILITARY EFFECTIVENESS**

Culture is admittedly a broad concept, covering ideas as disparate as beauty, justice, identity, and trust. Any attempt to squeeze this expansive topic into a neat little box warrants extreme care. With that said, considering cultural linkages to an existing battle-informing paradigm, specifically regime type, is useful in helping us bridge the gap between far-reaching principle and narrow practice.

In this chapter, I discuss the relationship between democracy and culture, highlighting the ways that democratic norms correlate with societally informed values and behaviors. This discussion establishes context for a theory relating culture to military effectiveness by way of soldier behavior, offering several testable hypotheses in the process. The chapter also provides some explanation of previous models and of how their measures might cooperate or conflict with culture.

#### **DEMOCRACY AND CULTURE**

Some of the earliest treatises on governance describe how different forms of government appear to reflect the values held by the governed. Notable explanations of this phenomenon appear in the classical Greek writings of Aristotle and the Enlightenment writings of Charles de Montesquieu.<sup>1</sup> These and other scholars of political culture maintain that system-level functional

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<sup>1</sup> Charles de Montesquieu, *The Spirit of the Laws* (Cambridge: Cambridge University Press, 1989 [1748]).

and resilient democratic institutions correlate highly with trends in individual-level attitudes and value orientations.<sup>2</sup>

Empirical studies into this premise conclude that a mixture of subordinate and participant orientations manifest the civic culture within which democratic governments thrive.<sup>3</sup> Decades of similar studies followed, deepening and broadening the base of scholarly support for the role of individual-level values in system-level political institutions.<sup>4</sup> In addition to the studies conducted on populations with comparatively long traditions in a their given form of government, the emergence of new democracies in Latin America, Southeast Asia, and Central Eastern Europe precipitated another wave of studies into this notion of political culture.<sup>5</sup> Nearly all of these studies conclude that mass tendencies in attitudes and value orientations at the individual-level

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<sup>2</sup> Daniel Lerner, *The Passing of Traditional Society* (New York: Free Press, 1958).; Gabriel Almond and Sidney Verba, *The Civic Culture: Political Attitudes in Five Western Democracies* (Princeton: Princeton University Press, 1963).; Harry Eckstein, *A Theory of Stable Democracy* (Princeton: Princeton University Press, 1966).

<sup>3</sup> Gabriel Almond and Sidney Verba. *The Civic Culture: Political Attitudes in Five Western Democracies* (Princeton: Princeton University Press, 1963).

<sup>4</sup> Samuel Barnes and Max Kaase et. al., *Political Action: Mass Participation in Five Western Democracies* (Beverly Hills: Sage, 1979).; Kendall Baker, Russell Dalton and Kai Hildebrandt, *Germany Transformed* (Cambridge: Harvard University Press, 1981). Robert Putnam, *Making Democracy Work: Civic Traditions in Modern Italy* (Princeton: Princeton University Press, 1993).; Hans-Dieter Klingemann and Dieter Fuchs, eds., *Beliefs in Government*, vol. 1 (Oxford: Oxford University Press, 1995).; Jan van Deth and Elinor Scarbrough, eds., *Beliefs in Government*, vol. 4 (Oxford: Oxford University Press, 1996).; Ronald Inglehart, *Modernization and Postmodernization: Cultural, Economic and Political Change in 43 Societies* (Princeton: Princeton University Press, 1997).; Susan Pharr and Robert Putnam, eds., *Disaffected Democracies* (Princeton: Princeton University Press, 2000).; Russell Dalton, *Citizen Politics: Public Opinion and Political Parties in Advanced Western Democracies*, 3rd ed. (Chatham: Chatham House, 2002).; Pippa Norris, *Democratic Phoenix: Political Activism Worldwide* (Princeton: Princeton University Press, 2002).

<sup>5</sup> James Gibson, "Mass Opposition to the Soviet Putsch of August 1991; Collective Action, Rational Choice, and Democratic Values," *American Political Science Review* 91 (1997): 671-684.; William Mishler and Richard Rose, "Political Support for Incomplete Democracies: Realist vs. Idealist Theories and Measures," *International Political Science Review* 22 no. 4 (2001): 303-320.; Michael Bratton and Robert Mattes, "Support for Democracy in Africa: Intrinsic or Instrumental?" *British Journal of Political Science* 31 (2001): 447-474.; Kenneth Newton, "Trust, Social Capital, Civil Society, and Democracy," *International Political Science Review* 22, no. 2 (2001): 201-214.; Larry Diamond and Marc Plattner, eds. *The Global Resurgence of Democracy* (Baltimore: Johns Hopkins University Press, 1993).



possess meaningful influence over the longevity and functionality of democracy at the system-level.<sup>6</sup>

It is important to note that though scholars almost unanimously accept the link between culture and regime type, the debate continues regarding any causal direction in that relationship. For example, many scholars assert that societies develop democratic values at the individual-level by abiding among functioning democratic institutions, not as a precursor to such a regime.<sup>7</sup> We do not require certainty regarding the causal relationships between culture and regime-type for the purposes of this study. Instead, it may be most beneficial to consider the two phenomena as mutually reinforcing in absence of an exogenous destabilizing influence—such as war, famine, or insurgency.

Regardless of which came first, the concomitance of culture and government is critical.<sup>8</sup> Pressing ever deeper into this relationship, civic culture scholars argue that democracy is more than a mere collection of official political institutions.<sup>9</sup> Instead, democracy is a system of principles that permeates society, concurrently influencing institutions on a national scale while also shaping the norms of people in their daily lives.<sup>10</sup> As such, highly effective democracies require people to not only demonstrate confidence in democratic political institutions but also demonstrate preferences for democratically informed civic relationships. Consequently,

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<sup>6</sup> Ronald Inglehart and Christian Welzel, *Modernization, Cultural Change, and Democracy: The Human Development Sequence* (Cambridge: Cambridge University Press, 2005), 2.

<sup>7</sup> Dankwart Rustow, “Transitions to Democracy: Toward A Dynamic Model,” *Comparative Politics* 2, no. 4 (1970): 337-363.; Robert Jackman and Ross Miller, “Social Capital and Politics,” *Annual Review of Political Science* 1 (1998): 47-73.; Edward Muller and Mitchell Seligson, “Civic Culture and Democracy: The Question of Causal Relationships,” *American Political Science Review* 88, no.3 (1994): 635-652.

<sup>8</sup> Heated debate over the existence, strength, or directionality of any causal relationship among culture, regime type, and economic predispositions is beyond the scope of this study. The fact that a correlative relationship exists is not.

<sup>9</sup> Crawford Macpherson, *The Life and Times of Liberal Democracy* (Oxford: Oxford University Press, 1977).; Jack Donnelly, *Human Rights and World Politics* (Boulder: Westview Press, 1993).

<sup>10</sup> Alexis de Tocqueville. *Democracy in America* (London: Fontana Press, 1994 [1837]).

democracies should manifest distinctions from non-democracies not only in their associated institutions but also in their people's behavior. Civic culture scholars note a number of different ways that democratic principles evidence at the interpersonal level, including the propensities for planning, risk acceptance, individualism, open communication, and Inclusivity. Conceptually, as these traits tend to correlate to democracy and democracies tend to win the conflicts they fight, it is worth considering how these traits might inform conflict outcomes.

### **Planning Propensity**

Democracies tend to institutionalize civil liberties and property rights, with states guaranteeing the opportunity for citizens to exert free choice both publically and privately, but making no guarantee regarding outcomes.<sup>11</sup> This stands in contrast to authoritarian regimes, where population control manifests either through coercive effects or through guarantees of long-term gain in exchange for short-term pain. As such, democratic principles favor opportunity-maximizing behavior over planning or saving behaviors. These conditions readily explain the tendency for democracies to exhibit lower Future Orientation scores (i.e. less propensity for planning) than autocracies who exhibit higher Future Orientation scores (i.e. greater propensity for planning).<sup>12</sup> Although intuitively higher degrees of planning should benefit states, extant theory asserts that western democratic culture tends to produce beneficial battle outcomes.

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<sup>11</sup> Ronald Inglehart and Christian Welzel, *Modernization, Cultural Change, and Democracy: The Human Development Sequence* (Cambridge: Cambridge University Press, 2005), 6.

<sup>12</sup>Future Orientation is a *Cultural Dimension*, or measurement of a societally informed value or practice, in the GLOBE study of 62 societies. Although discussed in detail in Chapter 4 of this study, Future Orientation is the degree "to which individuals in organizations or societies engage in future-orientated behaviors such as planning, investing in the future, and delaying individual or collective gratification." For more information see, Robert House et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 282-342.

*Hypothesis 1a: States with lower propensity for Planning should tend to experience positive battlefield outcomes.*

### **Risk Aversion**

Another societal trait associated with democracy is that they tend to reward voluntary associations and cooperative action with enhanced social capital.<sup>13</sup> This positive condition leverages an intrinsic cost for non-cooperation or breach of trust with their fellow citizens. Consequently, this environment inherently increases the likelihood of participative solutions to complex problems and reduces distraction stemming from environments of mistrust. These conditions readily explain the tendency for democracies to exhibit lower Uncertainty Avoidance scores (i.e. less aversion to risk) than autocracies who exhibit higher Uncertainty Avoidance scores (i.e. greater aversion to risk).<sup>14</sup> On the battlefield, lower degrees of Risk Aversion likely manifests in prudent risk-taking behavior and improved options generation.

*Hypothesis 1b: States with lower propensity for Risk Aversion should tend to experience positive battlefield outcomes.*

### **Collective Deference**

Democracies tend to enfranchise members as individual contributors to collective decision, simultaneously demanding a high level of personal responsibility from each citizen

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<sup>13</sup> Pippa Norris, *Democratic Phoenix: Political Activism Worldwide* (Princeton: Princeton University Press, 2002).; Michel Crozier, Samuel Huntington and Joji Watanuki, *The Crisis of Democracy* (New York: New York University Press, 1975).; Margret Levi and L. Stoker, "Political Trust and Trustworthiness," *Annual Review of Political Science* 3 (2000): 475-507.; Bo Rothstein, "Trust, Social Dilemmas and Collective Memories," *Journal of Theoretical Politics* 12, no. 4 (2000): 477-501.

<sup>14</sup> Uncertainty Avoidance is a *Cultural Dimension*, or measurement of a societally informed value or practice, in the GLOBE study of 62 societies. Although discussed in detail in Chapter 4 of this study, Uncertainty Avoidance is the extent "to which members of a society seek certainty in their environment by relying on established social norms, rituals, and bureaucratic practices." For more information see, Robert House et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 603-653.

while diffusing the consequences of failure.<sup>15</sup> This enhances individual initiative and autonomy, maintaining personal purpose even in participative enterprises. Put another way, higher levels of individualism do not necessarily lead to isolation, but instead, reduce the likelihood that individual members of a team will delay necessary action while awaiting confirmation from some communal or corporate source of authority. These conditions readily explain the tendency for democracies to exhibit lower In-Group Collectivism scores (i.e. less deference paid to collective decision-making) than autocracies who exhibit higher In-Group Collectivism scores (i.e. greater deference paid to collective decision-making).<sup>16</sup> On the battlefield, lower degrees of Collective Deference likely manifest in maneuvers of higher complexity and faster overall response times to dynamic operational conditions.

*Hypothesis 1c: States with lower propensity for Collective Deference should tend to experience positive battlefield outcomes.*

### **Communication Impedance**

Along similar lines, democracies tend to manifest values and behaviors that enhance public life, strengthen social ties, and encourage community engagement.<sup>17</sup> This reduces barriers to social interaction and improves collegial communication. These conditions readily explain the tendency for democracies to exhibit lower Power Distance scores (i.e. less societal impedance to communication) than autocracies who exhibit higher In-Group Collectivism scores (i.e. greater

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<sup>15</sup> Ronald Inglehart and Christian Welzel, *Modernization, Cultural Change, and Democracy: The Human Development Sequence* (Cambridge: Cambridge University Press, 2005), 6.

<sup>16</sup> In-group Collectivism is a *Cultural Dimension*, or measurement of a societally informed value or practice, in the GLOBE study of 62 societies. Although discussed in detail in Chapter 4 of this study, In-group Collectivism is the degree “to which individuals express pride, loyalty, and cohesiveness in their organizations or families.” For more information see, Robert House et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 438-512.

<sup>17</sup> Daniel Bell, *Communitarianism and Its Critics* (Oxford: Clarendon Press, 1993).; Amitai Etzioni, *The New Golden Rule: Community and Morality in a Democratic Society* (New York: Basic Books, 1996).

societal impedance to communication).<sup>18</sup> On the battlefield, lower degrees of Communication Impedance likely manifests in improved decision-making, because of enhanced information flow and options generation.

*Hypothesis 1d: States with lower propensity for Communication Impedance should tend to experience positive battlefield outcomes.*

## **Inclusivity**

Lastly, democracies tend to prioritize emancipative ideals, valuing civic autonomy over state authority, human diversity over group conformity, and individual expression over collective discipline.<sup>19</sup> These conditions enhance the intrinsic value of individuals as individuals, leading to a more inclusive society and readily explaining the tendency for democracies to exhibit higher Gender Egalitarianism scores (i.e. greater societal Inclusivity) than autocracies who exhibit lower Gender Egalitarianism scores (i.e. lower societal Inclusivity).<sup>20</sup> The manner in which higher societal Inclusivity likely manifests on the battlefield represents a meaningful conceptual challenge, but should allow for larger formations by virtue of access to expanded resources (i.e. mixed-gender forces).<sup>21</sup>

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<sup>18</sup> Power Distance is a *Cultural Dimension*, or measurement of a societally informed value or practice, in the GLOBE study of 62 societies. Although discussed in detail in Chapter 4 of this study, Power Distance is the degree “to which members of a society expect and agree that power should be stratified and concentrated at higher levels of an organization or government.” For more information see, Robert House et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 513-563.

<sup>19</sup> Ronald Inglehart and Christian Welzel, *Modernization, Cultural Change, and Democracy: The Human Development Sequence* (Cambridge: Cambridge University Press, 2005), 7.

<sup>20</sup> Gender Egalitarianism is a *Cultural Dimension*, or measurement of a societally informed value or practice, in the GLOBE study of 62 societies. Although discussed in detail in Chapter 4 of this study, Gender Egalitarianism is the degree “to which a society minimizes gender role differences while promoting gender equality.” For more information see, Robert House et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 343-394.

<sup>21</sup> Although the ways that Gender Egalitarianism influences battlefield effectiveness are not readily apparent, extant theory asserts that western democratic culture tends to produce beneficial battle outcomes and measures of Gender Egalitarianism and Democracy are highly correlative.

*Hypothesis 1e: States with higher propensity for Inclusivity should tend to experience positive battlefield outcomes.*

## **CULTURE AND MILITARY EFFECTIVENESS**

Long before sophisticated quantitative methodologies revealed significant shortcomings in the material school's ability to explain battlefield outcomes, military theorists intuitively sought to expand their concepts of military power beyond tallying things. They knew this expanded concept needed to account for not only the quantity and quality of a state's military materiel, but also for how well employed those forces are on the field of battle. The preponderance of this tactics-related scholarship tends to be qualitative in nature, drawing broad conclusions about the most beneficial battlefield behaviors or best practices from historiographic case studies. Influential literature on the topic spans from antiquity to the modern era, gleaning insight from military theorists and practitioners alike, including Sun Tzu, Alexander the Great, Hannibal, Julius Caesar, Khalid ibn al-Walid, Genghis Khan, Antoine Jomini, Carl von Clausewitz, Alfred Mahan, and many others. Scholarship from this early period of the tactics school is responsible for developing the logical underpinnings for battle, war, and warfare. Although the logic is not always abundantly clear to the un-indoctrinated, it all makes sense to the practitioner. Battle is bloody, and war is Hell. The tactical school bids scholars and policy-makers toe into the trenches alongside scared boys with guns and salty men with scars. The theories that come from the tactical school and its causal mechanisms are not as sanitary as the material-centric views. It has taken thousands of years for quantitative methods to step in and add rigor to the weights and measures of tactical influence, but the thick descriptions of this period of scholarship are deep, and the logic is rich.

## **Principles of War**

The deep descriptive nature of this part of the literature finds commonality across different environments and experiences, coalescing into a number of persistent themes or principles. Although the terms used to describe these principles varied by author and era, their content remains impressively consistent. Nine of the most persistent principles of war include:

- 1) Mass, to concentrate combat power at the decisive place and time
- 2) Objective, to direct every military operation towards a clearly defined, decisive, and attainable goal
- 3) Offensive, to seize, retain, and exploit the initiative
- 4) Surprise, to strike the enemy at a time, at a place, or in a manner for which he is unprepared
- 5) Economy of Force, to allocate minimum essential combat power to secondary efforts
- 6) Maneuver, to place the enemy in a position of disadvantage through the flexible application of combat power
- 7) Unity of Command, to ensure unity of effort under one responsible commander for every discrete objective
- 8) Security, to deny the enemy any unexpected advantage
- 9) Simplicity, to develop uncomplicated plans and issue clear and concise orders to ensure thorough understanding.

These principles codified the effects commanders should seek to achieve with whatever resources they had available. The nine core concepts represented a tactical lexicon with which to describe success and failure. Military historians might attribute one commander's loss to an inability to achieve mass given sprawling formations while attributing another's victory to exceptional application of economy of force.

## **Tactics and Technology**

Punctuating continuity in these principle-inspired tactical goals, rapid developments in the technological context of war often require a commensurate adjustment in tactical approaches. For example, introduction of the Mesopotamian phalanx, Swiss pikemen, the English longbow, horse-drawn artillery, the rifle, machine gun, the tank, and the airplane each required commanders to modify the way they applied the aforementioned principles. Advances in martial

technology such as these did not change the nature of warfare, but rather its character. Such changes usually manifest as a temporary shift of inherent advantage to the early adopter of a particular weapon system—at least until both sides became proficient at this technique, thereby restoring martial equilibrium. In the case of the phalanx, the soldiers' interlocking shield and spear formation multiplied defensibility of each participating soldier. A non-phalanx army, facing off against a phalanx army, would adopt tactical approaches very different from those if it were facing a like force.

In a different example, the longbow greatly improved the lethality of English archers by virtue of its dramatically extended range, tipping advantage in their favor. At the battle of Agincourt, French commanders should have adopted different tactical approaches in response to reach of the English longbow, but failure to do so resulted in horrific losses on the part of the French. The machine gun and tank represent a problem-solution duo that manifest during the same war, whereby the overwhelmingly lethal machine gun necessitated development of an overwhelmingly protective response, the tank.

Consequently, tactics need not always respond to changes in technology, but may actually inform them as well. During the Cold War, military equipment developers in the United States knew Soviet doctrine and the preferred tactics therein extremely well. Late 20th Century Soviet doctrine represented cruel efficiency, but also rigid movement timelines down well-known maneuver corridors. This knowledge led American military planners to identify second echelon forces as the critical element of the Soviet formation to defeat—doing so would disrupt the advance of following echelons and deny critical support to preceding ones. Armed with this understanding of preferred Soviet tactics and the preferred US tactics to beat them, the American military-industrial complex produced four revolutionary pieces of equipment—the M1A1



Abrams Main Battle Tank, the M2A2 Bradley Infantry Fighting Vehicle, the AH-64 Apache Attack Helicopter, and the M270 Multiple Launch Rocket System (or MLRS). In this case, investments in military materiel and subsequent revision of tactical doctrine developed from a deeper understanding of how an enemy was to fight.

### **Tactics and Politics**

As with technology, changes in the political context of war also often require a commensurate adjustment in tactical approaches. Two examples of developments in the political context that elicited broad changes in tactics include the introduction of the professional Roman Legion and the French concept of *Levée en Masse*. These developments influenced actions in combat in similar fashion as changes in technology, but they also changed tactics on a grander scale. The Legion represented a professional standing army, dedicated to the task of fighting and winning its sovereign's wars. This societal investment in a warrior class tended to enhance each soldier's lethality, defensibility, and the complexity of maneuvers available to their commander. Overall, standing professional forces were more capable of achieving the goals outlined in the principles of war with reduced effort. The *Levée en Masse* concept infused the core of professional French soldiers with a massive conscript force upon demand. Although conscripted forces could not manifest the same principled effect with the same ease as professional forces, they effectively changed the scale of war dramatically. In this sense, quantity has a quality all its own.

### **Levels of War**

In addition to providing a way to describe the kinds of universal effects commanders seek to achieve on the battlefield, the tactics school also effectively established the three-tiered Levels of War concept we have today—comprising the strategic, the operational, and the tactical.

Military strategists, or grand tacticians, preceding the Franco-Prussian war tended to focus on the pursuit of Decisive Battle or a singular engagement in which one side might so soundly defeat the other that the defeated sovereign would surrender the war. Such phenomena occurred often in pre-Napoleonic wars between small-scale private armies, as at that scale battle effectively was war. However, during the Franco-Prussian War, the scale, scope, and complexity of war swelled, forcing the concept of Decisive Battle to give way to the idea of Operational Art, or the sequencing of tactical actions in time, space, and purpose to achieve the military end state and thereby the national political aim.<sup>22</sup> As such, the politics of war differentiated themselves from the blood of battle, and operations (or campaigning) bridged the gap between the two.

The strategic level of war represents the highest division of capability and capacity to wage war. Consequently, this level focuses predominantly on establishing and resourcing national policy as it relates directly to the outcome of war as a whole. It is here that the sovereign, or strategist, wields all of the familiar elements of national power—diplomatic, informational, economic, and military. At the strategic level of war, the military focuses on its interrelationship with the other elements of national power, seeking to define the *military end state* or the point at which the military element of power is no longer required for the state to pursue the sovereign's strategic intent or national political aim.<sup>23</sup> The sovereign's strategy centers on pursuing present actions that set conditions for future advantage. As the strategic level of war encompasses the whole of effort, within this study the terms war and strategy refer principally to the strategic level of war.

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<sup>22</sup> For more information, see Edward Luttwak, "The Operational Level of War," *International Security* (Winter 1980): 61–79.; William Lind, "The Operational Art," *Marine Corps Gazette*, April 1988, 45–47.; David Glantz, "The Nature of Soviet Operational Art," *Parameters* (Spring 1985): 2–12.; Vasilli Savkin, *The Basic Principles of Operational Art and Tactics (A Soviet View)*, trans. (Washington, D.C.: Government Printing Office, 1974).; Roger Jaroch, "MAGTFs and the Operational Level of War," *Marine Corps Gazette*, July 1989, 61–65.

<sup>23</sup> Allan R. Millett and Williamson Murray, "Lessons of War," *The National Interest*, 1988, no. 14: 83–95.

The operational level of war represents an intermediate division of capability and capacity to wage war. It is here that the commander, or operational artist, wields primarily the military element of national power. The operational level stands in the gap, linking strategic aim to battlefield actions and balancing desired ends, preferred ways, and available means as discussed later in this chapter. In this way, the operational level of war is the vital linking mechanism between the strategic intent in war and tactical actions on a battlefield. As the operational level of war stands in the conceptual gap between war as a whole and battle, within this study, the terms campaign and operation refer principally to the operational level of war.

The tactical level of war represents the lowest division of capability and capacity to wage war. It is here that a military commander, or tactician, wields only a subdivision or unit of the military element of national power. At the tactical level of war, the military focuses on the actions required in one battle to create advantage in the next, usually while in direct contact with the enemy or within range of enemy weapon effects. However, combat is not an end in itself, but a way to achieve the strategic military end state by way of accomplishing sequenced operational objectives. As the tactical level of war focuses on the immediacy of the fighting and the dying, within this study the terms battle and combat refer solely to the tactical level of war.

On the surface, the levels of war explain the physical scale of armed conflict at various political and functional echelons. However, the levels of war also help distinguish the temporal scope of combat at different echelons as well. At the strategic level, sovereigns may pursue positions of future advantage in years or even decades yet to come. The time horizon at the operational level of war may sequence events over a span of months or seasons. At the tactical level of war, the nature of battles and engagements mark time in measures of sunrises or heartbeats. Additionally, at the operational level, the events that occur early alter the realm of the

possible for the rest of the campaign. In this way, battle may not be as decisive as it once was, but its influence is no less fundamental.

### **Military Effectiveness**

For thousands of years, the qualitative nature of the tactics literature frustrated those searching for universal applicability as the glaring differences in political and technical contexts made such claims difficult to justify. In response to these frustrations and armed with the latest in quantitative methods, some scholars have attempted to add rigor to the discourse on tactics and military power.<sup>24</sup> Studies in this new wave of tactical school literature tend to quantify a state's relative tactical acumen by translating the principles of war into objective measures such as frontage, depth, and speed of advance. Other studies have taken a more direct approach, subjectively coding observations in terms of the principles in a more direct manner such as surprise, initiative, or favorability of terrain. A number of recent international relations studies suggest that a state's strategy, doctrine, and force employment each have decisive effects on combat outcomes. Scholarship from this latest period of the tactics school leverages quantitative methods to add rigor to the weights and measures of tactical influence. New studies translate the rich logic from millennia of qualitative discourse on the topic, benefitting greatly from new large-*n* datasets. Though many of the concepts forwarded by the tactics school represent more art than science, scholars continually seek to operationalize the data to capture the essence of their logic.

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<sup>24</sup> Ralph Rotte and Christoph M. Schmidt, "On the Production of Victory: Empirical Determinants of Battlefield Success in Modern War," *Defence and Peace Economics* 14/ 3 (June 2003), 175–92; Ivan Arreguin-Toft, *How the Weak Win Wars: A Theory of Asymmetric Conflict* (Cambridge: CUP 2005); Allan C. Stam, *Win, Lose, or Draw: Domestic Politics and the Crucible of War* (Ann Arbor, MI: Univ. of Michigan Press 1996); John J. Mearsheimer, *Conventional Deterrence* (Ithaca, NY: Cornell UP 1983).

For example, Stephen Biddle argues that military commanders who employ their forces in a very specific way are more likely to experience positive battle outcomes than those who do not—even against materially superior foes. Biddle calls this very specific way the *Modern System*, a recipe for success comprising tactical cover, concealment, dispersion, suppression, small-unit independent maneuver, and combined arms maneuver, in addition to operational depth, reserves, and differential concentration.<sup>25</sup> Biddle's work goes to great lengths to capture the essence of tactics in objective measures—a task easier said than done as most of the aforementioned principals reflect unique relationships in a very dynamic environment.

Another critical contributor to the quantitative study of tactics and battle, Colonel Trevor N. Dupuy's influential models and writings focus on the less tangible factors of combat, including morale, leadership, and training.<sup>26</sup> Dupuy's work receives some criticism for its mixture of objective and subjective measures, but in part, it is for this reason that his work is so meaningful for the discourse. The topic of warfare rarely receives appropriately rigorous intellectual attention. This occurs largely because the practitioners, who know the subject best, tend not to be scholars. Consequently, the scholars who know academic rigor best tend to avoid the gritty subject of warfare, favoring instead the aggregate study of war. Colonel Dupuy's work stands in that gap. He is perhaps a chief exemplar of the practitioner and scholar, trying to translate his intimate knowledge of military matters into academic terms while applying his academic rigor to chaotic battle.

Regardless of how objective or subjective research design may be, the inescapable argument made by all of these studies is that in the measure of military power, tactics modifies

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<sup>25</sup> Stephen Biddle, *Military Power: Explaining Victory and Defeat in Modern Battle* (Princeton: Princeton University Press, 2004).

<sup>26</sup> Trevor Dupuy, *Numbers, Predictions, and War* (Fairfax: Hero Books, 1985), 45-46.

materials—both positively and negatively. In other words, what you have is important, but how you use what you have is more so. Similarly, just because you have a trove of superior equipment, does not mean you know how to use it effectively. As such, the term Military Effectiveness now appears in the literature, referring to the relative ease with which a state translates military material into positive battlefield outcomes.

It is important to note that the concept of military effectiveness does not refute any of the other schools of thought on military power, but rather expands them. The challenge scholars often face when exploring the role of tactics or battlefield behavior is the lack of available cross-sectional data. As such, analysts find it difficult to articulate the actions of commanders and their soldiers for theoretical or practical reasons. This means that modelers must treat the influence of tactics on battlefield outcomes as otherwise equal and/or subsumed into the influence of their remaining variables. For example, when Realists describe the actions of states in a structural way they presume that the benefit-maximizing behavior of states will lead them to adopt functionally similar sets of military tactics to modify their military materiel.<sup>27</sup> As such, traditional concepts of military power do not disregard military effectiveness, but by not assigning it a causal role in military power, they do subsume its influence within measures of military materiel.

## **CULTURE IN CONTEXT**

Although the principle argument forwarded by this study is that culture is an important factor in military effectiveness, there is no claim that it is the only influence. A number of theoretically relevant variables remain and must be included too for this model to be comprehensive. As such, a description of the other factors considered in this model follows.

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<sup>27</sup> Kenneth Waltz, *Theory of International Politics* (New York: Random House, 1979), 127.

## **Material Quantity**

Just because an idea is old does not mean it is wrong. Plenty of empirical and anecdotal evidence exists supporting the role of things in battlefield outcomes. In conceptual partnership with the Material Quality argument, sometimes quantity has a quality all its own. Regardless, quantitatively superior forces should represent both an increased capacity to produce combat effects and an increased capability to execute complicated maneuvers.

*Hypothesis 2: States with the preponderance of personnel should tend to experience positive battlefield outcomes.*

## **Material Quality**

Qualitatively superior forces should amplify the combat effects of its soldiers and extend their capability to execute complicated maneuvers. During the twentieth century, conventional ground combat largely reflected a combined arms approach. Combined arms warfare integrates the effects of a ground maneuver force (usually infantry and/or armor), a ground fires force (i.e. artillery), and an aerial fires force (i.e. ground attack aircraft).<sup>28</sup>

*Hypothesis 3a: States with the preponderance of Tanks should tend to experience positive battlefield outcomes.*

*Hypothesis 3b: States with the preponderance of ground attack Aircraft should tend to experience positive battlefield outcomes.*

*Hypothesis 3c: States with the preponderance of Artillery should tend to experience positive battlefield outcomes.*

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<sup>28</sup> Some theorists include non-technological factors, including terrain, unit frontage, and other weapons beyond tanks, artillery, and aircraft. For more information, see: Stephen Biddle, "Rebuilding the Foundations of Offense-Defense Theory," *Journal of Politics* 63, no. 3 (2001): 741-774. The focus of this literature tends to be on technology alone, see: Sean Lynn-Jones, "Offense-Defense Theory and its Critics," *Security Studies* 4, no. 4 (1995): 666-667.

**Regime Type**

Empirically, democracies tend to win the wars they fight. Theoretically, for similar reasons, they should tend to win the battles they fight as well.

*Hypothesis 4: States with greater levels of democracy should tend to experience positive battlefield outcomes.*

**Economic Development**

Empirically, states with highly developed economies tend to win the wars they fight. Theoretically, for similar reasons, they should tend to win the battles they fight as well.

*Hypothesis 5: States with greater levels of economic development should tend to experience positive battlefield outcomes.*

**Education**

Increasingly during the twentieth century, conventional ground combat equipment incorporated the use of sophisticated electronics and computer systems in support of long-range communication, intelligence collection, and targeting. Superiorly educated forces should be more capable of employing technically sophisticated equipment and more capable of executing complicated maneuvers.

*Hypothesis 6: States with greater levels of education should tend to experience positive battlefield outcomes.*

**Civil –Military Relations**

Military forces maintaining a positive and stable relationship with their civil institutions should represent both an increased capacity to produce combat effects and an increased capability to execute complicated maneuvers. Negative and/or unstable civil-military



relationships increase political barriers to meaningful force generation, reducing resource allocation for military training, readiness, and modernization during times of peace and limiting material support during times of conflict. Consequently, positive and stable civil-military relationships reduce political barriers to meaningful force generation, improving resource allocation for military training, readiness, and modernization during times of peace and material support during times of conflict.

*Hypothesis 7: States with greater stability in their civil-military relationship should tend to experience positive battlefield outcomes.*

## **CHAPTER SUMMARY**

The record shows that democracies tend to win the wars they fight and scholars have evidence that democratic norms manifest at the interpersonal level for the people living within democratic societies. This basic relationship underscores the logic for why culture makes so much sense as a potential influence on battle outcomes. Looking deeper, studies in cultural anthropology and cultural psychology provide improved academic rigor and a more meaningful appreciation for the relationships between societies and their values, beliefs, and behaviors. Conceptualizing battle as a mixture of what you have and how you use it, culture provides a new way to approach the content on how military materials are used. Until recently, data capable of contributing to the exploration of cultural relationships such as these were not available—but now they are.

## CHAPTER IV

### DATA & OPERATIONALIZATION

Quantitative methodologies provide a number of strategic advantages in academic pursuits, especially during periods of theory generation or plausibility probing. Statistical analysis tends to benefit from improved claims to external validity and more structured treatments of chance. However, such approaches often suffer from a lack of available data. This was exactly the case in 2004 when Stephen Biddle and Stephen Long first posited that culture likely influenced battlefield outcomes—appropriate data just was not available at the time for them to incorporate into their statistical models.<sup>1</sup>

This study maintains continuity with extant literature by testing its proposed hypotheses using the same data from previous studies into the effects material, institutional, and unit-level factors have on military performance.<sup>2</sup> The intent is to arrive at an improved understanding of military power in a deliberate and iterative way. This should provide the greatest possible contribution to our understanding of military power with the smallest and most explicit disruptions in the extant literature's research design. Such an approach should minimize design bias in favor of this study's hypotheses and improve the reader's ability to follow the logic linking meaningful conclusions to specific changes in the models over time.<sup>3</sup> Therefore, except for the creation of culture-related, all of the data used in this study comes from the works of

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<sup>1</sup> Stephen Biddle and Stephen Long, "Democracy and Military Effectiveness: A Deeper Look," *Journal of Conflict Resolution* 48, no. 4 (2004): 526.

<sup>2</sup> Dan Reiter and Allan Stam. *Democracies at War* (Princeton: Princeton University Press, 2002), Ch. 3.; Stephen Biddle and Stephen Long, "Democracy and Military Effectiveness: A Deeper Look," *Journal of Conflict Resolution* 48, no. 4 (2004): 525-546.

<sup>3</sup> Gary King, "Publication, Publication," *Political Science and Politics* 39, no. 1 (2006), 119–126.

Biddle and Long (2004) and Beckley (2010), which represent the latest quantitative studies on the determinants of military effectiveness.

In this chapter, I describe the data sources used within this study to support quantitative analysis, both extant sources and novel ones. The principle family of data sources comes from the foundational work of Stephen Biddle and Stephen Long, including the data regarding battles and material factors (Combat Database 1990), polity (Polity III Dataset), and education (Cross-National Time Series Dataset). Additional data regarding Gross Domestic Product per Capita (Maddison Dataset) comes from Michael Beckley's work, which consequently built upon Biddle and Long.<sup>4</sup> The novel data that enables the introduction of rigor into our discussions of culture and military power is the advent of the GLOBE study of 62 societies.

## **BIDDLE & LONG DATASETS**

In 2004, Stephen Biddle and Stephen Long published their groundbreaking large-*n* quantitative study on the determinants of military effectiveness, exploring whether or not extant explanations for success in war also informed success in battle. Perhaps more fundamental an accomplishment than their actual conclusions was the impressive, and heretofore unmatched, collection of data the two scholars collected to test. As such, Biddle and Long found an appropriate core database of battles, including commensurate descriptive data on chronology, geography, participants, and even many material factors associated with each side. To this, the scholars added data on regime type, education, and stability in civil-military relations. Descriptions of these foundational sources appear below.

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<sup>4</sup> Angus Maddison, "Historical Statistics, World Population, GDP and Per Capita GDP, 1–2003 AD"

### **Data Base of Battles-Version 1990 (CDB90)**

The Data Base of Battles-Version 1990 (often referred to as CDB90 or by the originating agency's name, HERO (Historical Evaluation and Research Organization)) is the largest and most comprehensive quantitative dataset of ground combat activities available, spanning military engagements from 1600 to 1990.<sup>5</sup> The U.S. Army commissioned this compilation of combat-related data from the organization established by Colonel Trevor N. Dupuy in support of new advances in modeling and simulations, but also in recognition that other sources of combat data were neither sufficiently detailed nor systematically organized. The original database from 1984 includes 600 records, each representing a single discrete battle with both a synopsis of events and over 80 variables that capture contextual information about attacker, defender, and environmental attributes.

The scale of the CDB90 dataset and its reliance upon a highly varied historical record, leave it vulnerable to error.<sup>6</sup> Recognizing this, the Army extensively reviewed and modified the dataset since its original publication. In 1986 and again in 1987, the Army corrected errors discovered in a 1984 dataset review conducted by the U.S. Army's War College Military History Institute, Center for Military History, Combat Studies Institute, and Military Academy Department of History.<sup>7</sup> These agencies reviewed the accuracy of 159 values within eight

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<sup>5</sup> Robert Helmbold, *A Compilation of Data on Rates of Advance in Land Combat Operations: CAA-RP-90-04*, (Bethesda, MD: U.S. Army Concepts Analysis Agency, 1990).

<sup>6</sup> For more detailed information in the shortcomings and mitigation techniques associated with the CDB90 dataset, see Stephen Biddle, *Military Power: Explaining Victory and Defeat in Modern Battle* (Princeton: Princeton University Press, 2004).

<sup>7</sup> CHASE, *Combat History Analysis Study Effort (CHASE): Progress Report for the Period August 1984-June 1985*, CAA-TP-86-2 (Bethesda, MD: U.S. Army Concepts Analysis Agency, 1986).; Trevor Dupuy, *Analysis of Factors that Have Influenced Outcomes of Battles and Wars, vol. 1*, CAASR-84-6 (Dunn Loring, VA: Historical Evaluation and Research Organization, 1984).; John Mearsheimer, "Assessing the Conventional Balance: The 3:1 Rule and Its Critics," *International Security* 13, no. 4 (1989): 65-67.; Joshua Epstein, "The 3:1 Rule, the Adaptive Dynamic Model, and the Future of Security Studies," *International Security* 13, no. 4 (1989): 90-127.; Michael Desch, "Democracy and Victory: Why Regime Type Hardly Matters," *International Security* 27, no. 2 (2002): 5-47. References used in the Biddle and Long's spot checks included Sir James Edmonds, *Military Operations, France*

randomly selected battles, finding a greater than 67% error rate among the checked entries. The Army corrected all known errors prior to the release of Version 1990, but the size of the dataset and the varied nature of supporting historical documentation make identification and elimination of all inconsistencies impractical. In particular, different historical accounts often describe units and events in different ways; often for reasons no more substantial than the historian's implicit counting rule or tacit definition of the unit of significance.

This study employs a version of the CDB90 dataset modified by Drs. Stephen Biddle and Stephen Long to overcome additional challenges to analysis.<sup>8</sup> The first modification to the original database eliminated a number of redundant entries based upon a formal review conducted by the Institute for Defense Analyses (IDA) in 1997. The IDA review focused on the 20<sup>th</sup>-century records (419 of the original 600 records) and found that the dataset accounted for approximately 11% of the battles more than once. On occasion, the dataset accounted for a battle initially as the largest formation engaged and then again for each of the subunits associated with that largest parent formation. Removal of the identified redundant subunit records retains 382 distinct battle records available for analysis.<sup>9</sup> The second modification to the dataset included spot checks of individual data entries to assess the reliability of remaining data. During these

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*and Belgium, 1918* (London: MacMillan, 1935).; L.F. Ellis, *Victory in the West, vol. 1, The Battle of Normandy* (London: Her Majesty's Stationery Office, 1962).; Martin Blumenson, *Breakout and Pursuit*, Washington, DC: U.S. Army Office of the Chief of Military History, 1961.; I. S. O. Playfair, *The Mediterranean and Middle East*, vol. 3 (London: Her Majesty's Stationery Office, 1960).; David Glantz, *From the Don to the Dnepr* (London: Frank Cass, 1991).

<sup>8</sup> For a more detailed information, see Robert Helmbold, *A Compilation of Data on Rates of Advance in Land Combat Operations, CAA-RP-90-04* (Bethesda, MD: U.S. Army Concepts Analysis Agency, 1990). The CDB90 dataset comprises battles from the Russo-Japanese War, the Balkan War, two World Wars, the Russo-Polish War, the Spanish Civil War, five Arab-Israeli wars, the Korean War, and the Vietnam War. For additional information regarding battle selection in CDB90 see Stephen Biddle, *Military Power: Explaining Victory and Defeat in Modern Battle* (Princeton, NJ: Princeton University Press, 2004), Ch. 8.

<sup>9</sup> Missing data elements reduce the usable  $n$  for the regression analyses below to 193. This number of viable observations is 30 fewer than the number of viable records available to Biddle and Long or Beckley, as the GLOBE Study of 62 Societies does not have cultural data for North Korea, Iraq, Jordan, or Syria.

checks, six variable values required correction, reflecting values differing from pertinent official historical records by more than 20%.

Notwithstanding considerable time and effort invested to improve this battle-related dataset, coding errors persist. Beyond errors in the information actually accounted for in the data, questions remain concerning information absent from the records. In particular, the Historical Evaluation and Research Organization's selection criteria for military actions included and excluded from the dataset is imprecise. Equally troubling is how unsophisticated is the measurement of military equipment, merely tallying individual items within a given category without regard to technical specifications or performance. Regardless, the CDB90 dataset represents the most comprehensive data available to explore the influences on battle, as distinct from war; and is an established fixture within both military theory and scholarly literature.

Acceptance of likely residual measurement error in the CDB90 dataset's does not challenge reasonable desires for improved accuracy, but rather puts measurement error's risk in proper theoretical context. First, there is no reasonable expectation for any of the remaining measurement errors to correlate with any of the variables used in this study. Second, remaining measurement errors likely increase estimated standard errors, reducing opportunities to find statistically significant results while having no reason to expect bias in estimated coefficients. These conditions actually increase the chance of missing true relationships without increasing the chance of finding spurious ones. Consequently, this increases the substantive importance of null findings but means that statistically significant relationship remains noteworthy. Like all large- $n$  datasets in International Relations, the CDB90 data is imperfect, but it remains a reasonable and powerful point of departure for empirical analysis.

### **The Polity III Project**

The Polity III Project is a comprehensive longitudinal national data series listing authority characteristics for 177 nations (20 historical and 157 contemporary as of 1990) in support of comparative, quantitative analysis.<sup>10</sup> The dataset compiles qualities of democratic and autocratic authority in national governing institutions into a spectrum of regime types, distinguishing regime authority in terms of executive recruitment, executive authority, and political competition. This spectrum of regime types spans from fully institutionalized autocracies to fully institutionalized democracies and includes intermediate forms of mixed authority, or “anocracies.” The Polity III Project operationalizes regime authority on a 21-point scale ranging from -10 (hereditary monarchy) to +10 (consolidated democracy); or “autocracies” (-10 to -6), “anocracies” (-5 to +5 and the three special values: -66, -77, and -88), and “democracies” (+6 to +10). The Inter-university Consortium for Political and Social Research curates the complete Polity III Project dataset, limiting access to member institutions. However, specific elements of Polity III data sometimes appear integrated into other more accessible datasets.

### **Cross-National Time-Series (CNTS)**

The Cross-National Time-Series (often referred to as CNTS or by the principal investigator’s name, “Banks”) is a comprehensive longitudinal national data series listing international and national data facts for 167 nations.<sup>11</sup> The dataset compiles information from a variety of references including sources as varied as the Statesman Year Book, the United Nations Yearbook, and the New York Times. The Cross-National Time-Series Data Archive includes

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<sup>10</sup> Monty Marshall and Keith Jagers, “Polity IV Project: Political Regime Characteristics and Transitions, 1800-2002”

<sup>11</sup> Arthur Banks, “Cross-National Time Series, 1815-1973”

variables across a number of demographic, social, political, and economic areas, including Population, Industry, Labor, Military, Government Revenue and Expenditure, Education, Domestic Conflict, International Status, Income, Communications, Elections, Legislation, Trade, Energy, Literacy, Health Care, Urbanization, Transportation, and Politics. Cases in the data collection represent nation-year observations. The Inter-university Consortium for Political and Social Research curates the complete CNTS dataset, limiting access to member institutions. However, specific elements of Banks data sometimes appear integrated into other more accessible datasets.

## **BECKLEY DATASET**

In 2010, Michael Beckley published a subsequent large-*n* quantitative study on the determinants of military effectiveness. In his work, Beckley noted that Biddle and Long's study failed to address whether or not measures of economic development also influence battlefield outcomes. Consequently, Beckley found appropriate economic development data in the 2007 Angus Maddison study, entitled "Historical Statistics, World Population, GDP and Per Capita GDP, 1–2003 AD" and modified the data to fit into the existing Biddle and Long dataset.<sup>12</sup>

## **The Maddison Project**

The Maddison-Project is a consortium of academic professionals and colleagues of the late Dr. Angus Maddison, who continue his lifelong research into the measurement of economic performance in the world economy. The principle measure used in the Maddison dataset is per-capita Gross Domestic Product, cataloged by state on a yearly basis from establishment to present. Although the Maddison-Project team continually updates the dataset as new information

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<sup>12</sup> Angus Maddison, "Historical Statistics, World Population, GDP and Per Capita GDP, 1–2003 AD"



becomes available, the data used in this study mirrors that used by Michael Beckley in his 2010 article to maintain continuity with the extant literature.

## **CULTURE DATASET**

The obstacle dreaded by all researchers in their pursuit of knowledge is a lack of available data. In 2004, Stephen Biddle and Stephen Long encountered just such an obstacle. In their original work, Biddle and Long addressed culture as a unit-level variable, asserting culture offered a refined way to assess democratic and non-democratic influences on the way people behaved in battle.<sup>13</sup> In order to test their culture-related hypotheses, the authors incorporated the best available large-*n* data on culture they had available to fit into their battle-related dataset. Consequently, the two claimed that culture likely did influence battlefield outcomes based on the pair-wise comparison of predominant national religions of each battle's participant. Since then, scholars have published studies in cultural anthropology and cultural psychology, enabling a great deal of scholarship in need of just such data on culture.

## **Global Leadership and Organizational Behavior Effectiveness (GLOBE)**

The Global Leadership and Organizational Behavior Effectiveness Study of 62 Societies is one of the largest and most comprehensive cross-cultural anthropological studies in the world that examines the interrelationships between societal culture, organizational culture and practices, and organizational leadership. Conceived of and led by Dr. Robert House of the Wharton School of the University of Pennsylvania from 1993 to 2003, the core study involved nearly 200 researchers in 62 countries around the world. The GLOBE Project's international

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<sup>13</sup> Stephen Biddle and Stephen Long, "Democracy and Military Effectiveness: A Deeper Look," *Journal of Conflict Resolution* 48, no. 4 (2004): 525-546.

team collected data from 17,300 middle managers in 951 organizations, ultimately testing 27 distinct research hypotheses.

The overarching goal of the GLOBE Project is to “develop an empirically based theory to describe, understand, and predict the impact of cultural variables on leadership and organizational processes and the effectiveness of these processes.”<sup>14</sup> Although the consortium of GLOBE researchers developed their instruments to observe cultural influences under business conditions, their cultural dimension score dataset is useful across a broad range of theoretical contexts. Moreover, the cultural dimension dataset is highly compatible, both conceptually and physically, with existing large-*n* battle-related datasets.

In terms of academic heritage, the GLOBE study builds on an important conceptual foundation established by noted cultural anthropologists and cross-cultural psychologists as Clyde Kluckhohn, Fred Strodbeck, Milton Rokeach, Geert Hofstede, Shalom Schwartz, P.B. Smith, and Ronald Inglehart.<sup>15</sup> Their collective line of inquiry established a values-based language for describing differences in observable beliefs, attitudes, and behaviors—initially at the individual level and eventually at the societal level.<sup>16</sup> Hofstede established an important quantitative benchmark for this cultural lexicon in his landmark 1980 study. At that time, Hofstede identified four principle dimensions of cultural variation: power distance,

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<sup>14</sup> Robert House et al., *Cultural Influences on Leadership and Organizations: Advances in Global Leadership*, vol. 1. (Stanford, CT: JAI Press, 1999), 2.

<sup>15</sup> C. Kluckhohn and F. Strodbeck, *Variations in Value Orientations* (Evanston, IL: Row, Peterson, 1961).; M. Rokeach, *The Nature of Human Values* (New York: The Free Press, 1973).; Geert Hofstede, *Culture's Consequences: International Differences in Work-Related Values* (Thousand Oaks, CA: Sage, 2001).; S. H. Schwartz, “Universals in the Content and Structure of Values: Theoretical Advances and Empirical Tests in 20 Countries,” in vol. 25 of *Advances in Experimental Social Psychology*, ed. M. P. Zanna (San Diego: Academic Press, 1992), 1-65.; P.B. Smith and M.F. Peterson, “Beyond Value Comparisons: Sources Used to Give Meaning to Management Work Events in Twenty-Nine Countries” (paper presented at the annual meeting of the Academy of Management, Vancouver, Canada, August 1995).; Ronald Inglehart, *Modernization and Post-Modernization: Cultural, Economic, and Political Change in 43 Societies* (Princeton, NJ: Princeton University Press, 1997).

<sup>16</sup> Robert House et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), Ch. 5.

individualism, masculinity, and uncertainty avoidance. In 1994, Schwartz extended the taxonomy of human values from the individual-level to the society-level to identify variation across cultural lines, identifying seven ecological dimensions: Embeddedness (previously labeled Conservatism), Intellectual Autonomy, Affective Autonomy, Hierarch, Egalitarianism, Mastery, and Harmony.<sup>17</sup>

GLOBE researchers operationalize culture as practice scores and value scores (scored 1-7) for nine distinct dimensions (Future Orientation, Uncertainty Avoidance, In-Group-Collectivism, Institutional-Collectivism, Power Distance, Gender Egalitarianism, Performance Orientation, Assertiveness Quotient, and Humane Orientation). Brief explanations of each dimension and their conceptual heritage appear below:<sup>18</sup>

Future Orientation is the degree “to which individuals in organizations or societies engage in future-orientated behaviors such as planning, investing in the future, and delaying individual or collective gratification.”<sup>19</sup> This dimension developed from the Past, Present, Future Orientation literature of Kluckhohn and Strodtbeck, and the Long-Term Orientation literature of Hofstede.<sup>20</sup> Within this study, Future Orientation scores function as a measure of Planning Propensity in military organizations.

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<sup>17</sup> Shalom Schwartz, “Are There Universals in the Content and Structure of Values?” *Journal of Social Issues* 50 (1994): 19-45.; Shalom Schwartz and Gila Melech, “National Differences in Micro and Macro Worry: Social, Economic and Cultural Explanations,” in *Culture and Subjective Well-Being*, eds. Ed Diener and Eunkook Suh (Cambridge, MA: MIT Press, 2000), 219-256.

<sup>18</sup> Thom Wolf, review of *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies*, by Robert House, et al., *Journal of Applied Christian Leadership* 1, no. 1 (2006): 55-71.

<sup>19</sup> Robert House, et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 282-342

<sup>20</sup> Florence Kluckhohn and Fred Strodtbeck, *Variations in Value Orientations* (Oxford, England: Row, Peterson, 1961).; Geert Hofstede, *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Nations* (Thousand Oaks, CA: Sage, 2001).

Uncertainty Avoidance is the extent “to which members of a society seek certainty in their environment by relying on established social norms, rituals, and bureaucratic practices.”<sup>21</sup>

This dimension developed from the Uncertainty Avoidance literature of Geert Hofstede, Richard Cyert, and James March.<sup>22</sup> Within this study, Uncertainty Avoidance scores function as a measure of Risk Aversion in military organizations.

In-group Collectivism is the degree “to which individuals express pride, loyalty, and cohesiveness in their organizations or families.”<sup>23</sup> This dimension developed from the Individualism literature of Harry Triandis.<sup>24</sup> Within this study, In-group Collectivism scores function as a measure of Collective Deference in military organizations.

Power Distance is the degree “to which members of a society expect and agree that power should be stratified and concentrated at higher levels of an organization or government.”<sup>25</sup> This dimension developed from the Power Distance literature of Mauk Mulder and Geert Hofstede.<sup>26</sup> Within this study, Power Distance scores function as a measure of Communication Impedance in military organizations.

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<sup>21</sup> Robert House, et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 602-653

<sup>22</sup> Geert Hofstede, “Culture and Organizations,” *International Studies of Management & Organization* 10, no. 4 (1980): 15-41.; Richard Cyert and James March, *A Behavioral Theory of the Firm* (New York: Prentice-Hall, 1963).

<sup>23</sup> Robert House, et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 437-512

<sup>24</sup> Harry Triandis, *Individualism & Collectivism* (Boulder: Westview Press, 1995).

<sup>25</sup> Robert House, et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 513-563.

<sup>26</sup> Mauk Mulder, “Power Equalization through Participation,” *Administrative Science Quarterly* 16, no. 1 (1971): 31-38.; Geert Hofstede, “Culture and Organizations,” *International Studies of Management & Organization* 10, no. 4 (1980): 15-41.

Gender Egalitarianism is the degree “to which a society minimizes gender role differences while promoting gender equality.”<sup>27</sup> This dimension developed from the Masculinity literature of Hofstede.<sup>28</sup> Within this study, Gender Egalitarianism scores function as a measure of Inclusivity in military organizations.

The following cultural dimensions do not demonstrate a meaningful statistical relationship with regime-type and are therefore not formally part of this study. With that said, future research may find their incorporation in quantitative or qualitative models to be useful. As such, I provide their associated information as well.

Assertiveness is the degree “to which members of a society are assertive, confrontational, or aggressive in social relationships.”<sup>29</sup> This dimension also developed from the Masculinity literature of Hofstede.<sup>30</sup> Although one would think that Assertiveness should play a role in battlefield behavior, it does not vary systematically with regime type and, therefore, does not play a formal role in this study.

Performance Orientation behaviors is the degree “to which an organization or society encourages and rewards members for performance improvement and excellence.”<sup>31</sup> This dimension developed from the Achievement literature of McClelland.<sup>32</sup> Although one would

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<sup>27</sup> Robert House, et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 343-394

<sup>28</sup> Geert Hofstede, “Culture and Organizations,” *International Studies of Management & Organization* 10, no. 4 (1980): 15-41.

<sup>29</sup> Robert House, et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 394-436.

<sup>30</sup> Geert Hofstede, “Culture and Organizations,” *International Studies of Management & Organization* 10, no. 4 (1980): 15-41.

<sup>31</sup> Robert House, et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 239-281.

<sup>32</sup> David McClelland, *The Achieving Society* (New York: The Free Press, 1961).

think that Performance Orientation should play a role in battlefield behavior, it does not vary systematically with regime type and, therefore, does not play a formal role in this study.

Institutional Collectivism is the degree “to which organizational and societal institutional practices encourage and reward the collective distribution of resources and collective action.”<sup>33</sup> This dimension owes its concept to In-Group Collectivism but is otherwise unique to the House literature. Although one might think that Institutional Collectivism should play a role in battlefield behavior, it does not vary systematically with regime type and, therefore, does not play a formal role in this study.

Humane Orientation is the degree “to which members of a society encourage and reward individuals for being fair, altruistic, friendly, generous, caring, and kind to others.”<sup>34</sup> This dimension developed from Human Nature as Good vs. Human Nature as Bad literature of Kluckhohn and Stodtbeck, the Civic Society literature of Putman, and the Affiliative Motive literature of McClelland.<sup>35</sup> Although one might think that Humane Orientation should play a role in battlefield behavior, it does not vary systematically with regime type and, therefore, does not play a formal role in this study.

Each of the cultural dimensions mentioned above reflects a family of values and practices informed by those values, with the scores conceptually representing the strength of the identified effect. For example, a society with an Uncertainty Avoidance score of 7 would be highly risk averse while one with a score of 1 would be highly accepting of risk. Similarly, a society with a

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<sup>33</sup> Robert House, et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 437-512.

<sup>34</sup> Robert House, et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 564-601

<sup>35</sup> Florence Kluckhohn and Fred Stodtbeck, *Variations in Value Orientations* (Oxford, England: Row, Peterson, 1961).; Robert Putnam, *Making Democracy Work: Civic Traditions in Modern Italy* (Princeton, N.J.: Princeton University Press, 1993).; David McClelland, *Human Motivation* (Glenview, IL: Scott Foresman, 1985).

Power Distance score of 7 would be highly stratified while one with a score of 1 would be highly collegial. As the minimum and maximum scores actually recorded during the study vary from dimension to dimension, it is not possible to make absolute statements about the meaning of a particular score value without putting into context with other observations. As such, the explanatory power of the dataset rests in the ability to compare values across theoretically relevant categories.

## **VARIABLE OPERATIONALIZATION**

Data, except in cases requiring purely descriptive statistics, rarely exists in exactly the state required for analysis. As such, analysts must modify, or operationalize, the raw data into a format whose form and logic correspond to the statistical model in use. Operationalization essentially bridges the conceptual gap between phenomena and data, linking observable numbers or relationships to theoretically important concepts. The following section explains the operationalization for the principle dependent variable, as well as the independent variables associated with material, institutional, unit-level, and cultural factors of interest.

### **Dependent Variable**

Loss-Exchange Ratio (LER): the LER is calculated value, representing the attacker's casualties divided by defender's casualties (see Figure 1). This metric maintains a simple and straightforward logic, appearing consistently in previous battle-related studies on military effectiveness.<sup>36</sup> The LER value is essentially a measure of battlefield efficiency or the relative

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<sup>36</sup> Stephen Biddle and Stephen Long, "Democracy and Military Effectiveness: A Deeper Look," *Journal of Conflict Resolution* 48, no. 4 (2004): 525-546.; Stephen Biddle, *Military Power: Explaining Victory and Defeat in Modern Battle* (Princeton: Princeton University Press, 2004), 38-48.; Michael Beckley, "Economic Development and Military Effectiveness," *The Journal of Strategic Studies* 33, no. 1 (2010): 43-79.

acumen with which one commander consumes the other commander's military resources while concurrently preserving their own resources. This approach does carry with it a certain value-laden quality, presuming that a given commander is both aware of and attuned to care about the loss of their soldiers. However, analysts need not overburden the LER value in their interpretation, fully acknowledging both the high prices paid in blood for a given piece of ground and the militaries who supplant material quality with sheer quantities of people. Put another way, a beneficial LER value is no more representative of a commander achieving the intended aim in battle than a detrimental value is for a commander failing to achieve it. However, battlefield efficiency is an important measure of military effectiveness at the tactical level and is informative of effectiveness at higher echelons of conflict.

Figure 1. Dependent Variable Operationalization

$$\text{Loss Exchange Ratio} = \frac{\text{Attacker's Casualties}}{\text{Defender's Casualties}}$$

Beyond this, the LER value has several other inherent benefits. First, it is both scalable and scale independent. In other words, analysts can calculate a LER value for a distinct period of battle, for the full battle, or even an entire war. The LER value also naturally controls for the overall size of the units engaged in battle, eliminating much of the covariance associated with the size of a combat action. Second, the LER value provides a discrete, continuous variable that allows analysts to interpret as theory guides. Third, the LER value does not depend upon any subjective, posthoc coding (e.g. 'win/lose/draw', attainment of lofty political aims, seizure of distant territories, or the ever-shifting reference point of historical significance) as part of its



calculation process.<sup>37</sup> Fourth, the LER value inherently accounts for the magnitude of the casualties exchanged, retaining much of the actual variance in the data. Fifth, extant scholarship suggests that LER values coincide well with qualitative assessments of effectiveness.<sup>38</sup>

The operationalization of the LER value assumes a perspective of the attacker, resulting in an attacker-focused interpretation as well. A LER value of “1” represents a single attacker death for every single defender death, or a 1:1 Loss Exchange Ratio, an equitable outcome for both attacker and defender. A LER value of “0.5” represents a single attacker death for every two defender deaths, or a 1:2 Loss Exchange Ratio, a positive outcome for the attacker and a negative outcome for the defender. A LER value of “0.5” represents two attacker deaths for every single defender deaths, or a 2:1 Loss Exchange Ratio, a negative outcome for the attacker and a positive outcome for the defender. Consequently, smaller LER values coincide with greater battlefield efficiency for the attacker, while larger numbers coincide with greater efficiency for the defender. This means that within the statistical models appearing in previous studies, negative coefficients represented beneficial effects for the attacker and positive coefficients represent beneficial effects for the defender.

This study remains consistent with previous quantitative studies by modifying the LER value through a logarithmic function, creating the new LER\_log value. The LER\_log transformation reduces skew in the LER value, aids in interpretation, and improves the overall fit

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<sup>37</sup> For instance, the literature varies greatly on who won the Vietnam War, depending on the criteria and time periods used. See examples in Herbert Schandler, *America in Vietnam: The War That Couldn't Be Won* (New York: Rowman & Littlefield, 2011). Harry Summers, *On Strategy: A Critical Analysis of the Vietnam War* (New York: Random House, 1995).; Marc Jason Gilbert, *Why the North Won the Vietnam War* (New York: Palgrave Macmillan, 2002).; Robert Owens, *America Won the Vietnam War!* (New York: Xulon Press, 2004).; Mark Woodruff and James Jones, *Unheralded Victory: The Defeat of the Viet Cong and the North Vietnamese Army, 1961-1973* (New York: Random House, 2005).;

<sup>38</sup> Trevor Dupuy, *Numbers, Predictions, and War* (Fairfax: Hero Books, 1985), 45-46.; Stephen Biddle, “Explaining Military Outcomes.” in *Creating Military Power: The Sources of Military Effectiveness*, ed. Risa Brooks (Stanford: Stanford University Press, 2007), 213-214.

of the statistical model. It is important to note that all of the beneficial characteristics of the basic LER calculation hold true even after the logarithmic function is been applied. That said, the logarithmic function aids in interpretation by adjusting the mean from '1' to '0.' This means that negative LER\_log values and negative coefficients represent beneficial outcome and effects for the attacker while positive LER\_log values and positive coefficients represent beneficial outcome and effects for the defender. The one challenge in the LER\_log value as compared to the unmodified LER value is that basic interpretation is not as intuitive, often requiring a values table to help translate the variable's numerical value back into a common ratio. Although this extra step does require a bit more effort, it does not detract from the overall benefits of the modification.

The other way the logarithmic function benefits analysis is by actually improving the overall fit of the model. This phenomenon occurs because battlefield efficiency appears to be less sensitive to contributing factors the more they contribute. In other words, the independent variables theoretically associated with battlefield efficiency present diminishing returns at higher levels. This is likely some function of mortality in the dependent variable, whereby one commander can neither kill more soldiers than the enemy commander commits to the battle, nor kill any individual soldier more than once. Either way, the diminishing results effect is part of the battlefield efficiency model and modifying the LER value through logarithmic function better accounts for it.

Despite efforts to maintain consistency with previous statistical models, I do depart from the extant literature in a noticeable way. Specifically, I modified the LER\_log value further by multiplying it by  $-1$ , creating the new LER\_logM value. This modification effectively reverses the sign of the dependent variable and coefficients for each independent variable, greatly aiding

readers in their interpretation of the data without disrupting any of the coefficient values. Consequently, unlike previous studies, positive coefficients now represent beneficial effects to the attacker's battlefield efficiency while negative coefficients represent detrimental effects.<sup>39</sup>

### **Independent Variables**

The independent variables that follow represent the theory-informed, expected influences on battlefield efficiency. As the LER\_logM dependent variable inherently measures a relationship between the attacker and the defender, each of the contributing independent variables identified below also represents a relationship between battle participants. In other words, none of the independent variable used in this study refer to an attacker's condition or a defender's condition in isolation; all are reflections of their combined condition or relationship. For example, all independent variables used in this study (except for Civil-Military Relationship (CMR)) follow the same proportionality equation (see Figure 2). Each is a calculated value, dividing the attacker's contribution by the attacker and defender's total contribution.

Figure 2. Typical Independent Variable Operationalization

$$\text{Independent Variable Value} = \frac{\text{Attacker's Value}}{(\text{Attacker's Value} + \text{Defender's Value})}$$

This approach has many benefits and some notable drawbacks. The principle benefits mirror those described previously for the Loss Exchange Ratio value; including scalability, scale independence, discrete, continuous, and objective. As with the unmodified LER value, parity is a

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<sup>39</sup> All reproductions of models from the extant literature (i.e. from Biddle and Long, and from Beckley) employ the same LER\_logM transformation of the dependent variable to maintain consistency across models and aid in their comparison.

value of '0.5,' with the attacker's relative contribution increasing as the value approaches '1.0' and the defender's relative contribution increasing as the value approaches '0.0'. Unlike the dependent variable, more is not always better and less is not always worse when considering the relative benefit or detriment to battlefield efficiency offered by a particular variable. As will be explained in the chapter on statistical tests and findings, some variables suggest that possessing less of some traits can actually coincide with greater battlefield efficiency. The important concept to remember is that positive coefficients represent beneficial effects, and negative coefficients represent detrimental effects for the attacker's battlefield efficiency. Put another way, positive coefficients mean the attacker is killing more defenders for each soldier lost and negative coefficients mean that the defender is killing more attacker for each soldier lost.

The proportionality operationalization used for the independent variables is an important mathematical departure from the unmodified LER value (attacker casualties / defender casualties) as it divides the attacker's value by the combined attacker's and defender's value. This process retains many viable observations that would be otherwise lost under conditions where the defender's value is '0.' An example of this might be a battle where the attacker fielded '10' tanks and the defender fielded '0.' An operationalization that did not combine the attacker's and defender's tank contributions to the battle would result in a missing value and be excluded from analysis due to the technical error (equation divided by '0'). It does, however, maintain the logic necessary to reflect an overall value of '0' for a variable when both attacker and defender contributions are '0.'

The principle drawback to measuring the variables in such relational terms is the loss of any relationship with the absolute. Put another way, each independent variable measures the relative difference between participants, revealing how distinct or indistinct one is from the

other. This peculiarity, though seemingly technical in nature, is very important to highlight because it informs our basic appreciation of each variable. Fundamentally, this approach highlights the magnitude by which the attacking commander is advantaged or disadvantaged in a given factor when compared to the defender. This means that, if we want to evaluate a state's contribution to the fight in an absolute sense, we must refer to the original source data for that observation. Perhaps the largest theoretical drawback is that operationalizing independent variables in this way subsumes any influence selection effect may have on the part of the attacker or defender into proportional calculation. Selection effects, whether they manifest out of conscious participant choice or geographical proximity, may very well determine the pairing of battle belligerents. Despite these challenges, none of which are catastrophic, the proportional operationalization used to calculate independent variables remains the most effective transformation of the available raw data at the time.

### Material Factors

Independent variables from the material school of thought focus on resources, accounting for the quantity and quality of the tools of war. The statistical analysis in the next chapter employs four such variables, focusing on the people, tanks, planes, and artillery fielded by the participating forces. As described before, I use a proportional operationalization, dividing the attacker's contribution of the military material resource by the combined attacker and defender quantity of that same material resource.

This analysis uses the same data as previous studies but departs from their research design in a theoretically meaningful way. Biddle and Long (and consequently Beckley) used a prevalence operationalization in their approach to tanks, aircraft, and field artillery. This prevalence calculation divided the total number of attacker and defender tanks/aircraft/artillery

present in the battle by the total number of attacker and defender troops present in the battle. The authors' stated intent was to be able to address the character of the battles in their analysis, be they tank-heavy battles, air-craft-heavy, or artillery-heavy engagements.<sup>40</sup> Neither Biddle and Long, nor Beckley produced any meaningful findings regarding the character of battles or their influence on outcomes. I, however, assert that accounting for the proportionality of these material resources is both theoretically important and intuitive. The iterative statistical analysis process outlined in the next chapter offers a side-by-side comparison of the relevant statistical models as a means of contrasting the results of each given their particular variable operationalization approach. Furthermore, qualitative assessments of individual battles are likely better suited to address the conceptual topics regarding the nature or character of battle.

Personnel (PER): The attacker's fraction of the two sides' total troop strength. This variable measures the relative numerical advantage or disadvantage the attacker has in terms of soldiers on the field of battle. Personnel parity occurs at a value of 0.5, with the attacker's relative strength increasing as the value approaches 1.0 and the defender's relative strength increasing as the value approaches 0.0. Theoretically, greater battlefield efficiency should coincide with greater personnel resources.

Tank Prevalence (TNK\_P), Aircraft Prevalence (AVN\_P), and Artillery Prevalence (FAR\_P): The total tanks / aircraft / artillery engaged (on both sides) divided by total troops engaged (on both sides). Biddle and Long included these variable operationalizations in their 2004 study in efforts to highlight the character of each battle. The literature suggests that post-1900 the character of battle changes in concert with the prevalence of certain key technologies.

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<sup>40</sup> Stephen Biddle and Stephen Long, "Democracy and Military Effectiveness: A Deeper Look," *Journal of Conflict Resolution* 48, no. 4 (2004): 525-546.

Battles containing greater numbers of tanks and ground-attack-aircraft-prevalent theoretically tend to favor attackers and those containing greater numbers of artillery theoretically tend to favor the defender.

Although interesting, these prevalence-related operationalizations account for their intended phenomena in a circuitous manner. Consequently, I offer alternative operationalizations for tanks, aircraft, and field artillery in efforts to account for the role of tanks, aircraft, and artillery in battle as a function of their relationship to one another and not their relationship to the number of soldiers present is more intuitive and more consistent with the extant personnel variable. The revised variable transformations should permit each material factor to reflect its own influence instead alluding to the overall character of the battle as a tank-heavy, aircraft-heavy, or artillery-heavy event.

**Tanks (TNK):** The attacker's fraction of the two sides' total armored force strength. This variable measures the relative numerical advantage or disadvantage the attacker has in terms of tanks on the field of battle. Tank parity occurs at a value of 0.5, with the attacker's relative strength increasing as the value approaches 1.0 and the defender's relative strength increasing as the value approaches 0.0. Theoretically, greater battlefield efficiency should coincide with greater armored resources.

**Aircraft (AVN):** The attacker's fraction of the two sides' total air force strength. This variable measures the relative numerical advantage or disadvantage the attacker has in terms of ground-attack Aircraft on the field of battle. Aircraft parity occurs at a value of 0.5, with the attacker's relative strength increasing as the value approaches 1.0 and the defender's relative strength increasing as the value approaches 0.0. Theoretically, greater battlefield efficiency should coincide with greater ground-attack Aircraft resources.

Field Artillery (FAR): The attacker's fraction of the two sides' total artillery force strength. This variable measures the relative numerical advantage or disadvantage the attacker has in terms of artillery pieced on the field of battle. Artillery parity occurs at a value of 0.5, with the attacker's relative strength increasing as the value approaches 1.0 and the defender's relative strength increasing as the value approaches 0.0. Theoretically, greater battlefield efficiency should coincide with greater artillery resources.

### Institutional Factors

Independent variables from the institutional school of thought also address resources, but in a very different way. The common democracy and economic development variables used in this study mirror those used in previous studies.<sup>41</sup> Conceptually, analysts use these measures as proxies for much broader and much more nuanced phenomena than their direct value. For example, democracy variable use values accounting for the proportion of democracy scores among the participants of the battle, standing in for the myriad effects associated with democracy in the extant literature (e.g. selection effect, persistence effect, superior technology and superior human capital effect, etc...). Similarly, economic development variables use values accounting for the proportion of national financial resources among the participants of the battle, theoretically standing in for many of the same phenomena as democracy is supposed to provide. Although I assert that these institutional factors are more likely to affect battlefield outcomes through their effect on conflict at a much higher level, I incorporate their variables into this study's statistical model as a form of control. Once again, the iterative statistical analysis process

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<sup>41</sup> Stephen Biddle and Stephen Long, "Democracy and Military Effectiveness: A Deeper Look," *Journal of Conflict Resolution* 48, no. 4 (2004): 525-546.



outlined in the next chapter offers a side-by-side comparison of the relevant statistical models as a means of contrasting the results of each.

Democracy (DEM): The attacker's fraction of the two sides' total democracy score, measured by the respective Polity III "DEMOC" variable values in the year prior to the outbreak of war.<sup>42</sup> Polity parity occurs at a value of 0.5, with the attacker's relative level of democracy increasing as the value approaches 1.0 and the defender's relative level of democracy increasing as the value approaches 0.0. Theoretically, greater battlefield efficiency should coincide with greater levels of democracy.

Economy (ECD): The attacker's fraction of the two sides' total per-capita GDP, measured by the respective per-capita income values in the year prior to the battle.<sup>43</sup> Development parity occurs at a value of 0.5, with the attacker's relative level of economic development increasing as the value approaches 1.0 and the defender's relative level of economic development increasing as the value approaches 0.0. Theoretically, greater battlefield efficiency should coincide with greater levels of economic development.

### Unit-Level Factors

Independent variables from the unit-level school of thought address the more nuanced phenomena attributed to democracy and economic development in a much more direct way. The common human capital (education) and civil-military relations variables used in this study mirror

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<sup>42</sup> CNTS data lacks annual values during the World Wars. As the causal logic for institutional, unit-level, and cultural factors presumes a long-term effect instead of wartime fluctuation, Biddle and Long elected to use values immediately prior to the war, retaining much more of the available data without harming the underlying hypotheses' logic. Biddle and Long considered using a procedure for multiple random imputation, but rejected it because missing data was not randomly absent. For more on this process see: Gary King, James Honaker, Anne Joseph, and Kenneth Scheve, "Analyzing Incomplete Political Science Data: An Alternative Algorithm for Multiple Imputation," *American Political Science Review* 95, no. 1 (2001): 49-69.

<sup>43</sup> Angus Maddison, "Historical Statistics, World Population, GDP and Per Capita GDP, 1–2003 AD"

those used in previous studies.<sup>44</sup> Conceptually, the human capital variable directly accounts for an army's ability to operate and maintain technically sophisticated equipment as well as conduct complex tactical maneuvers. Civil-military relations theoretically accounts for the level of support an army receives from its national command authority during conflict and the political environment it operates within during peacetime. Although not the focus of this study, the effects these variables address remain theoretically important and should manifest in a direct way on the battlefield. Consequently, I also incorporate them into this study's statistical model as a form of control. The iterative statistical analysis process outlined in the next chapter offers a side-by-side comparison of the relevant statistical models as a means of contrasting the results of each.

Education (EDU): The attacker's fraction of the two sides' total years of primary and secondary education-per-capita in the year prior to the outbreak of war as reported in the Banks data. Parity is a value of 0.5, with the attacker's relative level of education increasing as the value approaches 1.0 and the defender's relative level of education increasing as the value approaches 0.0.

Attacker Stability (CUP\_1\_A) and Defender Stability (CUP\_1\_D): A pair of dummy variables, with the first taking a value of 1 when civil-military conditions favor the attacker (i.e. the defender had, at least one more *coup d'état* event in the 5 years prior to the war than the attacker) as reported in the Banks data. The second takes a value of 1 when civil-military conditions favor the defender (i.e. the attacker had at least one more *coup d'état* event in the 5 years prior to the war than the defender). Biddle and Long included these variable

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<sup>44</sup> Stephen Biddle and Stephen Long, "Democracy and Military Effectiveness: A Deeper Look," *Journal of Conflict Resolution* 48, no. 4 (2004): 525-546.; Michael Beckley, "Economic Development and Military Effectiveness," *The Journal of Strategic Studies* 33, no. 1 (2010): 43-79.

operationalizations in their 2004 study in efforts to highlight the character of each combatant's civil-military relationship.

As before, these operationalizations account for their intended phenomena in an interesting but circuitous manner. Consequently, I offer an alternative operationalization for the civil-military relationship in efforts to account for the role in battle as a function of their relationship to one another and not as independent conditions. The revised variable transformation should still permit each civil-military condition to reflect its own influence while also being both more intuitive and more consistent with other measures in the model.

Civil-Military Relationship (CMR): A single dummy variable, coded as “+1,” “0,” or “-1” based upon the relationship of *coup d'état* occurring in each side during the 5 years prior to the war as reported in the Banks data. The variable is coded as “+1” (advantage attacker) if the defender experienced at least one more *coup d'état* in the 5 years prior to the war than the attacker. The variable is coded as “-1” (advantage defender) if the attacker experienced at least one more *coup d'état* in the 5 years prior to the war than the defender. The variable is coded as “0” (advantage null) if either neither side experienced at least one more *coup d'état* in the 5 years prior to the war than the other or if neither side experienced *coup d'état* at all.

### Cultural Factors

In their original work, Biddle and Long addressed culture as a unit-level variable, asserting culture offered a refined way to assess democratic and non-democratic influences on the way people behaved in battle.<sup>45</sup> In order to test their culture-related hypotheses, the authors incorporated the best available large-*n* data on culture they had available to fit into their battle-

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<sup>45</sup> Stephen Biddle and Stephen Long, “Democracy and Military Effectiveness: A Deeper Look,” *Journal of Conflict Resolution* 48, no. 4 (2004): 525-546.

related dataset. Consequently, the two claimed that culture likely did influence battlefield outcomes based on the pair-wise comparison of predominant national religions of each battle's participant.

This is perhaps the most significant point of departure from the extant research in this study. I use neither the extant data nor its methodology to account for culture in my statistical model. Instead, to offer some consistency with the operationalizations used in elsewhere in the model, I calculate values for each of the five theoretically important culture variables using the proportionality approach. Each calculated cultural dimension variable value is the attacker's cultural dimension score value divided by the total attacker and defender cultural dimension scores. The iterative statistical analysis process outlined in the next chapter offers a side-by-side comparison of the relevant statistical models, including the original religion-based operationalization of culture used in previous studies, as a means of contrasting the results of each given their particular variable operationalization approach.

Culture (Original Biddle and Long operationalization): A series of seven dummy variables, representing the primary religious affiliations for each state participating in a given battle.<sup>46</sup> "Pc" denotes a state whose principal religious affiliation is Protestant or Catholic; "Bu" denotes a Buddhist, Confucian, Shintoist, or combined affiliation; "Mu" denotes a Muslim affiliation; "Je" for Jewish; and "Or" denotes Orthodox (Eastern Orthodox, Russian Orthodox, etc.). Each dummy represents a pair of states—the first two letters standing for the attacker's culture and the last two standing for the defender's. The authors drew their data from the CIA (2001) World Factbook. The seven pair of variables that represent battles in the dataset include:

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<sup>46</sup> Stephen Biddle and Stephen Long, "Democracy and Military Effectiveness: A Deeper Look," *Journal of Conflict Resolution* 48, no. 4 (2004): 536.

Protestant/Catholic versus Protestant/Catholic (PcPc), Protestant/Catholic versus Buddhist/Confucian/Shintoist (PcBu), Protestant/Catholic versus Muslim (PcMu), Orthodox versus Muslim (OrMu), Orthodox versus Buddhist/Confucian/Shintoist (OrBu), Jewish versus Muslim (JeMu), Orthodox versus Protestant/Catholic (OrPc).

Planning Propensity (VFO): The attacker's fraction of the two sides' total Future Orientation Value score as reported in the Globe data. Planning Propensity parity occurs at a value of 0.5, with the attacker's relative level of Planning Propensity increasing as the value approaches 1.0 and the defender's relative level of Planning Propensity increasing as the value approaches 0.0. According to extant theory, greater battlefield efficiency should coincide with lower levels of Planning Propensity (i.e. lower relative Future Orientation scores).

Risk Aversion (VUA): The attacker's fraction of the two sides' total Uncertainty Avoidance Value score as reported in the Globe data. Risk Aversion parity occurs at a value of 0.5, with the attacker's relative level of Risk Aversion increasing as the value approaches 1.0 and the defender's relative level of Risk Aversion increasing as the value approaches 0.0. Theoretically, greater battlefield efficiency should coincide with lower levels of Risk Aversion (i.e. lower relative Uncertainty Avoidance scores).

Collective Deference (PGC): The attacker's fraction of the two sides' total In-Group Collectivism Practice score as reported in the Globe data. Collective Deference parity occurs at a value of 0.5, with the attacker's relative level of Collective Deference increasing as the value approaches 1.0 and the defender's relative level of Collective Deference increasing as the value approaches 0.0. Theoretically, greater battlefield efficiency should coincide with lower levels of Collective Deference (i.e. lower relative In-Group Collectivism scores).

Communication Impedance (VPD): The attacker's fraction of the two sides' total Power Distance Value score as reported in the Globe data. Communication Impedance parity occurs at a value of 0.5, with the attacker's relative level of Communication Impedance increasing as the value approaches 1.0 and the defender's relative level of Communication Impedance increasing as the value approaches 0.0. Theoretically, greater battlefield efficiency should coincide with lower levels of Communication Impedance (i.e. lower relative Power Distance scores).

Inclusivity (VGE): The attacker's fraction of the two sides' total Gender Egalitarianism Value score as reported in the Globe data. Inclusivity parity occurs at a value of 0.5, with the attacker's relative level of Inclusivity increasing as the value approaches 1.0 and the defender's relative level of Inclusivity increasing as the value approaches 0.0. According to extant theory, greater battlefield efficiency should coincide with higher levels of Inclusivity (i.e. higher relative Gender Egalitarianism scores).

It is important to note that the culture variables derived from the GLOBE study data have a distinct temporal nature, specifically measuring cultural trends in the various studied societies between 1994 and 1997. This stands in contrast to the remaining variables in the model, which are come from the same period as the battles. As the large-*n* quantitative study of culture is a relatively new development, the pool of available statistical data remains fairly shallow. Consequently, the statistical models that follow will compare cultural factors measured in the mid-1990's to material, institutional, and unit-level factors far more contemporary to the battles' occurrence.

Despite the obvious conceptual drawbacks to this anachronistic approach, three practical considerations support it. First, it is the most theoretically sound and rigorously tested data available. Second, although evidence suggests cultures change the character with which they

express core values over time, consensus holds that core societal values change at a glacial pace.<sup>47</sup> Third, the degree to which cultural dimension scores from the 1990's reflect snapshots of otherwise dynamic phenomena should make statistical relationships across the decades more difficult to find—not easier. For these reasons, I maintain that the forthcoming models, though imperfect, are both adequate and appropriate for the task.

## CHAPTER SUMMARY

At this point, the components for a meaningful evaluation of culture's expected effect on battlefield outcomes are all in place. The extant literature describes a world where material factors, institutional factors, and unit-level factors all play a part. New studies cultural anthropology and cultural psychology make suggest that culture, and specifically democratic norms within cultures, likely influence interpersonal behaviors. Those same studies fill the critical culture-related gaps in the data available for rigorous study, and we have sound operationalization approaches for the variables values that come from that data. In the next chapter, I pull these critical components together into a singular battlefield efficiency model, subjecting it to statistical analysis in order to test and evaluate the validity and strength of our original hypotheses.

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<sup>47</sup> Geert Hofstede, Jan Hofstede, and Michael Minkov, *Culture and Organizations: Software of the Mind: Intercultural Cooperation and Its Importance for Survival* (New York: McGraw-Hill, 2010), 431-478.; W.H. Reinhart, *Taking Culture to the Next Level: Understanding and Using Culture at the Operational Level of War* (Newport: Naval War College, 2010), 12.; Patrick Porter, *Military Orientalism: Eastern War Through Western Eyes* (New York: Columbia University, 2009), 170.

## CHAPTER V

### STATISTICAL TESTS & FINDINGS

Statistical analysis represent a powerful tool for researchers, enabling analysts to assess the degree to which expected relationships coincide with observed phenomena. For many people, the world of statistics is daunting, filled with a confounding array of disconnected numbers, symbols, and words. Although some concepts in statistics are quite sophisticated, most are reasonably approachable. It is important to remember that statistics is not about the numbers themselves, it is about the numbers in context—it is about the data.

In this chapter, I will bring together all of the information from the previous chapters, painting a picture of what theory tells us should happen on the battlefield and comparing that to what the data tells us did happen. With the help of some common statistical tests, I will highlight where the historical record supports our expectations, where it contradicts theory, and even where history appears to remain silent. Although statistical analysis cannot prove anything, it does improve our chances of identifying meaningful relationships in the data. When taken together, multiple statistical tests essentially describe the influence each theoretical cause has on its theoretical effect. This process often reveals the direction of the effect, its magnitude, and the confidence we can have that what we see is more than mere happenstance.

After a practical discussion of the common statistical methods used in this study, I combine these tools with the data from the previous chapter to develop the most accurate statistical model of military effectiveness possible given available data. Then I use this preferred model to perform statistical hypothesis testing to either validate or invalidate our understanding of the theoretical influences on battlefield outcomes. With a model established and hypotheses



tested, I will summarize key findings from these quantitative tests as a precursor to the qualitative tests and discussions to follow.

## **STATISTICAL METHODS**

The data available and the hypotheses under review require a variety of statistical techniques to assess. In this study, I apply methods ranging from simple descriptive statistics to the more sophisticated ordinary least squares multiple linear regression and statistical hypothesis testing. The remainder of this section briefly discusses each of these methods in a conceptual way and then describes the kind of information each test can reveal in the data. Applying appropriate statistical methods to the different datasets comprising this study helps put the numbers in context. Consequently, this context adds important perspective, assisting in both analysis and interpretation of the underlying phenomena. The Appendix at the end of this study contains a more comprehensive compilation of statistics, but important highlights appear below.

### **Descriptive Statistics**

As mentioned before, statistics is not about the numbers, but about what having the numbers in context reveals. One of the most basic ways we put the numbers into context is through describing some of their basic characteristics. Descriptive statistics help us summarize the available data, including measures of both their limits and of their tendencies, such as:

- 1) The number of observations available
- 2) The highest and lowest values for a particular variable
- 3) The range, or distance, between highest and lowest values
- 4) The average (mean), middle (median), and mode (most common) values
- 5) Incomplete or missing values in the data

These particular tests may seem unsophisticated by comparison with other techniques, but that does not diminish their importance. An example from a more familiar context is

illustrative. Descriptive statistics for a hypothetical quiz-related dataset reveals 25 available observations, with an average (mean) score of 7.4, a middle (median) score of 3, and mode (most common) value of 1. This information does not likely raise any questions until one last descriptive statistic puts it all into perspective—a range (distance between highest and lowest values) of 98. Suddenly, we realize that the scores observed were marked against a 100-point scale and that only one of the participants performed exceedingly well while the other 24 participants performed quite poorly. That is unless we have additional contextual knowledge that the data does not actually record final scores, but the number of each participant's incorrect responses. Suddenly the entire context of the numbers changes and the data now suggests that only one participant performed dismally while the other 24 performed quite well.

### **Correlation**

A slightly more sophisticated technique that is also quite common is the correlation test. Correlation is the measure of relationship, specifically linear relationship, between two variables. Correlation can be positive, negative, or non-existent, and may vary in strength as well. The Pearson Product-Moment Correlation Coefficient (sometimes referred to as the PPMCC or Pearson's  $r$ -value) is a widely used statistic that assigns a value between +1 and -1 to the linear relationship between two variables. A Pearson's  $r$ -value of +1 represents a perfect positive correlation while a value of -1 represents a perfect negative correlation, and a value of 0 represents no correlation.

A perfect positive correlation means that for every 1-unit increase or decrease in the first variable, the second variable changes by 1-unit as well, each moving in the same direction at the same time. Alternatively, a perfect negative correlation reverses the direction of effect, translating a 1-unit increase in the first variable into a 1-unit decrease in the second, with each

moving in opposite directions. No correlation, or a Pearson's  $r$ -value of 0, means that for every 1-unit increase or decrease in the first variable the second variable remains either unchanged or changed without input by the first.

Depending on the number of observations used to determine the Pearson's  $r$ -value, the correlation measures may be absolute or representative of a trend. That means that some individual observations within a population may correlate positively between the two identified variables while the majority of observations correlate negatively. Such a condition would produce a generally negative Pearson's  $r$ -value, with the value approaching 0 the more often outlier observations of a positive nature occurred. Similarly, a positive Pearson's  $r$ -value will also approach 0 the more often negative outlier observations diminish otherwise positive correlative trends. This also means that under conditions of no correlation, or a Pearson's  $r$ -value of 0, reflects an equal mixture of positive and negative correlation observations, effectively canceling each other's effects in the aggregate.

Correlation is an important tool used by analysts to identify relationships, but there are a number of different ways to interpret the relationship. As with all statistical analysis, interpretation requires meaningful theoretical and practical support. In other words, a Pearson's  $r$ -value alone is insufficient to claim proof of an actual relationship, but it is indicative of some connection. Theory and logic provide the meaningfulness to that connection. Above all, correlation is not causality. For example, statistical analysis of a hypothetical dataset on rooster activity and sun position may produce a Pearson's  $r$ -value of +1, suggesting perfect positive correlation between the rooster crowing and the sun rising. This does not mean that the rooster's crow caused the sun to rise. Similarly, statistical relations can be mathematically accurate but theoretically and logically spurious. For example, analysis of a hypothetical dataset on cancer

and right-handed people may produce a perfect negative correlation, suggesting that left-handed people do not get cancer. This does not mean that being left-handed prevents cancer any more than being right-handed causes cancer. That is to say, unless meaningful theory or logic exists to support such an assertion.

A more responsible way to interpret correlation is to acknowledge the statistical relationship for what it is; an indication that the two variables have something in common, respond systematically to the same external influence or respond to one another. The Pearson's  $r$ -value adds fidelity to the relationship discussion by indicating the assessed direction of effect and magnitude of the relationship, highlighting positive and negative associations as well as weak and strong ones. Regardless of what the numbers say, analysts must use judgment to discern what the statistics likely mean.

## **Linear Regression**

Perhaps one of the most powerful tools available to the quantitative analyst is linear regression, an approach for modeling relationships between an effect, or dependent variable and one or more contributing explanations, or independent variables. This process, though more sophisticated than the tools mentioned previously, can be easy to understand with relatively minimal exposure. The term "linear" refers to the way this method allows analysts to represent the relationship between an observed effect and its theoretical explanations in the form of a linear equation. The "regression" element refers to the methods used by analysts to isolate the effects of each theoretical explanation, thereby better describing the relationships in question.

The concept of linear equation is not unfamiliar, as the Pearson's  $r$ -value is functionally a simple linear equation modeling the relationship between two variables. The important distinction in linear regression is the explicit assumption of causality or, at least, directional

influence. Put differently, the dependent variable (observed effect) is the result value of the equation and all other independent variables theoretically caused, influenced, or otherwise explained the effect. The power of linear regression is its ability to accommodate and evaluate the influence of numerous potential causal factors so long as theory and logic support it.

A multiple linear regression model accommodates the increased number of independent variables by assigning each one a coefficient, an estimated multiplier that denotes both the magnitude and direction of effect had on the dependent variable. The magnitude of effect is a function of the coefficient's relative value, with larger numbers exhibiting a greater magnitude than smaller numbers. The direction of effect is a function of the sign given to the variable's coefficient. Taken together, and informed by theory and logic, an analyst can interpret the linear model's coefficients, identifying the factors with the greatest influence and describing their effect as either adding to or taking away from the outcome.

It is important to note that linear regression models produce a line that estimates the overall relationship between the dependent variable and the independent variables. This means that, as was the case in the Pearson's  $r$ -value, that the estimated relationship line will represent a trend based on aggregate data, inherently including a number of outlier observations that do not conform (or may even contradict) the model. Linear models commonly use a fitting process, called the Ordinary Least Squares (OLS) approach, to minimize the discrepancy between the estimated relationship and each of the observations that contribute to the overall model. The OLS process commonly produces a statistic referred to as  $R$  (or one of its modified forms,  $R$  Square or Adjusted  $R$  Square), representing how closely the estimated line "fits," or accounts for, all the observed data. These  $R$  values behave in a similar fashion as the Pearson's  $r$ -value, with 0

representing a very poor fit between the model and the observed data and the fit improving as the R value approaches +1.

Table 1. Example of OLS Multiple Linear Regression

Hypothetical Child's Height Model	
R-sq	0.836
Adj R-sq	0.827
N	60
Mother Height	1.037
Father Height	-.164
Dog Height	.012
(Intercept)	.654

*Note:* Entries are OLS regression coefficients.

OLS linear regression is an admittedly involved process, but exhaustive knowledge of its inner workings are not required for the average user to appreciate this study. Again, an example from a more familiar context is illustrative. In this notional case, the dataset comes from a fabricated children's height-related study, testing how the height of occupants in a home inform resident children's height (See Table 1). OLS multiple linear regression of the hypothetical dataset produces an Adjusted R Square value of 0.827, a value that is quite close to +1, suggesting that the estimated model accounts for most (though not all) the variance observed in children's heights. Typically, the Adjusted R Square value is most appropriate for multiple linear regression models, accounting for not only the model's overall fit but also the number of variables used in achieving that fit. The theoretically informed independent variables for mother's height, father's height, and dog's height have coefficients of +1.04, -0.16, and +0.01, respectively. Without delving deeper into the theoretical underpinnings and research design for

this imitation study, we can see that both the heights of mothers and dogs positively influence the child's height. Alternatively, the heights of fathers negatively influence the child's height.

Presuming that the data accounts for these three factors using the same unit of measure, the mother variable exhibits a much larger magnitude of effect than the father variable; as does his height exhibit a much larger influence than the pet's. The last value in the equation above (+0.065) is the Constant, or Y-Intercept, is the portion of the estimated linear equation that cannot be associated with any particular independent variable. Typically, the Constant has no theoretically significant function but does perform a necessary mathematical function for the model to work appropriately. This fabricated example data provides an approachable glimpse of how interpretation of regression analysis might work, but it likely also begs a question—how confident can we be in the theoretical underpinnings of a dog's height influencing a child's height? The next set of statistical tools helps with this assessment.

### **Confidence, Significance, and Hypothesis Testing**

A statistical tool commonly used to further evaluate and interpret the influence of independent variables in linear models is an estimated parameter called a confidence interval. Analysts calculate confidence intervals using information from the observed data and assumptions based upon the mathematical principle of normal distribution. This process establishes a range of values centered on the observed mean, informing the likelihood that a particular value could appear in the data if the researchers repeated the experiment. For example, a confidence interval of 90% means that if the true value of the parameter lies outside the calculated interval, then an event has occurred which had a statistical probability of less than or equal to 10 percent. Functionally, confidence intervals help analysts identify the likelihood of

observed relationships, highlighting conditions that distinguish themselves from whatever theory and logic considers normal.

Statistical significance relates closely with confidence intervals and is an important part of statistical hypothesis testing; a tool researchers use to assess the results of multiple linear regression models. Significance tests provide a systematic way to determine whether a null hypothesis (the default statement that nothing happened) is valid or invalid.<sup>1</sup> For a researcher to reject the null hypothesis (claim something did happen), the effect must be statistically significant. In other words, the effect must be outside an appropriate confidence interval, or unlikely to have occurred due to sampling error alone.

Significance tests rely upon comparing a p-value (the probability of observing an effect given that the null hypothesis is true) to the  $\alpha$ -level (the probability of rejecting the null hypothesis given that it is true).<sup>2</sup> Analysts use their best judgment when establishing  $\alpha$ -levels, or significance thresholds, for their research. This process requires judgment because statistical analysis is inferential, or suggestive of phenomena in larger populations based upon observation of phenomena in smaller samples. This inferential nature of statistics means that all hypothesis testing will succumb to either Type I Error (detecting an effect that is not actually present) or Type II Error (failing to detect an effect that actually is present). The researcher's decision on where to draw the line for significance accounts for the quality of available data, maturity of the discourse, and risk of Type II Error (missing something that is actually there).

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<sup>1</sup> Kenneth Meier, Jeffrey Brudney and John Bohte. *Applied Statistics for Public and Nonprofit Administration*. 3rd ed. (Boston: Cengage Learning, 2011), 189–209.

<sup>2</sup> Jay Devore, *Probability and Statistics for Engineering and the Sciences*, 8th ed. (Boston: Cengage Learning, 2011), 300–344.



Quantitative studies in the social sciences commonly set initial thresholds at a confidence level of 95%, or the  $\alpha$ -level of 0.05, meaning that the conditional probability of detecting an effect that is not actually present given a valid null hypothesis (nothing happened) is 5%.<sup>3</sup> Consequently, a statistically significant result occurs when the observed p-value is less than 5%, formally written as  $p < 0.05$ .<sup>4</sup> Quantitative studies often establish a secondary confidence threshold level of 99%, or the  $\alpha$ -level of 0.01, meaning that the conditional probability of detecting an effect that is not actually present given a valid null hypothesis is only 1%.<sup>5</sup> Consequently, a highly statistically significant result occurs when the observed p-value is less than 1%, formally written as  $p < 0.01$ .<sup>6</sup> Analysts are well within their rights to establish confidence intervals lower than these conventions, especially if the research is novel or plausibility probing in nature. Doing so, however, does inherently increase the chance of Type I Error (detecting an effect that is not actually present).

Looking again at the results from the hypothetical children's height-related study (See Table 2), confidence intervals and significance testing tools add a new level of detail to the assessment. For example, although the overall model exhibited a good fit as noted in its elevated Adjusted R Square value, assessing each of the independent variables against a confidence interval of 95% or the  $\alpha$ -level of 0.05, is telling. The mother's height has a p-value of 0.000, well beyond a 99% confidence interval and significance test of  $p < 0.01$ . We can safely say that the

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<sup>3</sup> Joseph Healy, *The Essentials of Statistics: A Tool for Social Research*, 2nd ed. (Belmont: Cengage Learning, 2009), 177–205.

<sup>4</sup> Steve McKillup, *Statistics Explained: An Introductory Guide for Life Scientists*, 1st ed. (Cambridge: Cambridge University Press, 2006), 32–38.

<sup>5</sup> Joseph Healy, *The Essentials of Statistics: A Tool for Social Research*, 2nd ed. (Belmont: Cengage Learning, 2009), 177–205.

<sup>6</sup> Steve McKillup, *Statistics Explained: An Introductory Guide for Life Scientists*, 1st ed. (Cambridge: Cambridge University Press, 2006), 32–38.

sample data demonstrates a highly statistically significant relationship between a mother's height and a child's height. Despite the father's moderate magnitude of effect, his p-value of 0.16 is within our confidence interval and fails our initial significance test. Moreover, the dog's p-value of 0.78 is well within our confidence interval and fails the initial significance test too.

Consequently, we can safely say that the sample data demonstrates no statistically significant relationship between the heights of father and child or dog and child. Although this statistical test does not prove anything, it provides systematic evidence to support formal hypothesis testing.

Presuming that the hypothetical height-related study hypothesized that each of the household occupants theoretically influenced children's heights, our statistical significance tests warrant the rejection of the null hypothesis for mothers (something really did happen) and acceptance of the null hypotheses for fathers and dogs (nothing really happened).

Table 2. Example of OLS Multiple Linear Regression with p-Values

Hypothetical Child's Height Model	
R-sq	0.836
Adj R-sq	0.827
N	60
Mother Height	*** 1.037 [0.00]
Father Height	-.164 [0.16]
Dog Height	.012 [0.77]
(Intercept)	.654 [0.13]

*Note:* Entries are OLS regression coefficients with p-values in brackets.

\*\*\* p-value outside 99% Confidence Interval [ $p < 0.01$ ]

## STATISTICAL TESTS

With the practical discussion of the common statistical methods complete, in this section I combine these tools with the data from the previous chapter to describe, analyze, assess, and interpret available data. From this greater appreciation for the numbers in context, I develop the most accurate statistical model of military effectiveness possible given available data. The discussion that follows outlines the statistical analysis conducted on two distinct data sets, the principle one being the battle-related dataset, and the supporting one being a culture-related dataset. Unless specifically highlighted in the text, descriptions and commentary refer to the battle-related dataset.

### Descriptive Statistics

The battle-related dataset comprises 382 separate records, each representing a single discrete conventional battle from the twentieth century. Due to missing values, often multiple values from a single record, only 193 records are valid for statistical analysis in this study (See

Table 3).<sup>7</sup> Of the records not available for analysis, 5 are missing casualty information required to calculate the Loss Exchange Ratio value, 151 more are missing one or more values for material factors, 3 more are missing values for institutional factors, and 30 more are missing values for cultural factors. The battles excluded from analysis solely due to culture come from the Korean War and the Arab-Israeli Wars (1967, 1968, and 1973) and are missing due to the absence of data on North Korea, Jordan, and Syria in the GLOBE study.

Missing values inherently diminish the explanatory capacity of the resulting model. Replacing missing values with either novel research or deliberately calculated values represents two methodologically appropriate options for increasing available samples size. However, both choices carry with them their own set of benefits and consequences. Despite the reduction in available sample size, the remaining data retains sufficient records to represent the larger population adequately in terms of both temporal and geographical characteristics.

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<sup>7</sup> For additional information regarding skeweness and kurtosis in these data, see Table 17 in the Appendix.

Table 3. Battle-Related Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Dev	Variance
LER_logM	377	3.43	-1.71	1.72	.0919	.57415	.330
Personnel <sup>2</sup>	381	0.7401	0.2023	0.9424	0.6294	0.1473	0.0217
Tank Prevalence <sup>1</sup>	360	0.0635	0.0000	0.0635	0.0056	0.0068	0.0000
Aircraft Prevalence <sup>1</sup>	254	0.0452	0.0000	0.0452	0.0043	0.0064	0.0000
Artillery Prevalence <sup>1</sup>	327	0.0750	0.0000	0.0750	0.0082	0.0062	0.0000
Tanks <sup>3</sup>	361	1.0000	0.0000	1.0000	0.5238	0.3775	0.1425
Aircraft <sup>3</sup>	254	1.0000	0.0000	1.0000	0.5077	0.4303	0.1851
Field Artillery <sup>3</sup>	327	1.0000	0.0000	1.0000	0.6007	0.2162	0.0468
Democracy <sup>1</sup>	366	1.0000	0.0000	1.0000	0.6529	0.3786	0.1433
Economy <sup>2</sup>	362	0.8360	0.0820	0.9180	0.5778	0.1929	0.0372
Education <sup>1</sup>	370	0.7356	0.2009	0.9365	0.5475	0.1286	0.0165
Attacker Stability <sup>1</sup>	365	1.0000	0.0000	1.0000	0.0219	0.1466	0.0215
Defender Stability <sup>1</sup>	365	1.0000	0.0000	1.0000	0.0986	0.2986	0.0891
Civ-Mil Relationship <sup>3</sup>	366	2.0000	-1.0000	1.0000	0.0765	0.3386	0.1147
Prot/Cath v. Prot/Cath <sup>1</sup>	382	1	0	1	1	0.5006	0.2506
Prot/Cath v. Buddhist <sup>1</sup>	382	1	0	1	0	0.2997	0.0898
Prot/Cath v. Muslim <sup>1</sup>	382	1	0	1	0	0.1599	0.0256
Orthodox v. Muslim <sup>1</sup>	382	1	0	1	0	0.1245	0.0155
Orthodox v. Buddhist <sup>1</sup>	382	1	0	1	0	0.1245	0.0155
Jewish v. Muslim <sup>1</sup>	382	1	0	1	0	0.3406	0.1160
Orthodox v. Prot/Cath <sup>1</sup>	382	1	0	1	0	0.2522	0.0636
Planning Propensity <sup>3</sup>	330	0.1237	0.4126	0.5363	0.5024	0.0194	0.0004
Risk Aversion <sup>3</sup>	330	0.1652	0.4155	0.5808	0.5065	0.0492	0.0024
Collective Deference <sup>3</sup>	330	0.1486	0.4061	0.5547	0.4956	0.0333	0.0011
Comm Impedance <sup>3</sup>	330	0.1387	0.4564	0.5951	0.5048	0.0259	0.0007
Inclusivity <sup>3</sup>	330	0.1939	0.4030	0.5970	0.5107	0.0368	0.0014
Valid N	193						

*Sources:* Stephen Biddle and Stephen Long, "Democracy and Military Effectiveness: A Deeper Look," *Journal of Conflict Resolution* 48, no. 4 (2004): 525-546.; Michael Beckley, "Economic Development and Military Effectiveness," *The Journal of Strategic Studies* 33, no. 1 (2010): 43-79.; Robert House et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004).

<sup>1</sup> Variable from Biddle & Long (2004)

<sup>2</sup> Variable from Beckley (2010)

<sup>3</sup> Variable novel to this study (2016)

The culture-related dataset comprises 60 separate records, each representing a single discrete society from the GLOBE study (See Table 4). Of note, GLOBE data set accounts for three national entities twice, highlighting theoretically significant differences in subsets of their population. The first two, Switzerland (divided into francophone and germanophone subsets) and

South Africa (divided into Caucasian and Afrikaner subsets), are inconsequential to the battle-related analysis as they are not party to any of the recorded military engagements. The third, Germany (divided into eastern and western subsets), does influence the battle-related analysis as they are party to many of the recorded battles. I account for this distinction in the statistical analysis by using western German values for all Germany-related battles occurring on the western and southern European fronts and eastern German values for all Germany-related battles occurring on eastern European front.

Table 4. Culture-Related Descriptive Statistics

	N	Min	Max	Mean	Std. Deviation	Missing Values
Polity IV (1994-97) Average	60	-10.00	10.00	5.7625	5.99407	0
Performance Orientation Practice (PPO)	60	3.20	4.94	4.0862	.40188	0
Future Orientation Practice (PFO)	60	2.88	5.07	3.8427	.46571	0
Gender Egalitarianism Practice (PGE)	60	2.50	4.08	3.3680	.37136	0
Assertiveness Quotient Practice (PAQ)	60	3.38	4.89	4.1287	.36838	0
Institutional-Collectivism Practice (PIC)	60	3.25	5.22	4.2500	.42712	0
In-Group-Collectivism Practice (PGC)	60	3.53	6.36	5.1435	.74070	0
Power Distance Practice (PPD)	60	3.89	5.80	5.1723	.41043	0
Humane Orientation Practice (PHO)	60	3.18	5.23	4.0892	.47035	0
Uncertainty Avoidance Practice (PUA)	60	2.88	5.37	4.1595	.60916	0
Performance Orientation Value (VPO)	60	4.92	6.58	5.9443	.33571	0
Future Orientation Value (VFO)	60	4.33	6.20	5.4848	.40854	0
Gender Egalitarianism Value (VGE)	60	3.18	5.17	4.5098	.48466	0
Assertiveness Quotient Value (VAQ)	60	2.66	5.56	3.8068	.63881	0
Institutional-Collectivism Value (VIC)	60	3.83	5.65	4.7323	.49227	0
In-Group-Collectivism Value (VGC)	60	4.94	6.52	5.6725	.34939	0
Power Distance Value (VPD)	60	2.04	3.65	2.7378	.34575	0
Humane Orientation Value (VHO)	60	4.49	6.09	5.4245	.25408	0
Uncertainty Avoidance Value (VUA)	60	3.16	5.61	4.6218	.61054	0
Valid N (List wise)	60					0

Source: Derived from Robert House et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004).

## Correlation

In the search for disruptive or problematic variable relationships, applying correlative tests to the battle-related dataset reveals a general lack of correlation among the pairwise comparison of variables. Using +0.66 and -0.66 as threshold values for interest, only 3 of the 91 available variable relationships demonstrate any correlation (See Table 5). The first relationship of interest is Personnel (PER) and Artillery (FAR), sharing a positive correlation value of 0.78. Although this correlation is strong, these two variables directly account for the presence of discrete and concrete physical items on a battlefield. The correlation also passes the basic logic test, as the partnership between soldiers and artillery has a lengthy and well-established history.

Table 5. Battle-Related Correlation Matrix

DV	PER	TNK	AVN	FAR	DEM	ECD	EDU	CMR	VFO	VUA	PGC	VPD	VGE	
DV	1	.145**	-.240**	-.259**	.148**	-.195**	-.466**	-.091	-.209**	.324**	.405**	.385**	.266**	-.442**
PER	.145**	1	.349**	.142*	.779**	-.073	-.072	.015	-.208**	.356**	.326**	.276**	.215**	-.235**
TNK	-.240**	.349**	1	.458**	.283**	.063	.136*	-.077	-.225**	.203**	.174**	.272**	.015	-.022
AVN	-.259**	.142*	.458**	1	.164*	.339**	.367**	-.015	-.008	.243**	.180**	.047	.058	.256**
FAR	.148**	.779**	.283**	.164*	1	-.129*	-.136*	.063	-.306**	.373**	.333**	.329**	.201**	-.265**
DEM	-.195**	-.073	.063	.339**	-.129*	1	.685**	.355**	.228**	.300**	.317**	-.215**	.436**	.486**
ECD	-.466**	-.072	.136*	.367**	-.136*	.685**	1	.380**	.289**	-.105	-.200**	-.523**	.066	.852**
EDU	-.091	.015	-.077	-.015	.063	.355**	.380**	1	.329**	-.098	-.071	-.199**	.269**	.243**
CMR	-.209**	-.208**	-.225**	-.008	-.306**	.228**	.289**	.329**	1	-.349**	-.175**	-.414**	.075	.197**
VFO	.324**	.356**	.203**	.243**	.373**	.300**	-.105	-.098	-.349**	1	.833**	.646**	.543**	-.412**
VUA	.405**	.326**	.174**	.180**	.333**	.317**	-.200**	-.071	-.175**	.833**	1	.703**	.629**	-.503**
PGC	.385**	.276**	.272**	.047	.329**	-.215**	-.523**	-.199**	-.414**	.646**	.703**	1	.209**	-.684**
VPD	.266**	.215**	.015	.058	.201**	.436**	.066	.269**	.075	.543**	.629**	.209**	1	-.358**
VGE	-.442**	-.235**	-.022	.256**	-.265**	.486**	.852**	.243**	.197**	-.412**	-.503**	-.684**	-.358**	1

Note: Entries are Pearson's *r*-values.

\* p-value outside 90% Confidence Interval [ $p < 0.10$ ]

\*\* p-value outside 95% Confidence Interval [ $p < 0.05$ ]

\*\*\* p-value outside 99% Confidence Interval [ $p < 0.01$ ]

The second relationship of interest is Democracy (DEM) and Economy (ECD) with a positive correlation value of 0.69. Although this correlation is also strong, previous studies posit

their distinct nature and necessitate their incorporation in this model. The iterative regression analysis process outlined later in this section offers a side-by-side comparison of the relevant statistical models as a means of contrasting the results of each given their particular underlying logic and variable operationalization approach. In the final iteration, I remove the Economic Proportionality variable in a form of sensitivity test, specifically to address any theoretical implications of this correlative relationship.

The last relationship of interest is Economy (ECD) and Inclusivity Proportionality (VGE) with a positive correlation value of 0.85. This correlation statistic is admittedly high. However, it is understandable in light of the previously identified relationship between democracy and economic development. As can be seen in the culture-related correlation matrix below, the pairwise comparison of Democracy and Gender Egalitarianism (Value) has the highest Pearson's  $r$ -value of all the cultural dimensions. As such, this relationship likely mirrors the correlative relationship between democracy and economic development. As mentioned previously, I remove the Economy variable in a final iteration of the model as a sensitivity test, specifically to address any theoretical implications of this correlative relationship.

In the search for cultural traits systemically associated with western democratic culture, applying correlative tests to the culture-related dataset reveals few candidates (See Table 6). Specifically, when using +0.66 and -0.66 as threshold values for interest, only 1 of the 18 available variable relationships demonstrated any correlation (Gender Egalitarianism Value). As the specific intent of this statistical test was to find correlation, I accepted risk and reduced the threshold values to +0.33 and -0.33. Consequently, an additional 4 variable relationships demonstrated correlation (Future Orientation Value, Uncertainty Avoidance Value, In-Group Collectivism Practice, and Power Distance Value).



Table 6. Culture-Related Correlation Matrix

	Polity IV (1994-97)		Polity IV (1994-97)
Performance Orientation Practice (PPO)	-.028	Performance Orientation Value (VPO)	.030
Future Orientation Practice (PFO)	.145	Future Orientation Value (VFO)	** -.350
Gender Egalitarianism Practice (PGE)	* .264	Gender Egalitarianism Value (VGE)	** .722
Assertiveness Quotient Practice (PAQ)	.003	Assertiveness Quotient Value (VAQ)	* -.255
Institutional-Collectivism Practice (PIC)	-.145	Institutional-Collectivism Value (VIC)	-.177
In-Group-Collectivism Practice (PGC)	** -.422	In-Group-Collectivism Value (VGC)	.082
Power Distance Practice (PPD)	-.179	Power Distance Value (VPD)	** -.365
Humane Orientation Practice (PHO)	* -.311	Humane Orientation Value (VHO)	.000
Uncertainty Avoidance Practice (PUA)	.091	Uncertainty Avoidance Value (VUA)	** -.469

Note: Entries Pearson's  $r$ -values.

\* p-value outside 90% Confidence Interval [ $p < 0.10$ ]

\*\* p-value outside 95% Confidence Interval [ $p < 0.05$ ]

\*\*\* p-value outside 99% Confidence Interval [ $p < 0.01$ ]

The first relationship of interest is Democracy and Gender Egalitarianism (Value) with a positive correlation value of 0.72. Democracies do tend to prioritize emancipative ideals, valuing civic autonomy over state authority, human diversity over group conformity, and individual expression over collective discipline.<sup>8</sup> These conditions enhance the intrinsic value of individuals as individuals, leading to a more inclusive society and readily explaining the tendency for democracies to exhibit higher Gender Egalitarianism scores (i.e. greater societal Inclusivity) than autocracies who exhibit lower Gender Egalitarianism scores (i.e. lower societal Inclusivity).<sup>9</sup> The manner in which higher societal Inclusivity likely manifests on the battlefield represents a

<sup>8</sup> Ronald Inglehart and Christian Welzel, *Modernization, Cultural Change, and Democracy: The Human Development Sequence* (Cambridge: Cambridge University Press, 2005), 7.

<sup>9</sup> Gender Egalitarianism is a *Cultural Dimension*, or measurement of a societally informed value or practice, in the GLOBE study of 62 societies. Although discussed in detail in Chapter 4 of this study, Gender Egalitarianism is the degree "to which a society minimizes gender role differences while promoting gender equality." For more information see, Robert House et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 343-394.

meaningful conceptual challenge, but should allow for larger formations by virtue of access to expanded resources (i.e. mixed-gender forces).<sup>10</sup>

The second relationship of interest is Democracy and Uncertainty Avoidance Value with a negative correlation value of  $-0.47$ . Democracies do tend to reward voluntary associations and cooperative action with enhanced social capital.<sup>11</sup> This positive condition leverages an intrinsic cost for non-cooperation or breach of trust with their fellow citizens. Consequently, this environment inherently increases the likelihood of participative solutions to complex problems and reduces distraction stemming from environments of mistrust. These conditions readily explain the tendency for democracies to exhibit lower Uncertainty Avoidance scores (i.e. less aversion to risk) than autocracies who exhibit higher Uncertainty Avoidance scores (i.e. greater aversion to risk).<sup>12</sup> On the battlefield, lower degrees of Risk Aversion likely manifests in prudent risk-taking behavior and improved options generation.

The third relationship of interest is Democracy and In-Group Collectivism Practice with a negative correlation value of  $-0.42$ . Democracies do tend to enfranchise members as individual contributors to collective decision, simultaneously demanding a high level of personal responsibility from each citizen while diffusing the consequences of failure.<sup>13</sup> This enhances

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<sup>10</sup> Although the ways that Gender Egalitarianism influence battlefield effectiveness are not readily apparent, extant theory asserts that western democratic culture tends to produce beneficial battle outcomes and measures of Gender Egalitarianism and Democracy are highly correlative.

<sup>11</sup> Pippa Norris, *Democratic Phoenix: Political Activism Worldwide* (Princeton: Princeton University Press, 2002).; Michel Crozier, Samuel Huntington and Joji Watanuki, *The Crisis of Democracy* (New York: New York University Press, 1975).; Margret Levi and L. Stoker, "Political Trust and Trustworthiness," *Annual Review of Political Science* 3 (2000): 475-507.; Bo Rothstein, "Trust, Social Dilemmas and Collective Memories," *Journal of Theoretical Politics* 12, no. 4 (2000): 477-501.

<sup>12</sup> Uncertainty Avoidance is a *Cultural Dimension*, or measurement of a societally informed value or practice, in the GLOBE study of 62 societies. Although discussed in detail in Chapter 4 of this study, Uncertainty Avoidance is the extent "to which members of a society seek certainty in their environment by relying on established social norms, rituals, and bureaucratic practices." For more information see, Robert House et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 603-653.

<sup>13</sup> Ronald Inglehart and Christian Welzel, *Modernization, Cultural Change, and Democracy: The Human Development Sequence* (Cambridge: Cambridge University Press, 2005), 6.

individual initiative and autonomy, maintaining personal purpose even in participative enterprises. Put another way, higher levels of individualism do not necessarily lead to isolation, but instead, reduce the likelihood that individual members of a team will delay necessary action while awaiting confirmation from some communal or corporate source of authority. These conditions readily explain the tendency for democracies to exhibit lower In-Group Collectivism scores (i.e. less deference paid to collective decision-making) than autocracies who exhibit higher In-Group Collectivism scores (i.e. greater deference paid to collective decision-making).<sup>14</sup> On the battlefield, lower degrees of Collective Deference likely manifest in maneuvers of higher complexity and faster overall response times to dynamic operational conditions.

The fourth relationship of interest is Democracy and Power Distance Value with a negative correlation value of  $-0.37$ . Democracies do tend to manifest values and behaviors that enhance public life, strengthen social ties, and encourage community engagement.<sup>15</sup> This reduces barriers to social interaction and improves collegial communication. These conditions readily explain the tendency for democracies to exhibit lower Power Distance scores (i.e. less societal impedance to communication) than autocracies who exhibit higher In-Group Collectivism scores (i.e. greater societal impedance to communication).<sup>16</sup> On the battlefield,

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<sup>14</sup> In-group Collectivism is a *Cultural Dimension*, or measurement of a societally informed value or practice, in the GLOBE study of 62 societies. Although discussed in detail in Chapter 4 of this study, In-group Collectivism is the degree “to which individuals express pride, loyalty, and cohesiveness in their organizations or families.” For more information see, Robert House et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 438-512.

<sup>15</sup> Daniel Bell, *Communitarianism and Its Critics* (Oxford: Clarendon Press, 1993).; Amitai Etzioni, *The New Golden Rule: Community and Morality in a Democratic Society* (New York: Basic Books, 1996).

<sup>16</sup> Power Distance is a *Cultural Dimension*, or measurement of a societally informed value or practice, in the GLOBE study of 62 societies. Although discussed in detail in Chapter 4 of this study, Power Distance is the degree “to which members of a society expect and agree that power should be stratified and concentrated at higher levels of an organization or government.” For more information see, Robert House et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 513-563.

lower degrees of Communication Impedance likely manifests in improved decision-making, because of enhanced information flow and options generation.<sup>17</sup>

The fifth relationship of interest is Democracy and Future Orientation Value with a negative correlation value of  $-0.35$ . Democracies do tend to institutionalize civil liberties and property rights, with states guaranteeing the opportunity for citizens to exert free choice both publically and privately, but making no guarantee regarding outcomes.<sup>18</sup> This stands in contrast to authoritarian regimes, where population control manifests either through coercive effects or through guarantees of long-term gain in exchange for short-term pain. As such, democratic principles favor opportunity-maximizing behavior over planning or saving behaviors. These conditions readily explain the tendency for democracies to exhibit lower Future Orientation scores (i.e. less propensity for planning) than autocracies who exhibit higher Future Orientation scores (i.e. greater propensity for planning).<sup>19</sup> Although intuitively higher degrees of planning should benefit states, extant theory asserts that western democratic culture tends to produce beneficial battle outcomes.

### **Linear Regression, Confidence, Significance, and Hypothesis Testing**

The quantitative elements of this study derive their conceptual heritage from the novel work done by Stephen Biddle and Stephen Long in 2004 (herein designated Model #1), and by

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<sup>17</sup> George von Krogh and Johan Roos, *Organizational Epistemology* (New York: St. Martin's Press, 1995), 49-68; Barbara Forisha-Kovach, *The Flexible Organization: A Unique New System of Organizational Effectiveness and Success* (Englewood Cliffs, NJ: Prentice-Hall, 1984), 13-26, 75-92.

<sup>18</sup> Ronald Inglehart and Christian Welzel, *Modernization, Cultural Change, and Democracy: The Human Development Sequence* (Cambridge: Cambridge University Press, 2005), 6.

<sup>19</sup>Future Orientation is a *Cultural Dimension*, or measurement of a societally informed value or practice, in the GLOBE study of 62 societies. Although discussed in detail in Chapter 4 of this study, Future Orientation is the degree "to which individuals in organizations or societies engage in future-orientated behaviors such as planning, investing in the future, and delaying individual or collective gratification." For more information see, Robert House et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 282-342.

extension, Michael Beckley in 2010 (herein designated Model #2). In light of this heritage, I start this section by recounting the statistical results and findings from these two foundational studies. This effectively establishes a firm connection between this study to and those whom have come before.

It is important to note once again that despite efforts to maintain consistency with previous statistical models, I do depart from the extant literature in a noticeable way, modifying the dependent variable (LER\_log) by multiplying it by  $-1$ , creating the new LER\_logM value. This modification effectively reverses the sign of the dependent variable and coefficients for each independent variable, greatly aiding readers in their interpretation of the data without disrupting any of the coefficient values. Consequently, unlike previous studies, positive coefficients now represent beneficial effects to the attacker's battlefield efficiency while negative coefficients represent detrimental effects. .<sup>20</sup>

Next, I introduce two revised models, one based upon Biddle and Long's original work (Model A1) and the other on Beckley's (Model A2). This initial adaptation replaces the three equipment-based material factors and the two civil-military measures with new variable transformations. At this point, we test these modified variables in a deliberate manner and establish with a new baseline. As such, we set the necessary conditions for advancing into increasingly substantive changes regarding culture.

This third step introduces another pair of revised models (Models B1 and B2), building considerably upon the last two. This subsequent adaptation replaces legacy religion-based culture variables with dimension-based measures of culture described earlier in this section. Although

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<sup>20</sup> All reproductions of models from the extant literature (i.e. from Biddle and Long, and from Beckley) employ the same LER\_logM transformation of the dependent variable to maintain consistency across models and aid in their comparison.

methodical, this process supports the side-by-side comparison of the relevant statistical models, providing readers with a means of contrasting the results of each model. Ultimately, this approach highlights the relative influence a new variable or operationalization has on the statistical model and our subsequent understanding of military effectiveness.<sup>21</sup>

#### Biddle & Long Model #1

In 2004, the most robust battle-related model of military effectiveness tested by Biddle and Long assessed the influence of material factors (personnel, tanks, aircraft, and artillery), institutional factors (democracy alone), and unit-level factors (human capital, civil-military comity, and culture). Of note, the authors originally conceptualized culture as a result or component of western democracy. As such, they referred to their measure of culture (a cluster of religion-based nominal variables) as a unit-level factor along with measures of human capital (education proportionality) and civil-military comity (frequency of military revolt).

Statistical tests of their model reflected that, of the material factors, only Artillery Prevalence affected battle outcomes in a statistically significant way ( $p < 0.05$ ), although Personnel did approach significance with a p-value of 0.07 (See Table 7). Based on the way that Biddle and Long operationalized their material variables, this meant that attackers tended to suffer greater proportions of the overall casualties in battle as they fielded higher proportions of the soldiers involved. Furthermore, the model suggested that the more tank-heavy, aircraft-

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<sup>21</sup> Common visual and statistical methods for assessing homoscedasticity find evidence of heteroscedasticity in the residuals of all the models in this study, both extant and novel (see Figures 3 and 4 in the Appendix). The most likely source of this inefficiency is the log-linear transformation of the Loss Exchange Ratio dependent variable. Previous authors addressed this inefficiency in their model by using robust standard error values based upon the standards established by the work of Halbert Lynn White Jr. Consequently, I too employ robust standard error values to maintain a consistent methodological approach. For more information on the White method for identifying and addressing heteroscedasticity, see Halbert L. White, Jr, "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity," *Econometrica* 48, no. 4 (1980): 817–838.

heavy, and artillery-heavy the battle, the more casualties suffered by attacker in comparison to the defender.

Regarding unit-level factors, Human Capital (via measures of education) was both highly significant and a beneficial contributor to overall military effectiveness in battle. The civil-military relationship (as measured by a pair of *coup d'état*-related variables) did manifest effects in the expected direction. However, the factors was statistically significant (p-value of 0.02) for instances where the defender experienced one more *coup d'état* in the previous five years than the attacker, but no significance if the conditions were reversed.

As for culture, two of the seven religion-based culture variables (Protestant/Catholic vs. Buddhist and Jewish vs. Muslim) manifest significant beneficial effects for the attacker, with both exceeding the more stringent 0.01-level threshold. A third variable (Protestant/Catholic vs. Muslim) approached significance with a p-value of 0.10 but actually manifest a beneficial effect for the defender. The remaining four religion-based variables manifest a mixture of beneficial and detrimental effects, but none of them was statistically significant at even a 90% confidence interval.

This left institutional factors as the last subset to consider, of which the authors only included democracy in their model. With material, unit-level, and cultural factors accounted for separately, test results reveal a very significant (p-value < 0.01) relationship between the attacker's relative level of democracy and battlefield outcomes. As it turned out, higher degrees of democracy tended to manifest a detrimental influence on military effectiveness.

Table 7. Foundational Battlefield Effectiveness Models

	Biddle & Long (2004) Model #1	Beckley (2010) Model #2
R-sq	0.421	0.461
Adj R-sq <sup>1</sup>	0.379	0.420
N	223	223
Personnel <sup>2</sup>	* -0.51 (0.333)	-0.25 (0.327)
Tank Prevalence <sup>2</sup>	-1.68 (5.655)	-0.78 (5.467)
Aircraft Prevalence <sup>2</sup>	-3.22 (5.065)	-4.01 (4.874)
Artillery Prevalence <sup>2</sup>	** -10.70 (4.721)	* -8.10 (4.717)
Democracy <sup>2</sup>	*** -0.36 (0.140)	*** -0.72 (0.181)
Economy <sup>3</sup>		*** 1.89 (0.577)
Education <sup>2</sup>	** 1.13 (0.492)	0.26 (0.489)
Attacker Stability <sup>2</sup>	** -0.40 (0.173)	*** -0.48 (0.161)
Defender Stability <sup>2</sup>	0.15 (0.115)	*** 0.32 (0.113)
Prot/Cath v. Prot/Cath <sup>2</sup>	0.19 (0.161)	-0.08 (0.165)
Prot/Cath v. Buddhist <sup>2</sup>	*** 1.18 (0.174)	0.37 (0.304)
Prot/Cath v. Muslim <sup>2</sup>	-0.70 (0.601)	* -1.22 (0.621)
Orthodox v. Muslim <sup>2</sup>	-0.42 (0.258)	** -0.72 (0.298)
Orthodox v. Buddhist <sup>2</sup>	-0.22 (0.334)	-0.67 (0.387)
Jewish v. Muslim <sup>2</sup>	*** 0.78 (0.206)	0.18 (0.247)
Orthodox v. Prot/Cath <sup>2</sup>	-0.16 (0.232)	-0.18 (0.161)
(Intercept)	-0.19 (0.412)	-0.44 (0.350)

*Note:* Entries are OLS regression coefficients with robust standard errors in parentheses.

<sup>1</sup> Adjusted R-sq value from associated non-Robust Standard Error model

<sup>2</sup> Variable Operationalization from Biddle & Long (2004)

<sup>3</sup> Variable Operationalization from Beckley (2010)

<sup>4</sup> Variable Operationalization novel to this study (2016)

\* p-value outside 90% Confidence Interval [ $p < 0.10$ ]

\*\* p-value outside 95% Confidence Interval [ $p < 0.05$ ]

\*\*\* p-value outside 99% Confidence Interval [ $p < 0.01$ ]

The first major finding by the authors was that unit-level factors improved the fit of the model, suggesting that the estimated linear relationship produced by the model accurately captured more of the variance in observed battle outcomes. Second, each of the new unit-level factors influenced battle outcomes in a theoretically consistent way (i.e. battle outcomes improved with better human capital and more stable civil-military relations, and distinctions in



culture manifest statistically significant and systematic effects).<sup>22</sup> Perhaps the most interesting finding was the third element, that although democracy demonstrated a strongly beneficial influence on military effectiveness in simplified models, considering it in context with unit-level factors caused democracy to influence military effectiveness in a strongly detrimental way.

Based upon these findings, Biddle and Long asserted that the military effectiveness bonus historically associated with democracy might actually result from a set of more diffuse traits generally associated with western democracy. Consequently, states seeking to enhance their military power need not necessarily recast themselves as western democracies, but rather adopt certain unit-level traits informed by democracy. The statistical support for education and civil-military relations remained consistent with extant theory and logic, however, the statistical evidence in support of culture was new in the field.

#### Beckley Model #2

In 2010, Michael Beckley noted that Biddle and Long's original work failed to account for the theoretically important role of economic development in their models of military effectiveness (See Table 7). As such, Beckley incorporated an Economy statistic into the original 2004 dataset and performed quantitative analysis on the resulting model. Of note, Beckley did not modify any of Biddle and Long's original variables during his new study, seeking to maintain conceptual continuity and reduce the likelihood of competing explanations for changes in outcomes.

Statistical tests of Beckley's model reflected that none of the material factors affected battle outcomes in a statistically significant way ( $p < 0.05$ ), with the closest factor being Artillery

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<sup>22</sup> Stephen Biddle and Stephen Long, "Democracy and Military Effectiveness: A Deeper Look," *Journal of Conflict Resolution* 48, no. 4 (2004): 537.

Prevalence (p-value of 0.14). Regarding unit-level factors, Human Capital continued to represent a beneficial contributor to overall military effectiveness in battle, but the effect was no longer statistically significant. The civil-military relationship continued to influence battle outcomes in a consistent manner as it did for Biddle and Long. However, in Beckley's model, this relationship was stronger, with each of the two *coup d'état*-related variables being significant beyond the 0.05-level.

As for culture, Beckley's model saw six of the seven religion-based culture variables maintain their direction of effect, but the Protestant/Catholic vs. Protestant/Catholic variable changed direction. Although this particular change does represent a challenge for interpretation, the point was moot as that particular factor was statistically insignificant. As for the others, the religion-based culture variables that Biddle and Long had found as significant were no longer, and two new ones had risen in prominence (Protestant/Catholic vs. Muslim at the 0.01-level and Orthodox vs. Buddhist at the 0.05-level).

This left institutional factors as the last subset considered, of which Beckley included both democracy and Economy in his model. With material, unit-level, and cultural factors accounted for, test results continued to reveal a very significant (p-value < 0.01) and now even more detrimental (approximately twice the magnitude as the previous model) relationship between the attacker's relative level of democracy and battlefield outcomes. In stark contrast to this, Beckley's measure of economic development manifest a relationship well beyond the 0.01-level of significance but exerted over twice the influence of democracy in an overwhelmingly beneficial way.

From the beginning, Beckley's work demonstrated an improvement in statistical terms from the previous models, boasting a better fit (Adjusted R Square value of 0.420 as opposed to

the previous 0.379). Explaining this improved explanatory power, Beckley's first major finding was that Economy exhibited both a strongly positive and strongly significant influence on battlefield outcomes, even when controlling for the many material, institutional, and unit-level factors. Second, the unit-level factors of human capital and the two nominal variables Biddle and Long used to operationalize western culture (Protestant/Catholic vs. Buddhist and Jewish vs. Muslim) each became statistically insignificant when accounting for the influence of economic development. Third, democracy retained its statistically significant negative effect while accounting for Beckley's new measure for economic development and the previous material and unit-level factors.

Based upon these findings, Beckley asserted that the military effectiveness bonus historically associated with democracy does not result from a concomitant set of diffuse traits, but from concomitant economic development. He stated that absolute economic wealth explains the material quantity function in military power while economic development explains the material quality function. Consequently, states seeking to enhance their military power need not change their political and societal structures, but their economic ones.

#### Fowler Models

In the remainder of this section, I present the results from the testing of five separate statistical models. Models A1 and A2 retested the principle models from the two foundational studies, applying new transformations to three material factors and one unit-level factor. I replaced the prevalence-based values for the tank, aircraft, and artillery variables with proportionality-calculated values to achieve consistent operationalization across all four material factors and consolidated the two *coup d'état*-related variables into a single dummy value to improve interpretation. Models A1 and A2 maintained Biddle and Long's original religion-based

culture variables, allowing us to first appraise the value of these new variable transformations in isolation before moving to wholly new measures of culture. Models B1 and B2 retested A1 and A2 using new variables for culture. I replaced the seven religion-based variables with variables based upon cultural dimension scores to account for culture in a more direct and theoretically sound way. Models B1 and B2 provided a mechanism to assess the value of these new culture variables in a deliberate and systematic manner.

#### *Fowler Model A1*

Model A1 retested Biddle and Long's original 2004 model, applying new transformations to three material factors and one unit-level factor. Specifically, I employed proportionality-based values for the Tank, Aircraft, and Artillery variables instead of prevalence-based ones and consolidated the two *coup d'état*-related variables into a single one. Model A1 maintained the religion-based culture variables from Biddle and Long's original work, allowing us to assess these new variable transformations on their own merit.

Comparing the statistical results from Model A1 to those from Biddle and Long's original Model #1 produced a few minor distinctions, but maintained an overall sense of consistency (See Table 8).<sup>23</sup> From a material factor perspective, field artillery prevalence maintained its detrimental effect but lost its significance as a military factor (previously significant at the 0.05-level). At the same time, Tanks became quite a bit more significant (now beyond the 0.01-level) and changed its direction of effect from detrimental to beneficial. Institutionally, democracy remained influential and detrimental, but its statistical significance did diminish slightly, sliding from significance beyond the 0.01-level to the 0.05-level. Considering the unit-level factors, education remained both influential and beneficial, and combining the two

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<sup>23</sup> For additional information regarding p-values for these models, see Table 18 in the Appendix.

*coup d'état*-related variables into a single measure strengthened the civil-military relationship from statistical significance at the 0.05-level to the 0.01-level. As for culture, the family of religion-based variables remained effectively unchanged in terms of effect and significance.

Table 8. Model A1 Comparison Matrix

	Biddle & Long (2004) Model #1	Fowler (2016) Model A1
R-sq	0.421	0.436
Adj R-sq <sup>1</sup>	0.379	0.398
N	223	223
Personnel <sup>2</sup>	* -0.51 (0.333)	-0.58 (0.460)
Tank Prevalence <sup>2</sup>	-1.68 (5.655)	
Aircraft Prevalence <sup>2</sup>	-3.22 (5.065)	
Artillery Prevalence <sup>2</sup>	** -10.70 (4.721)	
Tanks <sup>4</sup>		*** 0.37 (0.110)
Aircraft <sup>4</sup>		0.05 (0.121)
Field Artillery <sup>4</sup>		-0.21 (0.322)
Democracy <sup>2</sup>	*** -0.36 (0.140)	** -0.30 (0.134)
Education <sup>2</sup>	** 1.13 (0.492)	** 1.03 (0.487)
Attacker Stability <sup>2</sup>	** -0.40 (0.173)	
Defender Stability <sup>2</sup>	0.15 (0.115)	
Civ-Mil Relationship <sup>4</sup>		*** 0.26 (0.100)
Prot/Cath v. Prot/Cath <sup>2</sup>	0.19 (0.161)	0.08 (0.148)
Prot/Cath v. Buddhist <sup>2</sup>	*** 1.18 (0.174)	*** 0.97 (0.158)
Prot/Cath v. Muslim <sup>2</sup>	-0.70 (0.601)	-0.57 (0.563)
Orthodox v. Muslim <sup>2</sup>	-0.42 (0.258)	-0.21 (0.256)
Orthodox v. Buddhist <sup>2</sup>	-0.22 (0.334)	-0.32 (0.356)
Jewish v. Muslim <sup>2</sup>	*** 0.78 (0.206)	*** 0.60 (0.207)
Orthodox v. Prot/Cath <sup>2</sup>	-0.16 (0.232)	-0.15 (0.410)
(Intercept)	-0.19 (0.412)	-0.28 (0.410)

Note: Entries are OLS regression coefficients with robust standard errors in parentheses.

<sup>1</sup> Adjusted R-sq value from associated non-Robust Standard Error model

<sup>2</sup> Variable Operationalization from Biddle & Long (2004)

<sup>3</sup> Variable Operationalization from Beckley (2010)

<sup>4</sup> Variable Operationalization novel to this study (2016)

\* p-value outside 90% Confidence Interval [p < 0.10]

\*\* p-value outside 95% Confidence Interval [p < 0.05]

\*\*\* p-value outside 99% Confidence Interval [p < 0.01]

Based upon these results, I conclude two principle things. First, the new variable transformations for tanks, aircraft, artillery, and *coup d'état* did not significantly alter the

influence of the existing culture-related variables. Second, the revised variable transformations did improve the fit of Biddle and Long's model in a meaningful way (a 5 percent increase) without altering its connection with the theory or the previous model in a disruptive way. This was an important outcome because I intended these changes to be essentially administrative instead of substantive, saving meaningful divergence for subsequent iterations.

With that said, I propose Model A1 is an appropriate incremental evolution of Biddle and Long's original work, accounting for their intended phenomena in a more direct manner. Accounting for the role of tanks, aircraft, and artillery in battle as a function of their relationship to one another and not their relationship to the number of soldiers present is more intuitive and more consistent with the extant personnel variable. These revised variable transformations permit each material factor to reflect its own influence instead alluding to the overall character of the battle as a tank-heavy, aircraft-heavy, or artillery-heavy event. Similarly, by accounting for the influence of civil-military stability as a function which participant stability happens to favor (i.e. attacker, defender, or neither), the measure is both more intuitive and more consistent within the model.

#### *Fowler Model A2*

Model A2 retested Beckley's revised 2010 model, applying the same transformations to three material factors and one unit-level factor as in Model A1. Model A2 also maintained the religion-based culture variables from Biddle and Long's original work, again allowing us to assess these new variable transformations on their own merit.

Table 9. Model A2 Comparison Matrix

	Beckley (2010) Model #2	Fowler (2016) Model A2
R-sq	0.461	0.495
Adj R-sq <sup>1</sup>	0.420	0.459
N	223	223
Personnel <sup>2</sup>	-0.25 (0.327)	-0.55 (0.428)
Tank Prevalence <sup>2</sup>	-0.78 (5.467)	
Aircraft Prevalence <sup>2</sup>	-4.01 (4.874)	
Artillery Prevalence <sup>2</sup>	* -8.10 (4.717)	
Tanks <sup>4</sup>		*** 0.44 (0.114)
Aircraft <sup>4</sup>		0.08 (0.118)
Field Artillery <sup>4</sup>		0.10 (0.313)
Democracy <sup>2</sup>	*** -0.72 (0.181)	*** -0.79 (0.174)
Economy <sup>3</sup>	*** 1.89 (0.577)	*** 2.38 (0.558)
Education <sup>2</sup>	0.26 (0.489)	-0.06 (0.514)
Attacker Stability <sup>2</sup>	*** -0.48 (0.161)	
Defender Stability <sup>2</sup>	*** 0.32 (0.113)	
Civil-Mil Relationship <sup>4</sup>		*** 0.48 (0.106)
Prot/Cath v. Prot/Cath <sup>2</sup>	-0.08 (0.165)	* -0.30 (0.160)
Prot/Cath v. Buddhist <sup>2</sup>	0.37 (0.304)	-0.13 (0.309)
Prot/Cath v. Muslim <sup>2</sup>	* -1.22 (0.621)	** -1.25 (0.583)
Orthodox v. Muslim <sup>2</sup>	** -0.72 (0.298)	** -0.60 (0.284)
Orthodox v. Buddhist <sup>2</sup>	-0.67 (0.387)	** -0.98 (0.406)
Jewish v. Muslim <sup>2</sup>	0.18 (0.247)	-0.15 (0.251)
Orthodox v. Prot/Cath <sup>2</sup>	-0.18 (0.161)	-0.22 (0.184)
(Intercept)	-0.44 (0.350)	* -0.58 (0.315)

*Note:* Entries are OLS regression coefficients with robust standard errors in parentheses.

<sup>1</sup> Adjusted R-sq value from associated non-Robust Standard Error model

<sup>2</sup> Variable Operationalization from Biddle & Long (2004)

<sup>3</sup> Variable Operationalization from Beckley (2010)

<sup>4</sup> Variable Operationalization novel to this study (2016)

\* p-value outside 90% Confidence Interval [ $p < 0.10$ ]

\*\* p-value outside 95% Confidence Interval [ $p < 0.05$ ]

\*\*\* p-value outside 99% Confidence Interval [ $p < 0.01$ ]

Despite Models A1 and A2 applying the same variable transformations to their parent models, statistical results from Model A2 reveal a larger number of key distinctions from its parent model than did A1 (See Table 9).<sup>24</sup> From a material perspective, Tanks again gained in significance (now beyond the 0.01-level) and changed its direction of effect to beneficial once

<sup>24</sup> For additional information regarding p-values for these models, see Table 19 in the Appendix.

more. Of note, in Beckley's Model #2, the role of artillery was not significant, so there was no change to highlight, as was required for Model A1. Institutionally, democracy remained influential but this time, its statistical significance did not diminish as it did in Model A1, remaining well beyond the 0.01-level. Beckley's added Economy variable remained consistently high in significance, although the newly transformed material and civil-military comity variables did appear to amplify economy's magnitude of effect by approximately 25%. Considering unit-level factors, values in Model A2 remain consistent with Beckley's model, education having no appreciable influence and the civil-military relationship maintaining significance beyond the 0.01-level in both. As for culture, Model A2 found the same two religion-based variables significant that did Beckley's model (PCMu and OrBu).

Based upon these results, I reaffirm my original two assertions. First, although the new variable transformations for Tanks, Aircraft, Artillery, and Coups did alter the influence of the existing culture-related variables, they did not do so in a systemically or theoretically meaningful way. The statistical results continue to support Biddle and Long's assertion that culture wields significant influence in battlefield outcomes, while at the same time generally corroborating Beckley's assertions that culture matters differently than Biddle and Long anticipated. Thus, the newly operationalized variables behave consistently in both Models A1 and A2.

Second, the revised variable transformations also improved the fit of Beckley's model (a 9 percent increase) without altering its connection with the theory or the previous model in a disruptive way. As was the case in Model A1, this was an important outcome, setting appropriate conditions for the more substantive culture-based variable iterations. Consequently, as was the case with Model A1, I propose that Model A2 is an appropriate incremental evolution of



Beckley's original work, accounting for his intended phenomena while improving the overall fit of the model with more direct measures.

### *Fowler Model B1*

Model B1 retested Model A1 using new, more robust variables for culture. Specifically, I replaced the seven religion-based culture variables first introduced by Biddle and Long with variables based upon relevant cultural dimension scores found in the recent GLOBE study of 62 societies. With the influence of the new material and unit-level variable transformations made explicit, Model B1 provided a mechanism to assess the value of the new dimension-based culture variables in a deliberate and systematic manner.

As before, comparing the outcomes of statistical tests between Models B1 and A1 revealed some notable distinctions, but also remarkable consistency (See Table 10).<sup>25</sup> From a material perspective, personnel continued to produce a detrimental, but statistically insignificant effect on battlefield outcomes. Tanks and aircraft still produced beneficial effects, with armor remaining highly significant (p-value < 0.01), but aircraft remaining statistically insignificant. Field artillery reversed its direction of effect, now benefitting battle outcomes, but it too remained under the statistically relevant threshold.

Considering unit-level factors, the civil-military relationship remained both beneficial (now more than doubled in magnitude) and statistically significant beyond the 0.01-level. On the other hand, education did reverse its direction of effect, intuitively becoming a trait beneficial for military effectiveness. Unfortunately, in this model, its significance dropped beneath the statistically relevant threshold.

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<sup>25</sup> For additional information regarding p-values for these models, see Table 18 in the Appendix.

Table 10. Model B1 Comparison Matrix

	Biddle & Long (2004) Model #1	Fowler (2016) Model A1	Fowler (2016) Model B1
R-sq		0.421	0.436
Adj R-sq <sup>1</sup>		0.379	0.398
N		223	223
Personnel <sup>2</sup>	* -0.51 (0.333)	-0.58 (0.460)	-0.59 (0.393)
Tank Prevalence <sup>2</sup>	-1.68 (5.655)		
Aircraft Prevalence <sup>2</sup>	-3.22 (5.065)		
Artillery Prevalence <sup>2</sup>	** -10.70 (4.721)		
Tanks <sup>4</sup>		*** 0.37 (0.110)	*** 0.42 (0.120)
Aircraft <sup>4</sup>		0.05 (0.121)	0.17 (0.125)
Field Artillery <sup>4</sup>		-0.21 (0.322)	0.41 (0.271)
Democracy <sup>2</sup>	*** -0.36 (0.140)	** -0.30 (0.134)	0.22 (0.314)
Economy <sup>3</sup>			
Education <sup>2</sup>	** 1.13 (0.492)	** 1.03 (0.487)	-0.63 (0.564)
Attacker Stability <sup>2</sup>	** -0.40 (0.173)		
Defender Stability <sup>2</sup>	0.15 (0.115)		
Civ-Mil Relationship <sup>4</sup>		*** 0.26 (0.100)	*** 0.57 (0.179)
Prot/Cath v. Prot/Cath <sup>2</sup>	0.19 (0.161)	0.08 (0.148)	
Prot/Cath v. Buddhist <sup>2</sup>	*** 1.18 (0.174)	*** 0.97 (0.158)	
Prot/Cath v. Muslim <sup>2</sup>	-0.70 (0.601)	-0.57 (0.563)	
Orthodox v. Muslim <sup>2</sup>	-0.42 (0.258)	-0.21 (0.256)	
Orthodox v. Buddhist <sup>2</sup>	-0.22 (0.334)	-0.32 (0.356)	
Jewish v. Muslim <sup>2</sup>	*** 0.78 (0.206)	*** 0.60 (0.207)	
Orthodox v. Prot/Cath <sup>2</sup>	-0.16 (0.232)	-0.15 (0.410)	
Planning <sup>4</sup>			*** 31.24 (8.139)
Risk Aversion <sup>4</sup>			*** -10.30 (3.060)
Collective Deference <sup>4</sup>			*** -10.45 (3.549)
Communication Impedance <sup>4</sup>			** -9.24 (4.730)
Inclusivity <sup>4</sup>			-0.93 (2.945)
(Intercept)	-0.19 (0.412)	-0.28 (0.410)	-0.15 (3.126)

Note: Entries are OLS regression coefficients with robust standard errors in parentheses.

<sup>1</sup> Adjusted R-sq value from associated non-Robust Standard Error model

<sup>2</sup> Variable Operationalization from Biddle & Long (2004)

<sup>3</sup> Variable Operationalization from Beckley (2010)

<sup>4</sup> Variable Operationalization novel to this study (2016)

\* p-value outside 90% Confidence Interval [p < 0.10]

\*\* p-value outside 95% Confidence Interval [p < 0.05]

\*\*\* p-value outside 99% Confidence Interval [p < 0.01]

Institutionally, democracy faced a similar fate as education. Namely, the influence exerted by regime type reversed from being a detrimental trait to being a beneficial one.

However, just like measures of education, democracy's significance plummeted well outside the range of statistical relevance.

With the old institutional and new material and unit-level factors accounted for separately, we were ready to assess the new dimension-based culture variables. First, four of the five new culture variables (Planning Propensity, Risk Aversion, Collective Deference, and Communication Impedance) demonstrated statistical significance beyond the 0.05-level. Moreover, three of those factors (Planning Propensity, Risk Aversion, and Collective Deference) proved significant beyond the 0.01-level. The remaining dimension, Inclusivity, proved statistically insignificant.

Regarding the direction of effect for the new cultural factors, Planning Propensity possessed a positive coefficient, meaning that states with higher assessed levels of Future Orientation tended to demonstrate higher levels of battlefield efficiency. The four remaining variables each possessed negative coefficients. This meant that states with relatively lower levels of Uncertainty Avoidance (Risk Aversion), In-Group Collectivism (Collective Deference), Power Distance (Communication Impedance), and Gender Egalitarianism (Inclusivity) than their competitors tended to demonstrate higher levels of battlefield efficiency.

Adding to the remarkable nature of these statistically significant and theoretically reasonable effects was the relative magnitude of their influence in comparison to the other categories of factors. Although the units of measure in the raw data were quite diverse, representing hundreds of thousands of soldiers in one case and a calculated score from a 7-point scale in another, Model B1 was the first iteration in this series of models to offer consistent comparison of influence because of consistent operationalization. In Model B1, all variables (except the -1/0/+1 coding for Civil-Military Relations) reflect a proportionality function for the attacker's proportion of the total factor's measure. This effectively normalized the mathematical way each variable interacted with the model, enabling direct comparison of relative effects. As

such, a 1% change in the proportionality of Planning Propensity on the battlefield manifests 74-times more effect on battlefield outcomes than a similar change in the proportionality of Tanks. Risk Aversion and Collective Deference demonstrate a similar, though not quite as powerful effect, still orders of magnitude more influential than even the most powerful material or unit-level factors in the model.

Based upon these results, I conclude three primary things. First, the preponderance of new dimension-based culture variables demonstrated both statistically significant effects individually and as a group. The newly introduced variables improved the overall fit of Model A1 by almost 24 percent and of Biddle and Long's Model #1 by nearly 30 percent.

Second, accounting for culture in this more robust manner tended to either reinforce existing theoretically sound relationships among the other factors and battlefield outcomes or effectively reinstate them. For example, incorporation of the new culture variables increased both the magnitude and significance of each of the material factors and for civil-military comity as well. In the case of democracy and artillery, the new model reversed the coefficients' signs, intuitively reinstating the military effectiveness bonuses theoretically associated with both democracy and material resources.

Third, the new dimension-based measures of culture did change the non-material factors in a systemic way. Particularly, the new model reflects a diminished significance in the non-cultural factors that conceptually related to battlefield behavior. Although the new model affected democracy in a mixed manner, its effects on education were wholly dismissive. The new model reassessed the once positive and significant Education as detrimental and insignificant.

In light of these results, I propose that Model A2 represents a meaningful evolutionary leap forward from Biddle and Long's original work. This model not only accounted for their

intended phenomena but also did so with a completely new perspective on culture. Culture was no longer a mere unit-level result of western democratic governance, but its own formidable force in the determining of military power. In addition to having elevated the role of culture in military effectiveness to a position of prominence, the more effective method of accounting for culture actually restored the most intuitive and theoretically important factors to their appropriate positions and postures as well.

### *Fowler Model B2*

Similar to the previous iteration, Model B2 retested A2 using the new dimension-based measures for culture. Comparing the outcomes of statistical tests between Models B2 and A2 revealed some notable distinctions, but also remarkable consistency (See Table 11).<sup>26</sup> Beginning with the new dimension-based culture variables, this time, the three statistically significant culture variables from Model B1 (Planning Propensity, Risk Aversion, and Collective Deference) increased slightly in terms of magnitude of effect, but remain unchanged in their direction of effect and significance. The once statistically significant Communication Impedance experienced a drop in both magnitude and significance. Inclusivity did happen to change its direction of effect but remained statistically insignificant in this model as well.

From a material perspective, personnel continued to produce a detrimental, but statistically insignificant effect on battlefield outcomes. On the other hand, Tanks, Aircraft, And Artillery continued to produced beneficial effects, with Tanks remaining highly significant (p-value < 0.01) and Aircraft approaching statistical significance (p-value of 0.06). Field artillery remained beneath the statistically relevant threshold.

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<sup>26</sup> For additional information regarding p-values for these models, see Table 19 in the Appendix.

Table 11. Model B2 Comparison Matrix

	Beckley (2010) Model #2	Fowler (2016) Model A2	Fowler (2016) Model B2
R-sq	0.461	0.495	0.524
Adj R-sq <sup>1</sup>	0.420	0.459	0.490
N	223	223	193
Personnel <sup>2</sup>	-0.25 (0.327)	-0.55 (0.428)	-0.56 (0.405)
Tank Prevalence <sup>2</sup>	-0.78 (5.467)		
Aircraft Prevalence <sup>2</sup>	-4.01 (4.874)		
Artillery Prevalence <sup>2</sup>	* -8.10 (4.717)		
Tanks <sup>4</sup>		*** 0.44 (0.114)	*** 0.42 (0.120)
Aircraft <sup>4</sup>		0.08 (0.118)	0.18 (0.127)
Field Artillery <sup>4</sup>		0.10 (0.313)	0.42 (0.275)
Democracy <sup>2</sup>	*** -0.72 (0.181)	*** -0.79 (0.174)	0.14 (0.324)
Economy <sup>3</sup>	*** 1.89 (0.577)	*** 2.38 (0.558)	-0.51 (0.966)
Education <sup>2</sup>	0.26 (0.489)	-0.06 (0.514)	-0.56 (0.551)
Attacker Stability <sup>2</sup>	*** -0.48 (0.161)		
Defender Stability <sup>2</sup>	*** 0.32 (0.113)		
Civ-Mil Relationship <sup>4</sup>		*** 0.48 (0.106)	*** 0.56 (0.184)
Prot/Cath v. Prot/Cath <sup>2</sup>	-0.08 (0.165)	* -0.30 (0.160)	
Prot/Cath v. Buddhist <sup>2</sup>	0.37 (0.304)	-0.13 (0.309)	
Prot/Cath v. Muslim <sup>2</sup>	-1.22 (0.621)	** -1.25 (0.583)	
Orthodox v. Muslim <sup>2</sup>	-0.72 (0.298)	** -0.60 (0.284)	
Orthodox v. Buddhist <sup>2</sup>	-0.67 (0.387)	** -0.98 (0.406)	
Jewish v. Muslim <sup>2</sup>	0.18 (0.247)	-0.15 (0.251)	
Orthodox v. Prot/Cath <sup>2</sup>	-0.18 (0.161)	-0.22 (0.184)	
Planning <sup>4</sup>			*** 34.30 (10.408)
Risk Aversion <sup>4</sup>			*** -10.78 (3.219)
Collective Deference <sup>4</sup>			*** -10.77 (3.541)
Communication Impedance <sup>4</sup>			* -8.14 (4.956)
Inclusivity <sup>4</sup>			2.30 (6.682)
(Intercept)	-0.44 (0.350)	* -0.58 (0.315)	-3.23 (6.741)

Note: Entries are OLS regression coefficients with robust standard errors in parentheses.

<sup>1</sup> Adjusted R-sq value from associated non-Robust Standard Error model

<sup>2</sup> Variable Operationalization from Biddle & Long (2004)

<sup>3</sup> Variable Operationalization from Beckley (2010)

<sup>4</sup> Variable Operationalization novel to this study (2016)

\* p-value outside 90% Confidence Interval [p < 0.10]

\*\* p-value outside 95% Confidence Interval [p < 0.05]

\*\*\* p-value outside 99% Confidence Interval [p < 0.01]

Considering unit-level factors, the Civil-Military Relationship remained both beneficial and statistically significant. As for Education, Model B2 witnessed a modest increase in magnitude of effect. However, its overall influence on military effectiveness remained both negative and statistically insignificant.

In this iteration, the institutional factors represented the most dramatic departure from Model A2 and Beckley's original model. When accounting for culture with the new dimension-based variables, democracy's direction of effect reversed, reinstating its beneficial influence on military effectiveness. However, at the same time, democracy's magnitude of effect dropped by 80 percent and its significance plummeted well outside the range of statistical relevance. Similarly, Economy's magnitude of effect dropped by roughly 77 percent and its significance plummeted far below statistical relevance. Moreover, just as in the case of Democracy, Economy's direction of effect reversed from beneficial to detrimental.

Consistent with the results from Model B1, the relative magnitude of the new culture variables' influence in comparison to the other categories of factors remained extraordinarily high. In the previous model, a 1% change in the proportionality of Planning Propensity on the battlefield manifested 74-times more effect on battlefield outcomes than a similar change in the proportionality of Tanks. In this model, a 1% change in the proportionality of Planning Propensity on the battlefield manifested 81-times more effect on battlefield outcomes than a similar change in the proportionality of Tanks.

Based upon these results, I conclude three primary things. First, the preponderance of new dimension-based culture variables continued to demonstrate both statistically significant effects individually and as a group. The newly introduced variables improved the overall fit of Model A2 by nearly 7 percent and of Beckley's Model #2 by almost 17 percent.

Second, as it did in the previous model, accounting for culture in this more robust manner tended to either reinforce existing theoretically sound relationships among the other factors and battlefield outcomes or effectively reinstate them. For example, incorporation of the new culture variables increased both the magnitude and significance of each of the material factors (although

not for civil-military comity in this iteration). In the case of Democracy, the new model reinstated the military effectiveness bonuses theoretically associated with democracy.

Third, the new dimension-based measures of culture did change the non-material factors in a systemic and consistent way. Just as the previous iteration, Model B2 reflects a diminished significance in the non-cultural factors that conceptually related to battlefield behavior. Although the new model's effects benefitted the assessed role of Democracy in a theoretically positive way, the exact same effects reflected on the role of Economy in a wholly dismissive manner. The new model reassessed the once powerful, positive, and significant role of Economy in battle as weak, negative, and insignificant.

In light of these results, I propose that Model B2 represents a revolutionary leap forward from Beckley's revision of Biddle and Long's work. As before, this model successfully accounted for each of the intended phenomena. However, in this particular case, accounting for culture using more robust measures essentially demonstrated just cause to question those who claim distant institutional factors determine local battlefield effects.

### *Fowler Model C*

As one final step, Models C1 thru C4 tests the efficacy of the dimension-based cultural measure by, dropping a statistically insignificant factor in each successive turn. Model C1 retests Model B2, dropping the Democracy variable while retaining Economy measure. This particular turn evaluated the relative stability or instability in material, unit-level, and cultural factors across all permutations of the institutional measures. Model C2 repeats C1, dropping both Democracy and Economy. Model C3 repeats C2, dropping Education from the unit-level factors



and C4 drops Inclusivity from the new cultural factors. Comparing the outcomes of statistical tests across the B- and C-Series of models revealed remarkable consistency (See Table 12).<sup>27</sup>

Beginning with material factors, the influence of personnel, Tanks, Aircraft, and Artillery remained essentially unchanged from Model B2 through to Model C4 in terms of direction of effect, magnitude, and statistical significance. As for unit-level factors, the Civil-Military Relationship remained both beneficial and statistically significant. Similarly, Education remained both negative and statistically insignificant.

Regarding cultural factors, these measures demonstrated remarkable stability across this series of models. Planning Propensity, Risk Aversion, and Collective Deference changed minimally in terms of magnitude of effect, but remain unchanged in their direction of effect and statistical significance. Of note, as Democracy, Economy, Education, and Inclusivity dropped from the models, Communication Impedance remained consistent in direction of effect but increased in magnitude and statistical insignificance.

Based upon these results, I conclude two primary things. First, when accounting for culture using dimension-based variables, the remaining material, and unit-level factors demonstrated remarkable resilience in the face of changing institutional variables. Moreover, regardless of whether Democracy, Economy, or both appeared in the model, the remaining factors maintained generally consistent directions of effect, magnitudes, and measures of statistical significance. In fact, Democracy and Economy appear to have more influence over one another than the model itself.

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<sup>27</sup> For additional information regarding p-values for these models, see Table 20 in the Appendix.

Table 12. Model C Comparison Matrix

	Fowler (2016) Model C1	Fowler (2016) Model C2	Fowler (2016) Model C3	Fowler (2016) Model C4
R-sq	0.524	0.522	0.520	0.519
Adj R-sq <sup>1</sup>	0.492	0.493	0.493	0.496
N	193	193	193	193
Personnel <sup>2</sup>	-0.56 (0.408)	-0.60 (0.391)	-0.56 (0.388)	-0.54 (0.377)
Tanks <sup>4</sup>	*** 0.42 (0.119)	*** 0.42 (0.118)	*** 0.43 (0.117)	*** 0.44 (0.117)
Aircraft <sup>4</sup>	0.18 (0.127)	0.17 (0.124)	0.17 (0.125)	0.17 (0.120)
Field Artillery <sup>4</sup>	0.41 (0.277)	0.38 (0.278)	0.37 (0.274)	0.37 (0.274)
Democracy <sup>2</sup>				
Economy <sup>3</sup>	-0.69 (0.930)			
Education <sup>2</sup>	-0.43 (0.449)	-0.46 (0.456)		
Civ-Mil Relationship <sup>4</sup>	*** 0.51 (0.150)	*** 0.49 (0.166)	** 0.37 (0.171)	** 0.37 (0.172)
Planning <sup>4</sup>	*** 35.04 (10.643)	*** 30.68 (7.941)	*** 30.17 (8.035)	*** 28.95 (7.912)
Risk Aversion <sup>4</sup>	*** -10.30 (2.847)	*** -9.11 (2.096)	*** -7.60 (1.679)	*** -7.78 (1.715)
Collective Deference <sup>4</sup>	*** -11.25 (3.420)	*** -11.14 (3.405)	*** -12.92 (2.876)	*** -11.97 (2.277)
Comm Impedance <sup>4</sup>	-7.06 (4.504)	* -7.96 (4.379)	*** -10.53 (3.861)	*** -9.72 (3.439)
Inclusivity <sup>4</sup>	4.31 (5.452)	0.77 (2.002)	-0.53 (1.584)	
(Intercept)	-5.04 (6.084)	-1.57 (2.998)	0.50 (2.425)	0.04 (1.786)

Note: Entries are OLS regression coefficients with robust standard errors in parentheses.

<sup>1</sup> Adjusted R-sq value from associated non-Robust Standard Error model

<sup>2</sup> Variable Operationalization from Biddle & Long (2004)

<sup>3</sup> Variable Operationalization from Beckley (2010)

<sup>4</sup> Variable Operationalization novel to this study (2016)

\* p-value outside 90% Confidence Interval [p < 0.10]

\*\* p-value outside 95% Confidence Interval [p < 0.05]

\*\*\* p-value outside 99% Confidence Interval [p < 0.01]

In light of these results, I propose that Models C1-C4 effectively confirm the initial results from Model B2, suggesting that, when appropriately accounting for culture, Economy does not add any more clarity to our understanding of military effectiveness at the battle level of analysis. Instead, measures of Economy tend to compete with the influence of Democracy in an unhelpful and distracting way. Consequently, Model B1 stands out in this study as likely the soundest statistical model based upon currently available data, while Model B2 represents the

most comprehensive.<sup>28</sup> As such, I use both by means of comparison during the hypothesis testing that follows.

### **Hypothesis Testing**

Although much of this information appears in one form or another within this chapter, I consolidate the most relevant statistical results here. The process of hypothesis testing provides a systematic way to determine whether a null hypothesis (the default statement that a phenomenon did not really happen) is valid or not. Rejecting the null hypothesis, essentially claiming that something did happen, requires the effect to be statistically significant. In other words, the effect must be outside an appropriate confidence interval, or unlikely to have occurred due to sampling error alone.

#### **Hypothesis 1a (Preponderance of Planning)**

Based on a  $p$ -value  $< 0.01$  for the Planning Propensity variable in Models B1 and B2, we can reject the null hypothesis (that nothing happened) with a confidence level greater than 99%. This means that, based upon available data, Planning Propensity (as measured by proportionality of participant Future Orientation scores) does manifest a statistically significant effect on the Loss Exchange Ratio of belligerents in battle. However, the positive coefficient modifying the Planning Propensity variable means that higher levels of Planning Propensity benefit battle outcomes, as opposed to lower levels as Biddle and Long's Western Democratic Culture theory suggests. Consequently, we can accept the alternative Hypothesis 1a with greater than 99%

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<sup>28</sup> Models C1 through C4 are compelling in their parsimony, but their process of elimination served a mathematical purpose instead of a theoretical one. I caution readers who may be drawn to one of these simplified models that the literature needs to continue to progress and mature in a deliberate manner before throwing out theoretically important variables. Case in point, if I had undertaken a similar approach with Beckley's Model #2 before developing the dimension-based culture variables used here, this study may never have existed.

confidence. States with higher propensity for Planning do tend to experience positive battlefield outcomes.

#### Hypothesis 1b (Preponderance of Risk Aversion)

Based on a p-value  $< 0.01$  for the Risk Aversion variable in Models B1 and B2, we can reject the null hypothesis with a confidence level greater than 99%. This means that, based upon available data, preponderance of Risk Aversion (as measured by proportionality of participant Uncertainty Avoidance scores) does manifest a statistically significant effect on the Loss Exchange Ratio of belligerents in battle. The negative coefficient modifying the Risk Aversion variable means that lower levels of Risk Aversion benefit battle outcomes. Consequently, we can accept the proposed Hypothesis 1b with greater than 99% confidence. States with lower propensity for Risk Aversion do tend to experience positive battlefield outcomes.

#### Hypothesis 1c (Preponderance of Collective Deference)

Based on a p-value  $< 0.01$  for the Collective Deference variable in Models B1 and B2, we can reject the null hypothesis with a confidence level greater than 99%. This means that, based upon available data, preponderance of Collective Deference (as measured by proportionality of participant In-Group Collectivism scores) does manifest a statistically significant effect on the Loss Exchange Ratio of belligerents in battle. The negative coefficient modifying the Collective Deference variable means that lower levels of Collective Deference benefit battle outcomes. Consequently, we can accept the proposed Hypothesis 1c with greater than 99% confidence. States with lower propensity for Collective Deference do tend to experience positive battlefield outcomes.

#### Hypothesis 1d (Preponderance of Communication Impedance)

Based on a p-value  $< 0.05$  for the Communication Impedance variable in Models B1 (but  $> 0.05$  in Model B2), we must make apply more judgment to whether we accept the null hypothesis. In other words, we accept the default position that preponderance of Communication Impedance (as measured by measured by proportionality of participant Power Distance scores) does not meaningfully affect the Loss Exchange Ratio of belligerents in battle. As previously asserted, Model B2 is the most comprehensive, but Model B1 is the most accurate of the available models. Consequently, we can cautiously accept the proposed Hypothesis 1d with at least 90 percent confidence. States with lower propensity for Communication Impedance do tend to experience positive battlefield outcomes.<sup>29</sup>

#### Hypothesis 1e (Preponderance of Inclusivity)

Based on a p-value  $> 0.05$  for the Inclusivity variable in Models B1 and B2, we accept the null hypothesis. In other words, we accept the default position that preponderance of Inclusivity (as measured by the proportionality of participant Gender Egalitarianism scores) does not meaningfully affect the Loss Exchange Ratio of belligerents in battle. Inclusivity may actually affect battlefield efficiency, but the conditional probability of detecting this effect with it not actually present given a valid null hypothesis is greater than 70 percent. Consequently, we readily reject the proposed Hypothesis 1e. Available data does not currently support claims that states with higher propensity for Inclusivity tend to experience positive battlefield outcomes.

Unlike Communication Impedance, theory and logic present a far stronger case for a relationship

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<sup>29</sup> Despite Communication Impedance's failure to pass the statistical significance threshold in these two models, both theory and logic support its role in battlefield efficiency. The statistical record may not be capable of formally endorsing a relationship between Communication Impedance and battle outcomes, but the record does provide indicators that we can look for in more qualitative tests.

between Inclusivity and Democracy than for a meaningful relationship with military effectiveness.

#### Hypothesis 2 (Preponderance of Personnel)

Based on a p-value  $> 0.10$  for the Personnel variable in Models B1 and B2, we accept the null hypothesis. In other words, we accept the default position that preponderance of Personnel does not meaningfully affect the Loss Exchange Ratio of belligerents in battle. Preponderance of Personnel may actually affect battle outcomes, but the conditional probability of detecting this effect with it not actually present given a valid null hypothesis is greater than 90 percent. Consequently, based upon available data, we reject the proposed Hypothesis 2. Available data does not currently support claims that states with the preponderance of personnel tend to experience positive battlefield outcomes.

Despite the Personnel variable's failure to pass the statistical significance threshold in these models, theory and logic both support its role. The statistical record may not be capable of formally endorsing a relationship between preponderance of Personnel and battle outcomes, but the record does provide indicators that we can look for in more qualitative tests. In particular, the Personnel variable tends to manifest a consistently moderate and negative effect on LER\_LogM values. This means that, if the effect were statistically significant, states with relatively fewer personnel would tend to experience positive battlefield outcomes.

#### Hypothesis 3a (Preponderance of Tanks)

Based on a p-value  $< 0.01$  for the Tank Proportionality variable in Models B1 and B2, we can reject the null hypothesis with a confidence level greater than 99%. This means that, based upon available data, preponderance of Tanks do manifest a statistically significant effect on the Loss Exchange Ratio of belligerents in battle. The positive coefficient modifying the Tanks

variable means that greater quantities of Tanks benefit battle outcomes. Consequently, we can accept the proposed Hypothesis 3a with greater than 99 percent confidence. States with the preponderance of Tanks tend to experience positive battlefield outcomes.

#### Hypothesis 3b (Preponderance of Aircraft)

Based on a p-value  $> 0.15$  for the Aircraft variable in Models B1 and B2, we accept the null hypothesis. In other words, we accept the default position that preponderance of Aircraft does not meaningfully affect the Loss Exchange Ratio of belligerents in battle. Preponderance of Aircraft may actually affect battle outcomes, but the conditional probability of detecting this effect with it not actually present given a valid null hypothesis is greater than 85 percent. Consequently, based upon available data, we reject the proposed Hypothesis 3b. Available data does not currently support claims that states with the preponderance of aircraft tend to experience positive battlefield outcomes.

Despite the Aircraft variable's failure to pass the statistical significance threshold in these models, theory and logic both support its role. The statistical record may not be capable of formally endorsing a relationship between preponderance of Aircraft and battle outcomes, but the record does provide indicators that we can look for in more qualitative tests. In particular, the Aircraft variable tends to manifest a consistently minor, but positive effect on LER\_LogM values. This means that, if the effect were statistically significant, states with the preponderance of aircraft would tend to experience positive battlefield outcomes.

#### Hypothesis 3c (Preponderance of Artillery)

Based on a p-value  $> 0.10$  for the Artillery variable in Models B1 and B2, we accept the null hypothesis. In other words, we accept the default position that preponderance of Artillery does not meaningfully affect the Loss Exchange Ratio of belligerents in battle. Preponderance of

Artillery may actually affect battle outcomes, but the conditional probability of detecting this effect with it not actually present given a valid null hypothesis is greater than 90 percent.

Consequently, based upon available data, we reject the proposed Hypothesis 3c. Available data does not currently support claims that states with the preponderance of artillery tend to experience positive battlefield outcomes.

Despite the Artillery variable's failure to pass the statistical significance threshold in these models, theory and logic both support its role. The statistical record may not be capable of formally endorsing a relationship between preponderance of Artillery and battle outcomes, but the record does provide indicators that we can look for in more qualitative tests. In particular, the Artillery variable tends to manifest a consistently moderate, but positive effect on LER\_LogM values. This means that, if the effect were statistically significant, states with the preponderance of artillery would tend to experience positive battlefield outcomes.

#### Hypothesis 4 (Levels of Democracy)

Based on a p-values  $> 0.45$  for the Democracy variable in Models B1 and B2, we readily accept the null hypothesis. In other words, we accept the default position that higher levels of Democracy do not meaningfully affect the Loss Exchange Ratio of belligerents in battle. Higher levels of Democracy may actually affect battle outcomes, but the conditional probability of detecting this effect with it not actually present given a valid null hypothesis is greater than 55 percent. Consequently, we reject the proposed Hypothesis 4. Available data does not currently support claims that states with higher levels of Democracy tend to experience positive battlefield outcomes. Unlike other statistically insignificant but theoretically cogent factors, theory and logic present a stronger case for Democracy's relationship with military effectiveness at the strategic level of war instead of at the tactical level.



#### Hypothesis 5 (Levels of Economic Development)

Based on a p-value  $> 0.45$  for the Economy variable in Models B2 (and Model C1 as well), we readily accept the null hypothesis. In other words, we accept the default position that higher levels of Economic Development do not meaningfully affect the Loss Exchange Ratio of belligerents in battle. Higher levels of Economic Development may actually affect battle outcomes, but the conditional probability of detecting this effect with it not actually present given a valid null hypothesis is greater than 55 percent. Consequently, we reject the proposed Hypothesis 5. Available data does not currently support claims that states with higher levels of Economic Development tend to experience positive battlefield outcomes. As was the case with Democracy, theory and logic present a stronger case for Economic Development's relationship with military effectiveness at the strategic level of war instead of at the tactical level.

#### Hypothesis 6 (Levels of Education)

Based on a p-value  $> 0.25$  for the Education variable in Models B1 and B2, we readily accept the null hypothesis. In other words, we accept the default position that higher levels of Education do not meaningfully affect the Loss Exchange Ratio of belligerents in battle. Higher levels of Education may actually affect battle outcomes, but the conditional probability of detecting this effect with it not actually present given a valid null hypothesis is greater than 75 percent. Consequently, we reject the proposed Hypothesis 6. Available data does not currently support claims that states with higher levels of education should tend to experience positive battlefield outcomes.

#### Hypothesis 7 (Stability in the Civil-Military Relationship)

Based on a p-value  $< 0.05$  for the Civil-Military Relationship variable in Models B1 and B2, we can reject the null hypothesis with a confidence level greater than 95%. This means that,

based upon available data, greater degrees of Civil-Military Stability does manifest a statistically significant effect on the Loss Exchange Ratio of belligerents in battle. The positive coefficient modifying the Civil-Military Relationship variable means that greater degrees of Civil-Military Stability benefit battle outcomes. Consequently, we can accept the proposed Hypothesis 7 with greater than 95% confidence. States with greater stability in their civil-military relationship do tend to experience positive battlefield outcomes.

## **SUBSTANTIVE FINDINGS**

The principle contribution of this study, based upon statistical the tests conducted on available data, is that culture matters. When accounting for the influence of theoretically relevant material, institutional, unit-level, and cultural factors on battlefield outcomes, three of the five dimension-based culture variables consistently manifest statistically significant and theoretically meaningful effects. Societies that possess the cultural traits of increased Planning Propensity, decreased Risk Aversion, and decreased Collective Deference tend to field military formations that take increasing more lives than they lose in battle as their relative cultural advantages grow. A fourth cultural trait, decreased Communication Impedance, fails to meet conventional statistical thresholds for significance in more complex models, but approaches statistical significance even then and exceeds the threshold in less crowded models. Though inconclusive, the relationship between Communication Impedance and military effectiveness appears to behave as expected, warranting more focused study in the future.

Perhaps nearly as interesting as the fact that culture matters is how much it does matters. These cultural traits influence battle outcomes by orders of magnitude more than any material, institutional, or unit-level factor identified thus far. This means it really is less important what you have and more important how you use it. This means that culture is more than just an

academic footnote in the battlefield calculus equations. Culture is a practical force in battle and a necessary component of military effectiveness. Consequently, in order for our concepts of military power to be accurate, they must account for the meaningful influence of culture.

The second major contribution from this study is restoration of the military effectiveness discourse, reinstating both the theoretical underpinnings and intuitive logic of battle. As mentioned earlier in this chapter, statistics is not about the numbers, but the data in context. Biddle and Long took exceptional risk in attempting to account for culture on the battlefield, but they did so with the best available data at the time. Regrettably, that data was sufficient to highlight the potential influence of culture but did so at the expense of other theoretically meaningful factors in their model. Accounting for the influence of culture through dimension-based unburdens relevant material, institutional, and unit-level factors from the noise associated with measures of religious effects. This essentially restores to them their rightful influence on battlefield outcomes and the intuitive logic that goes with it.

The third major contribution from this study is evidence suggesting that the continued debate over institutional influences on military effectiveness, at least at the battlefield or tactical level-of-analysis, is not helpful. When accounting for the influence of culture and civil-military stability, Democracy maintains a theoretically consistent but statistically insignificant influence on battlefield efficiency. Similarly, when accounting for the influence of culture and material factors, Economy Development maintains a theoretically inconsistent and statistically insignificant influence on battle outcomes. Democracy and Economy Development have ample evidence supporting their influence on military power at the highest levels, but this study provides evidence that such influence may not reach the battlefield intact and unaltered.

The fourth contribution from this study is more evidence to support the continued development of better military equipment. In a very practical sense, the statistical models revealed that having more Tanks, Aircraft, and Artillery on the battlefield improved chances of killing people while having more soldiers on the battlefield increased the chances of those soldiers dying. This logic is so intuitive, yet its meaning should not get lost in its simplicity. Although some resource-poor states may elect to field larger populations of soldiers to achieve their military goals, relying upon the notion that quantity has a quality of its own; this practice is an inefficient use of resources. Smaller, more lethally equipped, forces have a better chance of inflicting higher numbers of casualties on the enemy while reducing the opportunity to die.

## **CHAPTER SUMMARY**

Statistical analysis is a powerful tool available for researchers to seek, find, and assess relationships in the world around us. The practice's reliance upon numbers and equations has an off-putting effect for many people, but it need not do so. Readers otherwise unfamiliar with quantitative methods can appreciate many of the most common techniques with only limited exposure to the sophisticated mathematics that makes them work.

In this chapter, I started by introducing a number of common quantitative methods in a practical and approachable manner. With a better understanding of the statistical concepts at work in this study, I applied these tools and tests to the available data, producing mathematically sound and theoretically relevant results. I then consolidated the most meaningful results and interpreted them based upon theory and logic, highlighting findings that represent the greatest contributions to our broader understanding of culture, military effectiveness, and military power. In the next two chapters, I take these findings based upon trends in the aggregate historical data and look for them in individual battles.

## CHAPTER VI

### TYPICAL CASE STUDIES

In the previous chapter, I employed a family of quantitative methods help put available data in context. The statistical tests performed provided evidence supporting many of the hypotheses offered in Chapter III, but not all phenomena demonstrated statistical significance. These conditions represent a meaningful opportunity for the qualitative analysis of the material, institutional, unit-level, and cultural factors associated with military effectiveness.

Qualitative methods represent another powerful tool available for researchers to seek, find, and assess the natural world. Where statistical analysis was best suited for accounting for trends across a large number of observations, qualitative analysis is much better suited for delving deeper into the rich narratives of just a few observations at a time. As such, the next two chapters will put the substantive findings from the previous chapter through additional tests, comparing what influences the statistical model says should be there to what actually happened.

The skills and techniques required to draw meaning from the prose of history are different than those used to put numbers in context, but the principles remain the same. Each of the historical battles represents a single battle outcome, with its ratio of attacker casualties and defender casualties representing the dependent variable. Each battle also possesses its full complement of material, institutional, unit-level, and cultural characteristics. However, unlike statistical analysis where numerical values stand in to reflect substantive effects, qualitative studies explore the historical record for the effects that substantiate those numerical values.

Similar to statistical hypothesis testing, qualitative assessments that observe theoretically meaningful and consistent phenomena in a selection of historical cases result in a body of evidence. Analysts may present that evidence either to support or refute the null hypothesis (the

default claim that nothing happened). Qualitative analysts must make the same decisions regarding threshold for significance that quantitative analysts do, but the way researchers express these thresholds is not quite as formulaic as the relationship between a confidence interval and a p-value. Instead, scholars must apply their understanding of theory, logic, and the historical case under review to make a compelling argument for why what they observed is important.

In this chapter and the next, I describe four separate battles from the twentieth century where the observed outcome (in terms of Loss Exchange Ratio) failed to conform to expectations set by the relative distribution of material resource between attacker and defender. The primary distinction between the two case study chapters is the extent to which the distribution of material resources failed to explain outcomes, with this chapter reviewing battles where the force ratios upheld conventional attacker-defender ratios and the next reviewing cases where attackers broke with convention in a notable way.

Despite these theoretically important distinctions, the two chapters follow the same practical approach. First, in each chapter I outline the case study selection process used to arrive at the two studies reviewed therein. Next, I review two separate cases per chapter, including a detailed description of the battle in terms of its strategic context, operational plan, and key events from the battle's timeline. Then, I present relevant quantitative data associated with the material, institutional, unit-level, and cultural determinants of each battle as a way of connecting these qualitative assessments to the statistical tests in the preceding chapter. Afterward, I attempt to highlight the influence of each of the given values within the battle narrative as a means of comparing the observed outcome to the outcome predicted by each set of theoretical factors. I conclude each of the cases with an assessment of its implications for the theories under study.

## TYPICAL CASE STUDY SELECTION

Conventional military theory holds the 3:1 force ratio as an important benchmark, purporting that attackers who achieve it tend to experience positive battlefield outcomes—even against the increased protection and preparation associated with an enemy in a deliberate defensive posture. Consequently, attacking commanders that exceed the 3:1 force ratio should tend to experience increasingly positive outcomes and those attacking with less than the 3:1 ratio should suffer noticeably negative outcomes. At the extreme, conventional wisdom tells us that only the most foolhardy commander would think to attack a numerically superior force expecting anything but assured destruction.

In efforts to select the most appropriate battles within which to assess the findings proffered in the previous chapter, case selection began with a series of systematic record eliminations from the dataset, intended to highlight the most theoretically relevant and logically satisfying cases from the hundreds of available records. Once complete with objective cuts based upon general cases characteristics, I made more subjective cuts based upon relative availability of data and other, non-quantitative, factors for which I wanted the qualitative analysis to control for. For example, the effect on battle outcomes exerted by relative differences in commander experience and soldier training are often topics of heated debate within military history circles. By applying some subjective filters on case selection, I attempted to avoid battles where scholars habitually ascribe the reason for the outcomes to one or both of these particular distinctions. The result of this selection process provided the two cases in this chapter, and I offer them as the most appropriate battles within which to assess the findings proffered in the previous chapter.

The first and easiest objective reduction in records under review eliminated the 189 records with missing values from the 382 records available in the battle-related dataset, leaving 193 valid records for review. Although it is possible to conduct a meaningful qualitative study on

a compelling but incomplete story, I wanted the records under review to have participated in both quantitative and qualitative processes. Next, for this typical case study chapter I eliminated 132 of the remaining records that did not achieve at least a 3:1 attacker-defender force ratio, leaving 61 records for review. Next, in a more subjective cut, I eliminated 54 of the remaining records that did not achieve at least a 7:1 Loss Exchange Ratio. The 7 remaining records now had both theoretically appropriate force ratios for success (at least 3:1) but had remarkably poor outcomes. As a final cut, I selected the two battles with the highest percentage of participants killed, the WWII Battles of Salerno and Operation ISKRA.

### **CONVENTIONAL FORCE RATIO (3:1)**

Why Salerno? The 1943 battle of Salerno between the British 10th Corps, commanded by Lieutenant General (LTG) Sir Richard L. McCreery, and elements of the German 16th Panzer Division, commanded by Major General (MG) Rudolf Sikenius, is a classic case where the attacker maintained a 3:1 ratio against the defender.<sup>1</sup> This 3-day battle proceeded from September 3–6 as part of the larger Allied Naples-Foggia Campaign and is a case where material factors should have handed the attacker a positive outcome.<sup>2</sup> However, the reality for the British attackers was quite grim. Despite their 3:1 ratio, the attacking British forces lost 13 soldiers for every German life they took during their 3-day offensive. Where material factors fail to explain the observed outcome, differences between the participants in their unit-level and cultural attributes succeed. In particular, cultural differences appear to explain much of the participants' most beneficial and detrimental battlefield behaviors.

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<sup>1</sup> Kenneth Smith, *Naples - Foggia* (Washington, D.C.: U.S. Army Center of Military History, 1994), 1-2; Rick Atkinson, *The Day of Battle: The War in Sicily and Italy, 1943-1944* (New York: Henry Holt, 2007), 236.

<sup>2</sup> Harold Nelson, *SALERNO: The Beaches to the Volturno, 9 September - 6 October 1943* (Washington, D.C.: U.S. Army Center of Military History, 1990), 1.



## Strategic Context

As the summer of 1943 approached, the Allies had many reasons to feel optimistic: Russian forces had halted the German juggernaut along the Eastern Front, North Africa was all but free of Axis influence, the Allied Combined Bomber Offensive was reducing German heavy industry into oblivion, and operations in Sicily were well underway.<sup>3</sup> Actually, the invasion of Sicily on July 10 proved to be successful beyond the Allied most optimistic projections, gaining more ground and suffering far fewer casualties than expected.<sup>4</sup> By July 26, the American and British Combined Chiefs of Staff announced intentions for an invasion of the Italian mainland, ordering General (GEN) Dwight D. Eisenhower, commander of Allied forces in the Mediterranean, to prepare plans for establishing a Southern Front in Europe<sup>5</sup>.

Success in Sicily and reports of dissent within the Italian Army's ranks spurred GEN George C. Marshall to propose a bold initiative codenamed Operation AVALANCHE, to seize port facilities and airfields at Naples and Foggia as precursor to an advance on Rome.<sup>6</sup> Eisenhower's staff initially concurred with GEN Marshall's plan but believed that the overall scheme of maneuver also required landings at Calabria, the extreme southern reaches of the Italian peninsula.<sup>7</sup> On August 16, GEN Eisenhower ordered the British Eighth Army to make ready for amphibious operations to cross the Strait of Messina and fix Axis forces that might otherwise threaten Allied operations farther north. Operations at Calabria would commence by

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<sup>3</sup> Kenneth Smith, *Naples - Foggia* (Washington, D.C.: U.S. Army Center of Military History, 1994), 3.

<sup>4</sup> Ralph Mavrogordato. "Chapter 12: Hitler's Decision on the Defense of Italy," in *Command Decisions*, ed. Kent Roberts Greenfield. (Washington, D.C.: U.S. Army Center of Military History, 2000), 303.

<sup>5</sup> Rick Atkinson, *The Day of Battle: The War in Sicily and Italy, 1943-1944* (New York: Henry Holt, 2007), 136.

<sup>6</sup> Kenneth Smith, *Naples - Foggia* (Washington, D.C.: U.S. Army Center of Military History, 1994), 4.

<sup>7</sup> Kenneth Smith, *Naples - Foggia* (Washington, D.C.: U.S. Army Center of Military History, 1994), 3.

September 4, with LTG Mark Clark's Fifth Army executing Operation AVALANCHE near Naples within five days.<sup>8</sup>

Although initial plans called for amphibious operations at Naples, the neighboring beaches proved ill-suited for such landings and the city proper was beyond effective range of Allied land-based fighter aircraft operating out of Sicily. These and other geographical considerations led planners to select Salerno as the principle alternative landing site. Nearly fifty miles south of Naples, smaller port city of Salerno possessed nearly twenty miles of continuous beach with favorable approaches and ample access to the coastal highway network that connected Calabria, Naples, and Rome. Perhaps the most influential contributor to Salerno's selection was that, compared to Naples, it was lightly defended.<sup>9</sup>

Around the same time that Allied planners were determining how to approach the Italian mainland from the north, German Chancellor Adolf Hitler was issuing orders for Field Marshal (FM) Albert Kesselring to prepare for the defense of Italy from the south.<sup>10</sup> Rumors of looming Italian defection abounded at the time; pushing Hitler to order his commanders to prepare for the occupation of key infrastructure throughout the peninsula and the disarming of the Italian forces should they decide to switch sides.<sup>11</sup> FM Kesselring would share responsibility for the defense of Italy with Field Marshal Erwin Rommel, with the former overseeing the south and the latter controlling the north.

As August progressed, Axis presence in Italy swelled. FM Rommel relocated seven divisions (five infantry and two armored) from Germany into the north, and nearly 102,000 Axis

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<sup>8</sup> Rick Atkinson, *The Day of Battle: The War in Sicily and Italy, 1943-1944* (New York: Henry Holt, 2007), 184.

<sup>9</sup> Kenneth Smith, *Naples - Foggia* (Washington, D.C.: U.S. Army Center of Military History, 1994), 5.

<sup>10</sup> Ralph Mavrogordato. "Chapter 12: Hitler's Decision on the Defense of Italy," in *Command Decisions*, ed. Kent Roberts Greenfield. (Washington, D.C.: U.S. Army Center of Military History, 2000), 304.

<sup>11</sup> Rick Atkinson, *The Day of Battle: The War in Sicily and Italy, 1943-1944* (New York: Henry Holt, 2007), 187.

soldiers withdrew across the Strait of Messina into the south from Sicily. These forces increased German defensive strength on the Italian mainland greatly but tended to remain most concentrated at the extreme northern and southern reaches.<sup>12</sup>

FM Kesslering assigned GEN Heinrich von Vietinghoff's Tenth German Army to facilitate the evacuation of German forces from Calabria (the "toe" Italy) by protecting their flanks (the "shin" and "heel") from Allied attack. GEN Vietinghoff had three German divisions and the entire Italian Seventh Army to hold the Naples region and secure withdrawal routes to Rome.<sup>13</sup> The 15th Panzer Grenadier Division defended north, while the Hermann Goering Division occupied the Naples' plain and the 16th Panzer Division, commanded by MG Sikenius, defended Salerno to the south.<sup>14</sup>

On September 3 at 4:30 am, six days prior to the landings at Salerno, lead elements of the British Eighth Army crossed the Strait of Messina towards Calabria in the south, facing minimal resistance. That same day, the post-Mussolini Badoglio government secretly signed an armistice agreement in response to an Allied ultimatum. The day prior to the Salerno operation, on September 8, official announcement of the Italian surrender echoed over the airwaves, prompting German units to disarm their former allies in haste and occupy defense of the entire peninsula.<sup>15</sup>

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<sup>12</sup> Ralph Mavrogordato, "Chapter 12: Hitler's Decision on the Defense of Italy," in *Command Decisions*, ed. Kent Roberts Greenfield. (Washington, D.C.: U.S. Army Center of Military History, 2000), 306.

<sup>13</sup> Harold Nelson, *SALERNO: The Beaches to the Volturno, 9 September - 6 October 1943* (Washington, D.C.: U.S. Army Center of Military History, 1990), 1.

<sup>14</sup> Ralph Mavrogordato, "Chapter 12: Hitler's Decision on the Defense of Italy," in *Command Decisions*, ed. Kent Roberts Greenfield. (Washington, D.C.: U.S. Army Center of Military History, 2000), 307.

<sup>15</sup> Kenneth Smith, *Naples - Foggia* (Washington, D.C.: U.S. Army Center of Military History, 1994), 6.

## Operational Plan

The U.S. Fifth Army, commanded by GEN Mark Clark, formed the Salerno invasion force with three divisions forming the assault force.<sup>16</sup> The first two divisions came from the British 10 Corps, commanded by LTG Sir Richard L. McCreery, and the third division came from the U.S. VI Corps, commanded by MG Ernest J. Dawley. The British 10 Corps was responsible for landing the British 46th and 56th Divisions abreast closest to the town, with MG U.S. 36th Division landing farthest south.<sup>17</sup> An additional three U.S. Ranger Battalions and the 2d and 41st British Commandos rounded out the Salerno assault element.

GEN Clark expected to face nearly 40,000 enemy soldiers upon landing at Salerno and another 60,000 more within three days once German commanders developed an appreciation for the situation.<sup>18</sup> He hoped to push 125,000 Allied troops ashore south of the city within the first two days, enabling landed commanders to prepare for the Axis counterattack by the third. GEN Clark assigned LTG McCreery's British 10 Corps responsibility for initially seizing the Salerno port facilities and key terrain to the south, easily identified by a sizeable amphitheater complex. These two areas flanked the Montecorvino airfield and set conditions for its use as an aerial supply line in follow-on operations.<sup>19</sup> LTG McCreery assigned the British 46th Division, commanded by MG John Hawkesworth, to seize the port facilities and the 56th Division, commanded by MG Douglas A. H. Graham, to seize the amphitheater.<sup>20</sup> The Rangers and Commandos would land along some narrow stretches west of Salerno in advance of the main

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<sup>16</sup> Kenneth Smith, *Naples - Foggia* (Washington, D.C.: U.S. Army Center of Military History, 1994), 7.

<sup>17</sup> Harold Nelson, *SALERNO: The Beaches to the Volturno, 9 September - 6 October 1943* (Washington, D.C.: U.S. Army Center of Military History, 1990), 4.

<sup>18</sup> Kenneth Smith, *Naples - Foggia* (Washington, D.C.: U.S. Army Center of Military History, 1994), 8-10.

<sup>19</sup> Harold Nelson, *SALERNO: The Beaches to the Volturno, 9 September - 6 October 1943* (Washington, D.C.: U.S. Army Center of Military History, 1990), 8.

<sup>20</sup> Rick Atkinson, *The Day of Battle: The War in Sicily and Italy, 1943-1944* (New York: Henry Holt, 2007), 239.

assault, securing key passes in the mountains to the north of the city and preparing to defend against German counterattack from the Naples garrison.<sup>21</sup> Once the assault force received reinforcements from the British 7th Armored Division around the fifth day ashore, the three divisions of the assault force would pivot north and advance toward Naples with the remaining elements of the Allied 5th Army following behind.<sup>22</sup>

### **Battle Narrative**

On September 9 at 3:10 am, U.S. Rangers landed unopposed and moved quickly inland to seize their mountainous objectives, with the British Commandos making quick work of the Salerno residential districts.<sup>23</sup> The British 10 Corps landed its two divisions under the cover of naval guns, meeting strong opposition as soldiers fought their way off the beaches. The U.S. 36th Infantry Division came ashore farther south (some time later and without support from naval guns), hoping to take the defenders by surprise. Although leading elements suffered losses, especially the 36th Division, all assault elements were ashore within three hours of initiation.<sup>24</sup>

German Luftwaffe attacks harassed allied landing craft and those forces already ashore before daybreak, but the influence of German airpower lessened as Allied aircraft began arriving from Sicily. Despite concentrated local fighting, the greater German response to the Allied invasion was uncoordinated. By 7:00 am, a company of 15 tanks from MG Sikenius' 16th Panzer Division made first contact with the British forces on the beach but were repelled a mixture of

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<sup>21</sup> Kenneth Smith, *Naples - Foggia* (Washington, D.C.: U.S. Army Center of Military History, 1994), 8-10.

<sup>22</sup> Rick Atkinson, *The Day of Battle: The War in Sicily and Italy, 1943-1944* (New York: Henry Holt, 2007), 202.

<sup>23</sup> Kenneth Smith, *Naples - Foggia* (Washington, D.C.: U.S. Army Center of Military History, 1994), 10-13.

<sup>24</sup> Potter, E.B.; Nimitz, Chester W. (1960). *Sea Power*. Englewood Cliffs, New Jersey: Prentice-Hall. pg 595-598

naval gunfire, artillery, infantry, and engineers.<sup>25</sup> However, even the disjointed harassment by German artillery, tank, and infantry units soon disrupted Allied beachhead operations. In particular, Allied artillery and armor units arrived late and disorganized, frustrating the landed units' ability to establish effective defensive perimeters and push farther inland.<sup>26</sup>

German forces from the 16th Panzer Division conducted probing and spoiling attacks to determine the extent of the Allied operation, without decisively engaging the enemy.<sup>27</sup> These small-scale and seemingly uncoordinated attacks continued throughout the day but decreased in effectiveness and frequency as GEN Clark's Fifth Army established a defensible lodgment. Allied resources poured ashore as the divisions of the British 10 Corps pressed towards their objectives.<sup>28</sup> The British 46th and 56th Divisions faced stiff and increasingly coordinated opposition as they met with heavier concentrations of 16th Panzer Division forces. However, by nightfall on September 9, the British 10 Corps was three miles inland and was in sight of their objectives on either side of the Montecorvino airfield.

As Allied forces flowed into Salerno, FM Kesslering was overseeing the deliberate withdrawal of German forces opposite the Allied Eighth Army landings.<sup>29</sup> Although FM Kesslering was responding to the discord from the Italian surrender, reports of the Salerno invasion did not surprise him. He had already had the GEN Vietinghoff's Tenth German Army

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<sup>25</sup> C. J. C. Molony, *History of the Second World War: The Mediterranean and Middle East. Vol. 5, the Campaign in Sicily 1943 and the Campaign in Italy 3rd September 1943 to 31st March 1944* (London: Her Majesty's Stationary Office, 1973), 268.

<sup>26</sup> Kenneth Smith, *Naples - Foggia* (Washington, D.C.: U.S. Army Center of Military History, 1994), 10-13.

<sup>27</sup> Robert Citino, *The Wehrmacht Retreats: Fighting a Lost War, 1943*. (Lawrence, Kansas: University Press of Kansas, 2012), 255-257.

<sup>28</sup> Kenneth Smith, *Naples - Foggia* (Washington, D.C.: U.S. Army Center of Military History, 1994), 10-13.

<sup>29</sup> Albert N. Garland, Howard McGaw Smyth, and Martin Blumenson, *Sicily and the Surrender of Italy* (Washington, D.C.: U.S. Army Center of Military History, 1994), 163-74.

defending the greater Naples region, with the 16th Panzer Division at Salerno even now.<sup>30</sup>

Within a matter of days, the 76th Panzer Corps would be complete with their orderly withdrawal from southern Italy and available to push the Allies back into the sea.

On September 10, GEN Vietinghoff ordered MG Sikenius to focus his efforts on fixing the Allied forces in their positions astride the Montecorvino airfield until German reinforcements arrived to prevent the Allies from organizing for follow-on offensive operations.<sup>31</sup> Although LTG McCreery's forces could see the ground they intended to occupy, MG Sikenius' 16th Panzer Division maintained constant contact with the 46th and 56th Divisions lead elements, exacting a considerable toll from the Allies for each inch they moved forward.<sup>32</sup> LTG MCreery's forces failed to build any momentum, stopped in their tracks by short but intense fighting, perpetrated by small but coordinated German units.<sup>33</sup> Squads and platoons from the 16th Panzer Division often engaged simultaneously across wide fronts, giving the appearance of a much larger force only to melt away in the face of resistance. Alternatively, the Germans allowed lead elements of a British column to advance followed by a violent counterattack where they enveloped large swaths of unsuspecting Allies.

On the evening of September 10, GEN Clark recognized that though the U.S. VI Corps had made solid progress, the British 10 Corps sector was essentially a stalemate.<sup>34</sup> GEN Clark abandoned his initial plan, reassigning the southernmost portion of the British 10 Corps sector to

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<sup>30</sup> Harold Nelson, *SALERNO: The Beaches to the Volturno, 9 September - 6 October 1943* (Washington, D.C.: U.S. Army Center of Military History, 1990), 14-15.

<sup>31</sup> Kenneth Smith, *Naples - Foggia* (Washington, D.C.: U.S. Army Center of Military History, 1994), 10-13.

<sup>32</sup> C. J. C. Molony, *History of the Second World War: The Mediterranean and Middle East. Vol. 5, the Campaign in Sicily 1943 and the Campaign in Italy 3rd September 1943 to 31st March 1944* (London: Her Majesty's Stationary Office, 1973), 280.

<sup>33</sup> Robert Citino, *The Wehrmacht Retreats: Fighting a Lost War, 1943.* (Lawrence, Kansas: University Press of Kansas, 2012), 255-257.

<sup>34</sup> Kenneth Smith, *Naples - Foggia* (Washington, D.C.: U.S. Army Center of Military History, 1994), 10-13.

the VI Corps in hopes that an increased force ratio against the 16th Panzer Division would tip the scales in Allied favor.<sup>35</sup> The redistribution did not work, and three days later, on September 13, GEN Vietinghoff brought the weight of the German 10th Army and 76th Panzer Corps down on top of the U.S. Fifth Army, penetrating the forward lines and threatening the Allied rear area. The Allied offensive at Salerno had ended with the massive German counterattack, turning their hopeful offense into a desperate defense.<sup>36</sup>

### Values for Key Independent Variables

LTG McCreery's British 10th Corps had 25,834 personnel under his command; consisting of no tanks, 276 artillery pieces, and 262 aviation sorties. During this period, Britain maintained a Polity IV Democracy Score of 10, a education per capita score of 1072, a per capita income of \$7,639 in the year prior to the battle, and had suffered no *coup d'état* within the previous five years. MG Sikenius' German 16th Panzer Division had 8,500 personnel under his command; consisting of 166 tanks (all heavy tanks), 102 artillery pieces, and 230 aviation sorties. During this period, Germany maintained a Polity IV Democracy Score of 0, a education per capita score of 1252, a per capita income of \$5,740 in the year prior to the battle, and had suffered no *coup d'état* within the previous five years. During the 72-hour battle, the British 10th Corps possessed 75 percent of the soldiers, 73 percent of the artillery pieces, 53 percent of the aircraft sorties, and none of the tanks on the battlefield.

By battle's end, nearly 10 percent (2,904) of the soldiers who participated were dead (See Table 13). LTG McCreery lost 2,684 personnel, an unknown number of artillery, and an

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<sup>35</sup> C. J. C. Molony, *History of the Second World War: The Mediterranean and Middle East. Vol. 5, the Campaign in Sicily 1943 and the Campaign in Italy 3rd September 1943 to 31st March 1944* (London: Her Majesty's Stationary Office, 1973), 293-294.

<sup>36</sup> Kenneth Smith, *Naples - Foggia* (Washington, D.C.: U.S. Army Center of Military History, 1994), 13.



unknown number aircraft. MG Sikenius lost 220 personnel and an unknown number of tanks, artillery, and aircraft. Even though the British forces attacked in adherence with the conventional 3:1 force ratio, 13 British soldiers died for every German soldier killed, a level of battlefield efficiency strongly favoring the Germans.

Table 13. Battle Summary (WWII –Salerno)

	Attacker	Defender	Advantage
	Britain	Germany	
Personnel	25,834	8,500	Britain*
Armor †	0	166	Germany**
Aircraft	262	230	Britain
Artillery	276	102	Britain*
Democracy	10	0	Britain
Economy	\$7,639	\$5,740	Britain
Education	1072	1252	Germany
Civ-Mil Relationship ‡	0	0	---
Planning †	5.06	4.85	Britain
Risk Aversion †	4.11	3.32	Germany**
Collective Deference ‡	4.08	4.02	---
Communication Impedance	2.80	2.54	Germany
Loss Exchange Ratio	2,904	220	Germany**
	13:1		

† Significant beyond 0.01      \* Advantage is  $\cong$  3:1 ratio  
‡ Significant beyond 0.05      \*\* Advantage is  $>$  3:1 ratio

The British cultural traits associated with battle consisted of Planning Propensity (5.06), Risk Aversion (4.11), Collective Deference (4.08), and Communication Impedance (2.80). The German cultural dimension scores associated with battle consisted of Planning Propensity (4.85), Risk Aversion (3.32), Collective Deference (4.02), and Communication Impedance (2.54). This pairing of opponent cultures should have greatly favored the Germans in terms of their low levels of relative Risk Aversion and slightly favored them in terms of their lower levels of Communication Impedance. The British should have had a slight advantage in terms of their

higher levels of relative Planning Propensity. Both parties were functionally similar in terms of relative Collective Deference.

### **Outcome versus Expectation**

#### Material Factors

The British 10 Corps generally fielded a materially superior force than the elements of the German 16th Panzer Division they faced. Regarding personnel and artillery, the British functionally achieved a 3:1 ratio, meeting the threshold for offensive operations against a deliberate defense. Unfortunately, the principle material shortfall for the British 10 Corps was the overwhelming absence of tanks in their formation during the first few days ashore. Consequently, LTG McCreery absolutely lacked the most statistically significant material resource he could want on the battlefield. Regardless, the British commander would have likely expected a much more positive outcome given the advantages he did possess.

This would have been even truer as the 16th Panzer Division did not appear to have committed to a deliberate defensive posture within its assigned area of responsibility, as evidenced by the lengthy period of piecemeal and probing responses to the Allied landing. Instead, MG Sikenius appears to have elected to adopt a hasty defensive posture until the Allied situation developed further. As such, the British to German ratio of forces should have been sufficient to produce a more favorable—or, at least, less unfavorable—outcome for the British 10 Corps.

#### Institutional and Unit-Level Factors

If Democracy and Economy led to greater effectiveness on the battlefield, the British 10 Corps should have taken the field handily. Unfortunately, the overwhelmingly more representative and economically advanced Britain did not field the most efficient or effective

forces at Salerno. As for the influence of Education and Civil-Military Relationships on outcomes, Education levels slightly favored the Germans but tend not to influence outcomes in a significant way, and Civil-Military Relationships appear not to play a part in this case though they do affect others significantly.

### Cultural Factors

Culturally, the British 10 Corps should have been able to leverage their modest advantage in terms of greater Planning Propensity to greater effect, but the German 16th Panzer appears to have made the most of their relatively lower levels of Risk Aversion, Collective Deference, and Communication Impedance traits. On a very basic level, the British propensity to plan is evident in the time-phased approach to the Allied amphibious landings and the sequencing of events in the larger Salerno-Naples-Rome context. This stands in contrast to the Germans' less committed, area defense approach. The 16th Panzer Division retained improved freedom of maneuver over their British counterparts, engaging only as current conditions dictated. Furthermore, MG Sikenius used his soldiers' capacity for highly complex, coordinated, and risky maneuvers to great effect.

### Implications

The principle lesson from the WWII Battle of Salerno is that force ratios alone are insufficient to explain the battle's outcome. The Germans had fewer material resources, but spilled more British blood; leveraging inferior means with superior ways. German soldiers, operating in small and well-coordinated units, executed high risk and complex maneuvers to exact a withering toll on the British. Perhaps revealing an inherent appreciation for their condition and their capability, the Germans elected to defeat the British through a thousand paper cuts instead of an all-out pitch battle.

## **SUPERIOR FORCE RATIO (>3:1)**

Why Operation ISKRA? The 1943 offensive to break the siege at Leningrad, fought between the Russian 2nd Assault Army, commanded by Lieutenant General V.Z. Romanovsky, and the German 18th Army, commanded by Colonel General (CG) Georg Lindemann, is a case where the commander attacked with a greater than 3:1 ratio against the defender. This 7-day battle took place from January 12–19 as part of a larger Russian campaign to defend Leningrad and is a case where material factors should have produced a markedly positive outcome for the attacker.<sup>37</sup> In actuality, the Russian forces did not fare well at all. Despite their greater than 3:1 ratio, the attacking Russian forces lost seven soldiers for every German life they took during their 7-day offensive. As in the previous case of Salerno, material factors fail to explain the observed outcome. Instead, differences in unit-level and cultural attributes appear to explain much more of the participants' most beneficial and detrimental battlefield behaviors.

### **Strategic Context**

On August 19, 1939, mere 13-days before Nazi forces invaded Poland, the Soviet Union entered into the “German–Soviet Commercial Agreement” with Germany, whereby the Soviets would provide raw materials in exchange for certain German military and civilian equipment.<sup>38</sup> Five days later, the two parties entered into the Molotov-Ribbentrop Pact, a secret agreement that divided the states of Europe into German and Soviet “spheres of influence.”<sup>39</sup>

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<sup>37</sup> Albert Pleysier, *Frozen Tears: The Blockade and Battle of Leningrad* (Lanham, Maryland: University Press of America, 2008), 143.; Harrison Salisbury, *The 900 Days: The Siege Of Leningrad* (Boston: Da Capo Press, 2009), 158.

<sup>38</sup> William Shirer, *The Rise and Fall of the Third Reich: A History of Nazi Germany* (New York: Simon and Schuster, 1990), 668.; Edward Ericson, *Feeding the German Eagle: Soviet Economic Aid to Nazi Germany, 1933–1941* (Westport, CT: Greenwood Publishing Group, 1999), 57.

<sup>39</sup> Modern History Sourcebook, “The Molotov-Ribbentrop Pact, 1939,” *Fordham University*, August 23, 1939, <http://legacy.fordham.edu/halsall/mod/1939pact.html>.

On September 1, the Germans commenced their assault into western Poland, joined on the 17th by Russian advances in the east.<sup>40</sup> As the two forces neared one another, German and Russian commanders actually coordinated attacks to snuff out pockets of resistance and avoid fratricide.<sup>41</sup> Stunned and wholly unprepared for war, the three states along the Baltic Sea—Estonia, Latvia, and Lithuania—had no choice but to agree to the Soviet terms in the “Pact of Defense and Mutual Assistance,” opening the door for Soviet troops to occupy them for their own good.<sup>42</sup>

As the Nazis continued their methodical dismembering of Europe through 1939 and 1940, the agreements between the Germans and Russians maintained an eerie status quo and largely kept the Russians from interfering in German business.<sup>43</sup> Both parties reaffirmed their pact in 1940 and 1941, avoiding distracting border disputes and continuing lucrative trade. However, the 1941 Commercial Agreement proved to be short lived. Hitler, buoyed by success in Western Europe and North Africa, turned his eyes eastward and invaded the Soviet Union just six months after signing their last agreement.

The capture of Leningrad represented one of three strategic goals of the Nazi Operation BARBAROSSA, along with Stalingrad and Moscow. Hitler wanted Leningrad for both military and political reasons. Militarily, the city hosted headquarters for the Soviet Baltic Fleet, a major industrial center (responsible for over 10% of all Soviet heavy industry at the time), and protected the port of Murmansk (the Russian terminus for arctic aid convoys from Britain and

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<sup>40</sup> Prit Buttar, *Between Giants: The Battle for the Baltics in World War II* (Oxford: Osprey Publishing, 2013), 32.

<sup>41</sup> Geoffrey Roberts, *Stalin's Wars: From World War to Cold War, 1939–1953* (Cambridge: Yale University Press, 2006), 43.

<sup>42</sup> Gerhard Wettig, *Stalin and the Cold War in Europe* (Landham, MD: Rowman & Littlefield, 2008), 20-21.

<sup>43</sup> Modern History Sourcebook, “The Molotov-Ribbentrop Pact, 1939,” Fordham University, August 23, 1939. <http://legacy.fordham.edu/halsall/mod/1939pact.html>.

the United States).<sup>44</sup> Politically, the city was a former Russian capital, the birthplace of the Communist Revolution, and the namesake of the father of Soviet Communism.<sup>45</sup>

Although Hitler wanted to take the city, he did not want to keep it. On September 29, the German High Command sent the Army Group North Commander instructions to ignore any Russian requests for negotiation, as care and administration of such a large urban population was not in the best interest of the Reich.<sup>46</sup> Fundamentally, Hitler intended to seize Leningrad, raze the city to the ground, and pass control of areas north of the River Neva to Finnish forces.<sup>47</sup>

Although German forces enjoyed great success during the early weeks of Operation BARBAROSSA, moving farther faster than many planners had hoped. As the Nazi's supply lines strained to keep up with the precipitous advance, German Army Group North forces faced increasingly stubborn Soviet resistance as they approached Leningrad.<sup>48</sup> Intent to isolate and capture the city before winter arrived, the prize proved difficult to win, and the once optimistic German soldiers nestled deep into the mire of siege operations.

Shortly after its encirclement in November 1941, the luster of Leningrad wore off for Hitler, overshadowed by military and political happenings elsewhere. Consequently, the German High Command redistributed combat power from the German Army North to operations in the Army Center and Army South's areas of responsibility. The remaining German forces were

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<sup>44</sup> Paul Carell, *Scorched Earth: The Russian-German War 1943–1944* (Berlin: Schiffer Publishing, 1966) 205-206.

<sup>45</sup> Chris Bellamy, *Absolute War: Soviet Russia in the Second World War* (New York: Knopf Doubleday Publishing Group, 2008), Ch 4.

<sup>46</sup> Anna Reid, *Leningrad: The Epic Siege of World War II, 1941-1944* (London: Bloomsbury Publishing, 2011), 134-135.

<sup>47</sup> On 27 November, 1941, Hitler explained to the Finnish Foreign Minister Witting, that Leningrad was to be razed and turned over to the Finns, establishing the River Neva as the new post-war border between the two partners. Olli Hannikainen, *Finland in the Second World War: between Germany and Russia* (Basingstoke, UK: Palgrave Macmillan, 2002), 104.

<sup>48</sup> Nikolaj Kislitsyn, Nikolaï Gavrilovich Kislitsyn, and Vasilii Efimovich Zubakov, *Leningrad Does Not Surrender* (Moscow: Progress, 1989), 227-238.

simply not strong enough to press any advantage they may have had against the city.

Regrettably, the Soviets also redistributed their combat power elsewhere along the Eastern Front. The concurrent reprioritization resulted in a stalemate lasting nearly 900 days, killing more than 300,000 soldiers, and starving over a million civilians to death.<sup>49</sup>

During the spring and summer of 1942, the Russians attempted repeatedly to breach the blockade from within and without. The Soviets came closest to raising the siege during the Sinyavino Offensive of late August-early September, but the Russian advance collapsed with lines settling a mere 10 miles from their comrades' city.<sup>50</sup> In November, the Russians began preparations for yet another offensive; this time, the Soviets would attack with as much material as the *Stavka* could muster.<sup>51</sup> Codenamed Operation *ISKRA* (or "Spark"), the Russians would commence offensive operations in January 1943.<sup>52</sup>

By the end of the first week of the new year, Soviet forces were conducting offensive operations across nearly the entire Eastern Front. The Soviet High Command had intended to begin operations at Leningrad at the same time but had to delay the assault due to poor ice conditions on the Neva River that precluded forces attacking from the west. Though unforeseen, the delay benefitted the Russian operation greatly. Recent Russian successes at Stalingrad and beyond created quite a commotion in the German High Command and before the end of the second week of January, the German 11th Army and 9 additional divisions from the German Army North's were headed south to reinforce other German Fronts.<sup>53</sup> The quiet in the north was

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<sup>49</sup> Robert Cowley and Geoffrey Parker, eds., *The Reader's Companion to Military History* (Boston: Harcourt Publishing Company, 1996).

<sup>50</sup> Aleksey Isayev, *Vanished: History of the Second World War We Did Not Know* (Eksmo: Yauza, 2005), 441.

<sup>51</sup> Albert Pleysier, *Frozen Tears: The Blockade and Battle of Leningrad* (Lanham, Maryland: University Press of America, 2008), 145.

<sup>52</sup> David Glantz, *The Battle for Leningrad 1941–1944* (Lawrence, KS: Kansas University Press, 2002), 265.

<sup>53</sup> David Glantz, *The Battle for Leningrad 1941–1944* (Lawrence, KS: Kansas University Press, 2002), 262.

not to last, as the Stavka intended for the liberation of Leningrad to be the first of many offensive operations against the German Army Group North despite delay and promised to redirect resources to ensure its overwhelming success.<sup>54</sup>

### **Operational Plan**

The Axis encirclement of Leningrad made the Russian-controlled area resemble an island with Finnish forces along its northern shore, Germans to the south, and water to the east and west.<sup>55</sup> Leningrad's major population center dominated the west, positioned along the Baltic shore between Finnish and German armies to the north and south. The city's principal lifeline for so many months had been a "Road of Life" crossing the southern reaches of the massive Lake Ladoga in the east; a solid expanse of water navigated by ships in the summer and of ice navigated by trucks in the winter.

The German 18th Army, led by CG Lindemann maintained responsibility for contact with the Russians in and around Leningrad. His command consisted of 26 divisions spread across nearly 280 miles.<sup>56</sup> This level of dispersion resulted in a broad but thin front and required division-level reserves to fill in the seams between units. Divisions established small-scale tactical reserves of a battalion or two as the German 18th Army relied on portions of the 96th Infantry and 5th Mountain Divisions. The 1st Air Fleet provided the Nazis with air support over the sprawling area.

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<sup>54</sup> David Glantz, *The Battle for Leningrad 1941–1944* (Lawrence, KS: Kansas University Press, 2002), 259

<sup>55</sup> Chris Bellamy, *Absolute War: Soviet Russia in the Second World War* (New York: Knopf Doubleday Publishing Group), Ch 13.

<sup>56</sup> Chris Bellamy, *Absolute War: Soviet Russia in the Second World War* (New York: Knopf Doubleday Publishing Group), Ch 13.



In January of 1943, the shortest distance separating General Zhukov's Leningrad Front and FM Voroshilov's Volkov Front was the 10-mile wide German salient connecting the main body of Army North to the southern shore of Lake Ladoga.<sup>57</sup> Five German divisions and elements of a sixth occupied the narrow corridor, nicknamed the "bottleneck." It would be here that the Russians would focus their attack.

Dense forests covered the area while soupy wetlands and half-frozen peat bogs filled the gaps closer to the lake's shore. In the center, at the town of Sinyavino, stood an impressive bald, rising nearly 500 feet above the surrounding terrain.<sup>58</sup> The thick trees greatly reduced visibility for both sides and the saturated soil limited the mobility of Russian mechanized forces to a sparse road network. The heights are one of the few dry and clear areas in the lake region, making them key terrain from which to observe and defend.<sup>59</sup> Throughout the woods German units occupied abandoned Russian work settlements, turning each one into a fortified outpost with responsibility for defending its local area of the road network.

Overall, the physical conditions strongly favored the German defenders. Adding to their natural advantage, the Germans maintained a dense network of interconnected defensive strong points and trenches.<sup>60</sup> Each location, no matter how remote, enjoyed the support from both formidable obstacles and interlocking artillery fire. Although German preparations had been extensive, their current strength in the area was not. Given the circumstances, the German's plan for doing more with less was simple, defend the high ground and control the road network. For

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<sup>57</sup> Otto Preston Chaney, *Zhukov* (Norman, OK: University of Oklahoma Press, 2014), 256-259.

<sup>58</sup> David Glantz, *The Battle for Leningrad 1941–1944* (Lawrence, KS: Kansas University Press, 2002), 264

<sup>59</sup> David Glantz, *The Battle for Leningrad 1941–1944* (Lawrence, KS: Kansas University Press, 2002), 264.

<sup>60</sup> David Glantz, *The Battle for Leningrad 1941–1944* (Lawrence, KS: Kansas University Press, 2002), 216-217.

the Russians, these conditions meant that any offensive through the bottleneck would see their light infantry forces attacking deliberate fortifications without the support of tanks or artillery.<sup>61</sup>

The Russians had experience with this kind of fighting, and only just recently. The later 1942 Operation SINYAVINO, Russian forces attacked across the bottleneck south of the heights. The Stavka intended for forces from the Leningrad and Volkhov Fronts to attack towards one another, meet in the center and encircle the half-dozen or so German divisions to their north.<sup>62</sup> That operation ended in failure, plagued by poor weather and assault forces insufficient to the task. The nearly encircled Germans within the bottleneck rallied early in operations, counterattacked into the attackers' exposed flank, and pushed the would-be liberators back to their original lines.

In 1943, however, the Russians would change their approach during Operation ISKRA. The Stavka ordered the two Russian Front Commanders to attack simultaneously north of Sinyavino, preceded by a short aerial bombardment of critical German positions.<sup>63</sup> The January offensive would take the Russians through the marshy lowlands along the Lake Ladoga shoreline where their tanks and artillery might have a chance to be more effective if the ground remained sufficiently frozen to support their movement.<sup>64</sup> This orientation essentially concentrated Russian combat power against the two northernmost German divisions, the 170th Infantry in the west and the 227th Infantry in the east, supported by elements of the 26th Corps Artillery on the Sinyavino Heights. This approach effectively eliminated the possibility of Russian forces capturing multiple

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<sup>61</sup> David Glantz, *The Battle for Leningrad 1941–1944* (Lawrence, KS: Kansas University Press, 2002), 216-217.

<sup>62</sup> Otto Chaney, *Zhukov* (Norman, OK: University of Oklahoma Press, 2014), 256-259.

<sup>63</sup> Aleksey Isayev, *Vanished: History of the Second World War We Did Not Know* (Eksmo: Yauza, 2005), 444.

<sup>64</sup> Aleksey Isayev, *Vanished: History of the Second World War We Did Not Know* (Eksmo: Yauza, 2005), 444.

German divisions during the assault.<sup>65</sup> However, it also greatly reduced the risks associated with Germans attacking an unguarded or understrength flank during the assault as well.

As the date for the offensive approached, General Zhukov selected the Russian 67th Army from his Leningrad Front to attack across the partially frozen Neva River from the west.<sup>66</sup> FM Voroshilov chose the 2nd Assault Army from his Volkhov Front, commanded by LTG Romanovsky, to attack overland from the east. The Russian 8th Army would also participate in the east, but would conduct only limited offensive operations against the German 1st Infantry Division to protect the 2nd Assault Army's southern flank.<sup>67</sup> The Stavka reassigned the Russian 13th and 14th Air Armies to provide air support during the operation as well.

True to their word, the Russian High Command sent considerable reinforcements to the north in preparation for Operation ISKRA during the month of December.<sup>68</sup> New arrivals included the usual contingent of rifle divisions and brigades to replenish the core combat formations, but also critical support units as well. In particular, the 2nd Assault Army received hundreds of additional artillery and aircraft to make up for their catastrophic absence in Operation SINYAVINO.<sup>69</sup> LTG Romanovsky's forces also received numerous engineer units to help reduce the expected heavy German defenses. So important was this push to Leningrad, that the 2nd Assault Army also received special operations units in the form of three ski brigades and four aero-sleigh battalions.<sup>70</sup>

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<sup>65</sup> Anna Reid, *Leningrad: The Epic Siege of World War II, 1941-1944* (New York: Bloomsbury Publishing USA, 2011), 373.

<sup>66</sup> Otto Preston Chaney, *Zhukov* (Norman, OK: University of Oklahoma Press, 2014), 256-259.

<sup>67</sup> David Glantz, *The Battle for Leningrad 1941-1944* (Lawrence, KS: Kansas University Press, 2002), 268.

<sup>68</sup> Prit Buttar, *Between Giants: The Battle for the Baltics in World War II* (Oxford: Osprey Publishing, 2013), 161.

<sup>69</sup> David Glantz, *The Battle for Leningrad 1941-1944* (Lawrence, KS: Kansas University Press, 2002), 269-270.

<sup>70</sup> Nikolaj Kislitsyn, Nikolaï Gavrilovich Kislitsyn, and Vasilii Efimovich Zubakov, *Leningrad Does Not Surrender* (Moscow: Progress, 1989), 244.

Not wanting to provide the German defenders with any forewarning of the coming attacks, the Russians implemented a number of operational security precautions.<sup>71</sup> First, the Russians limited the number of senior officers involved in planning operations and their preparations. Second, Soviet forces relocated only at night or during bad weather. Third, Russian forces simulated attack preparations and conducted provocative troop movements elsewhere to disguise their true intentions.<sup>72</sup> By January 12, all operational leaders were present, rifle divisions were in their assembly areas, and the first echelon tanks were in their assault positions.<sup>73</sup> The battle was about to begin.

### **Battle Narrative**

Hours before daybreak on January 12, 1943, Soviet night bombers attacked the three German divisional headquarters positions in the bottleneck in efforts to disrupt the defenders' ability to mount an effective response.<sup>74</sup> The bombers also attacked German airfields, communication centers, and artillery positions to disrupt the flow of support to the front lines.<sup>75</sup> The ground assault phase of Operation ISKRA began a short time later, at 9:30 am, as artillery from the two Soviet Fronts began pounding German defenses simultaneously for nearly two hours. As shells continued to rain down from above, Soviet first echelon forces advanced. These lead elements of Russian infantry and engineers began to sprint forward as cannon fire melted

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<sup>71</sup> Chris Bellamy, *Absolute War: Soviet Russia in the Second World War* (New York: Knopf Doubleday Publishing Group), Ch 13.

<sup>72</sup> David Glantz, *The Battle for Leningrad 1941–1944* (Lawrence, KS: Kansas University Press, 2002), 272.

<sup>73</sup> David Glantz, *The Battle for Leningrad 1941–1944* (Lawrence, KS: Kansas University Press, 2002), 273.

<sup>74</sup> Descriptions of this battle tend to be vague in terms of unit designations. As such, much of the information regarding unit designation required interpretation of period Russian battle maps using US Army technical manuals. "Russian Map of the Operations Conducted from the 11th to 30th of January 1943," *Gott Mit Uns*, [https://1infanteriedivision.files.wordpress.com/2012/04/leningrad\\_jan11-30\\_43.jpg](https://1infanteriedivision.files.wordpress.com/2012/04/leningrad_jan11-30_43.jpg) (accessed January 6, 2016); Department of the Army, *Technical Manual 30-546: Glossary of Soviet Military and Related Abbreviations* (Washington, D.C.: Department of the Army, 1956).

<sup>75</sup> Aleksey Isayev, *Vanished: History of the Second World War We Did Not Know* (Eksmo: Yauza, 2005), 454.

away into a final barrage of Katyusha rockets.<sup>76</sup> The Soviet BM-8 (48 x 82mm) and BM-13 (16 x 132mm) truck-mounted multiple launch rocket systems, nicknamed “Katyusha” (a diminutive girl’s name in Russian), delivered a volley so devastating it turned the dense forest before them into a wall of fire, splintered trees, and death.<sup>77</sup>

In the west, the Russian 67th Army’s assault force achieved their greatest success between the towns of Shlisselburg in the north and Gorodok in the south.<sup>78</sup> Attacking across the half-frozen Neva River, the 136th and 268th Rifle Divisions captured a bridgehead approximately 3 miles wide and 2 miles deep, maintaining great pressure against the German defenses.<sup>79</sup> This kind of success was not universal across the front. Attacks farther south at Gorodok proper did managed to capture the first line of German trenches, but the attack farther north failed outside the city of Shlisselburg.<sup>80</sup>

In the east, the Russian 2nd Assault Army also fared poorly. On the first day, LTG Romanovsky’s 128th Rifle Division nearly managed to envelop the German’s lakeside strong point at Lipka in the far northeast, but could not destroy it due to intense supporting fire from defenders at the nearby Workers’ Settlements #4.<sup>81</sup> The Russian 372nd and 256th Rifle Divisions enveloped Workers’ Settlement #8 but were also unable to reduce its defenses meaningfully. Settlement #8 occupied a central position in the Germans’ eastern defensive lines and represented a particularly well-defended garrison of over 700 soldiers and 16 bunkers. Between

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<sup>76</sup> Níkolaj Kíslítsyn, Nikolaï Gavrilovich Kíslítsyn, and Vasiliï Efimovich Zubakov, *Leningrad Does Not Surrender* (Moscow: Progress, 1989), 169.

<sup>77</sup> David Glantz, *The Battle for Leningrad 1941–1944* (Lawrence, KS: Kansas University Press, 2002), 274.

<sup>78</sup> Níkolaj Kíslítsyn, Nikolaï Gavrilovich Kíslítsyn, Vasiliï Efimovich Zubakov, *Leningrad Does Not Surrender* (Moscow: Progress, 1989), 172.

<sup>79</sup> David Glantz, *The Battle for Leningrad 1941–1944* (Lawrence, KS: Kansas University Press, 2002), 274.

<sup>80</sup> Aleksey Isayev, *Vanished: History of the Second World War We Did Not Know* (Eksmo: Yauza, 2005), 456-457.

<sup>81</sup> Níkolaj Kíslítsyn, Nikolaï Gavrilovich Kíslítsyn, and Vasiliï Efimovich Zubakov, *Leningrad Does Not Surrender* (Moscow: Progress, 1989), 169-172.

Workers' Settlement #8 and the Kruglaya Grove, the Russian 327th and 314th Rifle Divisions advanced just over half a mile.<sup>82</sup> Overall, the first day of Operation ISKRA saw the 2nd Assault Army penetrate the German defensive line by little more than a mile in most places and far less in others. At the southernmost reaches of the Volkov Front advance, the Russian 8th Army only managed to capture the first line of German trenches.<sup>83</sup>

Under the cover of darkness on the night of January 12, the Germans responded to the Russian attacks by rapidly deploying available reserves into the region.<sup>84</sup> CG Lindemann sent one makeshift battle group of five battalions from the 96th Infantry Division, supported by a small contingent of tanks and artillery, to reinforce the 170th Infantry Division in the west. He sent a similar battle group of only infantry battalions from the 96th Division to support the 227th Infantry Division in the east.<sup>85</sup> The rest of the German 96th Infantry Division remained in the railroad depot of Mga, miles south of the Sinyavino Heights and well outside the path of the principle Russian attackers.

On January 13, high winds and low cloud cover prevented the Russian soldiers from receiving any air support. This resulted in the Russians exchanging heavy losses for almost no ground gained.<sup>86</sup> The Germans changed tactics after their counterattacks failed to stem the incessant waves of Soviet troops. CG Lindemann kludged together more makeshift battle groups to reinforce the 170th and 227th Infantry Divisions, using elements of German units from quieter parts of the front. Donor units at CG Lindemann's disposal tended to be those along Leningrad's

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<sup>82</sup> Nikolaj Kíslítsyn, Nikolaï Gavrilovich Kíslítsyn, and Vasilii Efimovich Zubakov, *Leningrad Does Not Surrender* (Moscow: Progress, 1989), 169-172.

<sup>83</sup> Aleksey Isayev, *Vanished: History of the Second World War We Did Not Know* (Eksmo: Yauza, 2005), 455.

<sup>84</sup> Nikolaj Kíslítsyn, Nikolaï Gavrilovich Kíslítsyn, and Vasilii Efimovich Zubakov, *Leningrad Does Not Surrender* (Moscow: Progress, 1989), 172.

<sup>85</sup> David Glantz, *The Battle for Leningrad 1941–1944* (Lawrence, KS: Kansas University Press, 2002), 277.

<sup>86</sup> Aleksey Isayev, *Vanished: History of the Second World War We Did Not Know* (Eksmo: Yauza, 2005), 456-457.

southern front, including the 5th Mountain Division south of Peski, the SS Police Division south of Porogi, and the German 61st Infantry Divisions farther to the southwest.<sup>87</sup>

On January 14, improved weather conditions permitted Soviet ground forces to advance once more, this time with the help of much needed Russian air support. LTG Romanovsky's deployed his special 12th Ski Brigade north across the ice of the Lake Ladoga and then south to attack the German's rear lines along the coast.<sup>88</sup> This bold maneuver helped isolate the enemy's northernmost strong points at Lipka in the east and Shlisselburg in the west.<sup>89</sup>

Over the next three days, the two Soviet Fronts ground away at the heavy German defenses, attacking nearly continuously throughout the morning, noon, and night. In the west, the Russian 67th Army captured the Neba River villages from Shlisselburg to Annenskoye, and then pressed on to the north central strong points at Workers' Settlements #3 and #2.<sup>90</sup> In the east, LTG Romanovsky's 2nd Assault Army experienced greater success, completing the capture of German forces at Lipka and the destruction of strong points at Workers' Settlements #4, #8, and #7. By the end of January 17, only about one mile separated the Russian lines, occupied by a determined series of German fortifications along the central north-south railroad. Without any real plan for reinforcement or rescue, remnants of the German 170th and 227th Infantry Divisions continued to defend from their positions at Workers' Settlement #1, #5, #6 and the rail depot at Sinyavino.<sup>91</sup>

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<sup>87</sup> David Glantz, *The Battle for Leningrad 1941–1944* (Lawrence, KS: Kansas University Press, 2002), 280.

<sup>88</sup> Nikolaj Kislitsyn, Nikolaï Gavrilovich Kislitsyn, and Vasilii Efimovich Zubakov, *Leningrad Does Not Surrender* (Moscow: Progress, 1989), 185.

<sup>89</sup> Aleksey Isayev, *Vanished: History of the Second World War We Did Not Know* (Eksmo: Yauza, 2005), 457.

<sup>90</sup> Chris Bellamy, *Absolute War: Soviet Russia in the Second World War* (New York: Knopf Doubleday Publishing Group), Ch 13.

<sup>91</sup> David Glantz, *The Battle for Leningrad 1941–1944* (Lawrence, KS: Kansas University Press, 2002), 281-282.

On the morning of January 18, at 9:30 am the lead elements of the 67th Army's 123rd Infantry Division and the 2nd Assault Army's 372nd Infantry Division conducted link up operations north of Workers' Settlement #1.<sup>92</sup> Although the threat to Leningrad would take nearly a year longer to alleviate, the Soviets had essentially broken the blockade and enabled the overland resupply of the city.<sup>93</sup> Over the next day and a half, the two Russian Fronts conducted similar link up operations along the central railroad corridor, isolating and then eventually capturing the German strong points at Workers' Settlement #1, #5, #6 and Sinyavino.<sup>94</sup>

### **Values for Key Independent Variables**

LTG Romanovsky had 120,000 personnel under his command; consisting of 316 tanks (90 light tanks, 226 heavy tanks), 1,173 artillery pieces, and 350 aviation sorties. During this period, Russia maintained a Polity IV Democracy Score of 10, a education per capita score of 1951, a per capita income of \$2,144 in the year prior to the battle, and had suffered no *coup d'état* within the previous five years. CG Lindemann had 30,000 personnel under his command; consisting of 20 tanks (0 light tanks, 20 heavy tanks), 182 artillery pieces, and 140 aviation sorties. During this period, Germany maintained a Polity IV Democracy Score of 0, a education per capita score of 1252, a per capita income of \$5,403 in the year prior to the battle, and had suffered no *coup d'état* within the previous five years. During the this 7-day battle, the Russian 2nd Assault Army (+) possessed 80 percent of the soldiers, 94 percent of the tanks, 71 percent of the aviation sorties, and 87 percent of the artillery pieces on the battlefield.

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<sup>92</sup> Harrison Salisbury, *The 900 Days: The Siege Of Leningrad* (Boston: Da Capo Press, 2009), 158.

<sup>93</sup> Evelina De Gelmont, *Misha and His Leningrad Diary* (Maitland: Xulon Press, 2008), 226.

<sup>94</sup> Anna Reid, *Leningrad: The Epic Siege of World War II, 1941-1944* (New York: Bloomsbury Publishing USA, 2011), 373.



By battle's end, over 21 percent (32,150) of the soldiers who participated were dead. LTG Romanovsky lost 28,000 personnel and an unknown number of tanks, artillery, and aircraft. CG Lindemann lost 4,150 personnel, 7 tanks, an unknown number of artillery and aircraft (see Table 14). Even though the Russian forces attacked with greater than the conventional 3:1 force ratio (actually 4:1), seven Russian soldiers died for every German soldier killed, a level of battlefield efficiency strongly favoring the Germans.

Table 14. Battle Summary (WWII – Operations Spark)

	Attacker	Defender	Advantage
	Russia	Germany	
Personnel	120,000	30,000	Russia**
Armor †	316	20	Russia**
Aircraft	350	140	Russia*
Artillery	1173	182	Russia**
Democracy	0	0	---
Economy	\$2,144	\$5,403	Germany
Education	1124	413	Japan**
Civ-Mil Relationship ‡	0	1	Japan
Planning †	5.48	5.23	Russia
Risk Aversion †	5.07	3.94	Germany**
Collective Deference ‡	5.63	4.52	Germany**
Communication Impedance	2.62	2.69	---
Loss Exchange Ratio	28,00	4,150	Germany**
	7:1		

† Significant beyond 0.01      \* Advantage is  $\cong$  3:1 ratio  
‡ Significant beyond 0.05      \*\* Advantage is  $>$  3:1 ratio

The Russian cultural traits associated with battle consisted of Planning Propensity (5.48), Risk Aversion (5.07), Collective Deference (5.63), and Communication Impedance (2.62). The German cultural dimension scores associated with battle consisted of Planning Propensity (5.23), Risk Aversion (3.94), Collective Deference (4.52), and Communication Impedance (2.69). This pairing of opponent cultures should have greatly favored the Germans in terms of their relative

lower levels of Risk Aversion and Collective Deference. The Russians should have had a slight advantage in terms of their higher levels of relative Planning Propensity. Both parties were functionally similar in terms of relative Communication Impedance.

### **Outcome versus Expectation**

#### Material Factors

The Soviets fielded a materially superior force in the Russian 2nd Assault Army than the elements of the German 18th Army they faced. In all categories, the Russians achieved at least a 3:1 ratio, with their advance extending to 6:1 in Artillery and 16:1 in armor. This meant that the Soviets more than meet the threshold for offensive operations against a deliberate defense. As such, the Russian to German ratio of forces should have been sufficient to produce an overwhelmingly favorable outcome for the Russian 2nd Assault Army.

#### Institutional and Unit-Level Factors

If economic development leads to greater effectiveness on the battlefield, then the case of Operation ISKRA offers some support for that. German GDP per capita before in the year before the battle more than doubled that of Russia, perhaps offering some insight into how Germany was able to field the more efficient or effective forces in the battle. As for the influence of Education on outcomes, education levels slightly favored the Russians during this period but do not appear to have influenced outcomes in a significant way. Democracy and Civil-Military Relationships are also supposed to inform outcomes, but in this case, these factors appear not to play a part.

## Cultural Factors

Culturally, the Russian 2nd Assault Army should have been able to leverage their modest advantage in terms of higher Planning Propensity to greater effect, but the German 18th Army appears to have made the most of their relatively lower Risk Aversion and Collective Deference traits. Although the Soviets and Nazis maintained different Communication Impedance levels, their score are functionally equivalent and would have manifest little effect on behavior.

The Russian propensity to plan is evident in the numerous stages of secret preparation prior to beginning offensive operations as well as in the larger Stavka plan to attack all along the Eastern European Front simultaneously. Although the Russians had a bit of an advantage in planning, the difference was not overwhelming. As was the case for the Germans in Salerno, CG Lindemann dispersed his forces evenly, adopting an area defense approach with his limited resources and appreciating his need to concentrate combat power in key locations along the front.

Perhaps more obvious in the two Armies' behaviors were the disparity in their Risk Aversion and Collective Deference traits. Except for the remarkable northern ice-borne assault by the Russian 12th Ski Brigade, the Soviets did little more daring or complex maneuvering than relentless and costly frontal assaults against fixed enemy positions. On the other hand, the Germans were able to build impromptu yet functional battle formations from elements plucked out of disparate and distant organizations. With these makeshift battle groups, CG Lindemann could put unfamiliar men in unfamiliar surroundings with very little notice and still expect superior results.

## **Implications**

The principle lesson from the WWII Soviet Operation ISKRA is that even seemingly overwhelming force ratios really are not enough to assure the battle's outcome. The Russians had far more material resources than convention required, but the Germans spilled more Soviet blood once more. In this battle, however, the Germans did not exact their toll through small-scale, complex maneuvers. Instead, different attributes stand out—their ability to function as effective makeshift teams in unfamiliar surrounds. The Russians did eventually win the field, but it was a “win” at great cost. The Russians opened their corridor to Leningrad, but their path to victory lay littered with broken Soviet bodies and drenched in Soviet blood.

## **CHAPTER SUMMARY**

The cases presented in this chapter provided actual historical examples of battles where material factors failed to explain the observed outcome. In the two cases presented here, both attacking commanders achieved theoretically appropriate force ratios for success, with LTG Sir Richard L. McCreery of the British 10th Corps meeting the requisite 3:1 ratio at Salerno and LTG V.Z. Romanovsky of the Russian 2nd Assault Army exceeding it (4:1 force ratio) in Operation ISKRA. Despite their adherence to convention, both commanders suffered remarkably poor outcomes, with the British losing 13 soldiers for every German they killed and the Russians suffering a 7:1 Loss Exchange Ratio.

At the same time that material factors generally failed to explain the observed outcomes, many institutional and unit-level explanations also fell short. This was particularly the case in battles where the attacker did maintain some material advantage. For example, in Salerno, the less democratic and less economically developed participant performed better. Additionally, in Operation ISKRA, the less educated participant performed better, and democracy did not appear

to play a part. In both Salerno and Leningrad, the civil-military environment too did not play a part.

What stands out in these cases is the consistency with which the participant with greater battlefield efficiency possessed noticeably beneficial cultural traits. For instance, in the case of Salerno, the difference between German and British Risk Aversion alone would be sufficient to change the battle's outcome by 3:1 in the German's favor. In the case of Operation ISKRA, the difference between German and Russian Risk Aversion and Collective Deference would likewise shift the battle's outcome by 3:1 in the Germans' favor for each trait.

The qualitative results here add great depth to the statistical processes performed in earlier chapters. However, these cases only tell half the story, the part when a commander follows the rules and fails. In the next chapter, I apply similar methods to look at exceptional cases, where the attacking commander broke with convention and won.

## **CHAPTER VII**

### **EXCEPTIONAL CASE STUDIES**

In the previous chapter, I introduced qualitative analytical methods as another powerful tool available for researchers to seek, find, and assess the natural world. I used that chapter to describe two battles where the attacker conformed to conventional military wisdom regarding appropriate attacker-defender force ratios prior to initiating offensive but still suffered disproportionate losses. Specifically, those two cases reflected a 3:1 attacker-defender force ratio, but a 7:1 Loss Exchange Ratio. This chapter extends this conceptual inquiry by considering cases where the attacker broke with convention, initiating offensive operations with less than the typical 3:1 ratio.

Despite conceptual distinctions, this chapter follows the same practical approach as the previous one. Again, I first outline the case study selection process used to arrive at the two studies reviewed herein. Next, I review two separate cases per chapter, including a detailed description of the battle in terms of its strategic context, operational plan, and key events from the battle's timeline. Afterward, I present relevant quantitative data associated with the material, institutional, unit-level, and cultural determinants of each battle as a way of connecting these qualitative assessments to the statistical tests in the preceding chapter. Then, as before, I attempt to highlight the influence of each of the given values within the battle narrative as a means of comparing the observed outcome to the outcome predicted by each set of theoretical factors. I conclude each of the cases with an assessment of its implications for the theories under study.

## EXCEPTIONAL CASE STUDY SELECTION

As mentioned before, conventional military theory holds the 3:1 force ratio as an important benchmark, claiming that attackers who achieve it tend to experience positive battlefield outcomes. But what happens when commanders break with convention?

Theoretically, commanders that ignore the 3:1 ratio do so at great peril, essentially inviting death and destruction into their ranks. With that said, at least two cases from the historical record suggest that this particular piece of conventional wisdom may actually represent more convention than wisdom.

In efforts to select the most appropriate battles within which to assess the findings proffered in the Statistical Tests & Findings chapter, case selection followed the same process as the previous chapter. It began with a series of systematic record eliminations from the dataset, followed by cuts that are more subjective. The result of this process provided the two cases in this chapter, and I offer them as the most appropriate battles within which to test our previous findings.

Once again, the first and easiest objective reduction in records under review eliminated the 189 records with missing values from the 382 records available in the battle-related dataset, leaving 193 valid records for review. Next, for this exceptional case study chapter I eliminated 134 of the remaining records that functionally achieved at least a 2:1 attacker-defender force ratio, leaving 59 records for review. Next, in a more subjective cut, I eliminated 25 of the remaining records that did not achieve at least a 2:1 Loss Exchange Ratio. The 34 remaining records now had remarkably positive outcomes (at least 2:1) despite theoretically inappropriate force ratios for success (no more than 1:1). As an additional subjective cut, I dropped 27 of the remaining records whose losses failed to exceed 20% percent of total participating soldier population, leaving 7 cases. In the final cut, I selected the Russo-Japanese Battle of Mukden for

its sheer size (over 600,000 combatants) and the Arab-Israeli Battle of Khan Yunis for its geographical/cultural context.

### **EQUIVALENT FORCE RATIO (1:1)**

Why Mukden? The 1905 battle of Mukden between the Japanese Army Group, commanded by Field Marshal Iwao Oyama, and the Russian Army Group, commanded by Field Marshal Alexei Kuropatkin, is a case where the commander attacked with only a 1:1 force ratio against the defender.<sup>1</sup> This 18-day battle proceeded from February 20 to March 10 as part of the larger Japanese Manchuria Campaign and is a case where material factors should have left the attacker with a squarely negative outcome.<sup>2</sup> At the end of the grueling fight, the results turned out to be quite positive for the brash Japanese commander. Despite their equivalent force ratio, the attacking Japanese forces killed two Russian soldiers for every Japanese life lost during their 18-day offensive. Once again, material factors fail to explain the observed outcome, but differences in unit-level and cultural attributes appear to explain a great deal of why the battle ended as it did.

### **Strategic Context**

Throughout the late 1800s, Russian and Japanese ambitions in the coastal regions of eastern Asia remained at odds, but generally peaceful.<sup>3</sup> However, on February 8, 1904, Japanese

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<sup>1</sup> James Sisemore, "The Russo-Japanese War, Lessons Not Learned" (master's thesis, United States Army Command and General Staff College, 2003), 65-68.

<sup>2</sup> Spencer Tucker, *Battles That Changed History: An Encyclopedia of World Conflict* (Santa Barbara, CA: ABC-CLIO, 2015), 384.

<sup>3</sup> Scott Horrigan, "Rethinking Cultural Influences on Warfare" (master's thesis, Army Command and General Staff College School of Advanced Military Studies, 2012), 31-33.



naval forces attacked the woefully unprepared Russian economic center of Port Arthur.<sup>4</sup> Within a matter of days, Japanese forces effectively controlled the coastal waters around the Russian city and put multiple divisions ashore. The Russo-Japanese War had begun.

From February through May, Japanese forces moved in a sweeping arc to surround Port Arthur and drive Russian forces into the city.<sup>5</sup> The Russians would not go without a fight. From late August through mid-October, the two sides battled at Liaoyang and Sha Ho, both ending in Russian retreat.<sup>6</sup> Unable to break the Japanese siege lines from within or without, the commander of the Russian garrison at Port Arthur surrendered on January 1, 1905.<sup>7</sup> In late January, the Russian attempted to mount a counter-offensive during the Battle of Sandepu but found themselves facing familiar Japanese formations and also fresh reinforcement from the Japanese 3rd Army, who had recently been freed from siege duty at Port Arthur.<sup>8</sup>

By February 1905, all of the Japanese ground forces under the command of FM Oyama (except for token garrisons along the coast) were committed to defeating FM Kuropatkin's remaining Russian forces in Manchuria.<sup>9</sup> Severe casualties and a bitter winter both weighed heavily on the two armies. News of the imminent arrival of Russian Baltic Fleet gave FM

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<sup>4</sup> Philip Jowett and Alexei Ivanov, *The Russo-Japanese War 1904-05* (University Park, IL: Osprey Publishing, 2004), 4-7.

<sup>5</sup> R. M. Connaughton, *Rising Sun and Tumbling Bear: Russia's War with Japan* (New York: Sterling Publishing, 2004), 44-64.

<sup>6</sup> R. M. Connaughton, *Rising Sun and Tumbling Bear: Russia's War with Japan* (New York: Sterling Publishing, 2004), 128-154.

<sup>7</sup> Philip Jowett and Alexei Ivanov, *The Russo-Japanese War 1904-05* (University Park, IL: Osprey Publishing, 2004), 4-7.

<sup>8</sup> Spencer Tucker, *Battles That Changed History: An Encyclopedia of World Conflict* (Santa Barbara, CA: ABC-CLIO, 2015), 386.

<sup>9</sup> Philip Jowett and Alexei Ivanov, *The Russo-Japanese War 1904-05* (University Park, IL: Osprey Publishing, 2004), 4-7.

Kuropatkin hope but pressed FM Oyama to achieve an outcome more decisive than one from which the Russians could just withdraw and regroup.<sup>10</sup> The Battle of Mukden was at hand.

### **Operational Plan**

FM Kuropatkin formed his forces, comprising the 2nd, 3rd, and 1st Armies, into a 90-mile long defensive line to the south of the city of Mukden.<sup>11</sup> The Russian lines had little depth and maintained only one set of at the center. The Russian's 2nd Army, commanded by General Alexander Kaulbars, occupied the low-lying flatlands in the west. In the center, General Aleksandr Bilderling's 3rd Army held the railway and highway that led north to the city.<sup>12</sup> In the east, General Nikolai Linevich's 1st Army controlled the hilly terrain that tied into impassible mountains. FM Kuropatkin's plan was evident from the way he arrayed his forces in a decidedly defensive manner. The Russians had insufficient depth or freedom of maneuver to form offensive ranks without opening major gaps in their lines.

As for the Japanese, they matched his first echelon armies, 1-for-1, with the Russians. FM Oyama paired the Japanese 2nd Army under General Oku in the west with the Russian 2nd Army, the Japanese 4th Army under General Nozu in the center with the Russian 3rd Army, and the Japanese 1st Army under General Kuroki in the east with the Russian 1st Army as well.<sup>13</sup> FM Oyama fielded two additional formations. The first was General Nogi's Japanese 3rd Army, concealed behind General Oku's Japanese 2nd Army in the west.<sup>14</sup> The second unit was a newly

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<sup>10</sup> H. Rowan-Robinson, *The Campaign of Liao-Yang* (London: Constable & Co, 1914), 166.

<sup>11</sup> University of California, *A Diary of the Russo-Japanese War*, vol. 2 (Kobe, Japan: Kobe Chronicle, 1904), 28.

<sup>12</sup> Philip Jowett and Alexei Ivanov, *The Russo-Japanese War 1904-05* (University Park, IL: Osprey Publishing, 2004), 14-17.

<sup>13</sup> R. M. Connaughton, *Rising Sun and Tumbling Bear: Russia's War with Japan* (New York: Sterling Publishing, 2004), 282.

<sup>14</sup> Philip Jowett and Alexei Ivanov, *The Russo-Japanese War 1904-05* (University Park, IL: Osprey Publishing, 2004), 35-36.

formed 5th Army under the command of General Kawamura, deployed in the rugged mountains to the far eastern flank of the Russian 1st Army. The 5th Army was little more than the Japanese 11th Division, fresh from duty at Port Arthur, and a contingent of reservists.

FM Kuropatkin read what Japanese forces he saw and prepared for a main Japanese thrust from the mountainous east.<sup>15</sup> Previous battles had proven the Japanese could fight effectively in such unforgiving terrain, and the presence Japanese forces in the heights reinforced his convictions. FM Oyama's deception had worked.

The actual Japanese battle plan comprised coordinated offensive operations in both the east and west, intending to achieve double envelopment and capture of all the Russians in the center.<sup>16</sup> FM Oyama did not want to see the complete destruction of the Russian forces in Manchuria for another day but wanted to see the war end at Mukden.<sup>17</sup> With that said, FM Oyama did temper the ambitions of his commanders with an ounce of perspective, making explicit his orders to avoid combat within the city of Mukden itself at all costs.

### **Battle Narrative**

On February 20, the Battle of Mukden began with a general offensive across the Japanese 2nd, 4th, 1st Army lines.<sup>18</sup> In the east, the Japanese 5th Army began attacking into the exposed flank of the Russian 1st Army from their position in the mountains. The Russian 1st Army, actually the target of three separate Japanese Armies at the moment, was fixated on the Japanese

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<sup>15</sup> Alekseĭ N. Kuropatkin, *The Russian Army and the Japanese War: Being Historical and Critical Comments on the Military Policy and Power of Russia and on the Campaign in the Far East, Vol. 2*, trans. Alexander Lindsay (Cambridge, MA: Harvard University Press, 1909), 318-323.

<sup>16</sup> R. M. Connaughton, *Rising Sun and Tumbling Bear: Russia's War with Japan* (New York: Sterling Publishing, 2004), 282.

<sup>17</sup> James Sisemore, "The Russo-Japanese War, Lessons Not Learned" (master's thesis, United States Army Command and General Staff College, 2003), 75.

<sup>18</sup> Philip Jowett and Alexei Ivanov, *The Russo-Japanese War 1904-05* (University Park, IL: Osprey Publishing, 2004), 4-7.

1st Army to its south.<sup>19</sup> Succumbing to the pressure, GEN Linevich collapsed his units into secondary defensive positions to reduce the overall frontage of the Russian 1st Army considerably and called for reinforcements. Although largely imperceptible to the Russians, GEN Oku's Japanese 2nd Army was simultaneously fixing both the Russian 2nd and 3rd Armies single-handedly.<sup>20</sup>

The initial actions pursued by FM Oyama's forces appeared to confirm FM Kuropatkin's assessment of the Japanese battle plan, justifying his relocation of the seemingly under-committed forces at the far western edge of the Russian line to the far eastern edge.<sup>21</sup> For days, the Japanese 4th and 1st Armies fixed the Russian 1st Army in place while the Japanese 5th Army bared down from the heights. FM Oyama was unable to gain any meaningful ground during this period, but its influence on FM Kuropatkin was worth it.<sup>22</sup> The Russian reinforcements from the west were effective in halting the Japanese advance, but they were tired, and the Russian western flank was now greatly understrength.

After a week of fighting the battle as FM Kuropatkin envisioned it, FM Oyama's trap was set. On February 27, the Japanese begin to slowly reorient GEN Nozu's 4th Army against the Russian center, allowing GEN Oku's 2nd Army to prepare for the next move.<sup>23</sup> On March 1, GEN Nogi set out west, unmasking from behind GEN Oku's 2nd Army and sweeping wide

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<sup>19</sup> Spencer Tucker, *Battles That Changed History: An Encyclopedia of World Conflict* (Santa Barbara, CA: ABC-CLIO, 2015), 386.

<sup>20</sup> Aleksei N. Kuropatkin, *The Russian Army and the Japanese War: Being Historical and Critical Comments on the Military Policy and Power of Russia and on the Campaign in the Far East, Vol. 2*, trans. Alexander Lindsay (Cambridge, MA: Harvard University Press, 1909), 288-291.

<sup>21</sup> Lionel James, *A Study of the Russo-Japanese War* (London: William Blackwood & Sons, 1905), 316-317.

<sup>22</sup> Spencer Tucker, *Battles That Changed History: An Encyclopedia of World Conflict* (Santa Barbara, CA: ABC-CLIO, 2015), 386.

<sup>23</sup> Philip Jowett and Alexei Ivanov, *The Russo-Japanese War 1904-05* (University Park, IL: Osprey Publishing, 2004), 4-7.

around the Russians' western flank. The fresh Japanese fighters quickly brushed aside the Russian cavalry that stood in their way, raising alarm in GEN Kaulbars' 2nd Army headquarters.<sup>24</sup> However, fighting in the east remained steady, leading FM Kuropatkin to dismiss reports of movement in the west as a Japanese feint. As such, he committed only minor forces from the central reserves to meet the Japanese challenge; forces, it would turn out, utterly insufficient to the task.<sup>25</sup>

During the first week of March, GEN Nogi's Japanese 3rd Army made short work of both the Russian cavalry and the meager central reserves sent out to meet it, all the while menacing the exposed western flank of the weakened Russian 2nd Army.<sup>26</sup> By March 7, FM Kuropatkin realized his mistake and began withdrawing forces from his extreme east to counter the Japanese 3rd Army in the extreme west.<sup>27</sup> FM Oyama responded to a slackening in the Russians' eastern defenses by ordering the Japanese 2nd and 4th Armies into full frontal assault. With the looming threat of Japanese fighters rolling his unguarded western flank, Kuropatkin committed his remaining reserves to screen against the oncoming Japanese 3rd Army. The Russian reserves fought a delaying action in the west, trading space for time, in support of the forces relocating from the east.

Movement of Russian forces from the east to west was poorly coordinated, leaving huge gaps in the lines and nearly causing the Russian 3rd and 1st Armies to disintegrate.<sup>28</sup> Seeing

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<sup>24</sup> J. N. Westwood, *Russia Against Japan, 1904-1905: A New Look at the Russo-Japanese War* (New York: SUNY Press, 1986), 134-136.

<sup>25</sup> Murat Halstead, *The War Between Russia and Japan: Containing Thrilling Accounts of Fierce Battles by Sea and Land* (London: Premiere Publishing, 1904), 465-466.

<sup>26</sup> James Sisemore, "The Russo-Japanese War, Lessons Not Learned" (master's thesis, United States Army Command and General Staff College, 2003), 82-86.

<sup>27</sup> Murat Halstead, *The War Between Russia and Japan: Containing Thrilling Accounts of Fierce Battles by Sea and Land* (London: Premiere Publishing, 1904), 465-467.

<sup>28</sup> Lionel James, *A Study of the Russo-Japanese War* (London: William Blackwood & Sons, 1905), 321-322.

opportunity in the Russians' misfortune, the Japanese 1st and 5th Armies pressed forward, displacing the thinned Russian eastern defensive lines. At the same time, FM Oyama deployed his own reserves from their position behind the 2nd Army to extend the reach of GEN Nogi's western flank. When the tired and disorganized Russian reinforcements finally did reach their destination, multiple units hastily attempted to occupy the same ground. FM Kuropatkin had intended for his forces to counterattack into the flank of an oncoming Japanese Army but ended up meeting the Japanese 3rd Army and Army Group reserves head-on instead.

On March 8, the Russian 1st Army in the east and 3rd Army in the center withdrew northward across the Hun River.<sup>29</sup> FM Kuropatkin ordered their withdrawal to shorten the Russian frontage and place what he considered a formidable natural obstacle in the path of an unrelenting Japanese advance. Thinking that the river would hold the Japanese at bay, FM Kuropatkin stripped more forces off the line and redirected them towards the crumbling Russian western flank.<sup>30</sup>

On March 9, GEN Kuroki's Japanese 1st Army attacked across the river, still frozen and offering less of an obstacle than FM Kuropatkin expected.<sup>31</sup> GEN Kuroki's forces exploited a seam between the Russian 3rd Army and 1st Army lines, tearing a hole in the Russian center and cutting off the eastern defensive lines from the main body. At the same time, GEN Nogi's Japanese 3rd Army launched an overwhelming assault in the west, shattering the Russian 2nd

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<sup>29</sup> Aleksei N. Kuropatkin, *The Russian Army and the Japanese War: Being Historical and Critical Comments on the Military Policy and Power of Russia and on the Campaign in the Far East, Vol. 2*, trans. Alexander Lindsay (Cambridge, MA: Harvard University Press, 1909), 333-335.

<sup>30</sup> James Sisemore, "The Russo-Japanese War, Lessons Not Learned" (master's thesis, United States Army Command and General Staff College, 2003), 74.

<sup>31</sup> Aleksei N. Kuropatkin, *The Russian Army and the Japanese War: Being Historical and Critical Comments on the Military Policy and Power of Russia and on the Campaign in the Far East, Vol. 2*, trans. Alexander Lindsay (Cambridge, MA: Harvard University Press, 1909), 265-266.

Army's forward units.<sup>32</sup> All Russian attempts to fill in the gaps and hold the lines failed. As night began to fall on the evening of March 9, FM Kuropatkin ordered the Russian Army Group's withdrawal from Mukden. By then, GEN Linevich's 1st Army in the east was already in full retreat, while GEN Kaulbars' 2nd Army and GEN Bilderling's 3rd were essentially fighting costly rear-guard actions in support their withdrawal under pressure in the west and center.<sup>33</sup> As the sun rose on March 10, GEN Nozu's Japanese 4th Army found a similar gap between the Russian center and western armies and in exploiting it, completed the encirclement of the unluckiest Russian 2nd Army units in the west.<sup>34</sup> The previously organized Russian retreat quickly devolved into a disorganized rout with panicked Russian soldiers abandoning their wounded, weapons, and supplies as they raced breakneck to Tiehling. By 10:00 am on March 10, soldiers of the Japanese 1st Army were occupying Mukden, while forces from the Japanese 3rd, 2nd, and 4th Armies lazily pursued the defeated Russians.<sup>35</sup>

### **Values for Key Independent Variables**

GEN Oyama had 314,000 personnel and 892 artillery pieces under his command (no tanks or aircraft participated in this battle). During this period, Japan maintained a Polity IV Democracy Score of 4, a education per capita score of 1124, a per capita income of \$1,180 in the year prior to the battle, and had suffered 0 *coup d'état* within the previous five years. GEN Kuropatkin had 310,000 personnel and 1,192 artillery pieces under his command. During this

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<sup>32</sup> Lionel James, *A Study of the Russo-Japanese War* (London: William Blackwood & Sons, 1905), 327-328.

<sup>33</sup> Alekseï Nikolaevich Kuropatkin, *The Russian Army and the Japanese War: Being Historical and Critical Comments on the Military Policy and Power of Russia and on the Campaign in the Far East*, Vol. 2 (Cambridge, MA: Harvard University Press, 1909), 282-284. Alexander Bertram Lindsay, Trans.

<sup>34</sup> Lionel James, *A Study of the Russo-Japanese War* (London: William Blackwood & Sons, 1905), 327-328.

<sup>35</sup> James Sisemore, "The Russo-Japanese War, Lessons Not Learned" (master's thesis, United States Army Command and General Staff College, 2003), 88.

period, Russia maintained a Polity IV Democracy Score of 0, a education per capita score of 413, a per capita income of \$1,237 in the year prior to the battle, and had suffered 1 *coup d'état* within the previous five years. During the 18-day battle, the Japanese Army Group made up 50 percent of the soldiers and 43 percent of the artillery pieces on the battlefield.

By battle's end, over 22 percent (137,500) of the soldiers who participated were dead. GEN Oyama lost 41,000 personnel and 0 artillery pieces. GEN Kuropatkin lost 96,500 personnel and 58 artillery pieces (see Table 15). Even though the Japanese forces attacked with far less than the conventional 3:1 force ratio (actually closer to 1:1), two Russian soldiers died for every Japanese soldier lost, a level of battlefield efficiency solidly favoring the Japanese.

Table 15. Battle Summary (Russo-Japanese War – Mukden)

	Attacker	Defender	Advantage
	Japan	Russia	
Personnel	314,000	310,000	---
Armor †	0	0	---
Aircraft	0	0	---
Artillery	892	1,192	Russia
Democracy	4	0	Japan
Economy	\$1,180	\$1,237	---
Education	1124	413	Japan**
Civ-Mil Relationship ‡	0	1	Japan
Planning †	5.25	5.48	Russia
Risk Aversion †	4.33	5.07	Japan
Collective Deference ‡	4.63	5.63	Japan**
Communication Impedance	2.86	2.62	Russia
Loss Exchange Ratio	41,000	96,500	Japan
	1:2		

† Significant beyond 0.01      \* Advantage is  $\cong$  3:1 ratio  
‡ Significant beyond 0.05      \*\* Advantage is  $>$  3:1 ratio

The Japanese cultural traits associated with battle consisted of Planning Propensity (5.25), Risk Aversion (4.33), Collective Deference (4.63), and Communication Impedance



(2.86). The Russian cultural dimension scores associated with battle consisted of Planning Propensity (5.48), Risk Aversion (5.07), Collective Deference (5.63), and Communication Impedance (2.62). This pairing of opponent cultures should have greatly favored the Japanese in terms of their relative lower levels of Collective Deference and slightly in terms of their lower Risk Aversion. The Russians should have had a slight advantage in terms of their higher levels of relative Planning Propensity and lower levels of Communication Impedance.

### **Outcome versus Expectation**

#### Material Factors

The Japanese and Russian Army Groups fielded essentially materially equal forces during the Battle of Mukden. In fact, counter to the desired 3:1 force ratio, the Russians actually possessed a slight advantage in artillery, a 4:3 ratio. As such, the Japanese to Russian ratio of forces did not even come close to the conventional 3:1 threshold needed to produce a favorable outcome for the Japanese Army Group.

#### Institutional and Unit-Level Factors

If Democracy and Economic Development led to greater effectiveness on the battlefield, then, at least, democracy might explain part of the Japanese success. However, in terms of economic development, the two sides were as functionally equal as their material resources. As for the influence of Education and Civil-Military Relationships on outcomes, both favored the Japanese, with Education greatly so.

#### Cultural Factors

Culturally, the Russian Army Group should have been able to leverage their modest advantages in terms of greater Planning Propensity and lower Communication Impedance traits

to greater effect, but the Japanese Army Group appears to have made the most of their relatively lower Risk Aversion and Collective Deference traits. The Russian propensity to plan is evident in multiple defensive positions that FM Kuropatkin prepared prior to the Japanese forces' arrival. However, FM Oyama's planning is also evident in the way he arrayed his forces to present a familiar posture to the Russians prior to attacking. Where Japanese culture appears to have made the most difference is in the risk FM Oyama was willing to accept by sending an understrength 5th Army into the fray and holding the entire 3rd Army back until just the right opportunity presented itself. Additionally, FM Oyama's subordinate commanders of the 4th and 1st Armies demonstrated exceptional initiative when they attacked across the Hun River, exploiting gaps in the Russian lines.

### **Implications**

The principle lesson from the Russo-Japanese Battle of Mukden is that military commanders may very well achieve success without coming near conventionally accepted force ratios. The Japanese and Russian Army Groups were functionally equivalent (with Russia even enjoying modest advantage in artillery), but the Japanese forces took the field of battle and spilled more Russian blood. In this battle, the Japanese often used fewer of their own soldiers to hold much larger Russian formations at bay, taking on great risk at the same time. This freed the Japanese leadership to reorient otherwise uncommitted forces quickly and with devastating effect. Additionally, the Russian forces appeared hamstrung in their reliance upon direction from above, while the subordinate Japanese Army commanders often demonstrated great personal initiative. The Japanese Army Group accomplished a great deal with far fewer resources than most would have thought possible.

## **INFERIOR FORCE RATIO (<1:1)**

Why Khan Yunis? The 1956 battle of Khan Yunis between the Israeli 11th Infantry Brigade, commanded by Colonel Aharon Doron, and the 86th Palestinian Brigade, commanded by General Yusuf al-Agrudi, is a solid case where a commander attacked a numerically superior force.<sup>36</sup> This 4-hour battle occurred on November 3 as part of a larger Israeli Gaza Campaign and is a case where material factors should have caused the attacker to experience an overwhelmingly negative outcome.<sup>37</sup> Remarkably, after only a few hours, the Egyptian forces were devastated and the Israeli fighters almost untouched. Despite their inferior force ratio, the attacking Israeli forces killed 17 Egyptian soldiers for every Israeli life lost during their 4-hour offensive. As in the previous case of Mukden, material factors fail to explain the observed outcome, but differences in unit-level and cultural attributes appear to fill in the gaps.

### **Strategic Context**

In 1956, a remote stretch of sandy Egyptian desert hosted a short, violent clash among three of the most influential forces of the Twentieth Century—post-Colonial Nationalism, the Cold War, and the Arab-Israeli conflict.<sup>38</sup> Worldwide, new nations emerged from the ashes of empire left in the wake of WWII. Among these new national entities, Egypt struggled to find its place in an increasingly uncertain geopolitical environment. The bi-polar world pulled at everyone and everything, as evidenced by Egypt slipping into ever-deeper ties with the Soviet Union when Western investors withheld material support for the Aswan Dam project.<sup>39</sup> With

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<sup>36</sup> Chaim Herzog, Shlomo Gazit, *The Arab-Israeli Wars: War and Peace in the Middle East from the 1948 War of Independence to the Present* (New York: Vintage Books, 2005), 133-134.

<sup>37</sup> Derek Varble, *The Suez Crisis 1956* (Oxford: Osprey Publishing, 2014), Ch. 2.

<sup>38</sup> Ray Takeyh, *The Origins of the Eisenhower Doctrine: The US, Britain and Nasser's Egypt, 1953-57* (London: Palgrave, 2000), 49.

<sup>39</sup> Anthony Eden, *The Memoirs of Sir Anthony Eden Full Circle* (London: Cassell and Company, 1960), 420.

time, Egypt's relationship with Russia increasingly caused the young nation's relationships with the West to sour.<sup>40</sup> More proximal a cause than nationalism or Cold War politics, the 1948 declaration of Israeli independence and the boundaries that emerged after a year of bloody battle with its Arab neighbors set conditions for the events of 1956.<sup>41</sup> Specifically, Israel had managed to occupy about 50 percent more territory than originally mandated by the United Nations partition as spoils of war in 1948, while Jordan and Egypt controlled the West Bank and the Gaza Strip, respectively.<sup>42</sup>

In the years that followed the 1948 Arab-Israeli war, Egypt's Gamal Abdel Nasser sought to head the confrontation with Israel in a bid for leadership of the Arab world.<sup>43</sup> Nasser had been openly supporting the activities of Palestinian Fedayeen partisans within Israel for years. However, he raised the geopolitical stakes in 1951 when Egypt formed a formal military alliance with Syria against Israel and deployed artillery within range of the narrow Tiran Straits.<sup>44</sup> These actions effectively blocked Israel's principle access to the Red Sea.<sup>45</sup>

Perhaps more troubling that Egyptian posturing was its 1955 purchase of Czech and Soviet arms; weapons capable of tipping the military capability balance in Egypt's favor within only a few years.<sup>46</sup> The arrival and integration of the new equipment into Egyptian formations preceded Nasser's next big move by only a few weeks. As part of his nationalist agenda, Nasser

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<sup>40</sup> Rose McDermott, *Risk-Taking in International Politics: Prospect Theory in American Foreign Policy* (Ann Arbor, MI: University of Michigan Press, 1998), 135-138.

<sup>41</sup> Trevor Dupuy, ed., *International Military and Defense Encyclopedia*. s.v. "Arab-Israeli Wars [1947-82]"

<sup>42</sup> S.L.A. Marshall, *Sinai Victory* (Nashville: Battery Press, 1985).

<sup>43</sup> Said Aburish, *Nasser: The Last Arab* (New York: Macmillan, 2013), Ch. 3.

<sup>44</sup> Trevor Dupuy, ed., *International Military and Defense Encyclopedia*. s.v. "Arab-Israeli Wars [1947-82]"

<sup>45</sup> Chaim Herzog, Shlomo Gazit, *The Arab-Israeli Wars: War and Peace in the Middle East from the 1948 War of Independence to the Present* (New York: Vintage Books, 2005), 133-134.

<sup>46</sup> Anthony Nutting, *No End of a Lesson* (London: Constable London, 1967), 21.

wrested the Suez Canal zone away from the British and French corporations that owned and operated it.<sup>47</sup> The war-weary European powers prepared to retake that which they had taken from others, acceding to plans for a joint invasion and occupation of the Suez Canal zone by Britain and France.<sup>48</sup> At France's recommendation, secret planning meetings between the European powers would also include Israel.<sup>49</sup>

### **Operational Plan**

The Anglo-French operation, codenamed MUSKETEER, focused on regaining control of the Suez Canal.<sup>50</sup> The Israeli operation, codenamed KADESH, primarily focused on destroying Egyptian-supported Fedayeen bases in Gaza and displacing the Egyptian artillery that threatened the Straits of Tiran.<sup>51</sup> The Israeli incursion into Egyptian territory was also supposed to act as pretext for European military intervention, representing a credible threat to Canal Zone operations and the global economy that depended on unimpeded access to the Suez. Although the Israeli planners never intended to press on to the actual Canal Zone, the Europeans' Operation MUSKETEER would flow Anglo-French forces into the area along the waterway, effectively requiring the Egyptian military to fight on two fronts simultaneously on opposite sides of the Sinai Peninsula.<sup>52</sup>

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<sup>47</sup> Beverley Milton-Edwards, *Conflicts in the Middle East since 1945* (London: Routledge, 2001), 13.

<sup>48</sup> Rashid Khalidi, "Consequences of the Suez Crisis in the Arab World," In *Suez 1956: The Crisis and its Consequences*, William Louis and Roger Owen, eds., (Oxford: Clarendon Press, 1989), 377-393

<sup>49</sup> A.J. Barker, *Arab-Israeli Wars* (New York: Hippocrene Books, 1980).

<sup>50</sup> Terence Robertson, *Crisis The Inside Story of the Suez Conspiracy* (London: Hutchinson & Co, 1964), 206.

<sup>51</sup> George Gawrych, *Key to the Sinai: The Battles for Abu Ageila in the 1956 and 1967 Arab-Israeli Wars* (Leavenworth, KS: Combat Studies Institute, 1990), 21-24.

<sup>52</sup> Chaim Herzog, Shlomo Gazit, *The Arab-Israeli Wars: War and Peace in the Middle East from the 1948 War of Independence to the Present* (New York: Vintage Books, 2005), 133-134.

Despite the involvement of capable and modern military forces, the Anglo-French-Israeli plan was not without its own perils. In particular, Egypt maintained both a substantial air force and an armored reserve capable of punishing all but a fully mobilized aggressor.<sup>53</sup> Consequently, operational security was foremost on especially the Israeli military's mind, since they would be the first to act and would do so days before any European forces arrived to distract the Egyptians.<sup>54</sup>

As such, the first phase of Operation KADESH consisted of an airborne operation along the Mitla Pass, intended to resemble just another in the long line of Israeli counter-Fedayeen raids.<sup>55</sup> The Israeli planners presumed that such a maneuver would successfully introduce forces deeper into the region without provoking a substantial Egyptian response. The Israelis specifically did not want to alert the well-dug-in Egyptian defenses that formed the northeastern "Sinai Triangle," comprising strongholds in the areas surrounding El Arish, Rafah, and Abu Ageila.<sup>56</sup> The second phase of Operation KADESH included breaching the forbidding Egyptian defenses at Abu Ageila (sometimes referred to as the "hedgehog") and establishing a supply corridor with the airborne units that had landed at the Mitla Pass.<sup>57</sup> Israeli offensive operations against enemy positions at Abu Ageila would be the an obvious indication to Egypt that this was no mere reprisal raid and just so happened to be the signaled for the Anglo-French forces to initiate Operation MUSKETEER. As the British and French flowed into the Canal Zone to

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<sup>53</sup> George Gawrych, *Key to the Sinai: The Battles for Abu Ageila in the 1956 and 1967 Arab-Israeli Wars* (Leavenworth, KS: Combat Studies Institute, 1990), 21-24.

<sup>54</sup> A.J. Barker, *Arab-Israeli Wars* (New York: Hippocrene Books, 1980).

<sup>55</sup> George Gawrych, *Key to the Sinai: The Battles for Abu Ageila in the 1956 and 1967 Arab-Israeli Wars* (Leavenworth, KS: Combat Studies Institute, 1990), 31-35.

<sup>56</sup> Trevor Dupuy, ed., *International Military and Defense Encyclopedia*. s.v. "Arab-Israeli Wars [1947-82]"

<sup>57</sup> George Gawrych, *Key to the Sinai: The Battles for Abu Ageila in the 1956 and 1967 Arab-Israeli Wars* (Leavenworth, KS: Combat Studies Institute, 1990), 24-36.

protect the common good, Israeli forces would begin the final phase of their operation, conducting a two-pronged assault on the Egyptian military bases in Gaza and the artillery positions threatening the Straits of Tiran from Sharm el Sheikh.<sup>58</sup> If all went according to plan, the British and French governments would have their obvious reason for intervention in the region, and the Israelis would have no reason to fear Egyptian air force or armored reserves until well after the British and French forces were already in theater.<sup>59</sup>

### **Battle Narrative**

As the sun rose on November 3, 1956, the Israeli 11th Infantry Brigade and a battalion supporting it from the 37th Armored Brigade approached the great walled city in Gaza, named Khan Yunis.<sup>60</sup> The city was the second largest in Gaza, and the Egyptians had turned the impressive structures, erected in the late 1300s, into a fortified garrison manned by three battalions of the 86th Palestinian Infantry Brigade.<sup>61</sup> The Egyptian stronghold comprised the ancient fortified city, minefields, wire obstacles, and heavy-weapon strongpoints with interlocking fields of fire. The garrison was nearly invulnerable to the advances of light infantry, necessitating a more robust source of mobile protected firepower—tanks.<sup>62</sup>

Around mid-morning, COL Doron deployed his tanks around the city, concentrating their firepower long enough to punch a hole in the Egyptian defensive perimeter before redirecting them to the next focal point.<sup>63</sup> With the Egyptian perimeter now riddled with gaps and weak

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<sup>58</sup> Moshe Dayan, *Diary of the Sinai Campaign* (New York: Harper & Row, 1966), 210.

<sup>59</sup> Trevor Dupuy, ed., *International Military and Defense Encyclopedia*. s.v. “Arab-Israeli Wars [1947-82]”

<sup>60</sup> Derek Varble, *The Suez Crisis 1956* (Oxford: Osprey Publishing, 2014), 43-44.

<sup>61</sup> Chaim Herzog, Shlomo Gazit, *The Arab-Israeli Wars: War and Peace in the Middle East from the 1948 War of Independence to the Present* (New York: Vintage Books, 2005), 133-134.

<sup>62</sup> S.L.A. Marshall, *Sinai Victory* (Nashville: Battery Press, 1985).

<sup>63</sup> Derek Varble, *The Suez Crisis 1956* (Oxford: Osprey Publishing, 2014), 43-44.

points, COL Doron formed infantry-tank teams and distributed them around the city. Soldiers from the 11th Infantry Brigade entered the garrison's trench lines under the cover of supporting fire from their tanks and half-tracks, often appearing unexpectedly at the Egyptians' exposed flank or from the rear.<sup>64</sup>

Once inside the city, the COL Doron maintained this tank-infantry partnership. Soldiers cleared the city, building by building, but did not hesitate to employ the armored vehicles' big guns whenever they met even modest resistance.<sup>65</sup> At the end of only about four hours, the Israeli forces controlled the city, and with that, they controlled Gaza.<sup>66</sup>

### **Values for Key Independent Variables**

COL Doron had 4,000 personnel under his command; consisting of 25 tanks, 12 artillery pieces, and 8 aviation sorties. During this period, Israel maintained a Polity IV Democracy Score of 10; an education per capita score of 1710, a per capita income of \$3,701 in the year prior to the battle, and had suffered no *coup d'état* within the previous five years. GEN al-Agrudi had 6,400 personnel under his command; consisting of 8 tanks, 44 artillery pieces, and 8 aviation sorties. During this period, Egypt maintained a Polity IV Democracy Score of 0; an education per capita score of 971, a per capita income of \$885 in the year prior to the battle, and had suffered 2 *coup d'état* within the previous five years. During the 4-hour battle, the Israeli 11th Infantry Brigade possessed roughly 38 percent of the soldiers, 76 percent of the tanks, 50 percent of the aircraft sorties, and 21 percent of the artillery pieces on the battlefield.

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<sup>64</sup> S.L.A. Marshall, *Sinai Victory* (Nashville: Battery Press, 1985).

<sup>65</sup> Chaim Herzog, Shlomo Gazit, *The Arab-Israeli Wars: War and Peace in the Middle East from the 1948 War of Independence to the Present* (New York: Vintage Books, 2005), 133-134.

<sup>66</sup> Trevor Dupuy, ed., *International Military and Defense Encyclopedia*. s.v. "Arab-Israeli Wars [1947-82]"



By battle's end, over 20 percent (2,108) of the soldiers who participated were dead, and the overwhelming majority of them were Egyptian (see Table 16). Colonel Doron lost 121 personnel, 2 tanks, and an unknown number of artillery and aircraft. General al-Agrudi lost 1,987 personnel, no tanks, and an unknown number of artillery and aircraft. Even though the Israeli forces attacked with far less than the conventional 3:1 force ratio (actually 2:3), only one Israeli soldier died for every 17 Egyptian soldiers killed, a level of battlefield efficiency overwhelmingly favoring the Israelis.

Table 16. Battle Summary (Arab Israeli War of 1956 – Khan Yunis)

	Attacker	Defender	Advantage
	Israel	Egypt	
Personnel	4,000	6,400	Egypt
Armor †	25	8	Israel*
Aircraft	8	8	---
Artillery	12	44	Egypt**
Democracy	10	0	Israel
Economy	\$3,701	\$885	Israel**
Education	1710	971	Israel
Civ-Mil Relationship ‡	0	2	Israel**
Planning †	5.25	5.80	Egypt**
Risk Aversion †	4.38	5.36	Israel**
Collective Deference ‡	4.70	5.64	Israel**
Communication Impedance	2.72	3.24	Israel
Loss Exchange Ratio	121	1,987	Israel**
	1:17		

† Significant beyond 0.01      \* Advantage is  $\cong$  3:1 ratio  
‡ Significant beyond 0.05      \*\* Advantage is > 3:1 ratio

The Israeli cultural traits associated with battle consisted of Planning Propensity (5.25), Risk Aversion (4.38), Collective Deference (4.70), and Communication Impedance (2.72). The Egyptian cultural dimension scores associated with battle consisted of Planning Propensity (5.80), Risk Aversion (5.36), Collective Deference (5.64), and Communication Impedance

(3.24). This pairing of opponent cultures should have greatly favored the Egyptians in terms of their higher levels of Planning Propensity. However, it greatly favored the Israelis in terms of their relatively lower levels of Risk Aversion and Collective Deference. The Israelis also should have had a slight advantage in terms of their relatively lower Communication Impedance.

### **Outcome versus Expectation**

#### Material Factors

The Israeli 11th Infantry Brigade generally fielded a materially inferior force than the 86th Palestinian Brigade they faced. Regarding personnel and artillery, the Israelis did not even achieve a 1:1 force ratio before attacking, missing the conventional 3:1 threshold for offensive operations against a deliberate defense by about 14,000 soldiers and over 100 artillery pieces. The Israeli's did achieve an effective 3:1 ratio within their tank formation, but this alone should not have warranted an all-out assault on a deliberately defended walled city. Under normal conditions, COL Doron should have considered the requirement to attack the Egyptians at Khan Yunis as a suicide mission.

#### Institutional and Unit-Level Factors

If the democracy and economic development led to greater effectiveness on the battlefield, then this might help explain Israel's success. The overwhelmingly more representative and economically advanced Israel did field the most efficient and effective forces at Khan Yunis. As for the influence of education and civil-military relationships on outcomes, education levels greatly favored the Israelis but tend not to influence outcomes in a significant way, but the statistically significant civil-military relationships do appear to play a part in this case.

## Cultural Factors

Culturally, the 86th Palestinian Brigade should have been able to leverage their sizable advantage in terms of planning to greater effect. However, the Israeli 11th Infantry appears to have made the most of their relatively low levels of Risk Aversion, Collective Deference, and Communication Impedance traits. On a very basic level, the Egyptian propensity to plan is evident in their investment in well-dug-in fighting positions, pre-registered artillery targets, and interlocking fields of heavy-weapons fire throughout the Sinai Peninsula. This stands in contrast to the Israelis' opportunistic offensive approach. The Israelis retained improved freedom of maneuver over their Egyptian counterparts, often exploiting Egyptian rigidity to great effect. In particular, COL Doros accepted risk, allowing his subordinates to execute complex operations in small teams all around the facility.

## Implications

The principle lesson from the Arab-Israeli Battle of Khan Yunis is that military commanders, even when outnumbered, may very well achieve great success. The Israelis fielded a numerically inferior force against a well-established enemy defensive position. Regardless, in a matter of hours, the fortifications had changed hands, and thousands of Egyptian defenders were dead. A loss ratio of 1:17 is impressive in its own right, but it is even more remarkable when achieved while outnumbered and against an enemy's deliberate defense. In this battle, the Israelis moved quickly, exploiting weaknesses in the Egyptian lines as they appeared. In the end, the Israelis accepted greater risk and reaped a great reward for doing so.

## CHAPTER SUMMARY

The cases presented in this chapter also provided historical examples of battles where material factors failed to explain the observed outcome. In the two cases presented here, both attacking commanders failed to achieve theoretically appropriate force ratios for success, with FM Iwao Oyama of the Japanese Army Group attacking at a 1:1 ratio at Mukden and Colonel Aharon Doron of the Israeli 11th Infantry Brigade attacking with less than 1:1 at Khan Yunis. Despite their break with convention, both commanders experienced remarkably positive outcomes, with the Japanese killing Russian soldiers at a 2:1 ratio and the Israelis killing 17 Egyptians for every individual soldier lost.

At the same time that material factors generally failed to explain the observed outcomes, many institutional and unit-level explanations also fell short. Especially for the exceptional force ratio cases, the institutional and unit-level factors aligned better between expected and observed outcomes. For example, in Mukden, the more democratic, better educated, and more civil-militarily stable participant performed better. Similarly, in Khan Yunis, all of the institutional and unit-level factors were in favor of the participant that performed better.

What stands out in these cases is the consistency with which the participant with greater battlefield efficiency possessed noticeably beneficial cultural traits. For instance, at Mukden, the difference between Japanese and Russian levels of Collective Deference alone was sufficient to explain at least a 3:1 in Japan's favor. As for, Khan Yunis, the Israelis enjoyed, at least, a slight advantage in three of the four critical traits and the difference in their levels of Risk Aversion and Collective Deference traits explains at least a 3:1 advantage in the Israeli's favor for each trait.

As before, the qualitative results here combine with those from the previous chapter, add greater depth to the statistical processes performed earlier. The quantitative and qualitative

methods employed necessarily influence our understanding of the factors that influence battlefield outcomes. With the broader material, institutional, and unit-level contexts set, we are poised for a deeper appreciation for culture and the role it plays in battlefield behaviors, military effectiveness, and ultimately military power. In the next chapter, I discuss the critical aspects of this study's findings in light of their military, political, and scholarly applications.

## CHAPTER VIII

### DISCUSSION & CONCLUSION

Culture matters. Despite many insightful attempts to describe culture's influence by, its nuanced and intangible nature discouraged decision-makers from incorporating it into any meaningful concepts of military power. Regardless, empirical evidence shows that culture manifests concrete effects in combat, often determining battlefield outcomes, and sometimes explaining the unexplainable. At issue, is that so much of conventional wisdom regarding what does and does not constitute military power completely ignores culture. Consequently, evidence suggesting that cultural factors are not just contributors, but vested partners with material factors in determining battlefield outcomes has meaningful implications for many fields.

The most appreciable repercussions from this cultural fallout will be obvious for military commanders, national leaders, and scholars across multiple disciplines. Culture, when combined with relevant material, institutional, and unit-level factors, provides a systematic and increasingly comprehensive framework within which to structure the strategic, operational, and tactical assessment of military power. This new insight comes from restoration of the human dimension—accounting for people—in an otherwise platform-focused analytical process.<sup>1</sup> Incorporating robust measures of culture into how we think about military organizations provides rigorous new ways to assess relative military operational capacity in enemies, allies, and in oneself. Additionally, the cultural components of military power provide a means to assess the relative strength within and benefits of military partnerships. Armed with this knowledge, military decision-makers can better prepare for combat, policy-makers can better prepare for the

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<sup>1</sup> Emily Schultheiss, *Optimizing the Organization: How to Link People and Technology* (Cambridge, MA: Ballinger Publishing, 1988), 1-18, 49-84.

business of war, and scholars can finally have a clear and concise conceptual foundation for what does and does not constitute military power.

This chapter proceeds in five sections. The first section reviews four important cultural concepts not otherwise covered in this study, including battle culture, battlefield behavior, cultural malleability, and the consequences of cultural manipulation. I introduce these concepts now as they provide critical context for the discussion of culture's implications, but were not necessary elements of theory generation or hypothesis testing. The second section discusses in detail the military applications of a culturally informed concept of military power, including improved capability assessment, cultural intelligence, and cultural interoperability. The third section describes national policy applications for a culturally informed concept of military power, including improved conflict selection, alliance dynamics, and resource allocation. The fourth section discusses the scholarly applications of a culturally informed concept of military power, specifically for the fields of international relations and cultural anthropology. The fifth sections suggest some additional research opportunities that may benefit from the availability of a culturally informed concept of military power specifically or a more robust measurement of national culture.

This study's large-*n* statistical analysis and subsequent findings would not be possible without data from many different societies and is therefore broadly applicable across many states. Despite this broad applicability, the discussion that follows retains a noticeably U.S.-centric perspective. As the United States is one of the world's largest exporters of military intervention, material, and theory, this approach supports a consistent logic and ensures complex concepts are most accessible to principal audiences. Alternative perspectives appear where appropriate, but their absence should not imply that different applications of these findings either

do not exist or are not important in their own right. This study's findings are universally applicable so long as mortal conflict persists in the world despite any favor towards U.S.-based audiences.

## **CULTURAL CONCEPTS**

Before we delve too deeply into the practical applications of this study's findings, such discussions will benefit from a brief foray into some important concepts regarding culture. First, we consider the relationships among Regime Type, Culture, and Battle, separating expectations for observations. Second, we consider battle culture, or the profile of cultural traits considered ideal for battlefield success. Third, we consider the concept of cultural malleability, or the ability for culture to change. Fourth, we consider the concept of cultural consequence, or the family of disparate behaviors linked to each cultural trait and their relative benefit or detriment to society. Broaching these concepts in a focused manner affords an opportunity to frame both the discussions of underlying practical theory and explicate likely challenges for policy implementation.

### **Regime Type, Culture, and Battle**

This study exists largely because in 2004 Stephen Biddle and Stephen Long provided statistical evidence in support of their claim that western democracies possess a culture distinct from others that helps account for their inordinate success in battle. Their logic fit neatly into the broader theoretical framework that claims democracies tend to win the wars they fight. At issue is that upon reviewing the hypothesis testing in Chapter VI, one can see that one of the traits associated with western democratic culture, specifically lower Planning Propensity actually works against democracies. In actuality, higher levels of Planning Propensity tend to benefit



battle outcomes. Additionally, the cultural trait most strongly correlated with western democracy, namely higher levels of Inclusivity, proved to have mixed influence on battle outcomes, but never achieved any appreciable statistical significance.

Although the interaction between cultural traits and regime type is not deterministic, their associations are uncanny. Democracies tend to demonstrate noticeably lower levels of Collective Deference (In-Group Collectivism), Planning Propensity (Future Orientation), Communication Impedance (Power Distance,) and Risk Aversion (Uncertainty Avoidance), and markedly higher levels of Inclusivity (Gender Egalitarianism). Outliers exist—democracies with extremely high Planning Propensity and Risk Aversion (Thailand) or non-democracies with remarkably low Collective Deference (Qatar)—but regime types tend to coalesce around similar cultural dimension profiles.

### **Battle Culture**

The statistical tests employed in Chapter V reveal a consistent, influential, and significant relationship between culture and battlefield outcomes. The approach used to operationalize the dimension-based cultural variables produces a single calculated proportionality value based upon the attacker and defender's values. This means the explanatory power of the cultural variables come primarily from the relationship between belligerents' values. Consequently, each participant is ultimately responsible for the value it brings to the equation. Mathematically speaking, having a score at the extreme beneficial limit of the existing of cultural dimension scale represents the conceptual best-case scenario for maximizing positive cultural influences on battle outcomes. This admittedly abstract concept is Battle Culture.

Battle Culture is an idealized profile of cultural dimension values that maximizes these traits' beneficial influence on battle outcomes in accordance with statistical models of military

effectiveness. In non-technical language, though it may be either unattainable or undesirable (as will be discussed in the Cultural Consequence section of this chapter), it is the best possible ally to have and best possible enemy to face. The formula for this ideal comprises a maximum Planning Propensity, and minimum Risk Aversion, Collective Deference, Communication Impedance, and Inclusivity scores.

Although employing the absolute minimum and maximum scale values of 1 and 7 to define the artificial construct of Battle Culture is an acceptable approach, this study limits the constituent maximum and minimum dimension values to those actually observed in the Globe dataset. Doing so maintains a modest connection with reality and acknowledges that there may be practical limits to the extent states can manifest cultural traits while maintaining their societal cohesion. Expansion of the Globe study or like datasets to include additional societies whose cultural dimension values extend beyond the current minimum and maximum observations will greatly advance this study program, but will likely also demand refinement of the precise terms of Battle Culture.

### **Cultural Malleability**

Although a more detailed discussion of this process appears later in this chapter, at this point, we have conceptualized a goal in Battle Culture and likely have awareness of how alike or different our own nation's cultural dimension scores are from that goal. It is a short leap of logic to suggest that some national leaders may be interested in steering elements of their own culture towards Battle Culture to assure their nation's success in combat. A more detailed discussion on the practicality of manipulating a culture for the sake of battlefield success takes place in the Cultural Consequences section of this chapter. The precise degree to which manipulation of national and organizational cultures is possible and the methods by which such manipulation

may take place are outside the scope of this study. However, the literature does support the notion that policy-makers may manipulate culturally informed behavior through a deliberate external process.<sup>2</sup>

For the sake of this discussion, let us assume that the culture of a nation and its military are both malleable, with the latter more so than the former in terms of extent and rate of change. Let us also assume that a limit exists to the degree a military culture can differ from its national culture without adversely affecting the also statistically significant Civil-Military Relations. Under such conditions, a sovereign might invest in optimizing key values and practices in the target population to improve battlefield behaviors (increased Planning Propensity, decreased Risk Aversion, decreased Collective Deference, and decreased Communication Impedance); thereby improving the military's battlefield efficiency.

### **Cultural Consequence**

Having conceptualized Battle Culture as an ideal, deepened our understanding of battlefield-related traits and presumed that cultures are reasonably malleable, we must ponder an important question—"If you could select your own society's traits, would you want to live in a Battle Culture?" There must be limits to the degree an individual, a leader, or a society will go for the sake of success in that finite function in life. For example, if the King of Saudi Arabia were to have employed the findings originally presented by Biddle and Long in 2004, he would have faced wholesale democratization and mass conversion to Christianity as his potential policy prescriptions. Such changes to the fundamental fabric of a people are probably not the changes the king would enthusiastically pursue for the sake of improved national defense. This is not to say that outliers do not exist—individuals or societies within whom the drive for martial success

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<sup>2</sup> Malcolm Gladwell. *Outliers: The Story of Success*. (New York: Little, Brown and Co, 2008), 177-223

is all-consuming. Instead, it means that there must be a tipping point in most states at which the cost to civil society outweighs the benefits on the battlefield.

It is important to reinforce that though each cultural dimension score stands as a singular point on a discrete scale, the dimension and its associated score actually represents the relative tendencies of a collection of related societal traits (with some traits more readily explaining battlefield behaviors than others). For example, statistical models reveal a negative (albeit statistically insignificant) relationship between battlefield outcomes and both education and Gender Egalitarianism scores. In a very crass way, this suggests that societies with ignorant and gender-biased populations perform better in battle. But what if the relationships were statistically significant? Would a society with strong traditions of education and gender equality forego that in the name of a more effective fighting force? Likely not.

Two examples that are statistically significant, In-group Collectivism (Collective Deference) and Uncertainty Avoidance (Risk Aversion) represent areas where states would likely benefit very narrowly in combat at the expense of civil society were policy-makers inclined to pursue wholesale cultural modification. Low In-group Collectivism societies tend to do well in battle, but also tend to have a mix of beneficial and detrimental traits, including increased industrialization and wealth, more nuclear family structures, decreased distinctions made between in-groups and out-groups, but also faster pace of life, and higher rates of heart attack and divorce. Low Uncertainty Avoidance societies tend to do well in battle, but also have lower assurance of civil liberties, lower prevalence of technological integration, and diminished economic prosperity.<sup>3</sup> As such, policymakers would likely face meaningful challenges within

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<sup>3</sup> Robert House, et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 630.

their society to implementation of any wholesale cultural modification in the areas of In-group Collectivism and Uncertainty Avoidance.

Two examples that are statistically significant and represent opportunities for broader benefit to society are Future Orientation (Planning Propensity) and Power Distance (Communication Impedance). High Future Orientation societies tend to do well in battle and tend to have increased economic success, healthier populations, and intrinsically motivated people. Low Power Distance societies tend to do well in battle and tend to have strong civil liberties and low levels of corruption, larger middle classes, increased capacity for individual contribution and entrepreneurialism. As such, states would likely benefit both in combat and in a much broader sense across civil society were policy-makers inclined to pursue wholesale cultural modification in the areas of Future Orientation and Power Distance.

The remaining cultural dimensions from the GLOBE Study are Performance Orientation, Humane Orientation, Institutional Collectivism, and Assertiveness. Performance Orientation is the degree “to which an organization or society encourages and rewards members for performance improvement and excellence.”<sup>4</sup> Humane Orientation is the degree “to which members of a society encourage and reward individuals for being fair, altruistic, friendly, generous, caring, and kind to others.”<sup>5</sup> Institutional Collectivism is the degree “to which organizational and societal institutional practices encourage and reward the collective distribution of resources and collective action.”<sup>6</sup> Assertiveness is the degree “to which members

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<sup>4</sup> Robert House, et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 11-12

<sup>5</sup> Robert House, et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 11-12

<sup>6</sup> Robert House, et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 11-12

of a society are assertive, confrontational, or aggressive in social relationships.”<sup>7</sup> Though these four dimensions, like Gender Egalitarianism, represent important influences on general social values and practices, they do not appear to relate directly with any Battlefield Behaviors, and they do not correlate significantly with democracy. As such, these four cultural dimensions do not appear in the Battlefield Efficiency Model, even as representative components of culture.

## **MILITARY APPLICATIONS**

For the military commander, recognition that culture plays a pivotal role in combat means that the mechanisms of battlefield calculus and force generation must change. The first modification to the battlefield calculus appears in how culture influences assessments of enemy combat power. The second modification appears in how culture influences similar assessments of allied combat power, but also how culture influences interoperability between alliance partners—both friendly alliances and enemy. The third modification appears in how culture influences what we think we know about ourselves, principally in terms of our own self-assessments of combat power, but also in how we recruit, train, and retain before war even begins.

### **Assessing the Enemy**

The first touch point that culture has in the enemy assessment process is through intelligence collection. The first battle wrought between two standing armies may very well have been ill-prepared happenstance. More likely, the encounter followed at least one participant diligently collecting information on the other. Today, the relationship between this collection of

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<sup>7</sup> Robert House, et al., *Culture, Leadership, and Organizations: The GLOBE Study of 62 Societies* (New York: Sage Publications, 2004), 11-12

military intelligence and the conduct of military operations is well established—intelligence drives operations. Consequently, a general absence of relevant cultural content in the military intelligence cycle necessarily results in ill-informed military operations.

The challenge most commanders face during their pursuit of operations-driving intelligence is that the enemy has little incentive to provide this valuable information and is likely to conceal it with great enthusiasm. Commanders face a second challenge; knowing what information will be most useful for defeating the enemy. As mentioned in Chapter II, the three most fundamental pieces of information commanders require to develop their own plan of action are enemy composition, disposition, and strength. These reasonable and straightforward nuggets of information reveal the underlying deference paid by commanders to the perceived influence of material factors in combat outcomes but also highlight the most likely types of information intelligence analysts already collect.

On the other hand, indications of the enemy's most likely course of action tend to be more difficult to ascertain than types, locations, and quantities of equipment. As such, these bits of information often require a fair amount of intuition and interpretation on the part of military analysts. Of the four pieces of information discussed, predicting the enemy's most likely course of action is both the most challenging and the point at which our new understanding of cultural factors play the largest role.

By incorporating relevant human factors into their assessments, military intelligence analysts can expand the commander's understanding of the enemy's strengths and weaknesses at the behavioral level. This deeper understanding about how capable the enemy is at wielding their weapons of war and how complex an operation they are capable of undertaking may change the way we approach battle. This insight into the mind of an enemy may just give the commander

pause to reassess when the opportunity looks too good and attack with impunity under ostensibly dire straits.

### Cultural Intelligence

An important precondition required before analysts can incorporate measures of culture into their assessments is to—of course—possess such information. Unfortunately, having a responsive intelligence collection system, capable of providing militarily relevant, timely, and accurate information on an enemy's battle-informing cultural dimensions, represents an extensive investment in training and education at the national level. The intelligence discipline most closely associated with the collection, analysis, and assessment of qualities such as those comprising culture is Human Intelligence (HUMINT)—a niche capability today that was once a cornerstone of the Cold War intelligence landscape.

During the Cold War, NATO and Warsaw Pact HUMINT soldiers received focused training on intelligence techniques and education relevant to each other's organizations, languages, and cultures. The bi-polar world effectively limited the number of cultural and linguistic sets of interest, increasing the depth of experience covering each set. Within a few months of the Berlin Wall's collapse, the number of cultural and linguistic sets of interest spanned the globe. Unfortunately, even extremely proficient HUMINT soldiers require substantial retraining to transition from one target culture to another. Despite some cultures sharing the same or strongly similar language patterns, differences in geopolitical environments tend to manifest noticeably different cultural values and behaviors.

Although military commanders undoubtedly prefer intelligence analysis based upon timely and accurate reporting on the enemy whom they are about to face, incorporation of cultural factors into intelligence analysis may not require detailed intelligence collection beyond



the societal affiliation of the enemy unit. With this limited information, an intelligence analyst may determine the society's relevant cultural dimension scores and use that information to help the commander make appropriate operational decisions. Where records of a given society's cultural dimension scores do not yet exist, the dimensions offer a structure for the types of behavioral information commanders likely require to enhance their understanding of the enemy. This structure can shape both ongoing intelligence collection in support of imminent battle, but also long-term collection in support of future conflict.

For example, this study was unable to include over thirty records from the original Biddle and Long in the statistical analysis, as there were no cultural dimension records available in the GLOBE study for North Korea, Jordan, or Syria. Although the quality and scholarly reliability of cultural dimension scores derived from external observation instead of methodologically consistent survey data would likely be insufficient for publication, such information may be exceptionally useful for a military commander in a crisis. In this way, our appreciation for culture in terms of cultural dimensions offers a great deal of structure for interpreting behavioral observations, even in the absence of formal dimension scores.

Identifying an enemy's societal affiliation does not necessarily identify their actual course of action. Instead, it outlines the realm of the possible given their cultural constraints and offers a means to focus analytical attention. Enemy commanders always have the capacity to—deliberately or accidentally—undertake a course of action for which their forces are either ill-equipped or ill trained. Consequently, appreciating the enemy's culture can both shape assessments of their anticipated success and inform appropriate responses during an uncharacteristically challenging operation.

In addition to gaining an overall sense of the efficacy an enemy may display on the battlefield, considering the enemy's strengths and weaknesses in terms of individual cultural factors is perhaps more telling. By focusing on an enemy at the individual cultural dimensions level and comparing those values to the ideals of Battle Culture described earlier in this chapter, a commander may better understand tendencies in that enemy's behavior and plan accordingly to avoid strengths and exploit weaknesses. For example, China holds very high (unfavorable for battle) scores in both In-Group Collectivism (Collective Deference) and Uncertainty Avoidance (Risk Aversion). This represents an exploitable weakness in Chinese operations whereby they may rely too heavily on consensus-based leadership or overly adhere to rigid operational plans.

### Wargaming

With culture having influenced the information analysts possess on the enemy, the second point that our improved concept of culture has in the enemy assessment process is through wargaming. The coefficients associated with each variable in our multiple linear regression models provide a mechanism by which a commander might evaluate the enemy's relative operational capacity in the absence of more specific information. By holding all factors equal except for regime type and cultural dimension scores, the Model estimates a Loss Exchange Ratio between effectively materially equal competitors. Of course, improved fidelity regarding Material factors would improve the quality of predictions, but isolating the effects of the human element remains informative presuming an otherwise fair fight. This approach is likely insufficient to justify choosing any single plan of action but may help a commander focus intelligence collection efforts in a more meaningful way or eliminate some proposed plans outright.

For example, despite U.S. defense policy language referring to China and Russia as near-peer competitors; this study's statistical models suggest Russia is far more a peer than China. The Model predicts a 1:1 Loss Exchange Ratio in an otherwise fair fight between Russia and the United States. In such a fight between China and the United States, the Model predicts a 2:1 ratio in favor of the United States. Surprisingly, Iran demonstrates stronger near peer competitor characteristics to the U.S. in terms of cultural dimensions, resulting in a 1:1 Loss Exchange Ratio when holding Material Factors at parity. Using some non-U.S. examples, in an otherwise fair fight between China and India, the Model predicts a 4:1 Loss Exchange Ratio in favor of India. Similarly, in a fight between Malaysia and Singapore, the Model predicts a 5:1 Loss Exchange Ratio in favor of Malaysia. However, in an otherwise fair fight between Indonesia and Malaysia, the Model predicts a 4:1 Loss Exchange Ratio in favor of Indonesia.

It is important at this point to reinforce that the statistical models in this study are abstract representations of military organization attributes and behaviors intended to focus attention on key logics and causal mechanisms in a combat environment. Though the model is capable of predicting battlefield outcomes, these predictions rely heavily on estimated linear functions and trends in historical data. As such, they are indicative of the estimations, not prognostications of the absolute. With that said, they do highlight how changes in certain attributes and behaviors would likely influence battle outcomes.

### **Assessing Allies**

Although military commanders must take into account their allies' capabilities as part of overall calculations of combat power, the process for an ally is functionally no different from an enemy. However, military commanders must also be able to identify the seams created when organizations with disparate cultures join forces for a common purpose. Such seams primarily

represent a force protection issue for friendly forces to guard against, but when assessing cultural clefts in an enemy alliance, these seams become targets of opportunity to exploit.

Military alliances typically manifest in response to strategic political settlement. However, at their visceral and pragmatic level, they are often partnerships among disparate fighting forces. In battle, allies tend to represent additional capacity (or perhaps a unique capability) to defeat an enemy, but they can also represent a source of considerable friction.

Analysts tend to measure the depths of disparity in the readily available terms of equipment parity and interoperability. For example, it is nearly impossible to conduct even simple maneuvers on the modern battlefield if allies do not possess radios that transmit and receive signals in the same frequency range. It is similarly quite challenging to streamline logistics activities if everyone's vehicles use different fuel. Steps taken by allied organizations to standardize equipment and resources underscore the role material factors play in military operations.

Like differences in military equipment, culture influences the relative ease or friction with which allies conduct operations as well. Externally, culture manifests in organizational structures, tactics, techniques, and procedures. Perhaps less readily perceived—but still readily felt—is the way culture influences decision-making and social interaction. Although interoperability assessments tend to focus on material factors, the logic easily applies to cultural factors as well. By comparing individual cultural dimension scores held by partners within a military alliance, analysts can assess the level to which the members are similar or disparate. Similar scores represent the highest degrees of extant cultural inoperability, whereas disparate scores represent increased potential for conflict and friction.

This is not to say that similar scores manifest identical or ideal behaviors, but are more likely to manifest compatible perspectives on resultant behaviors. Additionally, this is not to say that high degrees of cultural similarity are desirable. Some degree of difference in perspectives is likely to improve options generation during decision-making as a function of increased divergent thinking or diminished groupthink.

Despite greater opportunity for operational friction, disaster may not be the inevitable outcome of cultural disparity. Instead, a number of potential relationships are possible under these conditions. One option may be for the beneficial cultural traits of one party to mitigate the detrimental traits of another. This mitigation function is more likely to appear in alliances where partners maintain some form of formal or informal hierarchy that pays deference to the partner with the more beneficial traits. Another option may be for the tension generated by the cultural differences of two functionally equal partners to create a synergistic effect, enabling solutions to battlefield problems a single partner could not achieve alone. In either case, a greater appreciation for the effects of cultural differences on allied operations only stands to help partners work through the friction and achieve more together.

Since the end of WWII, the U.S. maintains a number of allies with global reach (e.g. Australia, Canada, New Zealand, and the United Kingdom), but also engages many capable regional powers (e.g. South Korea, Singapore, Indonesia, and Qatar). One example of a long-standing military alliance is United Kingdom – United States of America Agreement (UKUSA). Commonly referred to as the Five Eyes community, the UKUSA is a multilateral agreement for cooperation in the highly technical and highly sensitive field of signals intelligence maintained, counting the United Kingdom, the United States, Canada, Australia, and New Zealand among its members. The five participants in this international alliance share highly similar scores across all

four battle-related cultural dimensions. The only noticeable outlier within the group is New Zealand, which maintains a markedly higher Power Distance (Communication Impedance) score than the four other states. The similarity in cultural context profiles demonstrated by these partners offers a compelling explanation for the longevity of their military agreement and the relative ease with which these organizations conduct coalition operations. The fact that New Zealand persists as a member of the group despite some cultural differences suggests a draw to work through any propensity for conflict and friction. Sustained interaction among military organizations is unlikely to change national cultures in a meaningful way. However, military partners are more likely to adopt beneficial behaviors observed in their allies with increased exposure to one another.

### **Assessing Oneself**

Often considered a continuous process, self-assessment occurs both in battle and long before boots ever touch the battlefield. As such, military leaders tend to invest considerably in their military forces during times of peace in efforts to be ready when war comes to call. Standing military organizations soak up a great deal of resources in the form of weapons, equipment, recruiting/retention, and training. The first two categories represent an appreciation for the role material factors play in military outcomes. The last two categories represent an acknowledgment of the role culture plays.

The recruiting/retention process—whether by force or by choice—seeks to draw the most militarily useful individuals from society, incorporate them into the fighting organization, and keep them there as long as possible. The training process often focuses on imbuing civilians with the technical skills necessary to employ military-specific equipment in a combat environment, creating technically proficient individuals. A bi-product of service within a broader military

context and subsequent focused collective training is exposure to organizational culture and adoption of organizational values. These intangible qualities are largely responsible for enabling trained individuals to function as members of highly effective teams, the hallmark of tactically proficient soldiers. In this way, society writ large represents the raw material and trained recruits represent refined versions of that material. Although the scope and scale of change is smaller in this discussion of military-specific training—likely making it more palatable than society-wide change for the benefit of military outcomes—all of the same moral challenges associated with the manipulation of society discussed previously remain in play here as well.

Additional information regarding the degree to which a given military is able to inculcate the most desirable battlefield traits into their soldiers would likely improve the quality of our statistical models and their subsequent predictions. In absence of such information, cultural dimension scores still provide valuable insight. In particular, comparing a nation's individual cultural dimension scores to those of the idealized Battle Culture reveals the degree to which a nation's soldiers already manifest beneficial traits for battle as an untrained civilian. This highlights how much effort will likely be required to elicit beneficial battlefield behaviors as a trained soldier.

For example, the United States ranks #11 of the 60 societies studied in terms of beneficial cultural trait scores. The U.S. cultural dimension profile comprises an In-Group Collectivism value of 4.25 (1st Quartile / 0.72 from ideal value), a Future Orientation value of 5.31 (3rd Quartile / 0.89 from ideal value), a Power Distance value of 5.06 (3rd Quartile / 0.81 from ideal value), and an Uncertainty Value of 2.85 (2nd Quartile / 0.84 points from ideal value). As such, U.S. policy-makers would do well to sustain current incentives and policies aimed at In-Group

Collectivism and invest in programs to modify Future Orientation, Power Distance, and Uncertainty Avoidance (in that order of priority).

Another example, Russia ranks #45 of the 60 societies studied in terms of cultural optimization for combat and #42 with cultural dimension scores weighted according to model  $\beta$ -values. The Russian cultural dimension profile comprises an In-Group Collectivism value of 5.63 (3rd Quartile / 2.10 from ideal value), a Future Orientation value of 5.48 (Mean / 0.72 from ideal value), a Power Distance value of 2.62 (2nd Quartile / 0.58 from ideal value), and an Uncertainty Value of 5.07 (3rd Quartile / 1.91 points from ideal value). As such, Russian policy-makers would do well to invest in programs to modify Future-Orientation, In-Group Collectivism, Uncertainty Avoidance, and then Power Distance (in that order of priority).

Furthermore, Egypt ranks #55 of the 60 societies studied in terms of cultural optimization for combat and #56 with cultural dimension scores weighted according to model  $\beta$ -values. The Egyptian cultural dimension profile comprises an In-Group Collectivism value of 5.64 (3rd Quartile / 2.11 from ideal value), a Future Orientation value of 5.80 (2nd Quartile / 0.40 from ideal value), a Power Distance value of 3.24 (4th Quartile / 1.20 from ideal value), and an Uncertainty Value of 5.36 (4th Quartile / 2.20 points from ideal value). As such, Egyptian policy-makers would do well to modify Uncertainty Avoidance, Power Distance, In-Group Collectivism, and then Future Orientation (in that order of priority).

## **POLITICAL APPLICATIONS**

For the national leader, recognition that culture plays a pivotal role in combat means that the mechanisms of foreign policy and resource allocation must change. The first change in foreign policy reflects upon how culture influences conflict selection. The second addresses how culture influences ally selection. The third appears in how culture influences investing in



partners. The last political application appears in how culture influences the allocation of national resources.

### **Selecting Conflicts**

Critical decisions about resource allocation often hinge on threat assessments; focused analysis regarding an enemy's capability and capacity to do harm. Armed with a new appreciation for culture's role in military power, national leaders must reassess the military posturing all around the world. Simply put, some of the states that we observe fielding massive militaries or purchasing the latest equipment may be doing little more than purchasing well-appointed tombs for their military men and women. Alternatively, some may be able to do far more with far less than their rich counterparts may.

A popular concept in U.S. Defense circles is to distinguish near-peer competitors from other lesser threats. Near-peer status connotes a state possessing a quantity and quality of martial material resources similar to that of the United States while the term competitor is a euphemistic expression of that state's political aims and proclivities. Though other states have vied for the status over the years, the U.S. developed two primary near-peer competitors since the end of WWII—namely, Russia and China.

By holding all factors in our statistical models at parity except for regime type and culture, the model estimates a Loss Exchange Ratio between effectively materially equal competitors. Of course, improved fidelity regarding Material factors would improve the quality of predictions, but isolating the effects of the human dimension remains informative and dramatically influences the discourse on what constitutes near peer. For example, despite China and Russia being treated as near peers to the U.S. in Defense policy language, Russia is far more a peer in the human dimension than China. Even then, the model predicts Russian battlefield

outcomes would be largely negative (estimated casualty rates of 6:1 due to culture influence alone).

On the other hand, the terror organizations such as the Islamic State in Iraq and Syria (ISIS) may possess cultural traits that make them far more capable with their material resources than the likes of Russia or China. The cultural capabilities of ISIS and other such transnational organizations are beyond the scope of this study as the GLOBE study organizes its quantitative data along as distinctively homogenous societal lines as possible. Although difficult to measure, the principles of cultural influence on organizational behaviors should remain true even in societally heterogeneous organizations. Transnational groups likely demonstrate a hodgepodge of cultural traits, changing prominence as the membership population ebbs and flows. That said, some well-established transnational organizations might well be able to establish a more robust organizational culture through rigorous indoctrination, thereby reducing the volatility in the way the traits manifest in behavior.

Making matters more complex is the speed and perceptibility with which these conditions might change. Culturally advantaged forces who suffer from a paucity of quality material might rectify their shortcoming with the right strategic partner or the fortuitous tactical win, making changes for these states potentially high speed but also highly perceptible. Alternatively, materially advantaged forces who suffer from a disadvantageous cultural traits might rectify their shortcomings through quiet and deliberate organizational culture modification, making changes for these states potentially slower but also likely imperceptible—until it is too late.

### **Selecting Allies**

In addition to selecting the right enemies, national leaders must also choose the right friends. National leaders determine who is best suited to share the burden of military action

based upon appraisals of potential partners' capacity to shoulder such burdens. Procedurally, this military capacity determination follows the same pattern as the military commander's assessment of enemy or allied military power, just occurring through a national policy lens. The other consideration when selecting friends returns us to the potential tradeoff between cultural advantage and cultural interoperability, whereby policymakers may face a choice between picking up positive traits from extended partnerships and relative ease of coalition operations.

For example, the summer of 2015 when France and China both pledged to extend military and economic cooperation to Nigeria. Nigeria and China share similar In-Group Collectivism (Collective Deference) and Uncertainty Avoidance (Risk Aversion) scores, but France maintains scores far more desirable than China in both cases. Regarding Gender Egalitarianism (Inclusivity) and Power Distance (Communication Impedance), Nigeria and France share similar scores, with the Power Distance trait being particularly more favorable than that of China. Remarkably, France and China maintain similar Future Orientation (Planning Propensity) scores at the opposite end of the spectrum from Nigeria, though France is nominally closer than China. If the Nigerian military prioritized cultural interoperability and thus similarity in their decision-making, partnership with China is the most reasonable choice. However, if Nigerian policy-makers sought a partnership where sustained interaction might influence its military organizational culture towards more beneficial behaviors, then France represents the far better choice. Policy-makers pursue their preferred courses of action in far more complicated environments than this scenario addresses, but the discussion is informative beyond what existing assessments of mere equipment can provide.

### **Investing in Partner Capacity**

International military interventions cover a spectrum of operations, from total war to humanitarian aid. Security Cooperation and Security Assistance operations represent limited mobilization of donor forces with the expressed goal to improve the capacity of the target nation to meet its own security requirements. As mentioned before, the tendency of decision-makers to focus on material factors is overwhelming, leading many security cooperation and security assistance operations to devolve into stylized Foreign Military Sales (FMS) affairs. Armed with a deeper appreciation for the influence cultural factors exert on battlefield outcomes, decision-makers have an opportunity to build security capacity in a more comprehensive way.

In larger part, the process of investing in a partner's capacity represents an outsourcing of the recruiting and training functions described earlier. As such, comparing a nation's individual cultural dimension scores to those of the idealized Battle Culture once again reveals the degree to which a nation's soldiers are culturally optimized for battle in their "raw material" state. This highlights how much effort will likely be required to elicit beneficial battlefield behaviors in their refined (trained) state.

Beyond providing policy-makers with an appreciation for the target amount of investment a partner state's security apparatus requires, cultural factor analysis also provides insight into which states are best suited to render such aid. By applying the logic of cultural interoperability discussed previously, policy-makers may compare cultural dimension profiles of militaries before they enter into a capacity-building relationship to assess the level by which the allies are similar or disparate. Partnerships where the intervening member demonstrates cultural traits more beneficial for battle than those of the target state, but not so different as to elicit highly contentious interaction may represent a better approach than partnership with the ideal. Such deference paid to higher degrees of extant cultural inoperability when selecting capacity-

building partners would likely improve the chance for deliberate and incremental improvement in the target state and reduce the likelihood of donor fatigue on the part of those states perceived as the more “ideal” partners.

### **Allocating Resources**

Besides shaping perceptions of enemies and allies, national leaders must use culture to shape their concepts of self as well. In the same way, that concepts of military power absent culture produce erroneous estimates of capability in others, they produce dangerously erroneous estimates of capability in us as well. National leaders must reconsider what challenges the state is willing or not willing to take on and what role military power should play in addressing such challenges.

Conceptually, policy-makers must establish culturally informed mechanisms to evaluate their own military power to avoid both unfounded military optimism (and its equally unfounded preference for the military element of national power). Alternatively, policy-makers must also avoid unfounded military pessimism (and its unfounded shrinking away from military commitment).<sup>8</sup> Such accurate self-assessments of military power will necessarily inform the resource allocation decisions for the military enterprise, but will concurrently inform the discourse on domestic resource allocation as well.

### **SCHOLARLY APPLICATIONS**

For the scholar, recognition that culture plays a pivotal role in combat means that the disciplines of international relations and cultural anthropology must change. For international relations scholars, the first change must be to redress the errant definitions of military power that

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<sup>8</sup> Geoffrey Blainey, *The Causes of War*, 3rd ed. (New York: Free Press 1988), Ch.3.

ignore the influence of culture. The second change that must come is for international relations scholars to become more culturally literate, adding a powerful new tool to the short list of democratic and economic explanations for phenomena. For scholars of cultural anthropology, the first change must be to expand the body of knowledge regarding cultural dimensions, deepening for the societies where data exists and broadening where data yet exists. The second change that must come is for cultural anthropology scholars and military scholars to repair their torn relationship, investing in a partnership that avoids the war we can and end quickly those we cannot.

### **International Relations**

The concepts of power and relative power are important to nearly every school of thought in international relations. Although military power may not be the only form of power to influence the behavior of states, it is a central force—both important and influential.<sup>9</sup> Empirical studies show that the conventional concept of military power influences a variety of interactions, including “patterns of international cooperation, trade policy, economic development, identity construction, and, of course, war causation, and termination.”<sup>10</sup> Speaking plainly, perhaps the most daunting challenge facing the field is the sheer volume of scholarship, influencing both policy and practice, which sits precariously atop a foundation of military power defined without culture. If culture really is more influential in battlefield outcomes than half the material factor, half the unit-level factors, and all the institutional factors, then culture may revolutionize the way we think about all manner of conflictual or cooperative relationships.

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<sup>9</sup> Kenneth Waltz, *Man, the State, and War* (New York: Columbia University Press, 1959).

<sup>10</sup> Michael Beckley, “Economic Development and Military Effectiveness,” *The Journal of Strategic Studies* 33, no. 1 (2010): 45.

The looming consequences of bloody battles prompt some national leaders to enter into non-aggression treaties, alliances, and even collective security agreements to shift the odds of battle and in battle more towards their favor.<sup>11</sup> Those same leaders who decry violence in others raise standing armies, enforce compulsory military service and invest in military material so as not to be caught ill-prepared.<sup>12</sup> At the systemic level, the concepts of anarchy, self-help, and the security dilemma all speak to an ever-present, pending state of war, while the conditions of multi-polarity, bi-polarity, and unipolarity define themselves largely in terms of relative military power.<sup>13</sup> The fact that culture makes a difference in battle means that it has an appreciable empirical effect, at least at the tactical level of war. Although there is reason to believe that the effects of culture extend beyond the battlefield, scholars must do more research to prove definitively whether culture manifests an effect at the operational and strategic levels as well.

Much of what we think we know about the way states and peoples relate to one another presumes a fungible effect by either democracy or economy. Our newfound ability to leverage culture as a systematic and rigorous explanatory force may open an entirely new dialogue with an entirely new lexicon of culturally influenced concepts. The limits really are bounded only by the creativity of the researchers who apply the available data to difficult problems in rigorous ways.

### **Cultural Anthropology**

As for cultural anthropology, the fact that culture makes a difference on the battlefield means that demand for relevant cultural insight will remain high among military commanders

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<sup>11</sup> Robert Axelrod, *The Evolution of Cooperation* (New York: Basic Books, 1984).

<sup>12</sup> Peter Katzenstein, *The Culture of National Security: Norms and Identity in World Politics* (New York: Columbia University Press, 1996), 29.

<sup>13</sup> Kenneth Waltz, *Theory of International Politics* (Boston: Addison-Wesley Press, 1979).

and national leaders. These audiences have life and death decisions to make, meaning that they need the most comprehensive and rigorous scholarship on culture the field can muster. Scholars must do more research to extend the reach of cross-cultural studies to include the full roster of nations and deepen the pool of research on culture and conflict.

More important than the research, the cultural anthropology community and the military community must repair their relationship. Scholars must not only take part in the discourse but also give direction to it. National leaders and military commanders must make well-informed decisions about military power, based upon rigorous scholarship from professional scholars. Through meaningful, ethical, and professional dialogue, a partnership can form that respects both communities' charters and their roles in our world society. Only then, will the world see fewer wars fueled by unfounded optimism and thereby a greater peace.

## **FUTURE RESEARCH**

### **Civil War, Insurgency, and Local Populations**

It is important to note that the explanatory power of Culture, as operationalized within this study, maintains certain inherent limitations. In particular, in cases where opponents represent otherwise indistinguishable subsets of a larger national population, such as civil war or insurgency, cultural dimension scores for each belligerent will equal each other and eliminate their influence in statistical models. Conversely, in cases where one belligerent's force comprises multiple nationalities, such as externally supported insurgencies or coalition formations, researchers will likely be unable to establish solid measures. Only in situations where national contributors to this heterogeneous formation share remarkably similar cultural dimension scores or the scale of battle reduced to sub-units with a homogenous nature, can the model work.



Even when extant conditions do not permit full assessment of the belligerents, exploring the influence of culture may still prove useful. In particular, using the four battle-related cultural traits and their underlying logic as a rubric for evaluating an enemy's structure or behavior might be useful. Similarly, applying cultural assessments of interoperability to local populations or other third party actors may prove helpful when dealing with expected responses to humanitarian aid/disaster relief operations. Similar assessments would be possible for indigenous population responses to insurgency.

### **Building Democratic Institutions**

Though far beyond the scope of this research, the fields of democratization and international development may also benefit from further research into the relationships between culture and institutional factors. Although the relationship between culture and regime type is not deterministic, their associations are uncanny. Democracies tend to demonstrate lower levels of In-Group Collectivism, Future Orientation, Power Distance, and Uncertainty Avoidance, and higher levels of Gender Egalitarianism. Outliers exist—democracies with extremely high Future Orientation and Uncertainty Avoidance (Thailand) or non-democracies with remarkably low In-Group Collectivism (Qatar)—regime types tend to coalesce around similar Cultural Dimension profiles. This observation suggests that the democratization pre-requisites of economic development and international environment may benefit from a third consideration—an internal cultural readiness component.

If additional research proves valid, then analysts can modify a tool to assess the relative level to which a state is more or less culturally optimized for democracy. Subsequent attention placed on individual traits highlights areas where investment in democratizing culture modification may improve governance outcomes and the degree to which behaviors require

change. Findings from these assessment methods might save billions of dollars in development and democratization resources by helping to target specific precursors and prioritize those factors with the broadest beneficial effects.

## CONCLUSION

Conventional concepts of military effectiveness are erroneous at best and negligent at worst. For too long, circular debates on the efficacy of boots on the ground, technologically superior equipment, forms of government, and bags of money have dominated the discourse on military power. Recent scholarship claims that other factors play a part, including education, civil-military relations, and culture. And despite well-meaning attempts to brush aside these novel ideas in favor of the well-worn ruts discourse, there is more here than meets the eye—much more. Culture matters.

In fact, of all the factors purported to explain battle outcomes, culture is paramount. A distant second is the equally novel concept of civil-military stability. Specifically, how well a state manages the relationship between its government and its military shapes how people die on the battlefield. Only then, do the usual suspects arrive; the material means of war—the tanks, the aircraft, and the artillery. Conspicuously absent from this auspicious list of battlefield influencers are democracy, economic development, and education.

The reason for this upturning of the conceptual apple cart is that until recently, statistically viable measures of culture were difficult to come by. Even those that were available were insufficient to tackle a battle-related database spanning nearly a century, with hundreds of battles, and dozens of countries. That is until the GLOBE study of 62 societies expanded the body of available data, enabling large-*n* quantitative study of battle determinants via direct measures of culture instead of crude proxies.

Consequently, culture takes its place as principle influence over military effectiveness and intuitive partner to the still relevant military means of tanks, aircraft, and artillery.

Functionally, culture describes the hand that wields the tools of war. Practically, culture informs how well a unit plans, accepts risk, seizes initiative, and communicates in the heat of battle. Culture's role has always been intuitive, logical, and theoretically sound. Now, newly available data supports this intuition with quantitatively and qualitatively derived empirical evidence.

Perhaps more pervasive and ubiquitous a force than government, economy, or education, culture is a phenomenon that every soldier carries with them at home and in war. Theoretically speaking, much of the extant literature regarding the influence of democracy and economy on individual behavior remains valid if the explicit vehicle by which democracy and economy manifest their influence is via culture. At that point, the diminished significance of these two institutional factors in battle is not academic surrender, but logical relief-in-place by a more direct measure of the behaviors seen in soldiers at task.

Consequently, with distracting discussions about institutional factors set aside for a time, the simple construct for military power becomes—a state's available military means (measured in terms of local equipment holdings) and a state's ability to use them effectively (measured in terms of their culture). As other scholars have envisioned but with different tools, combining the elements of resources and effectiveness produces an accurate indicator of military power upon which can be tested broader theoretical and empirical claims.<sup>14</sup> So much of the frustration facing military analysts stems from the general over-reliance on the means of war. The discourse is chockablock with newer and better ways of defining what a military has. By contrast, discussion

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<sup>14</sup> Michael Beckley, "Economic Development and Military Effectiveness," *The Journal of Strategic Studies* 33, no. 1 (2010): 74.

rarely rises beyond the water-cooler regarding better ways to measure how a military uses what they have.

With this advent of culture as a viable and valuable contributor to military power vis-à-vis military effectiveness, a new way of looking at the world dawns a well. China, with its massive military expenditures and stockpiles of military means, is functionally building the capacity to wage war. Military analysts spend so much time and effort trying to discern what they can do with all of this hardware. However, without a concurrent investment in their military's organizational culture to mitigate detrimental traits from their national culture, they may find themselves sorely outmatched in the capability to wage war. In fact, the much smaller militaries of South Korea, Taiwan, and Singapore are better prepared to win in conventional ground battle with China than China is with them, principally due to the way their national cultures will shape how they can fight.

This novel idea about culture is reason to celebrate because we now have a powerful tool to help describe phenomena that have historically eluded explanation. However, it is also a reason for concern. Whereas sophisticated satellites and sensors can help tally a potential adversaries' military means, no such technology exists with which to see into the culture of another military organization at distance. In this regard, states with an appreciation for the consequences of culture may be quietly shaping their militaries to manifest the most beneficial battlefield behaviors, doing so outside the prevue of interested onlookers. Consequently, the true military effectiveness of an adversary may remain hidden until it is too late.

This reinforces a generally held belief, especially in Realists circles, that the world is a dangerous place. So long as wars continue to occur in response to unfounded military optimism on one or both sides of the battle lines, it behooves everyone to be better informed. Military

commanders, national policy-makers, and learned scholars need to understand what really makes states powerful and be able to explain that in such a way that nobody picks a fight out of hopeful ignorance. Instead, a better appreciation for the real determinants in battle—military means and culture—might actually avoid the bloody sport of kings altogether.

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## APPENDIX

This appendix provides additional technical information regarding certain aspects of the statistical analysis performed in this study. This information will be of interest primarily to those responsible readers who possess a stronger appreciation for quantitative methods, but may also provide interesting context for those with limited statistical experience. The information contained herein is explanatory in nature, augmenting content already in the main portion of the document. No new data or conclusions appear below.

In particular, Table 17 provides additional skewness and kurtosis information to the battle-related descriptive statistics found in Table 3 in Chapter 5. Tables 18, 19, and 20 provide additional p-value information to the associated models found in Tables 8 through 12, also in Chapter V. Figures 3 and 5 provide the graphical outputs from the statistical software commonly used in visual methods for assessing homoscedasticity.



Table 17. Extended Battle-Related Descriptive Statistics

	N	Range		Minimum		Maximum		Mean		Std. Dev.		Variance		Skewness		Kurtosis		
		Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
LER_logM	377	3.431	-1.710	1.722	0.092	0.030	0.574	0.330	0.014	0.126	0.202	0.251						
Personnel <sup>2</sup>	381	0.740	0.202	0.942	0.629	0.008	0.147	0.022	-0.240	0.125	-0.472	0.249						
Tank Prevalence <sup>1</sup>	360	0.063	0.000	0.063	0.006	0.000	0.007	0.000	3.562	0.129	23.867	0.256						
Aircraft Prevalence <sup>1</sup>	254	0.045	0.000	0.045	0.004	0.000	0.006	0.000	2.688	0.153	9.572	0.304						
Artillery Prevalence <sup>1</sup>	327	0.075	0.000	0.075	0.008	0.000	0.006	0.000	5.259	0.135	46.341	0.269						
Tanks <sup>3</sup>	361	1.000	0	1	0.524	0.020	0.377	0.142	-0.301	0.128	-1.380	0.256						
Aircraft <sup>3</sup>	254	1.000	0	1	0.508	0.027	0.430	0.185	-0.078	0.153	-1.722	0.304						
Field Artillery <sup>3</sup>	327	1.000	0	1	0.601	0.012	0.216	0.047	-0.486	0.135	-0.184	0.269						
Democracy <sup>1</sup>	366	1.000	0	1	0.653	0.020	0.379	0.143	-0.718	0.128	-0.935	0.254						
Economy <sup>2</sup>	362	0.836	0.082	0.918	0.578	0.010	0.193	0.037	-0.406	0.128	-0.454	0.256						
Education <sup>1</sup>	370	0.736	0.201	0.936	0.548	0.007	0.129	0.017	0.721	0.127	1.633	0.253						
Attacker Stability <sup>1</sup>	365	1.000	0	1	0.022	0.008	0.147	0.021	6.557	0.128	41.226	0.255						
Defender Stability <sup>1</sup>	365	1.000	0	1	0.099	0.016	0.299	0.089	2.703	0.128	5.338	0.255						
Civ-Mil Relationship <sup>3</sup>	366	2.000	-1	1	0.077	0.018	0.339	0.115	1.293	0.128	4.798	0.254						
Prot/Cath v. Prot/Cath <sup>1</sup>	382	1.000	0	1	0.505	0.026	0.501	0.251	-0.021	0.125	-2.010	0.249						
Prot/Cath v. Buddhist <sup>1</sup>	382	1.000	0	1	0.099	0.015	0.300	0.090	2.687	0.125	5.247	0.249						
Prot/Cath v. Muslim <sup>1</sup>	382	1.000	0	1	0.026	0.008	0.160	0.026	5.959	0.125	33.682	0.249						
Orthodox v. Muslim <sup>1</sup>	382	1.000	0	1	0.016	0.006	0.125	0.016	7.821	0.125	59.474	0.249						
Orthodox v. Buddhist <sup>1</sup>	382	1.000	0	1	0.016	0.006	0.125	0.016	7.821	0.125	59.474	0.249						
Jewish v. Muslim <sup>1</sup>	382	1.000	0	1	0.134	0.017	0.341	0.116	2.164	0.125	2.695	0.249						
Orthodox v. Prot/Cath <sup>1</sup>	382	1.000	0	1	0.068	0.013	0.252	0.064	3.444	0.125	9.910	0.249						
Planning Propensity <sup>3</sup>	330	0.124	0.413	0.536	0.502	0.001	0.019	0.000	-0.599	0.134	0.220	0.268						
Risk Aversion <sup>3</sup>	330	0.165	0.416	0.581	0.507	0.003	0.049	0.002	-0.251	0.134	-1.703	0.268						
Collective Deference <sup>3</sup>	330	0.149	0.406	0.555	0.496	0.002	0.033	0.001	-0.393	0.134	0.199	0.268						
Comm Impedance <sup>3</sup>	330	0.139	0.456	0.595	0.505	0.001	0.026	0.001	-0.301	0.134	-0.752	0.268						
Inclusivity <sup>3</sup>	330	0.194	0.403	0.597	0.511	0.002	0.037	0.001	0.194	0.134	1.619	0.268						
Valid N	193																	

<sup>1</sup> Variable from Biddle & Long (2004); <sup>2</sup> Variable from Beckley (2010); <sup>3</sup> Variable novel to this study (2016)

Table 18. Extended Series-1 Models

	Biddle & Long (2004) Model #1	Fowler (2016) Model A1	Fowler (2016) Model B1
R-sq	0.421	0.436	0.523
Adj R-sq <sup>1</sup>	0.379	0.398	0.492
N	223	223	193
Personnel <sup>2</sup>	* -0.51 (0.333) [0.124]	-0.58 (0.460) [0.210]	-0.59 (0.393) [0.135]
Tank Prevalence <sup>2</sup>	-1.68 (5.655) [0.766]		
Aircraft Prevalence <sup>2</sup>	-3.22 (5.065) [0.525]		
Artillery Prevalence <sup>2</sup>	** -10.70 (4.721) [0.024]		
Tanks <sup>4</sup>		*** 0.37 (0.110) [0.001]	*** 0.42 (0.120) [0.001]
Aircraft <sup>4</sup>		0.05 (0.121) [0.661]	0.17 (0.125) [0.175]
Field Artillery <sup>4</sup>		-0.21 (0.322) [0.509]	0.41 (0.271) [0.135]
Democracy <sup>2</sup>	*** -0.36 (0.140) [0.010]	** -0.30 (0.134) [0.028]	0.22 (0.314) [0.490]
Economy <sup>3</sup>			
Education <sup>2</sup>	** 1.13 (0.492) [0.023]	** 1.03 (0.487) [0.036]	-0.63 (0.564) [0.262]
Attacker Stability <sup>2</sup>	** -0.40 (0.173) [0.022]		
Defender Stability <sup>2</sup>	0.15 (0.115) [0.197]		
Civ-Mil Relationship <sup>4</sup>		*** 0.26 (0.100) [0.009]	*** 0.57 (0.179) [0.002]
Prot/Cath v. Prot/Cath <sup>2</sup>	0.19 (0.161) [0.236]	0.08 (0.148) [0.613]	
Prot/Cath v. Buddhist <sup>2</sup>	*** 1.18 (0.174) [0.000]	*** 0.97 (0.158) [0.000]	
Prot/Cath v. Muslim <sup>2</sup>	-0.70 (0.601) [0.245]	-0.57 (0.563) [0.311]	
Orthodox v. Muslim <sup>2</sup>	-0.42 (0.258) [0.109]	-0.21 (0.256) [0.424]	
Orthodox v. Buddhist <sup>2</sup>	-0.22 (0.334) [0.506]	-0.32 (0.356) [0.367]	
Jewish v. Muslim <sup>2</sup>	*** 0.78 (0.206) [0.000]	*** 0.60 (0.207) [0.004]	
Orthodox v. Prot/Cath <sup>2</sup>	-0.16 (0.232) [0.500]	-0.15 (0.410) [0.496]	
Planning Propensity <sup>4</sup>			*** 31.24 (8.139) [0.000]
Risk Aversion <sup>4</sup>			*** -10.30 (3.060) [0.001]
Collective Deference <sup>4</sup>			*** -10.45 (3.549) [0.004]
Comm Impedance <sup>4</sup>			** -9.24 (4.730) [0.052]
Inclusivity <sup>4</sup>			-0.93 (2.945) [0.753]
(Intercept)	-0.19 (0.412) [0.643]	-0.28 (0.410) [0.496]	-0.15 (3.126) [0.962]

Note: Entries are OLS regression coefficients with robust standard errors in parentheses and p-values in brackets.

<sup>1</sup> Adjusted R-sq value from associated non-Robust Standard Error model

<sup>2</sup> Variable Operationalization from Biddle & Long (2004)

<sup>3</sup> Variable Operationalization from Beckley (2010)

<sup>4</sup> Variable Operationalization novel to this study (2016)

\* p-value outside 90% Confidence Interval [p < 0.10]

\*\* p-value outside 95% Confidence Interval [p < 0.05]

\*\*\* p-value outside 99% Confidence Interval [p < 0.01]

Table 19. Extended Series-2 Models

	Beckley (2010) Model #2	Fowler (2016) Model A2	Fowler (2016) Model B2
R-sq	0.461	0.495	0.524
Adj R-sq <sup>1</sup>	0.420	0.459	0.490
N	223	223	193
Personnel <sup>2</sup>	-0.25 (0.327) [0.457]	-0.55 (0.428) [0.204]	-0.56 (0.405) [0.170]
Tank Prevalence <sup>2</sup>	-0.78 (5.467) [0.898]		
Aircraft Prevalence <sup>2</sup>	-4.01 (4.874) [0.407]		
Artillery Prevalence <sup>2</sup>	* -8.10 (4.717) [0.089]		
Tanks <sup>4</sup>		*** 0.44 (0.114) [0.000]	*** 0.42 (0.120) [0.001]
Aircraft <sup>4</sup>		0.08 (0.118) [0.475]	0.18 (0.127) [0.169]
Field Artillery <sup>4</sup>		0.10 (0.313) [0.752]	0.42 (0.275) [0.129]
Democracy <sup>2</sup>	*** -0.72 (0.181) [0.000]	*** -0.79 (0.174) [0.000]	0.14 (0.324) [0.663]
Economy <sup>3</sup>	*** 1.89 (0.577) [0.001]	*** 2.38 (0.558) [0.000]	-0.51 (0.966) [0.595]
Education <sup>2</sup>	0.26 (0.489) [0.600]	-0.06 (0.514) [0.906]	-0.56 (0.551) [0.315]
Attacker Stability <sup>2</sup>	*** -0.48 (0.161) [0.004]		
Defender Stability <sup>2</sup>	*** 0.32 (0.113) [0.005]		
Civ-Mil Relationship <sup>4</sup>		*** 0.48 (0.106) [0.000]	*** 0.56 (0.184) [0.003]
Prot/Cath v. Prot/Cath <sup>2</sup>	-0.08 (0.165) [0.608]	* -0.30 (0.160) [0.065]	
Prot/Cath v. Buddhist <sup>2</sup>	0.37 (0.304) [0.230]	-0.13 (0.309) [0.668]	
Prot/Cath v. Muslim <sup>2</sup>	* -1.22 (0.621) [0.051]	** -1.25 (0.583) [0.034]	
Orthodox v. Muslim <sup>2</sup>	** -0.72 (0.298) [0.018]	** -0.60 (0.284) [0.036]	
Orthodox v. Buddhist <sup>2</sup>	-0.67 (0.387) [0.085]	** -0.98 (0.406) [0.017]	
Jewish v. Muslim <sup>2</sup>	0.18 (0.247) [0.468]	-0.15 (0.251) [0.555]	
Orthodox v. Prot/Cath <sup>2</sup>	-0.18 (0.161) [0.291]	-0.22 (0.184) [0.230]	
Planning Propensity <sup>4</sup>			*** 34.30 (10.408) [0.001]
Risk Aversion <sup>4</sup>			*** -10.78 (3.219) [0.001]
Collective Deference <sup>4</sup>			*** -10.77 (3.541) [0.003]
Comm Impedance <sup>4</sup>			* -8.14 (4.956) [0.102]
Inclusivity <sup>4</sup>			2.30 (6.682) [0.731]
(Intercept)	-0.44 (0.350) [0.192]	* -0.58 (0.315) [0.066]	-3.23 (6.741) [0.632]

Note: Entries are OLS regression coefficients with robust standard errors in parentheses and p-values in brackets.

<sup>1</sup> Adjusted R-sq value from associated non-Robust Standard Error model

<sup>2</sup> Variable Operationalization from Biddle & Long (2004)

<sup>3</sup> Variable Operationalization from Beckley (2010)

<sup>4</sup> Variable Operationalization novel to this study (2016)

\* p-value outside 90% Confidence Interval [p < 0.10]

\*\* p-value outside 95% Confidence Interval [p < 0.05]

\*\*\* p-value outside 99% Confidence Interval [p < 0.01]

Table 20. Extended Series-C Models

	Fowler (2016) Model C1	Fowler (2016) Model C2	Fowler (2016) Model C3	Fowler (2016) Model C4
R-sq	0.524	0.522	0.52	0.519
Adj R-sq <sup>1</sup>	0.492	0.493	0.493	0.496
N	193	193	193	193
Personnel <sup>2</sup>	-0.56 (0.408) [0.174]	-0.60 (0.391) [0.125]	-0.56 (0.388) [0.151]	-0.54 (0.377) [0.152]
Tanks <sup>4</sup>	*** 0.42 (0.119) [0.001]	*** 0.42 (0.118) [0.000]	*** 0.43 (0.117) [0.000]	*** 0.44 (0.117) [0.000]
Aircraft <sup>4</sup>	0.18 (0.127) [0.163]	0.17 (0.124) [0.174]	0.17 (0.125) [0.173]	0.17 (0.120) [0.168]
Field Artillery <sup>4</sup>	0.41 (0.277) [0.144]	0.38 (0.278) [0.178]	0.37 (0.274) [0.182]	0.37 (0.274) [0.183]
Democracy <sup>2</sup>				
Economy <sup>3</sup>	-0.69 (0.930) [0.459]			
Education <sup>2</sup>	-0.43 (0.449) [0.334]	-0.46 (0.456) [0.316]		
Civ-Mil Relationship <sup>4</sup>	*** 0.51 (0.150) [0.001]	*** 0.49 (0.166) [0.004]	** 0.37 (0.171) [0.030]	** 0.37 (0.172) [0.033]
Planning Propensity <sup>4</sup>	*** 35.04 (10.643) [0.001]	*** 30.68 (7.941) [0.000]	*** 30.17 (8.035) [0.000]	*** 28.95 (7.912) [0.000]
Risk Aversion <sup>4</sup>	*** -10.30 (2.847) [0.000]	*** -9.11 (2.096) [0.000]	*** -7.60 (1.679) [0.000]	*** -7.78 (1.715) [0.000]
Collective Deference <sup>4</sup>	*** -11.25 (3.420) [0.001]	*** -11.14 (3.405) [0.001]	*** -12.92 (2.876) [0.000]	*** -11.97 (2.277) [0.000]
Comm Impedance <sup>4</sup>	-7.06 (4.504) [0.119]	* -7.96 (4.379) [0.071]	*** -10.53 (3.861) [0.007]	*** -9.72 (3.439) [0.005]
Inclusivity <sup>4</sup>	4.31 (5.452) [0.430]	0.77 (2.002) [0.700]	-0.53 (1.584) [0.736]	
(Intercept)	-5.04 (6.084) [0.408]	-1.57 (2.998) [0.600]	0.50 (2.425) [0.836]	0.04 (1.786) [0.983]

Note: Entries are OLS regression coefficients with robust standard errors in parentheses and p-values in brackets. model

<sup>1</sup> Adjusted R-sq value from associated non-Robust Standard Error

<sup>2</sup> Variable Operationalization from Biddle & Long (2004)

<sup>3</sup> Variable Operationalization from Beckley (2010)

<sup>4</sup> Variable Operationalization novel to this study (2016)

\* p-value outside 90% Confidence Interval [p < 0.10]

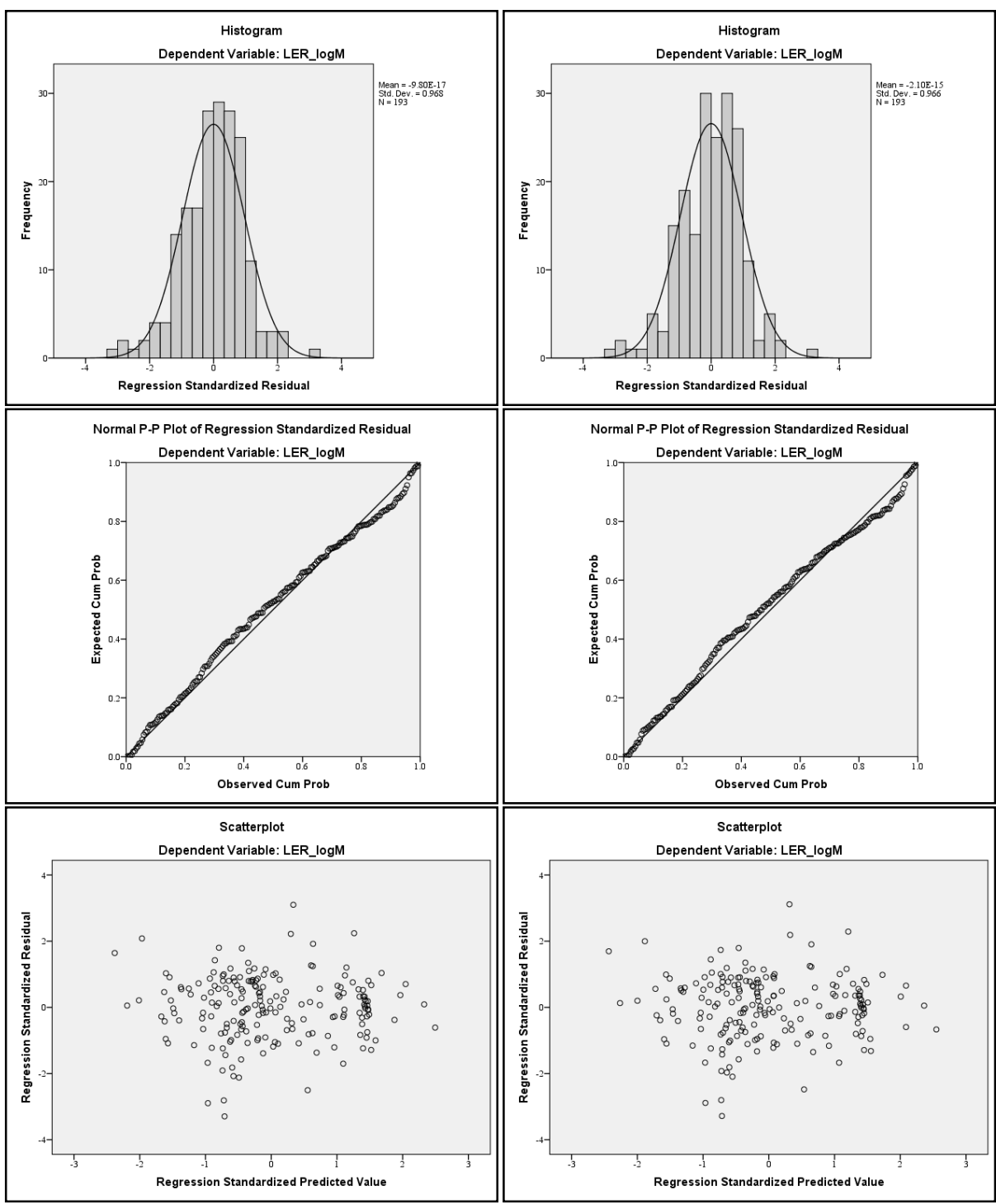
\*\* p-value outside 95% Confidence Interval [p < 0.05]

\*\*\* p-value outside 99% Confidence Interval [p < 0.01]

Figure 3. Graphical Outputs for Models #1 and #2

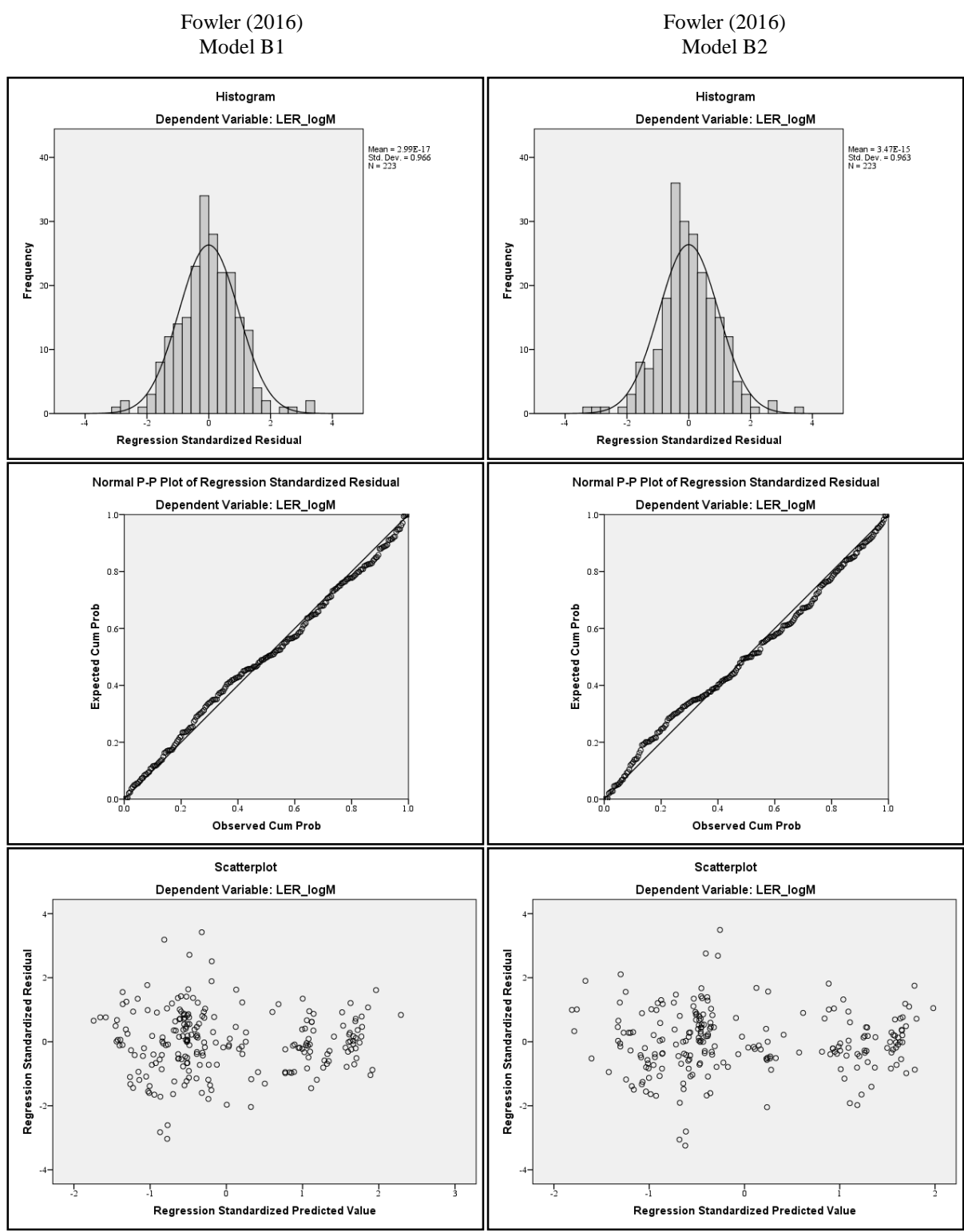
Biddle & Long (2004)  
Model #1

Beckley (2010)  
Model #2



Source: IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.  
Note: Graphical outputs represent OLS regression method without Robust Standard Error modification

Figure 4. Graphical Outputs for Models B1 and B2



Source: IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.  
Note: Graphical outputs represent OLS regression method without Robust Standard Error modification

## VITA

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### *Education*

- Old Dominion University—Norfolk, VA; PhD., International Studies (2016)
- US Army Command & General Staff College—Fort Leavenworth, KS; M.A., Operational Design (2012)
- Old Dominion University—Norfolk, VA; M.A., International Studies (2008)
- Norwich University—Northfield, VT; M.A., Diplomacy (2007)
- Samford University—Birmingham, AL; B.A., International Relations (1999)

### *Experience*

- Military Intelligence Officer—US Army, Washington, DC (August 2003-Present)
- Armor Officer— US Army, Washington, DC (May 1999-July 2003)

### *Certificates*

- Imagery and Geospatial Intelligence. (February 2003-March 2003)

### *Fellowships*

- Research Fellow, RAND Corporation, Army Arroyo Center—Santa Monica, CA (August 2015-July 2016)

### *Professional Training*

- U.S. Army Command and General Staff College's Advanced Military Studies Program (July 2011-June 2012)
- U.S. Army Command and General Staff College's Intermediate Level Education (July 2010-June 2011)
- U.S. Army Intelligence School Military Intelligence Officer's Advanced Course (August 2002-December 2002)
- U.S. Army Armor School Armor Officer's Basic Course (November 2000-March 2001)

### *Publications*

Fowler, Eric S. "Will-to-Fight: Japan's Imperial Institution and the US Strategy to End World War II." *War & Society* 34, no. 1 (2015): 43-64.

Yetiv, Steve A. and Eric S. Fowler. "The Challenges of Decreasing Oil Consumption." *Political Science Quarterly* 126, no. 2 (2011): 287-313.

### *Experience Abroad*

- Military operations to support security cooperation in South Korea (July 2012-July 2014)
- Diplomatic operations to support security assistance in Saudi Arabia (March 2008-June 2010)
- Military operations to support security cooperation in Germany (February 2005-July 2007)
- Military operations to support nation-building in Afghanistan (February 2005-January 2006)
- Military operations to support security cooperation in Germany (March 2004-January 2005)
- Military operations to effect regime change and initiate nation-building in Iraq (March 2003-February 2004)
- Military operations to support security cooperation in Germany (May 2000-August 2002)
- International Student Cultural Exchange Program in Japan (July 1994-August 1994)