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Introduction

Military power, or an actor's capacity to use its armed forces to defeat another's in battle, is central to the study and practice of international relations. Historically, the threat and use of such power has maintained periods of peace and war, governed the rise and fall of states and empires, reconfigured alignments of actors in the global arena, and conditioned the quality and duration of untold numbers of human lives. Today, analysts and policymakers strive to understand how different actors' military power could affect potential future conflicts and political dynamics in virtually every corner of the world. As a consequence of its significance in international relations, the nature and sources of military power have been and continue to be intensely studied. Despite this scrutiny, however, many of the most common understandings of martial strength often fail to shed light on why some actors are more militarily powerful than others.

Consider, for example, Genghis Khan's Mongol army. At the turn of the thirteenth century, this band of warriors emerged from the East Asian steppe and quickly established dominion over lands stretching from what is now Poland to the Pacific Ocean. In roughly seventy years, the Mongols vanquished many of their historical oppressors, conquered territory and peoples far-flung from their historical homeland, and fundamentally altered the balance of power in Asia. Conventional understandings of military power suggest the Mongols' sudden and decisive surge in martial capability was likely a function of their growing ranks' outnumbering those of their adversaries, their development of particularly powerful weapons, or their use of particularly effective warfighting techniques. Yet the conquering forces did none of these things. The Mongols were frequently outnumbered and often exacerbated their disadvantage by splitting their forces into smaller units during combat. The Mongols' famous recurved composite bow was capable of firing arrows between 300 and 500 yards, but the

weapon's effective direct-aim reach fell to approximately 100 yards when shot, as it usually was, from horseback – a range comparable to that of their adversaries' missile weaponry. And, while the Mongols' tactical swarming techniques enabled them to isolate and defeat stationary adversaries in detail, many of their opponents fought in the same way.[1]

Instead, the Mongols' sudden ability to dominate their adversaries came when Genghis reorganized his army's command and control system. Three adjustments were determinative. First, Mongol military units were stripped of their traditional tribal affiliations and rationalized such that all but the most senior officers commanded precisely ten subordinates. Second, Genghis broke with his predecessors in that, while both harsh discipline and strict obedience marked the lives of ordinary Mongol warriors, he permitted his generals significant leeway in conducting battle activities. Finally, Genghis ensured the Mongol system of communication, though technologically primitive, could quickly transmit most of the information required to guide forces during combat. The first of these changes permitted Mongol commanders to better understand what their subordinates were doing and increase the size of field units they could effectively control from approximately 1,000 warriors to as many as 40,000. The second enabled field-level officers briefed on the overall goals of the operation to react appropriately to developments in their sector without having to wait for approval from higher command. The third facilitated relatively reliable communication between the front and rear when higher-level guidance was required. Collectively, these changes empowered Genghis and his officers to use masses of well-trained men armed with powerful tools of war in tactically and operationally sophisticated ways on a previously unimaginable scale. The result was military power much greater than that of the Mongols' adversaries.[2]

The centuries-old Mongol case is instructive for today's students of military power for several reasons. First, it underscores the point that the most commonly used measure of military power – material preponderance – is often a poor predictor of martial strength. Though masses of men and materiel are necessary to wage war successfully, the effectiveness with which those resources are used on the battlefield is frequently more important than their mere possession. Second, the case reveals that the explanatory capacity of models of military power emphasizing qualitative assessments

[1] Martin 1950, 11–12; Hildinger 1997, 20–31, 126; Edwards 2000, 28; Gabriel 2006, 25; May 2007, 50–51.

[2] Gabriel 2006, 25–46; May 2007, 27–99.

of technologies, strategies, and manners of force employment is also quite limited when belligerents do not differ significantly in the weapons or methods they employ. Finally, the Mongol experience suggests it is possible to improve our understanding of military power by studying the way in which armed forces are structured to collect, transmit, and process the information necessary to facilitate coordination of their activities on the battlefield.

This book takes as its starting point the lessons of the Mongol case and, drawing on the insights of the international relations, security studies, and organization theory literatures, offers a new, institutional perspective on why some actors are more militarily powerful than others. It elaborates and assesses a novel claim, *command structure theory*, which emphasizes how the way in which armed forces organize to manage information and uncertainty on the battlefield conditions their combat strength. In doing so, this book sheds fresh light on an old question and explains why some actors, despite apparent similarity with or even inferiority to their adversaries, can emerge victorious from battle.

Command structure theory starts from the premise, made famous by Carl von Clausewitz, that combat occurs in the domain of uncertainty and chance. As the Prussian theorist notes, the battlefield's highly complex and uncertain nature thwarts the best-laid plans of generals, complicates the simplest of martial actions, and generally frustrates belligerents' efforts to achieve their intended ends.[3] In acknowledging this fundamental characteristic of warfare, command structure theory does not assume, as most extant models of military power do, that armed forces automatically use their men and materiel in an efficient fashion. Neither does it presume, as still other theories do, that powerful sensory, communications, and networking technologies can largely banish uncertainty and chance from the battlefield and, in doing so, facilitate the effective use of resources in combat. Rather, command structure theory takes as given that militaries are human institutions that have historically operated and will continue to fight in information-starved, complicated, and capricious environments that preclude optimal use of men and materiel.

The inherently uncertain nature of combat very often renders military power a function of armed forces' capacity to collect, transmit, process, and act on information about emergent opportunities and challenges on the battlefield. While some militaries may be capable of defeating others through the use of overwhelming numbers, extremely sophisticated weapons

[3] Clausewitz 1976, 101, 119. See also Beyerchen 1993; Watts 1996; P. Cronin 2008.

technologies, or particularly clever means of force employment, many – and perhaps most – are not. In engagements between relatively competitive belligerents, an edge gained through institutional mechanisms permitting swift and accurate perception of battlefield developments can be decisive; by enabling commanders to use the resources they possess to greater effect than they otherwise might, effective information management is likely to play an outsized role in determining which side achieves its objectives.

Managing battlefield information effectively is no easy task, however. A military's capacity to do so is contingent on the relationship between its command and control system, or command structure, and its operational environment. Specifically, a military is most likely to collect, transmit, process, and exploit emergent information effectively when its command structure is arranged such that it is able to inhibit, mitigate, or cope with the particular types of uncertainty inherent to the battlefield on which it is fighting, and less likely to do so when it is not. Unfortunately, no single command structure is generally useful in this regard; a system ideal for managing information and directing armored forces in battles fought in the wide-open desert, for example, is unlikely to perform as well when the fighting moves into cities. Armed forces must tailor their command structures to their operational environments if they are to extract maximal value from the information that pervades the battlefield, use their forces effectively, and generate high levels of military power.

The command structure components that must be fitted to the operational environment are those Genghis adjusted: the ratio of subordinates to officers, the degree of centralization in decision-making authority, and, to a much lesser degree, the communications network employed to transmit and process data. I argue in this book that militaries are best served by shrinking subordinate-to-officer ratios and decentralizing decision-making authority to lower levels of command as operational environments grow relatively more uncertain. Doing so reduces both the amount of information an officer must acquire to formulate an accurate picture of developments in his sector and the distance information must travel up the chain of command before reaching a responsible decision-making authority. Such structures accordingly facilitate relatively swift and responsive action in difficult environments. These institutional arrangements are not panaceas, however. I also argue that, in less complex and more certain operational environments, employing a command structure marked by larger subordinate-to-officer ratios and more centralized decision-making authority is likely to maximize information flow, reduce uncertainty, and facilitate coordination. Ultimately, I contend that a military adopting a command structure

approximating the theoretical ideal for its operational environment will generate high levels of military power from its stockpile of resources; one achieving a better fit between its command structure and operational environment than its adversary is likely to win an engagement between the forces.

Command structure theory thus offers an institutional explanation of military power: militaries that employ well-organized information management systems on the battlefield are most likely to generate high levels of strength and succeed in their endeavors. Before explicating my argument in detail and assessing its empirical utility, however, it is necessary to consider two sets of prior questions. First, what is military power, and why should we study it? In the current era, when many suggest that international politics are less bound to military power than they have ever been, what is to be gained from understanding why some armed forces are stronger in combat than others? Second, given the extensive extant literature on the sources of military power, what can be gained from yet another theory of martial prowess? Though an understanding of Mongol military capabilities may be improved by considering the institutional sources of their strength, can't existing theories account for belligerents' military power in the vast majority of other conflicts? The remainder of this chapter takes up these questions before describing the methodology I use to assess command structure theory and concluding with an outline of the book.

I What is military power and why should we care?

Military power, as the term is employed in this book, refers to an actor's capacity to use organized violence to defeat another in conventional land battles. Three characteristics of this definition merit explicit consideration. First, it draws on the body of social and political thought that conceives of power more generally as a relationship between rather than a dispositional trait of particular actors.[4] Power, these theorists argue, cannot be understood without reference to actors' situational context and interaction. For example, a bodybuilder unfamiliar with games of strategy might be quite powerful in a street fight but exceptionally weak in a chess match. Similarly, a feudal force built around heavy cavalry might be quite powerful when its mounted warriors take the field against an army of infantrymen they can run down and slaughter but less so when pitted against archers capable of using their weapons to pierce armor and kill horsed knights from a

[4] See, for example, Dahl 1957; Lukes 1974; Baldwin 1989.

distance. Military power cannot have a constant, definite value for any actor; an armed force's strength depends on the situation in which it is used.

Second, an actor's defeat of its adversary is the primary observable implication of military power. Robert Dahl famously argues that an actor has power over another to the extent the former can get the latter to do something it would not otherwise do.[5] Applying this notion to the specific domain of martial activity, a military may be said to be powerful to the extent that it can, if required to do so, force another to either capitulate or give up its attempt to achieve specific objectives. While measuring military power is difficult – and necessarily impossible to do with certainty – prior to the onset of combat, it is much easier to determine which side possessed the capacity to defeat the other once hostilities have been concluded. For the purposes of this book, a belligerent is judged to have had the capacity to defeat its adversary – that is, been the more militarily powerful actor – when, at the very least, it prevents the other from achieving its most important combat goals and achieves some or all of its own.

Third, this definition of military power focuses on armed forces' capacities to perform in conventional land battles. Battles are almost always driven and determined by belligerents' relative martial strength. War dynamics and outcomes, by contrast, are the product of many forces, only one of which is the power of the militaries engaged; political resolve, international pressure, and countless other exogenous factors can cause militarily stronger actors to lose the wars they fight. Focusing on actors' strength in battles rather than wars thus allows consideration of that which is properly understood as military power. Similarly, focusing on conventional land battle capabilities rather than the many other tasks armed forces perform facilitates theoretical and empirical concentration on those activities that have been both the most important mission of militaries historically and the most common object of scholarly focus in the study of military power.[6]

This book thus investigates the reasons why some actors are relatively more capable of defeating others in conventional land battles. But does military power so defined matter? Can an improved understanding of actors' martial strength shed light on important trends, dynamics, and developments in today's international political arena? Many scholars and analysts suggest the answer to these questions might be no. Some argue that

[5] Dahl 1957, 202–203. While power manifests through institutional, structural, and productive social arrangements as well as compulsion, the core of Dahl's idea of power as influence remains prominent in the literatures on social and political activity (Barnett and Duvall 2005).

[6] Brooks 2007; Biddle 2010.

increasing globalization and the development of new transnational norms of state behavior have rendered softer forms of power reliant on economic and normative inducements more relevant to the management of international relations than martial capability.[7] Others are more willing to afford martial strength some role in their models of world politics but contend it must be used sparingly and in conjunction with other forms of influence to create "smart power."[8] Still others, while admitting that military power is an important influence in the international arena, contend future conflicts are decidedly unlikely to take the form of large, conventional land battles.[9]

These scholars and analysts understate the significance of military power in the study and practice of contemporary international relations in at least three ways. First, the structure and features of the contemporary international arena are a function of past uses of martial strength. A brief overview of a few of the major developments in international history underscores this point. The Athenian victory over the Persians at Marathon in 490 BC ushered in Athens' golden age, with its attendant developments in political and civic philosophy, while Sparta's victory in the Peloponnesian War crushed that city and its influence in the Mediterranean. Caesar's victory over Vercingetorix at Alesia in 52 BC not only guaranteed Roman subjugation of Gaul, but also set in motion the series of events resulting in Rome's civil war and imperial period. Alfred the Great's defeat of the Danish invaders on Salisbury Plain in 878 very likely saved the nascent English polity and the language from an early extinction. The Union's defeat of the Confederacy in the American Civil War a thousand years later preserved the United States as a single entity, thereby enabling it to become arguably the strongest power the international system has ever seen. Germany was created through the effective use of Prussian military power in a series of nineteenth-century wars, while Israel secured and ensured its continued existence by repeatedly defeating its Arab neighbors in combat during the twentieth century. Virtually all international relations in the last seven decades must be understood as the result of or profoundly influenced by the Entente and Allied victories over Germany in the two world wars and the ability of Bolshevik forces to defeat the White Army and its allies during the Russian Civil War.

Second, though non-state actors' use of irregular warfare techniques and terrorism has grown in frequency and salience in recent years, states

[7] Keohane and Nye 1989; Nye 2004; Barnett and Duvall 2005.
[8] Nossel 2004; Wilson 2008; Nye 2009; Chong 2015; Gallarotti 2015.
[9] Van Creveld 1991; Hammes 2004; Smith 2007.

and many sub-national actors continue to engage in conventional land conflicts. Since the end of the Cold War, the USA alone fought five campaigns that featured significant conventional land components: the Persian Gulf War, the Bosnian War, the Kosovo War, the Afghanistan War, and the Iraq War.[10] Conventional battles have also been fought by non-American forces in a wide range of locales, including Somalia, Congo, Azerbaijan, Georgia, Kashmir, and Ukraine, as well as the borderlands separating Ecuador and Peru and Eritrea and Ethiopia. In 2014, belligerents were engaged in forty armed conflicts around the world, many of which featured conventional land engagements.[11] Global defense spending, driven in large part by the procurement of advanced technologies useful for conventional combat on land, at sea, and in the air, reflects the contemporary focus on conventional war. While the USA and many countries in Europe have cut such spending in recent years, many states around the world have increased the amount they spend on their militaries. In 2014, for example, Latin American states spent an average of 1 percent more on defense than they did in 2013. Asian states spent nearly 5 percent more, while Russia and other Eurasian countries increased their defense spending by more than 9 percent. States in the Middle East and North Africa increased their spending by an astounding 11 percent.[12]

Finally, military power of the sort described here has been, and continues to be, a foundational concept for scholars investigating a wide range of outcomes in international relations. Martial strength is used, for instance, to explain the emergence of the state-based international system.[13] Realist scholars regard military power as the key variable shaping outcomes in that system.[14] Liberal and constructivist analysts, though they reject the theoretical preeminence afforded to military power by realists, nevertheless believe it is an important factor conditioning relations between states.[15] Scholars also employ military power as an essential independent variable in their models of phenomena as diverse as power transitions,[16] war causation and termination,[17] arms

[10] While the USA did not engage in conventional land operations during the Kosovo War, the Federal Republic of Yugoslavia's forces fought numerous conventional set-piece battles with the Kosovo Liberation Army (Judah 2002).
[11] Pettersson and Wallensteen 2015.
[12] International Institute for Strategic Studies 2015, 22.
[13] Tilly 1985; Porter 1994.
[14] Waltz 1979; Morgenthau 1985; Carr 2001; Mearsheimer 2001.
[15] Keohane and Nye 1989; Katzenstein 1996; Wendt 1999; Keohane 2005.
[16] Gilpin 1981.
[17] Blainey 1988; Goemans 2000; Ramsay 2008.

races,[18] alliance formation,[19] conflict duration,[20] deterrence,[21] and economic interaction.[22]

In short, it is not possible to understand many of the most important historical and contemporary international political developments without some awareness of why particular belligerents were and are capable of defeating others in conventional land battles. Additionally, as conventional warfare is unlikely to disappear from the world stage anytime soon, it is likely that future international relations will similarly turn at least in part on militaries' strength in combat. To improve scholarly understandings of international politics – and provide better guidance to policymakers laboring to bolster their martial strength to hedge against an uncertain future – it is necessary to increase our comprehension of the sources of military power.

II Do we need another theory of military power?

The body of scholarship on the sources military power is large and wide ranging. It is also flawed and incomplete. First, from a theoretical perspective, no extant model of military power incorporates armed forces' capacities to cope with and overcome the effects of uncertainty in combat. As a result, the impact of an inherent characteristic of war that virtually all analysts agree conditions the generation of martial strength has not yet been examined in a systematic fashion. Second, from an empirical perspective, while existing models can explain belligerents' military power in many cases, all fail to account for variation in combatants' martial strength in a large number of historically and politically consequential battles. While no theory can explain all historical variations in military power, the salience of the anomalies makes these shortcomings particularly troubling. A new explanation that can both improve our conceptual understanding of military power and shed light on cases that at present appear inexplicable would thus be a significant contribution to an expansive and well-developed literature.

Existing theories of military power can be sorted into three categories. The first includes models emphasizing the importance of material and qualitative preponderance, the second comprises those highlighting the effects

[18] Glaser 2000.
[19] T. Christensen and Snyder 1990; Schweller 1994; Kaufman, Little, and Wohlforth 2007.
[20] Bennett and Stam 1996; Weisiger 2013.
[21] Schelling 1981; Mearsheimer 1983; Slantchev 2005.
[22] Krasner 1978; Hirschman 1980; Mansfield 1994; Gerace 2004.

of particular types of or levels of sophistication in weapons technologies, and the third captures claims ascribing military power to the clever use of forces in combat. In the remainder of this section, I review the major arguments in each category, discuss their empirical shortcomings, and explain why command structure theory offers a necessary corrective to the literature on and our understanding of military power.[23]

i Material and qualitative preponderance

Perhaps the most frequently employed theory of military power holds that belligerents with large populations, numbers of men under arms, economic output, and military expenditures also possess the capacity to defeat others in conventional land battles. While many versions of this claim simply assume that men, money, and materiel equate with martial capability, a few articulate causal logics explaining why material preponderance should facilitate strength on the battlefield. Some contend preponderance enables the larger force to break through the lines of the smaller and, by either encircling his forces or disrupting his rear, defeat the adversary. The most common such claim suggests a military achieving a force-to-force ratio (FFR) of at least 1.5:1 in the theater of operations or 3:1 at the primary point of attack is likely to be successful.[24] Others suggest high battlefield force densities – force-to-space ratios (FSRs) – are more likely to help defenders forestall breakthrough and defeat than low densities.[25] Finally, some rely explicitly or implicitly on the logic of equations devised by Frederick Lanchester and argue that numerical superiority allows preponderant forces to inflict casualties at particularly high rates.[26]

[23] Unless otherwise noted, data used in the remainder of this section are those introduced in Grauer and Horowitz 2012. The dataset includes values for a variety of hypothesized indicators of the martial strength for 125 belligerents that fought decisive battles in forty-three conventional wars waged between 1917 and 2003. It is available at www.ryangrauer.com/publications.html.

[24] Dupuy 1985, 11–12; Mearsheimer 1989.

[25] Liddell Hart 1960a, 97–109; Mearsheimer 1983, 43–52.

[26] The simplest versions of Lanchester's Square Law equations are:

$$\Delta A = -bB^2 \text{ and } \Delta B = -aA^2.$$

The left-hand terms represent change in the number of troops fielded by A and B as a consequence of attrition per unit of time. The right-hand A and B terms are each side's number of troops at the beginning of any given unit of time; they are squared because soldiers are assumed to concentrate their fire by re-aiming at live opponents once they kill their primary target. The a and b terms represent the killing efficiency of each side's troops, or the probability that a soldier will kill his primary target in a given unit of time, and are negative because they reduce the number of opposing forces. For details and elaborations,