

Cambridge University Press

978-1-107-10354-2 - China's Military Power: Assessing Current and Future Capabilities

Roger Cliff

Excerpt

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Introduction

As recently as the late 1990s, China's military, known as the People's Liberation Army (PLA), was being described as a "junkyard army" or "the world's largest military museum."¹ Aside from being equipped primarily with weapon systems based on 1950s Soviet designs, the PLA's combat doctrine was also outmoded, its training was lackadaisical, and its personnel were poorly educated and led. Indeed, the primary focus of the PLA was not on conducting military operations but on making money from a wide range of commercial operations.

Changes since that time have been rapid. Today China's defense industries are now producing weapon systems comparable to the M1 Abrams tanks, Aegis destroyers, and F-15 and F-16 fighter aircraft that are the mainstays of the U.S. military. In 2007, China tested a ground-launched missile that intercepted one of China's own weather satellites, making it only the third nation (after the United States and Soviet Union) to demonstrate the capability to destroy a satellite in orbit. In 2011, while U.S. defense secretary Robert Gates was in Beijing for meetings with China's leadership, China conducted a test flight of an advanced stealth fighter that looks remarkably like those recently developed by the United States.

In addition to modernizing its weaponry since the late 1990s, moreover, the PLA has revised its combat doctrine, upgraded its training, personnel, and leadership, and divested itself of its business interests. All of this progress has been accompanied by a massive increase in defense spending. In 1998, China's official defense budget was \$11.3 billion. Beijing's announced defense budget for 2014 was \$132 billion.² If these trends continue, how powerful will the PLA be in the future? Will its military capabilities soon rival or surpass those of the United States? Or is the U.S. military edge over China so great that it will take decades for the PLA to catch up?

The answers to these questions are of more than just abstract interest. Although China's economy is increasingly intertwined with that of the rest

of the world, China has territorial disputes with many countries in Asia and is becoming increasingly assertive regarding its claims. Most significantly, China claims that Taiwan, which has been politically independent from the mainland since 1949, is part of Chinese territory, and Beijing asserts that it has a right to use force to incorporate the island under its governance.³ The United States, on the other hand, in the 1979 Taiwan Relations Act (passed by the U.S. Congress after Washington established diplomatic relations with the People's Republic of China in Beijing and severed them with the Republic of China in Taipei), has declared that any effort to determine Taiwan's political future "by other than peaceful means" would be "a threat to the peace and security of the Western Pacific area and of grave concern to the United States."⁴ This phrase has generally been interpreted as implying an intention by the United States to defend Taiwan against military pressure or attack by the People's Republic. In addition, the United States has defense treaties with Japan and the Philippines, both of which have territorial disputes with China (albeit over sparsely inhabited islands). Thus, there is a real possibility of a war between the United States and China. In the words of one senior China expert, "For at least the next decade . . . the gravest danger in Sino-American relations is the possibility the two countries will find themselves in a crisis that could escalate to open military conflict."⁵

A war between the United States and China, regardless of its outcome, would likely have a transformative effect on the international system. As the United States and China are the world's two largest economies, the immediate impact on international trade and finance would be enormous. More lastingly, a war, even if it ended quickly, would likely result in a subsequent relationship of mutual suspicion and hostility for a long period. Much as during the Cold War, both sides would significantly increase their military spending, increase the numbers and combat readiness of their military forces in the region, and vie for political influence with other countries in the region and throughout the world.

China's military capabilities affect not only the potential outcomes of such a war, moreover, but also its likelihood. Empirical research has shown that movements toward approximate military parity between great powers are correlated with an increase in the likelihood of war between them.⁶ If China's military capabilities begin to approach those of the United States, therefore, the risk of war between the two countries is likely to increase.

Even if war never comes, China's military capabilities will affect its relations with the rest of the world. In disputes between China and other countries, knowledge of the likely outcome of a military conflict will implicitly shape the positions of both Beijing and its interlocutors. Although China's leaders have

been at pains to reassure Asia and the world that China's rise will be peaceful, therefore, China's influence in regional and global affairs will be in part a function of its military power. Thus, understanding China's current and future military capabilities is essential to an understanding of how China affects the international system, including an understanding of the likelihood of a great power war that would fundamentally transform the international system.

PREVIOUS STUDIES OF CHINA'S MILITARY

Although substantial work has been published describing the history and current conditions of the PLA, no significant attempts have been made to assess its overall capabilities as a fighting force and what these capabilities are likely to be in the future. The work published to date on developments in the PLA since the 1990s has generally been descriptive in nature or focused on the *processes* involved in the PLA's modernization effort. Neither of these approaches provides an understanding of the actual military capabilities of the PLA, because the former merely describe the constituent elements of military capability without providing a framework for evaluating their relative quality, and the latter are focused on explaining the causes for activities rather than on assessing the results of those activities. As a result, no comprehensive assessment has been published of the ability of the PLA to effectively conduct military operations.

The major books and reports on China's military that have been published over the past decade or so may be divided into four categories. The first consists of comprehensive examinations of the entire PLA.⁷ These studies, however, have several limitations. First, some of them focus primarily on the weapon systems China is acquiring, without considering the other dimensions of military capability such as organization, doctrine, training, and personnel. Second, even those that do consider such dimensions do not locate them within a generalized framework that would enable China's capabilities in these dimensions to be evaluated and compared to those of other countries. Finally, although some of these works describe the PLA's *aspirations* for different types of military capability, they do not provide a methodology for estimating when those aspirations might be achieved.

The second category of books and reports on China's military that have been published over the past decade consists of in-depth analyses of selected elements of the PLA. Topics include the PLA Army, PLA Navy, and PLA Air Force; China's defense industries; the history of the PLA; civil-military relations in China; and the PLA's combat doctrine.⁸ Studies such as these provide

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a wealth of valuable information about different aspects of China's military. In many cases, however, they are also primarily descriptive and lack a comparative perspective or analytic framework that could be used to make judgments about China's military capabilities in these different dimensions. In addition, by their nature these are examinations of a single aspect of China's military power and cannot provide a comprehensive assessment of China's overall military capabilities.

A third category of books and reports on China's military consists of assessments of the possible outcomes of a China-Taiwan conflict.⁹ These studies have been extremely valuable in providing in-depth analysis of the scenario that is by far the most likely to result in direct military conflict between the United States and China – a war over Taiwan. However, they generally focus on the material capabilities of the militaries involved without attempting to assess the impact of intangible qualities such as organizational structure, personnel quality, training, and organizational culture.

A final category consists of books warning of China's aggressive intentions and efforts to increase its military capabilities. The number of books of this type that have been published is large. These books generally present arguments for why conflict between the United States and China is likely in coming years and identify potential conflict scenarios between the United States and China. Some provide overviews of China's military or describe weapon systems that the PLA is reportedly attempting to acquire, but none attempts to systematically assess China's current or future military capabilities.¹⁰

ASSESSING MILITARY CAPABILITY

To assess China's current and future military capabilities, a rigorous, theoretically and empirically grounded methodology is needed. To date, however, none has been developed. Many estimates of the military power of nations, including those used by international relations scholars, simply count the number of military personnel or major weapon systems such as tanks, warships, and combat aircraft that a country possesses.¹¹ During the Cold War, academic analyses of the military balance between the United States and the Soviet Union similarly centered on comparisons of the weapon systems that the two sides possessed. Much of this literature was focused on the nuclear balance, but during the 1980s a number of studies of the conventional military balance in Europe were published as well. These analyses, too, were weapon system-centric, with the unit of comparison being the "armored division equivalent," a measure computed based on the total number of each type of

weapon possessed by the combat forces of the two sides multiplied by numerical estimates of the quality of those weapons.¹² Just as the Cold War was ending, however, the inadequacy of this way assessing of military capability was dramatically demonstrated in the 1991 Gulf War between a U.S.-led coalition and Iraq. Before the war, estimates, based primarily on comparisons of the weapon systems and numbers of soldiers each side had, were that the U.S. coalition would suffer as many as sixteen thousand casualties in expelling the “battle hardened” Iraqi army from Kuwait.¹³ As it turned out, however, these estimates were more than an order of magnitude too high.¹⁴

After the Gulf War ended, most accounts attributed the unexpectedly easy coalition victory to the technological superiority of a new generation of weapons such as M1 tanks, stealth fighters, and laser-guided bombs.¹⁵ Careful analysis of the Gulf War, however, decisively refutes this view. Coalition forces not equipped with advanced weapon systems performed no more poorly than forces equipped with the most advanced technology, and forces equipped with advanced technology performed far better than can be explained by superior technology alone. The one-sided coalition victory in the Gulf War was not primarily the result of the coalition’s technological superiority but rather of its superior tactics, training, personnel quality, and other nonmaterial factors.¹⁶

Indeed, many instances can be identified in which materially inferior forces have decisively defeated materially superior adversaries. The most prominent example is the 1940 Battle of France, in which the German army in ten days decisively defeated the combined British and French armies, which had numerical superiority and comparable technology (British and French tanks were better, the Germans had better aircraft). A more extreme example from World War II is Operation Compass in Egypt and Libya from December 1940 to February 1941. In this campaign, thirty-six thousand British Commonwealth soldiers armed with 120 artillery pieces, 275 tanks, and 140 aircraft took on 150,000 Italian soldiers armed with 1600 artillery pieces, 215 tanks (not including 339 “tankettes” equipped only with light machine guns), and 330 aircraft. Although the British artillery, tanks, and aircraft were unquestionably superior to their Italian counterparts, it is difficult to imagine that the material superiority of what were, in any case, relatively small numbers of these weapons was alone sufficient to make up for the Italian’s overwhelming numerical superiority in soldiers and weapons. And yet the British Commonwealth forces decisively defeated the Italians, driving the Italians out of Egypt and deep into Libya, taking most of the Italian force prisoner.¹⁷

More recent examples include 5 Commando’s defeat of the more-numerous and better-armed rebels of the Simba Rebellion in the Congo between 1964 and 1965 and Executive Outcomes’ defeats of União Nacional

para a Independência Total de Angola (UNITA) in Angola from 1993 to 1995 and the Revolutionary United Front in Sierra Leone between 1995 and 1996.¹⁸ Perhaps the most dramatic example, however, is the Battle of 73 Easting during the 1991 Gulf War. In this battle, nine M1 tanks and twelve M3 Bradley infantry fighting vehicles engaged thirty-seven T-72 tanks and more than seventy other armored vehicles, destroying all thirty-seven T-72 and seventy-six other armored vehicles, with the loss of only one M3. According to Lanchester's Law, a commonly used formula for predicting the results of such engagements based on material factors, such a lopsided outcome would have been possible only if each M1 was the equivalent of thirty-six T-72s, which is highly implausible.¹⁹

More generally, a comprehensive analysis of a wide range of modern conflicts indicated that nonmaterial factors were far more important than material factors in explaining combat outcomes.²⁰ Thus, any assessment of military capability that is based primarily on material measures is fundamentally flawed. As Biddle (2004) has noted, given the centrality of military power to many theories of international relations, this is a critical deficiency.²¹

Although some academic studies have recognized the inadequacy of purely material factors in assessing military power, they have not systemically specified or analyzed the nonmaterial contributors to military capability. Biddle (1996) and Biddle, Hinkle, and Fisherkeller (1999), for example, refer to "skill" without explicitly defining what that term encompasses. Biddle (2004) identifies "force employment," defined as "the doctrine and tactics by which armies use their materiel in the field" as "one key nonmaterial variable," but does not state what other key nonmaterial variables might be.²² Others have written about the importance of other nonmaterial features of military organizations, but none has attempted to comprehensively characterize the totality of nonmaterial dimensions of military capability.²³

The U.S. military, however, has long recognized that military capability is a function of more than just weapons and numbers of soldiers. U.S. military discourses often refer to military capability as comprising "doctrine, organization, training, materiel, leadership and education, personnel, and facilities," acronymized as DOTMLPF.²⁴ That is, the U.S. military believes that the effectiveness of military forces depends on the combat doctrine they employ, how the forces are organized, how they are trained, the weapons and supplies that they are provided with, how well they are led, how well they are educated, the quality of the people who make them up, and the capacities of the facilities that support them.

Although members of the U.S. military frequently use the term "DOTMLPF," however, they do not appear to have a detailed conception of what each component entails, and publications of the U.S. military do not

provide further explication. For example, the official U.S. Department of Defense dictionary does not have definitions for the terms “organization,” “training,” “leadership,” or “education,” and even for those terms that have definitions (doctrine, materiel, personnel, and facilities), what specific characteristics of those dimensions are important is not specified.²⁵

This book, therefore, employs the overall perspective represented by the DOTMLPF concept, but builds on it and converts it into an analytically applicable methodology by postulating that military capability is a function of seven distinct dimensions (which differ slightly from the DOTMLPF construct): doctrine, organizational structure, weaponry, personnel, training, logistics, and organizational culture. Each of these dimensions is defined in terms of key characteristics that can be used to assess a military's relative strength in that particular dimension and to compare its strength in that dimension to that of other militaries.

In some cases the key characteristics for a dimension were identified by drawing on previous research on that particular aspect of military capability (e.g., personnel quality) or on the more general social science literature related to that dimension (e.g., organization theory). For some dimensions, however, there was no preexisting theoretical literature or research on which to draw. In these cases, a theory of what the key characteristics of that dimension of military capability are was first developed based on analysis of publications of the U.S. military and other organizations. The specific theory and methodology used for assessing each particular dimension are described in the chapters in this book on each of the seven dimensions of the PLA (Chapters Two through Eight).

A key and unexpected discovery of this study was about the interrelationships between the different dimensions of military capability. The operational doctrines of militaries can be arrayed along a spectrum, from, at one end, doctrines based on direct engagement with an adversary, to, at the other end, doctrines based on indirection and maneuver. The type of doctrine a military employs affects its requirements in the other dimensions. A military that employs a doctrine that focuses on direct engagement can have an organizational structure that is more centralized and standardized and has low levels of horizontal integration. Its personnel do not need to be highly qualified, its training can be less sophisticated, its logistics support can be less robust and its organizational culture does not need to emphasize initiative, innovation, or risk taking. It does, however, need large quantities of capable weapons.

A military that employs a doctrine that emphasizes indirection and maneuver, on the other hand, needs an organizational structure that is decentralized and has low levels of standardization, but has high levels of horizontal

integration. It needs highly qualified personnel, high levels of training, highly robust logistics, and an organizational culture that emphasizes initiative, innovation, and risk taking. The quality and, especially, the quantity of its weaponry are less important.

As described in the next chapter, since 1999 the PLA has had a doctrine that emphasizes indirection and maneuver. The key question, therefore, is whether the PLA has, or will have, the organizational structure, personnel, training, logistics, and organizational culture needed to effectively employ this doctrine.

As implied by this last sentence, the goal of this project was not just to assess China's military capabilities at a particular point in time, but to measure its rate of progress in recent years and, based on this rate of progress, estimate its likely capabilities in the future. To this end, the PLA's capabilities in each of the seven dimensions were assessed at two different points in time: around 2000, when China's military modernization program was just beginning, and around 2010, the most recent year for which data were available at the time this study commenced in 2011. Based on the observed progress between 2000 and 2010, estimates of the PLA's capabilities in 2020 were then made for each of the seven dimensions. Given that many of the measures of military capability used in this study are not amenable to precise quantification, and that progress in any case cannot be expected to proceed at a uniform rate over a period of two decades, these estimates are necessarily approximate. Nonetheless they are useful for identifying which areas of military capability are likely to be relative strengths of the PLA in the future and which areas are likely to persist as weaknesses.

When this study commenced, the expectation was that information about the characteristics of the Chinese military in each of the seven dimensions would be found in the extensive body of (largely descriptive) secondary literature on the Chinese military and that the present project would essentially be a "meta-analysis" that simply applied an overarching framework to an existing body of information. It turned out, however, that because the various books, articles, and reports that constitute the secondary literature on the PLA were generally written without reference to any theoretical or conceptual framework, in many cases the needed data were not found in the extant literature or were insufficient. As a result, a substantial amount of primary source research was required to supplement the existing secondary literature. In most cases this consisted of analysis of publications (in Chinese) of the PLA and related organizations, but in one case (organizational culture) it entailed developing and administering a survey instrument.

Military capabilities, of course, are relevant only in particular contexts: That is, what is most important is not the abstract capability of a military but its

ability to conduct specific types of operations at specific places in the world. The final analytic task for this project, therefore, was to examine two hypothetical conflict scenarios involving China and the United States in 2020. Analyzing these scenarios provided a concrete way of assessing whether the Chinese military will have the capability to challenge U.S. military dominance in the region given China's projected improvements (or lack thereof) in each of the seven dimensions of military capability. The scenarios were analyzed based on the estimates that were developed of China's future military capabilities in each of the seven dimensions, estimates of the overall military capabilities of the United States and any other participants in the conflict (given that it was not practical to conduct in-depth analyses of the future military capabilities of the participants other than China, this was done using publicly available information and a few general assumptions), and basic military-operational analysis techniques for estimating movements and combat effects of forces. The performance characteristics of the forces involved were estimated using publicly available information about the capabilities of specific weapon systems as well as the historical performance records of different types of weapons, along with estimates of the effects of differences in doctrine, organizational structure, personnel quality, training, logistics capabilities, and organizational culture. The quantitative aspects of the scenario analysis were simple enough that all calculations could be done using a pocket calculator. Although such an approach cannot capture the effects of multiple interacting parameters in the way that a detailed computer simulation can, it has the advantage of being intelligible to any reader with a knowledge of high school mathematics and, given the uncertainties about how weapon systems that have never been tested in combat would actually perform, its results are not necessarily any less accurate.

A BRIEF HISTORY OF THE PEOPLE'S LIBERATION ARMY

The PLA was founded in 1927 as the military arm of the Communist Party of China (CPC). Initially an insurgent guerilla army, the PLA took advantage of the protection provided by the Soviet occupation of northern China at the end of World War II to develop into a more conventional military equipped with weaponry provided by the Soviets or captured from the forces of the Chinese government, which was then controlled by the rival Nationalist Party, and over the next four years the PLA was able to defeat the government's military in a series of increasingly large-scale conventional battles.²⁶

After the government military had been defeated and the CPC-controlled People's Republic of China had replaced the Nationalist Party-controlled

Republic of China as the government of the Chinese mainland in 1949, the PLA benefited from increased assistance from the Soviet Union, especially after China's entry into the Korean War in 1950. This assistance included training, provision of Soviet weapons to China, and the construction of factories in China capable of producing Soviet-designed aircraft, ships, tanks, and other weapon systems.²⁷

Soviet assistance to the Chinese military continued after the Korean War until 1960, at which point political friction between Beijing and Moscow resulted in the Soviets withdrawing most of their military and industrial assistance to China. In the years that followed, China struggled to master autonomous production of the Soviet weapons it had acquired. The task was made more difficult by the political and economic upheavals of the 1960s and 1970s including the "Great Third Line" (大三线) program, which relocated China's defense and other industries from cities near the coast and the Soviet border to China's interior, where poverty and transportation bottlenecks hampered their development.²⁸

The PLA of this time was poorly equipped and largely filled by minimally educated conscripts drawn from the countryside. PLA strategy and tactics until the 1970s were based on the concept of "People's War," which envisioned a guerrilla-like campaign in response to a large-scale invasion of China. Under this concept, the PLA would initially avoid direct engagement with the invader (at first assumed to be the United States, but from the late 1960s on assumed to be the Soviet Union) and instead allow the invader to penetrate deep into China before initiating counterattacks that would begin as small-scale, low-intensity operations but gradually increase in scale and intensity until the invader was expelled again.²⁹

When China's economic reform program began in 1978, the PLA, although huge (more than four million active-duty personnel) and relatively well funded (the official defense budget, which represented only a portion of total defense spending, was nearly 5 percent of China's gross domestic product [GDP] in 1978), was a backward and unwieldy fighting force. It was equipped mainly with 1950s-era Soviet weaponry, manned primarily by poorly educated conscripts; training was rudimentary and unsystematic; and its strategy and tactics were designed for territorial defense against a large-scale invasion. These flaws were exposed in China's 1979 punitive invasion of Vietnam, when the PLA took an estimated twenty thousand casualties in a month-long campaign.³⁰

The economic reform program China's leadership initiated in 1978, moreover, did not immediately result in a revitalization of the PLA. Instead it resulted in further stagnation and neglect. By 1996, official defense