

Acknowledgements

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Abstract

In this thesis I test whether the implementation of new military technology, which is based on precision and information, leads to a shift in the offense-defense balance to where the offense dominance is heightened, making great-power war more likely than in the nuclear era (before 1991). This is hypothesized to happen through four causal mechanisms: 1) promotion of first strike, 2) promotion of false expectations of own and others' capabilities, 3) promotion of more secrecy and fear, and lastly, 4) promotion of cleaner wars (i.e. fewer human casualties). I conduct a case study of the US-China relationship where an emerging competitor (China) poses a challenge the system leader (the US), a situation traditionally seen as unstable and more war prone. I argue that in a world where war is always a possibility, where we see an increasing western unwillingness to conduct conventional warfare and where new technology is fastening its grip on military organizations, there may be problems estimating relative power through military capabilities, which may lead to a heightened offensive dominance, in turn possibly leading to an increase in the likelihood of war. By analyzing 23 reports dated from 1999 to 2015 I find empirical support for the notion that new technology, especially in the domains of space and cyberspace, lends itself to a heightened offensive dominance and hence possibly the increased likelihood of a future great-power war. This seems to happen through the first of the three proposed causal mechanisms – first strike, false expectations and secrecy – whilst not through the last causal mechanism, cleaner wars.

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Chapter I

-Introduction-

“War is the realm of uncertainty; three quarters of the factors on which action in war is based are wrapped in a fog of greater or lesser uncertainty. War is the realm of chance. No other human activity gives it greater scope; no other has such incessant and varied dealings with this intruder. Chance makes everything more uncertain and interferes with the whole course of events.”

Such are the words of Carl Von Clausewitz (1976 [1832]:101) dated nearly two centuries ago, yet still appropriate. War has filled the papers of the social sciences since Thucydides wrote his *History of the Peloponnesian War* regarding the war between Sparta and Athens in the 5th century BC.¹ War has changed from what Schelling (2008 [1966]:28) characterizes as a sport of kings associated with wealth, honor and glory, to be a psychological fight for security. However, since the introduction of the nuclear weapon, war has been seen as a dangerous and destructive activity ill suited for economically and democratically advanced countries.

Schelling (2008 [1966:93]) writes that war is an uncertain activity because it is impossible to exercise control over all the variables for all the possible outcomes. War relies heavily on the untested performance of people and technology, as well as perceptions in an unpredictable situation, such as war. War has traditionally been the most potent tool available to states in ensuring its security. However, for warfare to remain as such, it must adapt to the surroundings of each given period. In the nuclear era, from 1945-1991, deterrence was key to survival (Mandelbaum 1998/99; Morgenthau 2006 [1948]), but today, in the precision and information era, where nuclear weapons seem less salient to international politics, war may again be an effective tool. This thesis seeks to map out how technology may affect this chance and uncertainty, and ultimately war.

¹ See Gomme (2014).

1.1 Research Question

Does the implementation of new military technology heighten the risk of future great-power war?

To outline the research question it is necessary to put it in the context of the scholarly debate. First: Is war a possibility in the future? Second: Does technology impact war, and if so how? And, lastly: Is China's rise a potential threat to continued peace?

Some argue that conventional great-power wars are highly unlikely because of their total nature (where *total* refers to the scope of which war influence everyday life, and as a contrast to the scope of war being *limited*), due not least to economic interdependence (Fukuyama 1989; Glaser 1994/95; Mandelbaum 1998/99) and because the nuclear dimension makes the possible costs of war prohibitively high (Gaddis 1986; Waltz 2003). As precision and information technology has entered the field of war rapidly since the end of the Cold War in 1991, it is necessary to evaluate the effects of this, as technology is developed and implemented to have a contribution to warfare, and by necessity some sort of effect. Shaw (2009) highlights that, where total wars, such as World War II, had a dominant role in shaping the economy, culture and politics, the limited wars of today are fought with due consideration to the electoral competition and the media, as well as to financial, international and legal aspects.

After the Gulf War in 1991 there were talks of a Revolution in Military Affairs (RMA), where new technology entered the battlefield. The RMA literature accounts for most of the research that reviews the military impact of the post 1991 precision and information technology. Some foresaw that the implications of this would be severe. Still, there is disagreement among the RMA theorists. Some believe a revolutionary change in warfare was seen with the Gulf War (Metz & Kievit 1994), others claim this has come after the wars in Afghanistan in 2001 and Iraq in 2003 (Cohen 2004). Yet another branch claims it has been a development, but not a revolution (Gray 1997/98, 2001). What seems to be agreed upon is that only states have solid military organizations that can properly utilize the technology (Cohen 2004; Gray 1997/98, 2001; Metz & Kievit 1994). Regardless, this literature offers little insight as to how the technology may impact a future great-power war where two actors both use, and take

advantage of this precision and information technology, and how it affects the decisions to go to war, and hence making great-power war more or less likely than before the advent of this technology.

Cohen (2004) emphasizes that the international system we have today, where the US is the system leader, with China and Russia as its main rising competitors, a possible war would take place in a multitude of spheres, as well as in cyberspace. He sees a future war to be characterized by waves of violence, and public opinion to be important. Mandelbaum (1998/99) also concedes China and Russia as the largest threat to a continued international peace, and highlights China's desire for regional control over the Taiwan Strait. Russian irredentism along the border of Ukraine, the latter of which we have witnessed with Russia's 2014 invasion and annexation of the Crimea in what Russia and its president, Vladimir Putin, call an act to protect Russian citizens outside the borders of Russia, is further emphasized.

Whether or not China's rise is peaceful, and if so will continue to be peaceful, has received much scholarly attention. Ikenberry (2008) argues that China's rise will be peaceful, because the economy of China – and the world – relies on it. The political and institutional logic of the western world order is very powerful, as the revolutions in technology and global economy have created an interdependence that differs from the past. Buzan (2010) argues that the rise of China will be peaceful. It involves the rising power accommodating the existing world order to get both absolute and relative gains in material terms and in status. This can only be done if this process is combined with other powers accommodating China to make the necessary changes in the international society. Mearsheimer (2006a) claims that the possibility of war is heightened if China's economic growth continues. In such an event he predicts that China's neighbors – India, Vietnam, Japan, Singapore, Russia and South Korea – will follow the US. He further proposes that whether or not China wants to rise peacefully, they will not be able to because the US will not allow China's rise to threaten the position that the US has built the last century using the fall of the Soviet Union and the Cold war as a direct result of US agitation.

1.2 Outline and Structure

In order to assess the probability that the implementation of new military technology leads to a heightened offense, which ultimately affects the likelihood of great-power war, valid measures have to be applied. The dependent variable is *likelihood of great-power war* and the independent variable is *new military technology*. To measure the dependent variable I will use *heightened offensive dominance* as a proxy for war in that the theory asserts that the higher the offensive dominance is, the more likely war will be. The independent variable, *new military technology*, is less straightforward as technology itself has no impact on war. It is the implementation and use of this technology that creates the hypothesized effect.

In testing the offense-defense theory, Van Evera (1999:180) finds evidence throughout history that war is more likely when states feel less secure, when conquest is easy, and interestingly, even more likely when conquest is *perceived* to be easy. In the preface to World War I the belief in the offense was strong. The European public and elites believed that the offense had the clear advantage over the defense in warfare, and that a future war would be a short clash over the domination of Europe, where the most offensive would win over a more defensive loser. On the basis of the existing offense-defense theory, I measure the impact that the new technology may have on the likelihood of future great-power war, by analyzing four causal mechanisms that, if present, are thought to lead to a heightened offensive dominance: 1) promotion of first strike, 2) promotion of false expectations of own and others' capabilities, 3) promotion of secrecy, and lastly, 4) promotion of cleaner wars (i.e. fewer human casualties). In order to test this empirically, I use 23 reports dated from 1999-2015 and analyze if they are in support of the causal mechanisms, and if so how. I conduct a case study of the US-China relationship to map their individual strategies and capabilities and how the new technology may impact how they perceive one another, how they perceive war and the possible gains from war and how perceptions may change in accordance with this. I will do this in order to identify how the implementation of new military technology may or may not lead to a heightened offensive dominance. I will test it by focusing on the technology and its perceived effect on each of the domains: *space, cyberspace, sea, air and land*.

For this particular case study there are a number of possible theoretical cases, but the thesis will build on the scholarly, as well as the general perception, that one – if not *the* – key

relationship to watch is the one between the US and China. Further, these are the two states that can be argued to possess (and have integrated) the technology at hand into their military organizations. Lastly, there is a potential risk for war due to China's ultimate desire (and existing plans) to integrate Taiwan into mainland China, an action the US will have to respond to in order to keep its hegemonial position in the East-Asia region.

In speaking of military capabilities and the technology, I refer in large part to post-nuclear technological advancements, such as information and precision technology. Little has been said about how the implementation of this technology can influence the future prospect of interstate war and how it impacts a state's capability to estimate a possible opponent's relative capabilities or power. This is of importance because if the new technology provides states with an opportunity to fight by increasing estimated gains over estimated losses of going to war, as well as making it more difficult for states to assess the willingness of another state to conduct an attack, this may lead to an unstable future.

1.3 Findings

The empirical analysis hold evidence that both China and the US seem to be preparing for a war against each other. This is made evident through China's Anti-Access Area Denial (A2AD) program and the US response through Air-Sea Battle (ASB), where the two are to the best of their ability trying to convince each other that they are both ready and that the consequences of engaging would be detrimental.

The empirical material shows evidence that the new technology is fostering first strike. For China this first-strike advantage is linked to the launch of a blinding campaign against the militarily superior US to hinder US information superiority, and hence allow for US loss of the real-time situational awareness that forms a central part of the US way of war. The first-strike advantage for the US is also linked to information superiority, albeit in a different way. The US may use their information superiority to perform a surprise attack on Chinese ground based launch assets, hindering a potential Chinese blinding campaign. The empirical data agrees on the importance of seizing the information initiative. In the event of such a first strike, a blinding campaign or an attack on ground based launch assets is likely to foster false expectations of own and others capabilities, and increase the distance between the actual (objective) capabilities and the perceived (subjective) capabilities. If China is successful in its

blinding campaign, it would not only make it difficult for the US to estimate Chinese capabilities, it may also cater to China becoming over-confident in its own capabilities, underestimating its (to date) militarily superior adversary.

Fear is the underlying mechanism of war, and although both China and the US are making diplomatic statements to foster transparency between the two, their actions tell a different story. Any reliance on any asset will necessarily make that asset vulnerable to attack. China is in the literature accentuated as the one lacking transparency, mainly because it is thought that secrecy will gain the (to date) perceived weaker party (China), whilst transparency will gain the stronger. What is worth noting is that the US regards its strongest vulnerabilities to be an attack on its information assets, leaving the US to be more secretive in the space and cyberspace domains as this is where China is thought to have the best chance to harm the US, as its capabilities are below those of the US. China remains most secret about the sea domain, both because this is the domain they regard as their most vulnerable, but also perhaps to conceal its capabilities to perform preemptive or surprise attacks against bases or aircraft carriers to hinder US deployment.

The hypothesized mechanism of cleaner wars is the most ambiguous one. Clean wars refer to wars where the human element is farther from conflict. The two domains space and cyberspace foster to the notion of cleaner wars in that the domains are not as accessible to humans as the domains of air, sea and land. However, much like air, the space domain is used for surveillance, and with such surveillance incapacitated a clean mode of war is likely more difficult to achieve, and hence the cleanness can be compromised by the clean strikes towards information technology, as it risks escalation. This may indicate that the new technology allows for a clean onset, but perhaps a more conventional escalation.

Chapter II

-Theory-

The theoretical framework seeks to outline that the implementation of new technology into military organizations since the end of the Cold War may again enable a potential great-power war. *Conventional warfare* with *conventional military technology*² is not rendered an effective tool, not only because the threat of nuclear escalation or because the democratic structure does not allow it, but also because of doubts that any state is able to challenge the US hegemony. I argue that if precision weaponry and information technology are implemented successfully into a military organization, this may lead to a heightened offensive dominance, providing states with an increased faith in its own military capabilities. Moreover, others will have problems assessing these capabilities, opening for a future with possibly more interstate tension, but with a changed character due to the effect of isolating targets and operating from a distance, minimizing the human casualties.

Section 2.1 will address that war is perhaps more likely than what is claimed by scholars like Fukuyama (1989), Glaser (1994/95), Mandelbaum (1998/99) and Mueller (1990), by focusing on three determinants of state-to-state interactions: *anarchy*, *power* and *war*. The changing character of war will be addressed in section 2.2, focusing on the implementation of new military technology and how the technology follows from the needs of its periodic surroundings by linking how the new technology separates from the nuclear bomb and the more conventional arms. Lastly, the offense-defense paradigm will be portrayed in section 2.3, showing how offense dominance is more war-prone than when the defense is dominant.

² As opposed to conventional warfare with unconventional (new) military technology, the latter of which, this thesis argues, may render great-power war possible. What is meant by new (unconventional) military technology will be addressed in section 2.2.1.

2.1 Great Powers and War in the International Anarchy

Anarchy is the structure under which the interaction between states takes place. This has important implications for the character of that interaction because there is no authority above the states, and no states have more (formal) authority than the other, by law, making it a hostile environment for states in which to operate because to survive they have to gain and maintain power to try to guarantee their own safety. *Power* is the main goal for states, according to Mearsheimer (2014 [2001]), because this helps heightening their security in the international anarchy. However, it is not easy to find the balance between *enough* power and *too much* power, because one may agitate other states in seeking to claim this power. *War* is a tool to obtain power, and has traditionally been one of the most important tools for doing so.

Not all embrace this realist interpretation of the international sphere. There have been claims for a more hierarchical structure in the international system (Weber 1997), as opposed to the anarchical structure emphasized by Mearsheimer (2006b, 2014 [2001]), Morgenthau (2006 [1948]), Waltz (1979, 1993, 2003) and many more. However, it is important to recognize that this “hierarchy” is not constant, it is not regulated by law and it emerges as a direct result of how much power each state possesses at a given time relative to the other states, and therefore fluctuates. Further, others argue that the anarchical international structure can encourage cooperation more than competition, as cooperation in the anarchy fosters self-help (Glaser 1994/95). Mandelbaum (1998/99) writes that the total wars, such as were seen in the first and the second World Wars, that set aside everyday life for the ordinary man for years, where the human casualties are high, and where borders are re-drawn as a result, are obsolete because they no longer serve their purpose as society has evolved. Stability in the international sphere is a function of both structure and the conscious behavior of the states. The international system is a system of fear, therefore survival is determined by how powerful one is relative to one’s adversaries (Mearsheimer 2006b, 2014 [2001]). The era after World War II, and its peacefulness, rests on a lower willingness to go to war than in past periods because the costs outweigh the gains. This does not mean that war *cannot* occur; only that war is *less likely* to occur in periods where willingness is low (Gaddis 1986).

Mueller (1990) argues that war is not a necessary part of human existence. As opposed to eating, war is not a physical necessity, it is a man-made institution, much like slavery or

dueling, that hence can disappear, as he claimed it was about to do in 1990. Mandelbaum (1998/99) states that major war, as a total war between the great powers in the international anarchy, where they draw on all their manpower and weapons and the result is revolutionary, is highly unlikely. He further emphasizes that social, technological and political changes throughout the twentieth century have made war ineffective at this point. He predicts that total wars are obsolete, and that we may have seen the end of conventional modern warfare where there are battles between armed forces with the use of mechanized weapons.

Many challenge Mandelbaum's arguments, including Cohen (1999), Doran (1999) and Kagan (1999) in an exchange. They all agree with Mandelbaum (1998/99) that a war described as total is highly unlikely, yet they all wish for caution in determining the future of warfare. Kagan (1999) draws attention to previous occasions where war has been seen as unlikely: right before World War I, after the Napoleonic war and also before World War II. Major war may be unlikely, but it is not unthinkable, therefore we must think about it. Cohen (1999) investigates the definitions and makes the separation between major and total wars. Wars may be major even if not total. Doran (1999) emphasize the fact that wars change character must not be confused with war no longer being viable as a tool. The fact that we may have more intense, but shorter conflicts, as opposed to total ones such as those of World War I and World War II, does not mean that they are not wars, or that they are not major in scope, it just means that they are different.

The reasons for this include an increase in the costs of going to war, a decrease in the gains and the status of war has eroded due in part to the nuclear technology that has a promise of total destruction, potentially for all parties, if used (Kagan 1999; Waltz 2003). It is difficult in democratic regimes for authorities of a state to go to war because one has to be held accountable by the people. The people of modern democracies today seem quite reluctant to risk dying or sacrificing the lives of their peers in a war, and in combination with the nuclear threat this perhaps makes war obsolete. What may be more important today is economic status, and this is a status that is no longer upheld by war (Mandelbaum 1998/99).

2.1.1 Anarchy

Hobbes (2000 [1651]) writes about men and their need to surrender parts of their sovereignty to the *Leviathan* (the sovereign) in order to ensure their survival and escape the brutish *state of nature*. In a world without a sovereign, life is unsafe and a constant struggle for survival

and power. It is a self-help system; it is an *anarchy*. This state of nature for men resembles the anarchical international system of states. There is no clear sovereign by law: survival is bound by self-help and by a quest for power. The strongest are those that have the most power, and Hobbes (2000 [1651]:364) views it as such:

“And from this diffidence of one another, there is no way for any man to secure himself, (...) till he see no other power great enough to endanger him; and this is no more than his own conservation requires, and is generally allowed.”

This fosters competition among men (states), because safety is not guaranteed, nor will it ever be so, because whilst you struggle to be the strongest yourself, you cannot allow for any other to be stronger than you, because then you are again in danger. This makes it a constant struggle for power, and as Hobbes (2000 [1651]:365) further acknowledges:

“So that in the nature of men, we find three principle causes of quarrel. First, competition; secondly, diffidence; thirdly, glory. The first makes men invade for gain; the second for safety; and the third for reputation. The first use violence, to make themselves masters of other men’s persons, wives, children and cattle; the second, to defend them; the third, for trifles, as a word, a smile, a different opinion, and any other sign of undervalue, either direct in their persons, or by reflection in their kindred, their friends, their nation, their profession, or other name. Hereby it is manifest that, during the time men live without a common power to keep them all in awe, they are all in that condition which is called war; and such a war as is of every man against every man.”

Waltz (1993) emphasizes that as long as the international structure is an anarchical structure, this will not be different. As we see today there are a multitude of alliances and common interdependence to try to break this destiny of friction and insecurity, but it is important to remember that at the basis of the system (in the state of nature), power and security have to be accounted for, and the means to do so may differ depending on the time, the situation and the actors, but one cannot remove a state’s (or a man’s) fundamental desire to have (and quest for) safety (Hobbes 2000 [1651]).

2.1.2 Power

Mearsheimer (2006b; 2014 [2001]) defines *power* as a state's *material resources*. Great powers monitor the military and economic power they have relative to each other. Balance of power is a function of armored divisions and nuclear weapons, namely the military assets that a state possesses. States have an additional power source called *latent power*. Latent power refers primarily to the state's wealth and the population size. These socio-economic characteristics can be seen as the state's potential because great powers rely on money, technology and personnel to fight wars. In addition to war a state may gain power through the increase of its population size and its international economic position. Ideally a state would like to obtain knowledge about other states' intentions; whether it is willing to forcefully alter the balance of power (a revisionist state) or whether it is satisfied with the existing order and therefore have no interest in changing it by the use of force (a status quo state). A state can never truly know the intentions of other states, and these intentions cannot be empirically verified, unlike the actual military capabilities.

The US is widely perceived as the hegemon in a unipolar international structure (Jervis 2002; Layne 1993; Mandelbaum 1998/99; Waltz 1993, 2003; Wohlforth 1999). Layne (1993) writes that the US is geopolitically preponderant in that it possess strength in the international scene that no other state can match. The US fulfill the term great power in all capabilities, not just in one, as many other states do. Jervis (2002) claims that China might not qualify to be called a great power, because it lacks important features associated with traditional great powers. Since Jervis wrote this in 2002 China has increased its power substantially, and although China may not fit the term great power as Jervis (2002) holds it, it will in this thesis be treated as a rising great power. This is so because the scholars of international relations – such as Buzan (2010), Ikenberry (2008), Jervis (2002), Mandelbaum (1998/99), Mearsheimer (2006a) and Smith (2012) – perceive China this way when acknowledging that the one state that can realistically challenge the US hegemony is China (possibly along with Russia, though likely only in a regional context).

As previously noted, a state will only be secure when it is more powerful than its competitors in a self-help world where fear is the main driver for interaction. This is so, according to Mearsheimer (2014 [2001], 2006b), because no other state will gain power from attacking someone it knows or thinks is more powerful than itself. This is a competition for power that is extremely important as it promotes that all states should try to retrieve as much power as possible. All great powers are showing, or at least indicating, a willingness to enhance their

power through violence when they acquire military capabilities that can be used in an offensive manner. That such capabilities *can* be used in an offensive manner does not translate into that they *will* be used. Yet military force has – historically – been used as leverage to influence other states by presenting potential harm (Schelling 2008 [1966]).

2.1.3 War

“The temptation of the moment is to believe that unceasing peace will ensue merely because tired men are determined that there shall be no more war. But international tension will accumulate again, though slowly at first.”

Such are the words of Halford J. Mackinder (2009 [1919]):1) after World War I. He asked for caution in interpreting the peace they saw at the time as everlasting. In his view history repeats itself as there are some truths that can be described as the nature of things that will not alter as the world alters. The period after World War II has been characterized as peaceful what interstate wars are concerned. However, Gaddis (1986) emphasizes that the Cold War period saw an unprecedented superpower arms race, so even though it has been peaceful the period has been a battle for security and power.

As the Cold War and its bipolar traits eroded, the US remained the only great power in the international anarchy after the dissolution of the Soviet Union. After the Gulf War in 1991 we have seen a decline in interstate wars, and an up-rise in intrastate wars (Metz & Kievit 1994). However, whether or not there has been an *evolution* or a *revolution* in the nature of warfare is up for debate. Gray (2001) stresses that many of the theorists have claimed a change in the *nature* of warfare, when what we are actually witnessing is a transformation in the *character* and *conduct* of war. That is, there has not been a change from war to peace, but a change in war itself.

The measurement of war is important, and it varies a great deal. Many scholars apply a rigid definition of war where certain kinds of war cannot be included. Quantitatively oriented researchers apply a statistical measurement that usually classifies events as war if there are more than 1.000 battlefield casualties in a year. For Mandelbaum (1998/99:22) it is questionable whether a nuclear war may constitute a war, as it would be over in a matter of hours, and as the political ends to which nuclear war serves are unclear. It is also debated

whether single attacks executed by one state to harm another in a way that will strengthen the aggressor by weakening the opponent, such as cyber-attacks, can constitute a war. One example of this is the Stuxnet worm the US used to slow down the Iranian nuclear program: It was an act of fear but it did not produce casualties directly, even if it disabled the adversary (Kello 2013). A separation has to be made between the *nature* and the *character* of war. Gray (2002) argues that the nature of war is constant. As the world develops and new technologies are implemented, the nature of war does not alter, but the conduct (character) of war changes. Therefore the right question is *how* the conduct of war has changed. War is a tool of strategy and strategy is an instrument to promote policy by the use or the threat to use force.

If warfare is moving away from conventional technology, the assessment of an enemy's relative power and capabilities becomes harder. With this in mind, how can this influence the concept of great powers in the sense of military great power? Perhaps there is a need for new concepts. The motives of war highlighted by Thucydides³ – *interest*, *honor* and *fear* – or in the words of Hobbes (2000 [1651]) – *gain*, *safety* and *reputation* – do not alter; however, as political, social and technological aspects change, the forms of war change. The attributes of modern technology, such as precision, long-distance range and information allocation do not banish war, it helps warfare develop to fit the political, social and economic conditions of our time. The technology cannot, by itself, have a large impact on warfare; it is how one uses it that is important (Gray 2001).

The war proneness of the international structure is another determinant of the likelihood of war. Waltz (1993) explains the great-power peace in the decades after World War II with the international structure being bipolar rather than multipolar, and that this structure is generally a peaceful structure. Wohlforth (1999) further develops this and claims that unipolarity – that is, when there is one state that is much more powerful than all the other states – is the most peaceful structure. The multipolar structure is seen as war-prone because of the many actors and hence the many different interests of those actors. The bipolar structure is very peaceful, but less stable in the sense that there are only two actors, so if a war is a fact it might be ever so destructive. Waltz (1993) stresses that this does not mean that the peace that has been witnessed will last, as this depends on the international structure. He also identifies nuclear weapons as a stabilizing factor. The international system will be anarchic regardless of other

³ See Gomme (2014).

structural changes (that is, the distribution of power). In a unipolar world the unipole will function as a quasi-sovereign, but it differs in that the other states have not signed over parts of their sovereignty to the unipole.

2.2 Technology & War

First, I will clarify what is meant by technology by making a distinction between old conventional technology and what represents something new with the technology that has emerged since the end of the Cold War and how it impacts the likelihood of future great-power war. The focus will not be on the technology itself, as the technology itself plays no role in the decision-making of going to war or not, and it does not cause wars (Gray 2002; Saltzman 2013), but on how the implementation of these new technologies as a group helps change the characteristics of war, so that it follows the demands from society. Then, I will address the role technology plays in war, and how this changes to promote the desired outcome relative to the structure within which it operates.

2.2.1 Technology

In the 1900s the military organizations were the main catalyst behind technological progress. Faced with two World Wars, the Vietnam War, the Korean War and a Cold War, the technological ingenuity reached an unprecedented pace and sophistication, giving us satellites, long range missiles, sophisticated navigation, and last, but not least: the nuclear bomb and a fear of total destruction (Misa 2004). In the world that we live in today, with transnational interaction being a central part of the international sphere, the weak (and the strong) can project power, because the communication we have available lets them look, feel and be stronger than before the communication era (Kay 2004).

Cohen (2004) identifies two subgroups of modern technology, namely *precision weaponry* and *information and communications technology*. Within these subgroups one can find unmanned aerial vehicles (UAV), heat-seeking bombs, stealth, sonars, intercontinental ballistic missiles, surveillance equipment, anti satellite (ASAT) missiles, laser technologies as well as an emerging cyber threat. What is of importance for this thesis is the perceived *combined* effect of these technologies. The combined effect can be to strike specific targets rather than uncoordinated bombshowers. If the decision makers perceive their capabilities as better than their opponent's, then war may be more likely as a result of this. This can be due

to the technology that makes it more difficult to estimate an opponent's power because it is more secretive. The full effect of the technology has not been seen, especially not in a situation where great powers that both possess the technology meet in combat (Boot 2003; Thayer 2000; Van Evera 1998).

The new technology has made the geographical scope of warfare broader, adding space and cyberspace as potential future battlefields. The geographical dimension is important, as all we as people do, we do within a geographical sphere, and therefore the geographical dimension is inescapable, also for the cyberspace domain, as Gray (1999) asserts. This is because humans control the actions in cyberspace and those humans have to operate from a physical domain. Combined with the technology being adapted to fit the social and political structures of its time, as emphasized by Schelling (2008 [1966]), these two effects indicate the importance that technology presents to war. In order for technology to have an optimal effect implemented into military organizations it must complement both the geographical scope of warfare and the social and political structures of its time.

2.2.2 The Changing Character of Warfare: Technology as a Tool

Gray (2001) states that the difficulty in the relationship between war and technology is found in *how* important technology is to warfare, not if it *is* important. Many claim that the new technology will not dramatically alter warfare. It has the potential to change components of warfare, but continuity will outweigh change (Biddle 2004; Gray 2001). Schelling (2008 [1966]) examines warfare and finds that it evolves according to the society around. Technology may also have symbolic effects, exemplified by the difference between TNT and the nuclear bomb. People will treat these two differently. The reasons to treat them differently are not military or physical. To illustrate the adaptation of technology one can see how chemical weapons were not used in World War II, while nuclear weapons were not used in the Korean War. States, as people, imitate each other. Over time they will imitate successful states in order to seek success for themselves. Waltz (1979:127) writes:

“The fate of each state depends on its responses to what other states do. The possibility that conflict will be conducted by force leads to competition in the arts and the instruments of force. Competition produces a tendency toward the sameness of the competitors. (...) Contending states imitate the military innovations contrived by the country of greatest capability and ingenuity. And so the weapons of major contenders, and even their strategies, begin to look much the same

all over the world. Thus at the turn of the century Admiral Alfred von Tirpitz argued successfully for building a battleship fleet on the grounds that Germany could challenge Britain at sea only with a naval doctrine and weapons similar to hers.”

Metz & Kievit (1994) predict that the emerging technology will not make war in a conventional form obsolete, but that it will rather enforce states with functioning military organizations to adapt their old conventional forces into new ones. Biddle (2003) assesses the war in Afghanistan and finds that the impact of the new technology was greatest at the onset of war, but that its role was banished because the US had to adapt its warfare to the Taliban’s, which did not rely on infrastructure or high technology. In addition, the Taliban’s use of caves to hide made them go under the radar of the US’s high technology surveillance equipment. From this he infers that the future of warfare will be similar to that of the past, but that the new technology might play a larger role when two, more equal states are at war.

In examining the RMA and the implications that technology has on warfare, O’Hanlon (2000) finds that the new technological advances in military affairs will be able to have as big an impact on warfare as the *blitzkrieg*, aircraft carriers and nuclear weapons if implemented successfully in military organizations. He also stresses that although the US today is the largest military power, the other states will also have the possibility to exploit the technological advancements, perhaps ultimately compromising US hegemony. He therefore sees it as crucial that the US continues its technological advancements so that their position in the international anarchy can be upheld. Especially vulnerable are the US dependency upon ships and large military bases to project power across continents, as well as the US dependency of minimizing their suffering of casualties.

Boot (2003) writes about the American involvement in Iraq 2003 where he recognizes that there has been a shift in “The American Way of War” from warfare characterized by destructive power and a large number of soldiers, to warfare that focuses on being less destructive, but more precise. Thayer (2000) emphasizes that the new technology lets one gather information in real time and over large territories and submit this to the forces in the field immediately. The technology provides knowledge that in turn can be used to confuse, mislead and ultimately attack an enemy. He fears that the US decision makers may overestimate the military capabilities that the new technology provides, and therefore chose to go to war against another nuclear power (a great power) believing it will be bloodless and that

it is safe to engage in war with a nuclear power because the retaliation will be in the form of an unbloody war, and therefore the need to use nuclear weapons disappears.

Nuclear weapons, and the fear of proliferation, have fostered the peacefulness between great powers since the end of the Cold War. The nuclear threat has made the tools of war less useful as a means for achieving appropriate goals because of the destructive nature of the conventional war technology might leave a potential adversary no other choice but to produce a nuclear response to aggression (Gray 2001; Mandelbaum 1998/99; Morgenthau 2006 [1948]; Waltz 2003). However, with a successful implementation of precision and information technology, war may again be perceived as a viable tool. This is because it holds a promise of minimizing the human casualties, and nuclear proliferation will up the costs and down the gains for great powers because of mutual assured destruction. Western democracies have in the past 20 years won wars and conflicts without large casualties on their hands. Modern warfare does not have traditional fronts, due to new technology such as long-distance ballistic missiles and long-range airpower. There has been a change in warfare, due to changes in international politics and the development and use of new technology in warfare. The RMA sought to enhance effectiveness in conventional weapons, in order to be on the level of small tactical nuclear weapons (Cohen 2004).

The main difference between nuclear and conventional war is the speed that the former endures. It allows for an asymmetric display of violence without achieving victory first. The nuclear weapon has its largest effect as an instigator rather than a concluder. It can make war less militarized, and there has been a drop in status for the military victory. One no longer need a victory to damage an adversary. Victory no longer assures a win. It makes leaders more cautious to go to war because they may experience attacks even though they would win a militarized war. It promotes striking first rather than waiting. In the nuclear age, a war, with detrimental consequences, can be compressed to a matter of seconds, minutes or hours. Schelling (2008 [1966]) acknowledges that this has implications for the politics of war, the decision-making, and the possibility to micromanage and gain control over the situation. Every process surrounding war changes because there is no time for the process to progress. Decisions have to be made without time to think and reflect. How can a war like this come to an end? The expectation is that it ends when one has spent all of one's resources. With regards to nuclear weapons the effect of this is enormous. This is perhaps why the concept of

“limited war” has risen in the recent years. There is room for negotiation. With nuclear weapons we will not witness a race in military strength as we have seen in the past.

The new information and precision technology is thought to allow for limited warfare or hybrid warfare. Fordham (2004) conducts an analysis of how military capabilities influence the decision making of going to war. His analysis indicates that states possessing greater military capabilities are more likely to use force. By looking at the US as an example, commenting his findings, he is careful to point out that this is not to say that an arms race will lead to military confrontation, because that is determined by the other states and their reactions. He suggests that there is more to the security dilemma than just the misperceptions of states’ intentions, that also the capabilities in themselves may lead a state to use force more often. To preserve the possibility to perform surprise attacks, states try to conceal their military capabilities, and uphold the element of tactical surprise. Waltz (1993) argues that as a state’s confidence in technical skill increases, along with an economic confidence, it aspires to increase its own role.

Huang & Rifkind (2012) seek to see how the implementation of new technology affects future conflicts, by focusing on the changing human role. Their argument is that how humans operate and are being affected by the technology is key to understanding what separates the new technology from the old. The new technology allows humans to operate from a distance and alter perceptual capabilities.⁴ With old conventional technology one had to be within a certain range of one another to conduct attacks and wage war. As society has changed and the new technology with it, two observations can be made: 1. War can be waged from great distances, and, 2. Killing is not the objective. Luttwak (1995:114) writes that as humans are more removed from direct battle, through warfare with new conventional technology as opposed to old conventional technology, this may render war an effective tool for democracies as it allows for the conduct of cleaner. States, as people, plan and act based on their perceptions of a given situation. The implementation of new military technology may alter the perceptions the parties have of one another, and lead the states to make different strategic choices than what they would otherwise do. It allows for assessments of information, incentives and capabilities to be influenced (Huang & Rifkind 2012: 13-14). An over-

⁴ As Huang & Rifkind (2012) wanted that permission were to be asked before using their unpublished paper, I wish to thank Mr. Huang for answering my email request, providing approval for its use in this thesis.

emphasizing of technology over training and readiness, may lead states to assess their technologically advanced adversaries as more threatening than their less technologically advanced ones, even if the latter have more combat readiness and training. As the debate assumes this, so are the policy makers likely to do, and underestimate more capable adversaries at the expense of less capable, more technologically advanced ones (Biddle 2004).

Cyber capabilities and their effect on war are debated, and it is apparent that no technology in itself can cause war. The main difference between the cyber domain and other domains is that the former domain is virtual, and its weapons cannot produce large-scale direct physical destruction and human casualties (Huang & Rifkind 2012:21). It is thought to have the greatest effect on warfare between two developed great powers, as those are the ones that are most dependent on cyberspace infrastructure. However, it is plausible that cyber capabilities, by their existence as a possible tool of war, might ease the decision of an escalation into armed conflict. This may be because it allows for one to perform cheap groundwork against an adversary, such as an attack on critical infrastructure or gather valuable intelligence that lets one have the upper hand in an eventual conflict (or at least the perception is that one is likely to have the upper hand). This is thought to give an attacker more freedom of action as it is allowed to escape some of the Clausewitzian “Fog of War”. This in turn may lead to states preferring military action to political action, as it holds a promise of a more fruitful outcome. Further, it allows for leaders to reduce their short-term risks in achieving their political objectives. Through this cyberspace is seen as offensive (Huang & Rifkind 2012:21; Saltzman 2013:41-43, 58). As cyber attacks can be conducted with a high degree of secrecy, it can be difficult to determine the source of the attack. Although one cannot be sure of whether the attacker has governmental affiliation, there is a growing consensus on those non-state actors performing large-scale cyber-attacks against strategic targets, often do so under the proxy of national governments (Saltzman 2013:45).

2.3 Offense-Defense Balance

The offense-defense theory⁵ is derived from structural realism, and argues that technology has great influence over the offense-defense balance, a balance that is thought to impact international stability, as states make foreign policy choices on the basis of this balance

⁵ For a collection of offense-defense literature, see Brown, Coté Jr., Lynn-Jones & Miller (eds.) (2004)

(Huang & Rifkind 2012:1). The *offense-defense balance* refers to a distinction between the *offense* and the *defense* in that at any given time one or the other is the dominant one, and hence, they offer different potential outcomes. War is more likely when an attack either is (or is perceived to be) easy; namely, when the advantage lies with being offensive (attacking), rather than defensive. This is known as a first-strike advantage (Van Evera 1998). According to Levy (1984), the determinants of the offense-defense balance is a combination of how easy conquest is; the characteristics of the weapons (the technology); the resources needed to win depending on the balance; and first-strike incentives. The actual military capabilities are often not the only important factor in evaluating an enemy's ability relative to oneself. It is often as important how one perceives an enemy's reaction based on the available information. In offense-defense balance there is a distinction between *subjective* (perceived) and *objective* (actual) offense-defense balance (Van Evera 1998).

Figure 2.1: Subjective vs. Objective Offense-Defense Balance

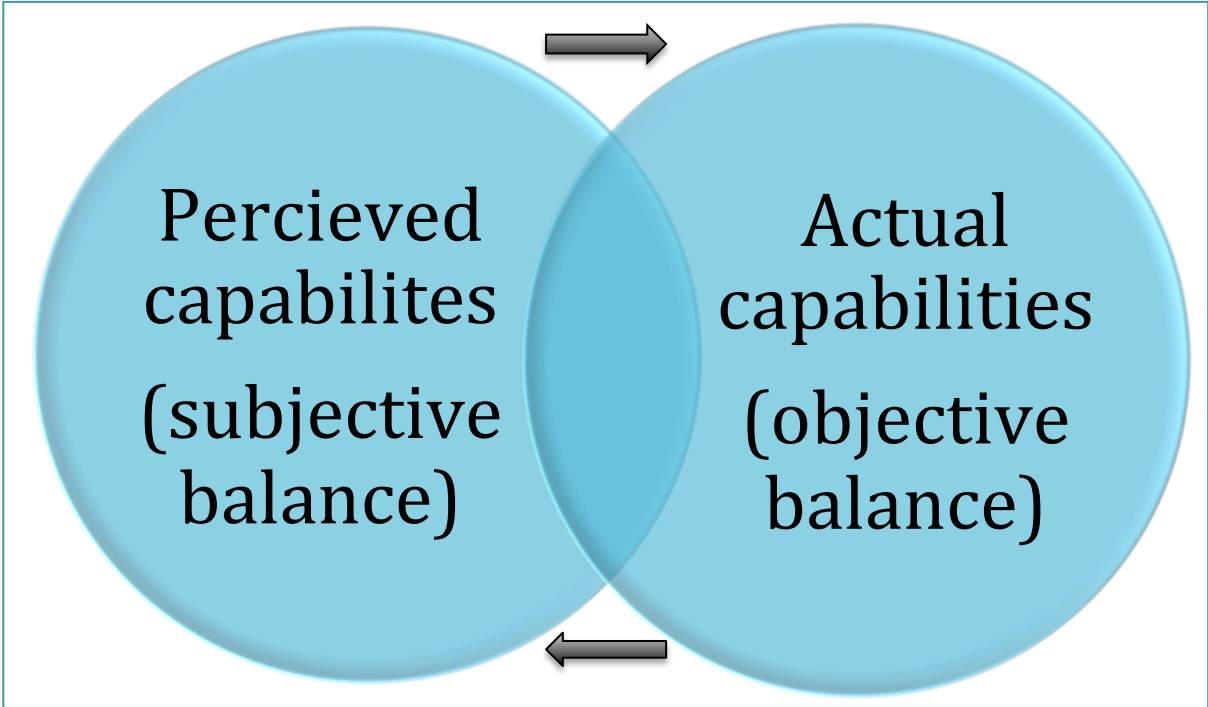


Figure 2.1 shows the gap between the objective and the subjective balance. This gap fluctuates and is influenced, among other things, by technology. The effect of the perceived balance is larger than that of the actual balance. Often this is so because one does not know the actual balance. This implies that even if a state does not know the military capabilities of another state, it will attack on the basis of its perception rather than its knowledge. As

conquest is easy the estimated cost of war sinks relative to when conquest is difficult. When offense is heightened, on the other hand, the neighboring states will become aggressive as they both are tempted to attack, but also because of fear. The incentive to strike first is larger because a successful surprise attack provides larger rewards when conquest is easy, i.e. when the balance is in favor of the offense. In an anarchic international structure, where fear is a driving component, the risk of war is highest when the offense is heightened. This arises from a first strike advantage that makes states adopt a strategy that is mainly offensive. The implementation of new technology may present an increase in this gap, as it is possible to keep the technology more concealed (Van Evera 1998).

The same perceptions do not automatically lead to the same responses. Responses will often be the same, but when they are not, the cause of the difference is found in their outlook, much in the same manner as when people who want the same vote for different political parties because they believe that the way to obtain their wants are different. The differing of perceptions is the basis for many disputes, big and small. This is why it is important to understand and explore the outlook of others and create the basis for common interests, so one can try to predict their actions, seek to influence them (Jervis 1976, 1978).

Offense-defense theory has received extensive critique. In summarizing the critique forwarded to offense-defense theory, Lynn-Jones (1995:667) accentuates five major points: 1) It is difficult to classify weapons as either defensive or offensive. 2) States are not able to perceive the actual offense-defense balance, only have a perception of this balance. 3) Other causes of war and peace are much more important. 4) The explanatory power of the offense-defense balance is low as it is claimed to always favor the defense. 5) The manipulation of the offense-defense balance is easy for states. Other common critiques include the use of World War I as a constant example for an offense advantage, and the lack of other examples (Goddard 1998/99), and that it ignores interaction effects (Finel 1998/99). Davis (1998/99), in reviewing Van Evera's (1998) article, accentuates that he fails to separate the objective and the subjective balance analytically.

2.3.1 Objective Balance

Jervis (1978) holds that with the heightened security of one state, the security of other states decreases, and one sees an increase in hostilities amongst the states trapped in the security dilemma, allowing for offensive dominance to increase and hence elevate the risk of unwanted escalation (Jervis 1976, 1978). Of importance is whether one can separate offensive weapons and policies from defensive ones, and whether the advantage lies with the defense or the offense. When a separation can be made between defensive and offensive weapons, a state can make itself more secure without threatening the security of other states, acquiring defensive weapons. Also, when it is the defense and not the offense that has the advantage, an increase in one state's security will decrease the security of the others, but only slightly so that it will not be a matter of war. When it is easier to conquer than to defend own territory, the offense has an advantage over the defense, and the defense has an advantage if it can hold its own – if it is easier than conquest. For a so-called status quo state it is preferable that the best is if the defense has an advantage because it will be able to enhance its security without endangering other states. Van Evera (1999) recognizes that a prediction given by stability theory is that war will not only be more common in periods of greater real first-move advantage, but also in times of greater *perceived* first-move advantage. False expectations of own capabilities often increase the risk of war, and as states may have different perceptions of relative power, war may be the only way to persuade the weaker state that it will not prevail because it is weaker. In similar ways, the underestimation of the costs of war can cause war. Waltz (2003) views miscalculations as a major cause of war. And Van Evera (1999:5) implies that transparency is key to prevent war when he writes: “If the losing side could foresee the outcome, it would often decline to fight”.

States conceal their military capabilities when there is a first-strike advantage to preserve the element of surprise and the ability to perform unpredictable attacks.⁶ This secrecy may lead states to underestimate its opponent, making it overconfident. There are different ways of doing this. One can actively pretend to be weak, or simply try to hide one's strength. The goal

⁶ Van Evera (1999:42-44) identifies three types of preemptive war. The *generic preemptive* war is characterized by states attacking because they fear they will be attacked and they therefore take advantage of the first-strike advantage. The *accidental* war is brought about when states attack because they see a first-strike advantage and have misread an action as a war threat, like technical errors in weapons and unauthorized firing. Lastly, when one state attacks because it sees a first-strike advantage and fears the attack from another because it thinks that the other state also sees a first-strike advantage.

is to avoid a preemptive attack from the opponent, and be able to perform a surprise attack on the opponent. However, this can also give the opponent over-confidence, perhaps triggering it to start a war that it has no chance of winning because it has been fooled by their adversary to believe that it is weaker than it really is. During the Korean War the communists would not have attacked had they known that the US was willing to intervene as it did. The Korean War was triggered by a misperception that could have been avoided had there been openness. A war is more likely when the results are expected to be better if the war is conducted now, rather than later. Incentives either come from a shift in the balance of power between contending states or a declining hegemon that seeks an early, preventive war (Van Evera 1999). Jervis (1976:112) writes as follows:

“Decision-makers would certainly have cause to worry if the only actions that would convince them that the adversary is not aggressive are measures they believe to be too risky for their own state to undertake.”

2.3.2 Subjective Balance

The intentions of an actor can be defined as the actions it will undertake at a given circumstance or, hypothetically speaking, the actions it would undertake if a given circumstance were to materialize. Often states are willing to sacrifice more to defend themselves than to procuring new values. The risk of war increases if the aggressor thinks that the status quo power has little capability, because this will lead the aggressor to test the status quo power. To avoid an unwanted war that both parties are pushed into by an aggressor, the status quo power must display both the willingness and the ability to wage war (Jervis 1976:48).

The risk of war rises with the potential gains that can be achieved from it. If it looks like a war may break out it is seen as more rewarding to attack first in fear of being attacked first or when an accidental act is misread as an attack. The risks are smaller because the attacker controls the initial attack and the reward is higher because the adversary has not prepared. Such preemptive attacks are not common, but they fuel war when they appear.

To explore how states perceive each other and why is extremely important. This is so because perceptions of a friend's or an enemy's intentions are what decisions are based on. These perceptions are often wrong, perhaps due to the fog of war, that there are limited abilities to know what military action the other may indulge in next. Predicting behavior is not an easy

task, and the fear of not knowing increases the independence the perceptions have from reality. In a situation such as the prelude of a potential war, the realm of strategy, the outcome relies on the interests of the parties, the perceptions of the interests they have and the perceptions of the others' perceptions of one's interest (Jervis 1976).

How perceptions are formed is more interesting than whether a perception is right or wrong, as this allows for explanations of both accurate and inaccurate perceptions from the same general theory. The rightness or wrongness of a perception does not offer valid information until after an event, such as a war, has ended. The actors will act upon their perceptions, and not until later, reflect upon reality. States have expressed interests, but these rarely give valid information about how they seek to obtain or procure these interests. Determining the accuracy of a perception is not easy, but misperceptions should not be treated as random accidents, but rather as patterned diverges that can be detected and analyzed (Jervis 1976).

2.3.3 Technology and the Offense-Defense Balance

Van Evera (1998:6) identifies that the offense-defense balance is an aggregate of military technology and doctrine, geography, diplomatic arrangements and national social structure. Van Evera (1998:12) writes that the offense is heightened the more secretive states appear, and in developing military arms, states are often secretive, to protect their capabilities and ultimately their chances of success in a potential war, giving reason to assume that technology may heighten the offense or the defense depending on the traits of the technology.

An offensive weapon must have striking power, mobility and protective ability. The primary determinants of the offense are the mobility and the movement toward the targets (Levy 1984). There are weapons that traditionally have been viewed as defensive and, following that, stabilizing in that they help reduce the likelihood of war that in the nuclear era has had a destabilizing effect. Therefore it is important to assess the collective impact of an arsenal rather than that of one individual weapon. However, this does not translate into that the attacker will win. The probability of victory is a function of the minimum ratio of forces needed by an attacker and the relative numbers of forces actually possessed by both the attacker and the defender at a given time. The technology of each epoch can heighten or dampen the security dilemma by favoring either the offense or the defense and thus alter the offense-defense balance (Huang & Rifkind 2012:3). The lower the security dilemma is, the

less likely war is. The security dilemma is at its highest when the offense is dominant, in combination with not being able to separate the defense from the offense (Jervis 2004).

Saltzman (2013:42-43) views offense-defense theory as too founded in territory, making cyber capabilities difficult to place in the context. This traditional interpretation of the offense-defense balance reflects a war-conduct that might belong in the past, partly due to the attributes of the new technology, as today one can imagine more limited conflicts that do not have the objective of territorial occupation, but rather seek to capture central assets⁷ such as critical infrastructure or strategic targets as the capture of those have a more desired effect than territorial control. One can say that warfare consists of five domains, four that are territorial – *air, sea, land and space* – and one virtual – *cyberspace*. Cyberspace still relies on territory, as Gray (1999) points out when addressing cyber warfare and its reliance on geography, albeit in a different way than the other.

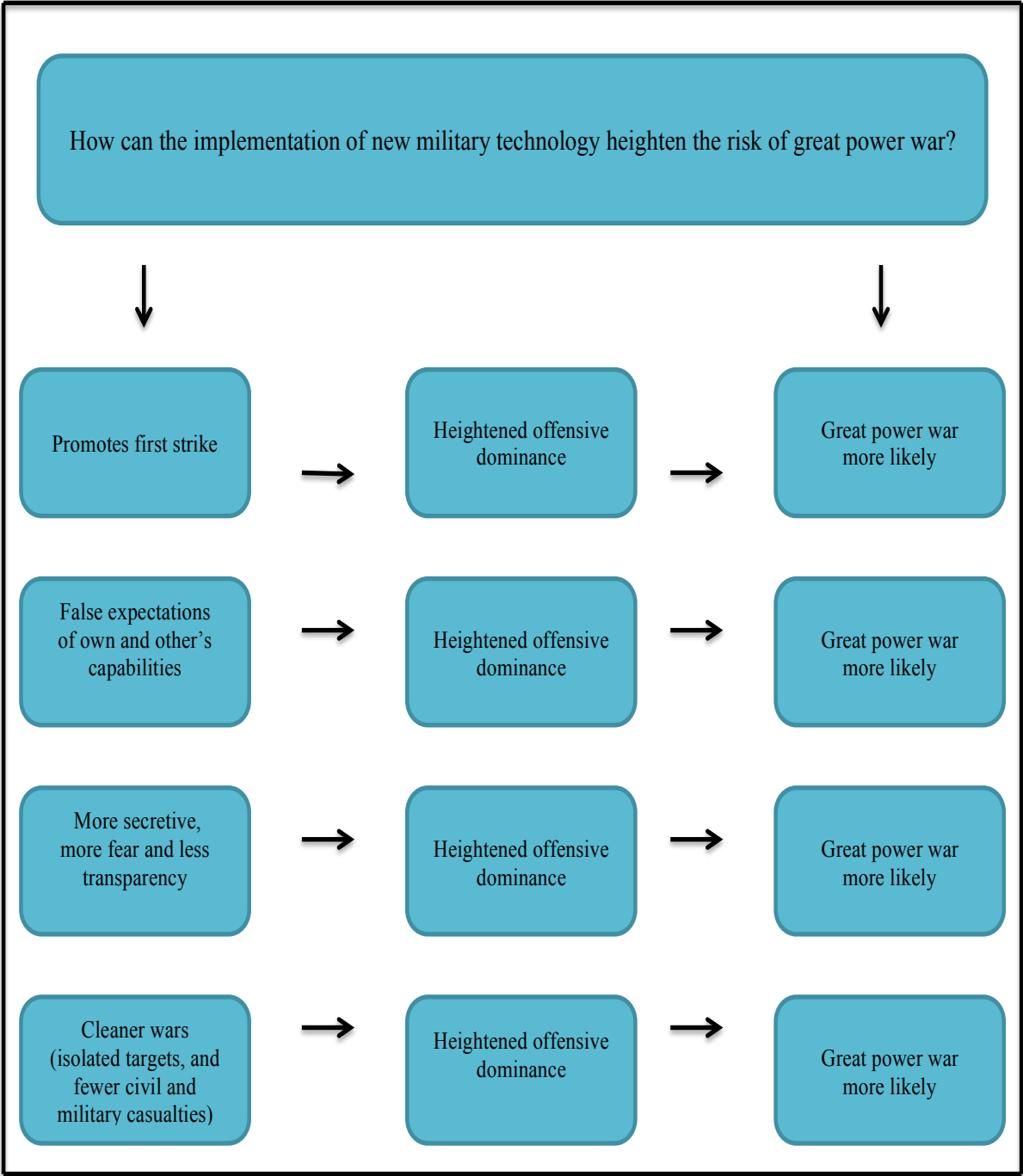
The offense is heightened through the use of cyber capabilities in that it allows for control over enemy execution of military operations, such as deployments, general preparedness and hence their possibility to preform counter attacks. This is thought to be more valuable in an eventual future great-power war than control over territory. A state's assets have shifted from being founded in its territory and its manpower to control the possibility of counter-attack (Saltzman 2013:44).

Through which mechanisms technology impacts the possibility of future great-power war, is unclear (Huang & Rifkind 2012: 3). Complicating this, whether the offense or the defense has the advantage, it is determined by the nature of those technologies that define each period of warfare (Huang & Rifkind 2012; Jervis 1978; Van Evera 1999), and hence the measurements must be somewhat dynamic to capture this. The degree of mobility and the mechanization of each technology have traditionally been applied as measurement, but this cannot apply, for example, to cyber technology. As one has yet to determine the effect of this new technology, and because it does not apply to the traditional territorial focus of offense-defense theory, it is more difficult to measure the balance through the established measurements (Huang &

⁷ Saltzman (2013:43-44) identifies such assets as "A state's military constellations, defense industrial base, satellite communication, electrical power grid, internet connectivity, central banking system, stock market, ministries and government agencies."

Rifkind 2012:3). Based on the theoretical framework, I have sought to map out the causal mechanisms that are thought to have an effect on the risk of great-power war. Four such mechanisms that are prone to influence by the implementation of technology are presented: 1) it promotes first strike, 2) it can foster false expectations of own and other’s capabilities, 3) fear increases as it is more secretive and less transparent, 4) it allows for cleaner wars, and therefore the incentives to avoid war decreases. This is exemplified in Figure 2.2.

Figure 2.2: New Technology & its Effect on the Offense-Defense Balance



That a technology promotes first strike means that there is an advantage to the one who chooses to use force first. When the first strike is advantageous it leads to a heightened offensive dominance: in other words, the situation is more war prone than when the defense is the more dominant one. This advantage will very often be biggest to the one that has the least military capabilities as it could benefit from the element of surprise more than the one that has the most military capabilities and that will be likely to win should there be a war at a later time (Van Evera 1998, 1999).

Secondly, false expectations of own and other's capabilities can have detrimental effects, miscalculation is more likely to occur. The technology is thought to impact this because it can create a greater gap between the perceived and the actual capabilities. This gap is also affected, and is widened, by the larger the part secrecy and deception plays in a relationship, the harder it is to build common trust, and the more tempting it gets to try and control the other part (Biddle 2004; Fordham 2004; Jervis 1976; Huang & Rifkind 2012; Thayer 2000; Van Evera 1999; Waltz 1993, 2003).

Thirdly, the new technology is thought to promote secrecy as it is easier to hide, and the implications of attacks are more uncertain as the full scope of the technology is not known. This is also supported by the low sustainability of each new technology. As it is superseded by further new technology at an unprecedented speed, one cannot ever be sure to have the newest and most efficient technology. This secrecy helps foster the mechanism of false expectations of own and other's capabilities as well. This, in turn, fosters fear (O'Hanlon 2000; Saltzman 2013; Van Evera 1998).

Lastly, the new technology allows for cleaner wars, arguably more suitable to a democratic structure. The cleaner or the swifter one perceives a war to be, the more likely war becomes because the gains will outweigh the losses. This is valid only for the onset of war. Should such a war happen, it is likely that it will develop in to a more conventional form of warfare, as the new technology and the idea of a short duration, limited, high intensity war can only help you reach limited objectives. If this warfare does not give the desired results, it is likely that the one who initiates the use of other forms of warfare will have a first-strike advantage (Biddle 2003; Huang & Rifkind 2012; Luttwak 1995; Thayer 2000).

The objective of this chapter has been to theorize around established concepts of international politics, such as anarchy, power and war, to show that these concepts are in their nature constant, but in their character changing to adapt to society. In the period after 1991 technology has been developed and implemented to accommodate democracies seeking to wage war by expanding the possible domains of war, and hence the image of cleaner wars. In introducing new domains – space and cyberspace –and tensions could rise between adversaries as the fog of war increases. The theoretical argument is that as new technology is implemented into military organizations offensive dominance is heightened through the four mechanisms presented in Figure 2.2. This, in turn, is thought to increase the likelihood of great-power war. To test this theory I will, in Chapter III, seek to measure this through each mechanisms and new technologies in the potential domains of a possible war between China and the US, focusing on the new domains, space and cyberspace.

Chapter III

-Empirical Analysis-

3.1 Methods

To outline the probability that the implementation of new military technology leads to a heightened offensive dominance, which ultimately affects the likelihood of great-power war, valid measures have to be applied. The dependent variable is *likelihood of great-power war* and the independent variable is *new military technology*. To measure the dependent variable I will use *heightened offensive dominance* as a proxy for war in that the theory asserts that the higher the offensive dominance is, the more likely war is. The independent variable – *new military technology* – is less straightforward as technology itself has no impact on war. It is the implementation of this technology that creates the hypothesized effect. It is the *precision* and *information* technology implemented into military organizations after 1991 that is thought to create this effect on the offense-defense balance.

3.1.1 Method

A research question that is exploratory requires a method that allows for in-depth analysis in order to get knowledge of the processes at hand. A qualitative method allows for such in-depth small-*N* studies (Jacobsen 2010). To test the theoretical framework, I have chosen to conduct a case study of the US-China relationship, and the likelihood of a future war between them, given the implementation of new military technology. The case study gives in-depth understanding and insight on a level that no other method allows for. However, this is not without reservations. A case study does not open for wide generalization, as there are some traits that are particular to the case being studied that may influence the outcome. The case selection in a case study is biased, as it is not randomly selected (Hancké 2009).

In order to identify how the implementation of new military technology may or may not lead to a heightened offensive dominance, the empirical analysis map out the US-China relationship, their individual strategies and capabilities as well as how the new technology

may impact how they perceive war and the possible gains from war and how perceptions may change in accordance with this. For this particular case study there are a number of possible theoretical cases, but the thesis will build on the scholarly, as well as the general perception, that one – if not *the* – key relationship to watch is the one between the US and China.⁸ These are the two states that arguably possess (and have implemented) the technology discussed herein into their military organizations. There is a risk of war due to China's ultimate desire (and existing plans) to integrate Taiwan into mainland China, an action the US will have to respond to in order to keep its hegemonial position in the East-Asia region.

A potential US/NATO-Russia war could also qualify as a case. Russia has seized Crimea from Ukraine, leaving Europe in a war-prone situation (in some ways just like the one the East-Asia would face if China were to forcefully take Taiwan). Although one can identify many of the same components in the US/NATO-Russia relationship as in the US-China relationship, a future US-China war is a more idealized version of my theoretical argument. And as I cannot focus on more than one case in this thesis due to space considerations, the US/NATO-Russia scenario has to be addressed at a later occasion. The reason the US-China case is closer to my theoretical argument is that it is less likely that the US/NATO will go in with military power against Russia in the midst of Europe unless they absolutely have to. This is because it will likely not be a clean war should it be fought at land on the European continent, hence it will not qualify one of the underlying theoretical assumptions of the heightened offensive dominance. Because two major world wars has already taken place in that same location, the decision-makers envision a war more similar to the ones we have seen before, whilst in the Asia-Pacific they are more inclined to envision a swift and clean high-intensity war of an unprecedented standard. Because of just this, a case study of the US/NATO-Russia scenario could help support the argument as such a war is probably more likely to evolve into a more conventional, total war than a war in the Asia-Pacific.

3.1.2 Variables, Measurements and Operationalization

The dependent variable – *likelihood of great-power war* – address great power war rather than other types of war, because the implementation of new technology into military organizations is thought to have the greatest impact on developed, economically and militarily advanced

⁸See Buzan (2010); Cohen (1999); Doran (1999); Ikenberry (2008); Kagan (1999); Jervis (2002); Mandelbaum (1998/99); Mearsheimer (2006a); Smith (2012).

states, as the technology targets infrastructure that is more commonly found, and heavily relied on, in these countries. Further, the strategic choices of great powers are thought to have an impact on all other states through interdependence and alliances.

The concept of war is important, and although clearly defined concepts provide the best basis for research, a rigid definition of war cannot be applied in this analysis. To capture a change in the traits of the technology, and ultimately in warfare, it is vital to have a dynamic concept of war to explore the impact of this new military technology, such as cyber weapons and other information technologies. Although the short-term individual lethality of cyber weapons is thought to be very low, it is important to think of cyber weapons as one potential technology and weapon that is helping create the combined effect that we are discussing, namely that war is perceived as cleaner. This also applies for the weaponization of space and its potential implications. One has to accept a broad definition of the term war, and see this as only one component that may – indirectly – lead to casualties, even if it in itself creates few casualties (Krepinevich 2012). This thesis does not suggest that war in any way is inevitable, nor is it saying that the implementation of new technology will alter warfare. It states that due to the nature of the current situation a war may occur if the decision-makers do not make an effort to create understanding and common ground with their adversary.

To capture the independent variable – *new military technology* – it will be measured by the four hypothesized causal mechanisms as shown in Figure 2.2: 1) technology promotes first strike, 2) technology can foster false expectations of own and other's capabilities, 3) the new technology allows for more secrecy, 4) the new technology allows for cleaner wars. These independent variables are not fully independent of one another. They are all aspects of heightened offensive dominance and should be treated as such. An increase in one of the causal mechanisms is likely to cause an increase in the others as well. For the causal mechanisms presented in Figure 2.2 to be supported there has to be evidence that the US-China relationship is fostering first strike, false expectations of capabilities, secrecy and/or the promise of a clean war through the implementation of new technology. First strike should be promoted, for example through the technology increasing US and Chinese faith in own possible victory in a potential war. In addition, false expectations of own and others' capabilities should prove to be fostered by the implementation of new technology to be supported. One should further look for heightened secrecy, especially on China's part, but also in critical domains, such as space and cyberspace for the US and from this identify how

the implementation of new technology promotes this. Lastly, one would expect to find that especially the US, but also China, envision a clean war, and that the technology promotes this type of warfare.

Table 3.1: Criteria Supporting Heightened Offensive Dominance by Domain

Space	Cyberspace	Air	Sea	Land
<ul style="list-style-type: none"> - Promotes first strike through wish for information superiority/ asymmetry - Blinding campaign makes estimation difficult/secretcy - Minimizing human casualties 	<ul style="list-style-type: none"> - Promotes first strike through element of surprise/ difficult to create defense - Very secretive/estimation more difficult -Minimizing human casualties 	<ul style="list-style-type: none"> -Surveillance fosters first strike - Can do damage without large number of soldiers (element of surprise) (cleaner wars) 	<ul style="list-style-type: none"> - Projecting power and maintaining control promotes first strike - Estimation difficult - Attacks on aircraft carriers complicates avoiding human losses 	<ul style="list-style-type: none"> - Estimation of quantitative/qualitative ratio more diffuse - Minimize human casualties to greatest extent, but more difficult than in the other domains

In scientific research there are certain criteria that have to be met. First, the *validity* concerns the application of measurements that measure the concepts as they have been defined for this purpose (Hancké 2009:87). To measure the likelihood of war, the thesis rests on an assumption that the likelihood of war increases the higher the offensive dominance is. So to measure the likelihood of war one has to measure the offensive dominance, effectively using the latter as a proxy for the former. To do so, I have identified four causal mechanisms, as exemplified in Figure 2.2, that are thought to have a significant impact on the offense-defense balance. Second, the stability of the measurement – that it will provide the same result if applied again under exactly same conditions – is a measurement’s *reliability* (Hancké 2009:90). In the US-China relationship, there are factors that may impact these criteria. For instance, the relationship between these two states is strained, and their cultures differ, making communication difficult from the offset. With the new technology that promotes more secrecy (a strategy China has followed) this strain only grows stronger. When I stress that wars are perceived as cleaner, I use the word “perceived” so as to emphasize that I am not saying that a future war necessarily *will* be cleaner.

Whether or not the US is a declining power, or if China in fact is a rising power, will not be evaluated. Neither will it be concerned about if China is a great power or not. Morgenthau

(2006 [1948]) states that a great power is able to have its will against a smaller state whilst a smaller state is not able to have his will against a great power. A great power, due to either its size or its military and economic strength, has a substantial influence and plays an important role in the international system (Mearsheimer 2006b, 2014 [2001]). The assumption of the thesis will be that both China and the US have the economic and military strength to be classified as a great power.

Another assumption of the thesis is that the future will follow as an extension of today; namely that the actors will continue to be China and the US, China will have economic growth, although probably not as high as it has seen the past 10 years, as well as the US will, in relative terms, have a slightly declining economy. China will be building up its military forces; whilst the US's military capabilities are already at an unprecedented level. The problem is that no one knows what the future will look like, let alone the future of war. It is presumed to resemble the past, and that the new technology will allow for a different onset, but later on, as stalemate is reached, resemble that of a conventional war. What this thesis attempts is to identify the factors that separate the pre-1991 technology from the post-1991 technology, whilst presuming that war will always be an opportunity, albeit not always as rewarding, depending on the technology at hand and the general surroundings.

Without discussing this at length, the thesis assumes that the United States (and China) envision a swift, precision and intelligence-based air-war where civilians and soldiers are spared, making the warfare less lethal and the consequences of war smaller and therefore possibly a more likely scenario (DoD 2013). I seek to control for nuclear weapons in concentrating on great-power war rather than war in general, because although nuclear weapons are an important part of US-China war scenarios, and will form an integral part of warfare purely by existing, decision makers in both China and the US assume that it will play a different part in an eventual US-China conflict. Prominent realist scholar John Mearsheimer predicts that nuclear weapons will have a different role in a possible future conflict between the United States and China than what it had during the Cold War, when it was largely judged to have been peace-promoting. Both the Soviet Union and the US acknowledged that a war would go nuclear quickly as there was a single center of gravity: the central European landmass. According to Mearsheimer they believe that they could fight without it going to the nuclear level, as a future US-Chinese war is likely not to have *one* center of gravity, but rather *many* (Keck 2014).

3.1.3 Empirical Data and Sources

The theoretical starting point of the US-China relationship will be the end of the Cold War and the dissolution of the Soviet Union in 1991. I have chosen 1991 to be the starting point because it represents important implications both for the US-China relationship, and the post-1991 technological advancements with the dissolution of the Soviet Union and the end of the Cold War. Although the theoretical starting point is set at 1991, I have chosen 23 reports dating from 1999-2015. The empirical starting point set at 1999 is set as it represents a shift in the US-China relationship with the (presumably accidental) US bombing of the Chinese embassy in Belgrade (Pollpeter 2004).

Analyzing official and unofficial publications from China and the US should provide some basis for assessing how they view each other, in terms of both capabilities and strategy. The problem with such documents is that they are meant for open publication; therefore they are often both vague and have particular strategic agendas. Another problem is the disproportion of information. This is an effect of both the more open American policy versus the closed Chinese, as well as the existence of a language barrier limiting the accessible material. Not only are the reports predominantly American, six different organizations, both governmental and non-governmental, provide two or more reports each and make out 19 of the total 23 reports, leaving only four reports originating from other organizations.⁹ Due to this high concentration of common origin, many of the same contributors figure in more than one report. Krepinevich, Chase, Pollpeter and Cliff, all figure more than once.¹⁰ As this thesis use the 2013-2015 annual DoD reports on China, it should also be mentioned that many of the other reports also use these reports as a foundation. I chose to use the 2013-2015 reports rather than just one to highlight the consistency of the US chain of thought on China's build up. They should be regarded as complementing each other. These problems combined suggest that it is not unreasonable to believe that the image that the empirical data provides is somewhat skewed. The sources and their arguments are explicated in Table 3.2.

⁹ Rand (5), Chinese Ministry of National Defense (2), CSBA (4), DoD (3), IISS (2) and the US-China Economic Review Commission (3).

¹⁰ Chase (2), Cliff (2), Krepinevich (2) and Pollpeter (3). In the no-author reports, there is also reason to believe that some of the same people may have contributed on reports published in different years, such as the Chinese Ministry of National Defense (2013, 2015); DoD (2013, 2014, 2015) and the IISS (2014, 2015).

Table 3.2: Empirical Sources and Arguments

Author(s)	Argument
Air-Sea Battle Office (2013) “Air Sea Battle Service Collaboration to Address Anti-Access & Area Denial Challenges”	China’s A2AD are designed to give adversaries (the US) operational problems, by threatening military bases, deployment and credibility. ASB is designed to counter this.
Chase, Engstrom, Cheung, Gunnes, Harold, Puska & Berkowitz (2015) “Chinas Incomplete Military Transformation- Assessing the weaknesses of the People’s Liberation Army (PLA).” <i>Rand National Security Research Division.</i>	China’s military transformation is not complete, but can still pose a threat, especially in the space and cyberspace domains. Information superiority is deemed key to gaining (or denying the adversary) situational awareness.
Chinese Ministry of National Defense (2013) “The Diversified Employment of China’s Armed Forces.	China Defense White Paper. Accentuates the role of the PLA and how its goal is to be able to win local wars under informationized conditions.
Chinese Ministry of National Defense (2015) “China’s Military Strategy.”	China’s latest defense White Paper. While highlighting China’s defensive intentions, especially stating that China will work hard to seize the strategic initiative in military competition, also in the new security domains space and cyberspace.
Cliff, Burles, Chase, Eaton & Pollpeter (2007) “Entering the Dragons Lair- Chinese Anti-Access Strategies and their Implications for the United States.” <i>Rand Project Air Force.</i>	Writes about how China can exploit US vulnerabilities through its A2AD strategy.
CSIS (2012) “U.S. Force Posture Strategy in the Asia Pacific Region: An independent Assessment.”	Although the US is dominant in the conventional domains, the US must gain superiority in cyberspace and space to hold its position in Asia-Pacific, and be sure to win.
DoA (2014) “The US Army Operating Concept – Win in a Complex World”	A2AD pose a challenge to US deployment = US air dominance and sea control. Cyber and space capabilities can be offensively used to disrupt and distract US communication and maneuver.
DoD (2013) “Annual Report to Congress: Military and Security Development Involving the Peoples Republic of China”	Regarding China’s military build up. As the US are facing threats regarding its dependency on the flow of real-time information and increased competition in the space and cyber domain, China’s capabilities are still lesser than those of the US.
DoD (2014) “Annual Report to Congress: Military and Security Development Involving the Peoples Republic of China”	Regarding China’s military build-up. As the US are facing threats regarding its dependency on the flow if real-time information and increased competition in the space and cyber domain, China’s capabilities are still lesser than those of the US.
DoD (2015) “Annual Report to Congress: Military and Security Development Involving the Peoples Republic of China”	As the US face threats regarding its dependency on the flow if real-time information and increased competition in the space and cyber domain, China’s capabilities are still lesser than those of the US.
Easton, Ian (2013) “China’s Military Strategy in the Asia Pacific: Implications for Regional Stability.” <i>Project 2049 Institute.</i>	Chinas projectile-centric military build up is destabilizing the security environment in the Asia pacific, making the PLA an offensive force, and one that risks causing an accidental war with rapid escalation and devastating effects in crisis. Growing threat to US dependency on platform-deployment.

IISS (2014 ¹) “The Military Balance”	With new technology more difficult to assess capabilities. Do not know the effect of new technologies, and therefore more secrecy.
IISS (2015 ¹) “The Military Balance”	The US see space as its most vulnerable domain, whilst China see the sea as its.
Khalilzad, Byman, Cliff, Orletsky, Shlapak, Shulsky & Tellis (1999) “The United States and a Rising China. Strategic and military implications.” <i>RAND Project Air Force</i>	Us deployment may be at risk faced with the Chinese way of war. China has one of the largest armed forces in the world, may not be as clean a war as the US would prefer.
Krepinevich, Andrew F. (2010) “Meeting the Challenge of a Proliferated World.” <i>CSBA backgrounder</i> .	Cyber weapons and long-range guided weapons, which are capable to disable, quickly and reliably, certain kinds of strategic targets, such as electric grids, complicate thinking about strategy and the role of the nuclear weapon, cannot displace nuclear weapons’ ability to unprecedented destruction, but are far more likely to be employed.
Krepinevich, Andrew F. (2012) “Cyber Warfare: A “Nuclear” Option?” <i>CSBA</i>	Cyber weapons foster secrecy, and enable new forms of warfare. Cannot be quantified as other arms, but can attack civil and military critical infrastructure with high degree of secrecy and anonymity.
Martitage, Robert (2014). “Toward a New Offset Strategy- Exploiting U.S. Long-term Advantages to Restore U.S. Global Power Projection Capability” <i>CSBA</i>	Growing operational changes for the US faced with China’s A2AD, such as crisis instability and less credibility to us deterrence. US deployment is at risk as China possess more equipment to trace and damage such assets.
Pollpeter, Kevin (2004). “U.S.-China Security Management – Assessing the Military to Military Relationship. <i>Rand Project Air Force</i>	The military relationship is strained, and more so as China continues to resist enhancing transparency. China knows their military capabilities to be inferior to that of the US, and therefore transparency is not beneficial to China.
Pollpeter, Anderson, Wilson & Yang (2015) “China Dream, Space Dream: China’s Progress in Space Technologies and Implications for the United States.” <i>Report Prepared for the U.S.-China Economic and Security Review Commission</i> .	Space is seen as the center of gravity for future war in China, and holds an important role in the A2AD strategy as it is thought to allow for China to achieve information superiority.
Stillion, John & Scott Perdue (2008) “Air Combat Past, Present and Future.” <i>RAND Project Air Force</i> .	Chinas A2AD may take advantage of US dependency on deployment of aircraft, and make US precision warfare difficult.
Thomas, Jim (2011) “Chinas Active Defense Strategy and its Regional Implications.” <i>Testimony presented before the U.S.-China Economic and Security Review Commission</i> .	China are making provocative moves, coupled with arms build up and development of naval power projection capabilities, US projection is thought to be at risk.
Van Tol, Jan, Gunzinger, Krepinevich & Thomas (2010) “Air-Sea Battle: A Point of Departure Operational Concept.” <i>CSBA</i> .	How Air-Sea Battle is crucial to balance China’s A2AD, and hence for the US to keep its position in the Asia-Pacific.
Watts, Barry D. (2011) “The Implications of China’s Military and Civil Space Programs.” <i>Testimony presented before the U.S.-China Economic and Security Review Commission</i>	About China’s space programs and how they are presumably designed to counter US vulnerabilities.

¹The IISS (2015) is divided into 2015a-c where each source represents one chapter in *The Military Balance*.

3.2 The US–China Relationship: History and Characteristics

3.2.1 Strategic Enemies vs. Strategic Allies: The Past and the Future

The historically strained US-China relationship is colored by both *cooperation* and *competition*. In the 1970's and the 1980's it was their individual relationships to the Soviet Union that were the focus. In the 1972 Shanghai Communiqué, China agreed to (temporarily) bury its quest for Taiwan to keep the US on its side as the Soviet Union were more dangerous and threatening in the eyes of the Chinese. As the Soviet Union became weaker, this shifted, and China again sought to incorporate Taiwan with the notion of one country, two systems. After the fall of the Soviet Union – their common enemy – there was no need for them to have a close relationship, and the symbolic disbeliefs between the two grew (Hadley & Haenle 2015; Khalilzad, Byman, Cliff, Orletsky, Shlapak & Tellis 1999; Pollpeter 2004).

The protection of the American people, ensuring economic expansion and promotion of democratic principles are the main reasons to explain US presence in Asia. Both the US and China have strong incentives to avoid a war with one another, as they are priced for each other's economic development. They also rely on each other to keep peace, and to mitigate the terrorism and piracy threats (CSIS 2012; Xinbo 2014). Chinese leaders emphasize China's rise as peaceful, to reassure its neighbors so that they will not seek to deepen their relationship with the US (Chinese Ministry of National Defense 2013). Simultaneously, steps are taken to tighten control over China's existing sovereignty as well as their territorial claims.¹¹ Should this mismatch of words and actions continue, concerns in the region are likely to intensify as the modernization continues, and perhaps its neighboring states will seek to the US, despite China's reassurances of a peaceful rise (DoD 2014:16). China has become more confrontational in recent years, in parallel with its economy growing and its military capabilities developing (DoD 2014). This is exemplified by the founding of BRICS (Brazil, Russia, India, China and South-Africa) as an alternative platform for cooperation (Ministry of External Relations n.d), and by more assertiveness towards the UN (Tiezzi 2015).

¹¹ Examples of this include the November 23, 2013 establishment of an Air Defense Identification Zone (ADIZ) in the East China Sea, and China's crossing of US aircrafts three times as they were flying into the Chinese exclusive economic zone (EEZ) that stretches 200 nautical miles from a state's costal line not considered part of a state's sovereign territory. The ADIZ covers areas under administration of Japan, South Korea and Taiwan. The US does not acknowledge this ADIZ, and therefore they will, allegedly, not let their operations in this area be affected by it (DoD 2014:5; Dutton 2015).

The rhetorical dimension is sizeable in the US-China relationship. As they both claim to seek cooperation and peace, and taking measures to improve their military-to-military activities on paper, their actions tell a different story. China is expanding, mainly in the South China Sea, and the US is searching for counter moves. As the US, in theory, views it as beneficial to have a more equal partner to cooperate with to provide for the continued stability and peace, it is also threatening that China has had such a rapid and extensive military modernization that may jeopardize US operations in the Asia-Pacific region (DoD 2014). In the international anarchy war can only be avoided as long as both US's and China's interests are protected (CSIS 2012). The problem is that those interests are on a collision course as China seeks to dominate the region, in part by acquiring new territories. China is seeking US respect for Chinese core interest in the region, but these core interests are both vague and evolving, as exemplified by the incident when a Chinese ministry spokesman for the first time, in April 2014, announced that the Senkaku Islands were a Chinese core interest (though this was later deleted from the transcript). More importantly, acknowledging these core interests would undermine other US alliances (Hadley & Haenle 2015; Zhao 2014).

3.2.2 Area of Concern: Taiwan

“Taiwan is part of the sacred territory of the People’s Republic of China. It is in the inviolable duty of all Chinese people, including our compatriots in Taiwan, to accomplish the great task of reunifying the motherland” (The National People’s Congress of the People’s Republic of China 2004: Preamble, section 9).

This abstract clearly states that Taiwan is to be considered part of the People’s Republic of China when it emphasizes that it is an *inviolable duty* for all Chinese people to reunify Taiwan with China. Not to work for this reunification is in direct contrast with the Chinese constitution, a constitution that is dated to 2004, making it a contemporary goal for China. Therefore there should be little doubt about China’s intentions in this matter.¹² China’s plans

¹² Until 1945 Taiwan was mainly under Japanese rule. In 1943 the Cairo declaration declared in a statement of intent that Taiwan, as well as Manchuria and Pescadores, were to be returned to Chinese control from Japan after World War II was over as punishment for Japanese actions in the war. This was followed through in the 1945 Potsdam Proclamation. However, there was an ongoing civil war in China at the time, where the Communist party was challenging the ruling nationalist party Koumintang. The result of the conflict was a separation and two rival states, where the Peoples Republic of China was founded by the Communist party and gained control over mainland China, and the existing Republic of China and the nationalist Koumintang retreated to Taiwan (BBC 2015a; BBC 2015b; NPM n.d).

for unification with Taiwan rests on the concepts of *one country, two systems*, in order to offer some limited accommodation to Taiwan (Haotian 2002). Through this accommodation China hopes to reach unification peacefully (as is the desired outcome), but if necessary through force as China reserves the right to secure its territorial integrity, an integrity that also comprises Taiwan in China's view (Khalilzad et.al 1999). As China writes in its 2013 White Paper: "(...) China will resolutely take all necessary measures to safeguard its national sovereignty and territorial integrity" (Chinese Ministry of National Defense 2013: Section 1, 4. Paragraph).

Even though China swear to be defensive in its military acts, others may perceive it as offensive. China considers the unification with Taiwan as defensively motivated (*internal affairs*), while both the US and Taiwan will consider this an offensive act (*external affairs*) (DoD 2013, 2014; Khalilzad et. al 1999; Zhao 2014) China has territorial claims in areas that are not currently under Chinese control besides Taiwan. The Senkaku Islands, Spratly Islands, Paracel Islands as well as claiming maritime rights to most parts of the South China Sea. These are territories that others also claim, and many of these are under *de facto* control of someone else. In China's view these territories have to be under Chinese control as they are vital to China's defense. These are strategic territories that will provide oil, gas and the ability to control the trade route and the freedom (or limiting) of navigation between the Middle East and East Asia. The Senkaku Islands are controlled by Japan, but China and Taiwan both claim eight uninhabited islands, approximately 100 miles north of Taiwan.

A future conflict with Taiwan is a driver and a key component in the Chinese military modernization program. A potential cross-strait conflict is necessarily thought to involve the US as it is the current regional hegemon. The US has close alliances with many of China's neighbors, including Taiwan through the 1979 Taiwan Relations Act (CSIS 2012). In 2014 President Obama clearly stated that Article 5 covered the Senkaku Islands in the Japan-US Treaty of Mutual Cooperation and Security,¹³ and therefore under the US protection should Japan suffer an armed attack (Panda 2014).

¹³ See Japan-US Security Treaty (1960).

3.2.3 Competing Strategies

“Changes in the form of war from mechanization to information are accelerating. Major powers are vigorously developing new and more sophisticated military technologies so as to ensure that they can maintain strategic superiorities in international competition in such areas as outer space and cyberspace (Chinese Ministry of National Defense 2013 section 1, paragraph 2).”

Space and cyberspace are now rapidly entering the field of war, and exemplify the unpredictability of the nuclear era. The reliance on the Internet, positioning and communication in warfare has created new ways of attacking. It is enabling computer and satellite attacks (Air-Sea Battle Office 2013). To win a future war, China (as does the US) identify space and cyber capabilities as crucial to its ability to deter or defeat an adversary that possesses these technologies in an informationized local war, for example over Taiwan. It is thought to be vital for the US to gain superiority in those domains to hold its position in the Asia-Pacific, as any attacks on the communication lines would make operations in the Asia-Pacific difficult (CSIS 2012). In order to best make use of the technology in an eventual future war, China has developed its Anti-Access Area Denial concept, while the US has developed Air-Sea Battle as a response.

A2AD: Anti-Access Area Denial and the New Historic Mission

“China’s armed forces broaden their visions of national security strategy and military strategy, aim at winning local wars under the conditions of informationization, make active planning for the use of armed forces in peacetime, deal effectively with various threats and accomplish diversified military tasks” (Chinese Ministry of National Defense 2013 section 1, paragraph 3).

The People’s Liberation Army’s (PLA) modernization has been a motivated effort for the last decade through the “New Historic Mission” articulated by the former Chinese President Hu Jintao. The mission is driven by the China Communist Party’s (CCP) strategic objectives. The PLA is to provide the CCP with a guarantee of strength to consolidate its political position, and to safeguard national interests as well as world peace by 2025. The PLA and its modernization focus on fighting and winning high-intensity, short duration, regional military conflicts in protecting their sovereignty and territory (DoD 2013:15; Chase, Berkowitz, Cheung, Engstrom, Gunnes, Harold & Puska 2015).

The idea of A2AD – the desire to deny the adversary access and ability to maneuver – is not a new idea, but because of the technological advances, potentially aggressive actors can now attain the military capabilities to see it through. Both production and proliferation of a new generation of weapons with improved accuracy, lethality and range are initiated. With adopting this strategy China is seeking to force potential adversaries to operate from a distance, and, in the US case, undermine the credibility of US deterrence in the region. This is because US allies in the region may doubt the US ability to counter potential Chinese power and seek accommodation with China rather than the US (Air-Sea Battle Office 2013).

Table 3.3: Anti-Access Area Denial

Anti-Access (A2)	Area-Denial (AD)
<p>Action intended to slow deployment of friendly forces into a theatre or cause forces to operate from distances farther from the conflict than they would otherwise prefer. A2 affects <i>movement to</i> a theatre.</p>	<p>Action intended to impede friendly operations within areas where an adversary cannot or will not prevent access. AD affects <i>maneuver within</i> a theatre.</p>

(Source: Air-Sea Battle office 2013:2)

Many states in the region fear China’s increasing power, and the US therefore has to respond to these concerns and be a counterweight in the region, and reassure its allies so that they remain in faith of US power projection, also towards an increasingly stronger China. This is referred to as the *Rebalance to the Pacific* (Zhao 2014). The US is countering the Chinese ambiguities with assurances to its allies (CSIS 2012). Etzioni (2013) emphasizes that the US has been the unchallenged power in the Western Pacific for over 60 years, providing security for the region. The US military might is based on projection of power through full and uninhibited access to the global commons with deployed forces through aircraft carriers and fixed bases. The US military bases and aircraft carriers have traditionally played a crucial role in US power projection and deterrence. Through the A2AD China is attempting to deny the US the ability to efficiently make use of its nearby bases and sea. This is a problem, as the Western Pacific theatre is so large. In addition, the US Air Force only has one base positioned within 500 nautical miles from the Taiwan Strait, making the fighter operations more difficult as they operate best within those 500 nautical miles. China, for its part, has 27 such bases within the same range of the Taiwan Strait (Stillion & Perdue 2008).

ASB: Air-Sea Battle and the Rebalance to the Pacific

“The Department of Defense recognizes the need to explore and adopt options that will preserve US ability to project power and maintain freedom of action in the global commons. (..) In January 2012 the President of the United States and the Secretary of Defense specifically tasked the US military to project power despite A2AD” (Air-Sea Battle Office 2013:1).

To counter the A2AD capabilities one has to create a concept that is based on how the adversary may employ A2AD, and for this purpose the Air-Sea Battle (ASB)¹⁴ doctrine was developed in accordance with the rebalance to the Pacific. It specifies how the US should and can respond to the A2AD challenge and helps project power by deterring adversaries and bringing assurance to US allies. The ASB helps maintain US freedom of action when the A2AD is designed to hinder it. It also enables conduct of limited strikes and show of force (Air-Sea Battle Office 2013). The maturation and proliferation of disruptive technologies, such as A2AD, undermines traditional sources of US military advantage (Martinage 2014). The goal of the ASB is to allow the existing military units in the US military to work together more effectively, to counter the A2AD effectively. It is worth noting that China does not present their strategy as A2AD, nor does the ASB formally counter China as a potential adversary (Air-Sea Battle office 2013; Raska 2012).

Table 3.4: Air-Sea Battle

Networked, Integrated and Attack-in-depth (NIA)	Disrupt, Destroy, Defeat (D3)
The application of cross-domain operations across all the interdependent war-fighting domains (air, sea, land, space and cyberspace) with intent to commence D3 to defeat A2/AD capabilities and provide maximum operational advantage to friendly joint and coalition forces.	<i>Disrupt</i> C4ISR (command, control, communications, computers, intelligence, surveillance and reconnaissance) networks (gain decision advantage), <i>destroy</i> enemy capabilities (regain freedom of action) and <i>defeat</i> enemy employed weapons (sustain offensive operations)

(Source: Air-Sea Battle office 2013: 4-5)

¹⁴ ASB recently changed name to Joint Concept for Access and Maneuver in the Global Commons (JAM – GC). As ASB is an established concept in the literature, I will refer to it as ASB rather than JAM – GC. For more information see Usni: News (2015).

The US Centre for Strategic and Budgetary Assessments (CSBA) runs war games envisioning future war scenarios. They are set 20 years ahead in time, and China is portrayed as an aggressive enemy seeking hegemony. US aircraft carriers are sunk by guided anti-ship missiles, American air bases are struck simultaneously to hinder the US from launching its fighter jets, leaving the American force to fight with conventional strikes on the Chinese mainland (Jaffe 2012). The ASB is viewed by defense analysts, both in the US and in other countries, to be provocative to China, as it in peacetime is excessively expensive and in a potential war it could manifest into incalculable destruction, both human and economic. For the ASB planners it is crucial to project that China certainly would lose should it engage militarily against the US. With employing the ASB the US hopes to enjoy the ability to end a future conflict with China in the same way as it did in World War II: China is defeated and the US can dictate the terms of that defeat (Etzioni 2013).

A US response through ASB toward a China that employs an A2AD strategy can be divided into three. First, the PLA intelligence, surveillance and reconnaissance assets will be targeted by submarine or ship launched cruise missiles, and the dropping of smart bombs from stealthy aircrafts, with the intent of blinding and incapacitating China by denying them the possibility of full situational awareness, and give US aircraft carriers access to the battle space. Second, a disruption of critical Chinese air defense networks, such as PLA surface-to-surface missiles and land based missile launchers to provide the US with air superiority. The last phase involves follow-up operations, such as blockades to ensure continued regional US freedom of action (Bitzinger 2012; Raska 2012)

3.3 New Domains and the Offense-Defense Balance

Based on the empirical data, Table 3.5 lists the different possible domains where war can be waged, why those domains are targets in a possible war, what technologies that can be used to attack those domains and what impact they are perceived to have on the offense-defense balance based on the empirical data presented in Table 3.2. *Air*, *sea* and *land* are domains that are familiar from previous wars, yet their roles alter as warfare develops and new domains are accessed. Accentuated in the empirical data is the perceived role of the new domains *space* and *cyberspace*.

Table 3.5: Domains and Technology – the Effects on the Offense-Defense Balance

DOMAIN	INTENTIONS	TECHNOLOGY	OFF./DEF. EFFECT
Space	<ul style="list-style-type: none"> - Attack satellites to deny adversary communication, navigation and intelligence - Use satellites to gain information about the adversary and hence, information superiority. - Seize initiative 	<ul style="list-style-type: none"> - Ground-based lasers - Long range ASAT missiles - Satellites 	<ul style="list-style-type: none"> - Promotes first strike through wish for information superiority/asymmetry - Blinding campaign makes estimation more difficult/secretcy - Minimizing human casualties
Cyberspace	<ul style="list-style-type: none"> - Gain access to intelligence/information - Attacks on infrastructure, both civil and military - Developed countries most prone 	<ul style="list-style-type: none"> - Software/Hardware -Computer networks - Hacking/Viruses - Satellites/ Internet 	<ul style="list-style-type: none"> - Promotes first strike through element of surprise/ difficult to create defense - Very secretive/estimation more difficult -Minimizing human casualties
Air	<ul style="list-style-type: none"> - Control over either land or sea territory to keep adversary from succeeding - Easy access over large territories - Surveillance/intelligence - Deny access/blind 	<ul style="list-style-type: none"> - Fighters - Precision guided munitions -UAVs 	<ul style="list-style-type: none"> -Surveillance fosters first strike - Can do damage without large number of soldiers (element of surprise) (cleaner wars)
Sea	<ul style="list-style-type: none"> - Control flow of merchandise and supplies, such as weapon traffic - Strategic buffer zone - Deny access/ blind 	<ul style="list-style-type: none"> - Ships/Air Craft carriers -Air support, fighters and UAVs - Submarines and unmanned underwater vehicles (UUVs) 	<ul style="list-style-type: none"> - Projecting power and maintaining control promotes first strike - Estimation difficult - Attacks on aircraft carriers make difficult to avoid human losses
Land	<ul style="list-style-type: none"> - Attack strategic goals - Infrastructure - Isolate important targets - Deny access/blind 	<ul style="list-style-type: none"> All of the above except submarines and UUVs - (Nuclear weapons) 	<ul style="list-style-type: none"> - Estimation of quantitative/qualitative ratio more diffuse - Minimize human casualties to greatest extent, but more difficult than in the other domains

3.3.1 Space

Armed forces are increasingly reliant on space-based assets for communication, targeting, surveillance and navigation. 17 of the 23 empirical sources indicate that space will play a significant part in a future war between China and the US and that the weaponization of space is upon us.¹⁵ China is developing substantial space capabilities, and of the most mature technologies, its anti-satellite (ASAT) missiles and its ground-based lasers can be mentioned (DoD 2015:13-14). In a future US-China war scenario, the use of space is linked to both the *attack on* satellites, as well as the *use of* satellites. In attacking satellites the adversary is blinded by denying its use of satellites that provide important real-time information, likely causing problems with the execution of its military operations. The attack on satellites can prove to be a powerful tool for China against the US, as the US is heavily reliant on this real-time flow of information (IISS 2015a:13). The use of satellites for military purposes can provide information superiority to those that possess such capabilities, and will likely benefit the US more than China due to the versatile US space assets (Pollpeter, Anderson, Wilson & Yang 2015:16).

Information Superiority = First Strike?

In Operation Desert Storm against Iraq in 1991, space was for the first time actively (and successfully) used to achieve situational awareness through information superiority during war (Watts 2011:2). Having information superiority is to be able to *use* information freely, and at the same time *deny* adversary-use of information (Pollpeter et al. 2015:8). Space will be a key domain in that so much of the events in the other domains are reliant on the real-time information provided by the space-assets. In order to have a chance against the militarily superior US, 16 of the 23 empirical reports indicate that China (as any potential adversary) will likely exploit the perceived US space-vulnerability and launch preemptive attacks on space-assets to blind and deafen the US, leaving China with everything to gain on striking first as this will incapacitate US ability to perform its informationized warfare. The information one can access allows for situational awareness, whilst the denial of adversary communication hinders its situational awareness, both of these mechanisms are thought to

¹⁵ For explicit examples of this, see Air-Sea Battle Office (2013:2); Chase et al. (2015:17); Chinese Ministry of National Defense (2013, 2015); Cliff, Burles, Chase, Eaton & Pollpeter (2007:57); CSIS (2012:12); DoA (2014:11); DoD (2013:32); (2014:30); (2015:33); Easton (2013:7); IISS (2015a:13); Khalilzad et al. (1999:81); Martinage (2014:23); Pollpeter et al. (2015:1); Van Tol, Gunzinger, Krepinevich & Thomas (2010:19); Watts (2011:9).

cater to first strike, according to the empirical data.¹⁶ China is improving its adversary denial capabilities in space to prevent or limit adversary use of space-based assets in a potential conflict (DoD 2014: 32-33; DoD 2015:13-15). In space, China is still behind US development, but as in the other domains, its modernization is rapid, and at some point China is likely good enough to compete at the same level as the US, especially if the US give less importance to military technological innovation in the future (Chase et al. 2015:17-18; Pollpeter et al. 2015: 115).

To achieve space dominance, Chinese writings accentuate attacks against targets in air, ground, sea or space with the use of space (mainly through denying adversary use of satellites, and hence loss of situational awareness) as well as attacks against targets in space from air, ground, sea and space (Pollpeter et al. 2015:8). Also the Chinese Ministry of National Defense (2015) writes about the importance for China to seize the initiative in the space domain, indicating that it acknowledges the perceived value of the domain. In order to determine whether the new technology is offense-dominant there has to be a first strike advantage for both states, as this will be reinforced by traits of the technology itself. Van Tol et al. (2010:58) highlight that within the scope of ASB both US neutralization of PLA assets, as well as the destruction of important components of PLA's counter-space capabilities is potential actions in a campaign against China. Should such initial preemptive attacks prove successful it could impose vital restrictions on the PLA's ability to maintain or increase situational awareness and its attack performance on US assets. This indicating that both sides may have a benefit of first strike in the space domain.

National sovereignty is not apparent in space, hence complicating arms control. China (and perhaps also the US) does not appear interested in arms control (Pollpeter et al. 2015:19). The absence of sovereignty in space may foster first strike comparable to the air domain. Examining Chinese sources, Pollpeter et al. (2015:13) and Cliff et al. (2007:57) both highlight that China regards space warfare in the context of air warfare.

¹⁶ See Air-Sea Battle Office (2013:3-4); Chase et al. (2015:17, 114-115, 135); Chinese Ministry of National Defense (2015); Cliff et al. (2007:14, 45, 57-58); CSIS (2012:12); DoA (2014:11-13); DoD (2013:9, 32-33, 2014:11, 32-33, 2015:14-15, 33-35); Easton (2013:9); IISS (2015a:13); Khalilzad et al. (1999:81-82); Martinage (2014:31-32); Pollpeter et al. (2015:10,111-112, 116); Van Tol et al. (2010:21, 27, 56); Watts (2011:4-5). Let it be noted that both Chase et al. (2015) and Martinage (2014) are quoting the DoD reports in their analysis.

China is strengthening its space capabilities, probably with a desire to gain more control over joint operations by the use of information through real time reconnaissance, surveillance and warning systems (DoD 2015:35). Informationized warfare can be used as an asymmetric means to weaken the ability an adversary has to use, process, acquire and transmit information during war (DoD 2015:37). This domain is important to the US conduct of informationized warfare, so for China to deny access to this domain is crucial as 15 of the 23 reports indicate that the US is likely to win a war against China in the conventional domains of air, sea and land, should it have access to space-based information assets.¹⁷ According to DoA (2014:11,13) the weakest link of US conduct of war is also one of its strongest assets; namely the connectedness and the flow of information. Adversaries invest in anti-access area denial capabilities to hinder US effective response and hence its power projection. These capabilities, ranging from unmanned areal systems to long-range precision fires, air-defense systems, computer attacks and ASAT attacks challenge US deployment and its ability to project power from the air and maritime domains onto land. China is becoming more reliant on the information provided by satellites, and hence growing more vulnerable to attacks on these assets (DoD 2013:32-33, 2014:30-31, 2015:33-34; Chase et al. (2015:115; Pollpeter et al. 2015:116). China should be prepared for counter attacks should it initiate a blinding campaign against a potential adversary (the US) (Easton 2013:14-15).

Vulnerability and strength follow each other, making areas of strength vulnerable, as the strength of one state is dangerous for other states. For the US and China to acquire offensive capabilities to disrupt each other's flow of information, they both have to increase their reliance on informationized systems. By today standards China seems to be in pursuit of an asymmetrical advantage over the US, but by pursuing this advantage China will at some point be symmetrically responding to the threats the US seems to be more vulnerable to today. The consequences of this may be that the US attempt to deter Chinese A2AD capabilities, resulting in a potential unstable situation making it advantageous for the both to strike first. Pollpeter et al. (2015:112) writes:

¹⁷ See Chase et al. (2015); Cliff et al. (2007:xvi); CSIS (2012); DoA (2014:11); DoD (2013:10, 2014, 2015:); Easton (2013:17); Khalilzad et al. (1999); Martinage (2014); Pollpeter (2004); Pollpeter et al. (2015:15); Stillion & Perdue (2008), Van Tol et al. (2010:24-27); Watts (2011:8).

“(..)Certainly China’s extensive counter space programs, coupled with US plans to gain advantages in space control technologies and to accelerate initiatives to counter adversary space capabilities including adversary ISR and space-enabled precision strike, suggest that outcome is now more probable.”

China might possess such an asymmetrical advantage fostering first strike in the space domain against the US. Although the Chinese space assets are vulnerable (Chase et al. 2015:115-117), a US attack on Chinese space assets would likely not serve the same purpose, mainly because Chinese capabilities are designed to counter others’ dependency on space (Chase et al. (2015:118), and are hence launched from the land domain, not space, through ground-based lasers or a launch of ASAT missiles (DoD 2015:14-15, IISS 2015a:10). This could in turn potentially lead to an escalation into the land domain should a counter-strike occur. It is plausible to think that in the event that the two were equally dependent on space, the first strike would be equally beneficial (and possibly equally problematic), in that both would necessarily be blinded, and both would lose an equal amount of situational awareness.

Blinding Campaign = Estimation Problems?

The reason why a blinding campaign through an attack on US space assets may have detrimental consequences is because it would likely limit the performance in all the other domains. If one no longer has information about the enemy’s whereabouts or actions, nor control over friendly forces, decisions and evaluations of a situation have to be done on the basis of pre-existing information, not allowing for real-time assessments increasing the possibility for miscalculation To ensure substantial damage to US performance, an adversary could target an Advanced Extremely High Frequency (AEHF) satellite, according to US Air Force General William Shelton. If one such satellite were to be incapacitated it would create a large geographical gap that would influence data transmission across large distances, making the US way of informationized warfare difficult to conduct. China demonstrated such capabilities when it in January 2007 performed an ASAT test shooting down one of its own weather satellites, causing US concern (DoD 2013:33). Since then, China has been believed to have executed ASAT tests both in 2010 and in 2014 (IISS 2015a:13). With these evolving ASAT capabilities, China can obstruct substantial US cyber and space capabilities. Should China be successful in denying US access to cyber and space assets, the US may be forced to project power from land to all the other domains, which in the Asia-Pacific theatre can be difficult as the land available to the US is highly limited (Easton 2013:8). In war games,

China often denies enemy use of satellites, based on the notion that the US has more to lose. For its precision warfare, the US is dependent on space, and this combat form is the one the US wishes to employ. China understands these US dependencies and should be expected to seek to deny US access (Watts 2011:5).

In an attempt to secure the space domain, the US is advancing its monitoring capabilities. With the advent of the US Air Force's Geosynchronous Space Situational Awareness Program (GSSAP), a satellite program designed to deter potential rivals in space as the GSSAP satellites can provide close up imagery of objects, it is no longer as easy to remain anonymous when engaging in hostile activities in space. Two such satellites were launched on July 28 2014, and should begin to deliver information in 2015. This project is highly classified, and the only reason its existence is known is that, for purposes of deterrence, the adversary needs to know that it exists. In attempts to control space, to deter and potentially disrupt future attacks, the US has improved its terrestrial radars to gain access to intelligence on Chinese launches (IISS 2015a:14). When anonymity is compromised, so is the element of surprise. As little is known about the GSSAP satellites, speculations regarding their possible impact are highly elusive. Although it is likely to help US estimation, it is also possible it may foster a more rapid escalation of a potential conflict, should it be uncovered that China had shot down a US asset or launched a potentially threatening object. Such a scenario could lead to increase US fear, and potential preemptive attacks. It is not easy to know the intentions of others, and it can be beneficial to either exaggerate or downplay own capabilities in some cases to install the adversary with skewed expectations. Chase et al (2015:50) writes that "(..) It is possible that the PLA may be seeking to present itself as less capable in some dimensions, to shape potential adversaries' expectations and planning." This may also be the case for the US in that so many of the reports hold that space is a great vulnerability for the US. It is difficult to know whether this vulnerability indeed is as large as proscribed.

If successful in its blinding campaign, China may interpret US loss of situational awareness in a way that gives China false expectations of own capabilities, in that it may perceive its own capabilities to be better than those of the US, and perhaps better than what they actually are relative to US capabilities. This can give China over-confidence in its own capabilities, and promote striking first. (Easton 2013:14).

Vulnerability = Secrecy?

Also fostering to estimation difficulties is the level of secrecy regarding space capabilities portrayed especially by China, but also by the US. China is secretive about its ASAT programs (DoD 2013:33, 2014:32 2015:35). In 2014 the Chinese was believed to have executed an ASAT tests. China holds it to be a missile intercept. Either way, this makes other states question China's intentions. China is believed to be investing in capabilities to influence operations in space, something that can threaten the US and its space services (IISS 2015a:13). For both China and the US it appears beneficial to be secret about their capabilities. For China, these benefits include to preserve the impact of a potential surprise attack on US space assets through a blinding campaign *gaining* information superiority, and for the US the key is in gathering intelligence, and *preserve* the information superiority in a potential surprise attack on Chinese ground-based assets.

As for secrecy the US-China case offers some challenges regarding measurements. This is mainly because China's secrecy and perceived strategic ground pillar of denial and deception (DoD 2015:47) must not be translated into traits of the new technology. As the secrecy of China is so often accentuated, it is difficult to evaluate how secrecy is promoted through the implementation of new technology, as it may very well be traits of China and its strategic culture rather than the technology itself. However, all great-power relations, especially between two rivals where both see their security challenged by the other, are affected by secrecy. There are indications, however, that the new technology allows for secrecy. With the exception of the GSSAP program, anonymity is a long way guaranteed in the space domain (IISS 2015a:14). Space is offense-dominant in that it seems easier to attack than to defend space assets, either assets located in space, its ground-based assets or the lines of communication (Chase et al. 2015:116). Although the US is most reliant on space-based attacks of the two, China is also having difficulties building a sustainable defense to protect its growing space interest, a problem that may become an even bigger problem as the PLA increase its reliance on vulnerable space based assets (Chase et al. (2015:119, 136).

China may value the denial of US access to space so high that it is willing to sacrifice its own access. Through its rapidly increasing anti-space capabilities China may seek to take advantage of the US's dependency on space systems in the coming decade. However, the advantage of first strike on space assets may lie with the US, as China may be dependent on

the use of these assets to conduct its anti-space attacks to hurt US assets. This indicates that the advantage follows the one who strike first (Van Tol et. al 2010:34). However, China is developing more space capabilities and desire to be more reliant on space (Pollpeter et al. 2015:7). In 2012 China conducted at least 18 space launches (DoD 2013:9), in 2013 at least 8 (DoD 2014:10), and in May 2015 China announced plans to launch 40 space-crafts in 20 separate space launches in 2015 (Akbar 2015).¹⁸ Reliance on any domain, and its adhering technology, will necessarily translate into an increased threat directed at that domain (Pollpeter et al. 2015:116). As China is becoming more reliant on space, it is likely to face more vulnerability in these areas, which is likely to foster Chinese insecurities, and hence protection through secrecy in this area. As the perceived space-threat is growing, more resources are being directed at securing space operations. China is often accentuated as the most secretive of the two, as it perceives its military inferior to that of the US. In parallel with the US seeing its space assets as increasingly vulnerable, the more secretive its space operations has become. Possible evidence for this may be the 2004 budgetary disappearance of the Counter Surveillance and Reconnaissance System, implying that it was either terminated or classified (IISS 2015a:15).

That some of the space technologies China possess are more mature than others, does not mean that they are mature enough for China to take control over space in a possible future war with the US (IISS 2015a). The US has developed its space capabilities for the entire latter part of the 20th century, and have continued to do so in the 21st. Many of China's strives in space are directly based on US (and Soviet) ground work (Easton 2013:9). With this being said, space and cyberspace may be the two domains that China can more rapidly gain access and control over comparative to the US because the acquisition of capabilities in these domains is easier, because it depends more on pure technology than buildings and quantities.

The space domain is increasingly important due to dependency on communication for command and control, precision strikes and detection of targets (Van Tol et al. 2010:56-60). The US has enjoyed military supremacy since the end of the Cold War, and China now stand as the one single actor perhaps strong enough to challenge this. The US threats have grown as these two domains have emerged as a part of future warfare (DoA 2014:11-12). The space-

¹⁸ These launches are made to expand satellite constellations for surveillance, intelligence, reconnaissance, meteorology and communication (Akbar 2015).

based assets that have enjoyed an integral part of this US supremacy, may be compromised for the first time.

Minimizing Human Casualties = Cleaner wars?

As space is less accessible for humans, than air, sea and land, the empirical data suggest that warfare in this domain promotes cleaner wars, making it a valuable domain in a possible future war. The US is perceived to have developed a casualty aversion. Because of its democratic structure, the US is likely the one that has the highest requirements of clean wars of the two. However, in the advent of a US-China war it is uncertain how clean or unclean it will be, as China has not signaled a similar casualty aversion. In fact, according to 12 of the 23 reports, Chinese military writings and the A2AD strategy seem to accentuate exploiting this aversion.¹⁹ With an attack on space, the cleanness of war is likely to be compromised, as it denies US access to information that allows for them to operate with precision. With the use of space, information can be gathered, and on the basis of this surprise attacks can be performed so that the impact can be as clean or as unclean as is desired. Although it would be more effective to launch large, sky-clearing operations if the desire is to create as much physical damage as possible, such operations would put China in a war with both the US and, possibly, US's allies. Therefore, more discrete ASAT attacks will probably benefit China more. That is also why this new technology is thought to be threatening: Because attacks on information infrastructure, in contrast to large, sky-clearing ones, are more likely, and caters less to nuclear escalation (Krepinevich 2010:3).

The US relies on information systems to strengthen its military capabilities and to ensure as low casualty rates as possible. This can be exploited by potential adversaries, and as DoA (2014:10) writes:

“Enemies avoid us strengths (such as long-range surveillance and precision strike) through traditional countermeasures (such as dispersion, concealment and intermingling with civilian populations). AS new military technologies are more easily transferred, potential threats emulate US military capabilities to counter US power projection and limit US freedom of action. (...) State and non-state actors apply technology to disrupt US advantages in

¹⁹ Chase et al. (2015); Cliff et al. (2007:41); DoA (2014); DoD (2013, 2014, 2015); Easton (2013); Khalilzad et al. (1999); Pollpeter et al. (2015:112); Stillion & Perdue (2008); Van Tol et al. (2010:20); Watts (2011).

communications, long-range precision fires, and surveillance. Enemy actions reduce U.S ability to achieve dominance in the land, air, maritime, space and cyberspace domains.”

The technology itself does not promote human casualties. It has been specifically developed for a purpose, for which it can be employed depending on the intentions of those in possession of the technology. The technology of today is developed by the US to try to avoid casualties, whilst China seem preoccupied with the countering of US capabilities. DoA (2014:12), when possibly writing about China, claims that US adversaries operate in heavily populated areas to neutralize US military advantages.

3.3.2 Cyberspace

The amount of critical information that today is transmitted, shared and stored on computer networks makes cyberspace a potential domain of war, much like the physical domains. For weak militaries, the use of cyber capabilities can be an effective tool to fight strong, information-dependent militaries (Cliff et al. 2007:54). However, cyberspace separates itself from the other domains in that its weapons cannot cause physical harm outside of cyberspace, as the weapons are virtual (Krepinevich 2012:156-157). Cyber capabilities enable adversaries to access critical infrastructure, as well as vital intelligence (DoD 2013:36, 2014:34-35, 2015:37-38; Chase et al. 2015:115; Krepinevich 2012:2-3). Because of the heavy reliance on information systems and widespread Internet access, an attack can be done within the scope of minutes, with no real defense possibilities and with a potentially catastrophic aftermath, especially for developed countries as these rely more on computer systems, both when it comes to communication and storage of information, as well as control over critical infrastructure (Krepinevich 2012:172). It may be used to disrupt enemy actions by interfering with communications, logistics and trade (DoD 2013:36).²⁰

²⁰ An offensive cyber attack can be performed in different ways, such as a malware manipulation of software or hardware during production. A Chinese-produced microchip can store viruses that will activate when connected to a computer network in the same way American-produced software can contain the same. Another way of spreading viruses to software or hardware is through the Internet, or through the use of devices such as USB pens. To use USB pens are difficult as it require direct contact with a computer in the targeted network. Because of this, cyber capabilities rely heavily on satellites and the Internet, as this allows for the element of surprise and the anonymity to remain until an attacker is ready to announce its actions (Krepinevich 2012:83-90).

18 empirical reports explicitly deem cyberspace as an important domain in a future war between the US and China.²¹ According to 11 of these, China appears to be developing its cyber capabilities with the intentions of collecting intelligence, delaying adversary response to Chinese actions, hindering US power projection in the Western Pacific as well as functioning as a force multiplier alongside other capabilities in the physical domains.²² The Pentagon has stated that it will deter, and by necessity disrupt and deny, threatening cyber operations (IISS 2015b:52). The Chinese government has both the means and the authority to shut down the Chinese Internet connection to external components of the Internet (as not controlled by China), making the Internet an intranet. If China undertakes a cyber strike, it has the option to disconnect itself awaiting retaliation (Krepinevich 2012:58). The US, however, does not have the same privilege (Van Tol et al. 2010:35).

Information Superiority and Difficulties to Defend = First Strike?

As in space, first strike appears to be promoted through the desire for information superiority in the cyber domain. According to 15 of the 23 reports, access to information allows for situational awareness, making it more difficult to win for a potential adversary that has been attacked even though its capabilities in conventional terms surpass those of the other.²³ Especially, cyberspace is thought to be helpful for states seeking to gain information superiority over a stronger foe (DoD 2013:36). Offensive cyber capabilities are applied to deny freedom of action to adversaries in and through cyberspace (IISS 2014:20).

Because the cyber weapons are versatile, and can be used both to exfiltrate and change information (Chase et al. 2015:115; DoD 2013:36; DoD 2014:35;) as well as to attack critical infrastructure, such as electrical grids (Krepinevich 2012:2-3). There is not necessarily a warning of an ongoing attack (Krepinevich 2012:83-90). Because of this the advantage will

²¹ Air-Sea Battle Office (2013:2); Chase et al. (2015:115); Chinese Ministry of National Defense (2013, 2015); Cliff et al. (2007:52); CSIS (2012:12); DoA (2014:11,13); DoD (2013:36-37, 2014:34-35, 2015:37-38); Easton (2013:15); IISS (2015c:246); Krepinevich (2010:3, 2012:2); Martinage (2014:23); Pollpeter (2015:10); Van Tol et al. (2010:3); Watts (2011:6).

²² Air-Sea Battle Office (2013:2); Chase et al. (2015:115); Cliff et al. (2007 51-52); DoA (2014:13); DoD (2013:36, 2014:35, 2015:37); IISS (2015c:246); Krepinevich (2012:57-61); Van Tol et al. (2010:3); Watts (2011:6).

²³ See Air-Sea Battle Office (2013:2-3); Chase et al. (2015); Chinese Ministry of National Defense (2013, 2015); Cliff et al. (2007:35,38-39); CSIS (2012); DoA (2014); DoD (2013:36, 2014:32, 2015); Easton (2013); IISS (2015a); Krepinevich (2012:3); Van Tol et al. (2010); Watts (2011).

lie with the one who invests in the offense, given equal resources (Krepinevich 2012:144). Van Tol et al. (2010:28, 35) regards the cyber competition to likely favor the offense, and in the specific case between the US and China, China would enjoy the advantage as the US is more reliant on cyberspace than China. One has to trust one's existing cyber defense; either it is good enough to withstand an attack, or it is not. It is difficult to make real-time steps to counter an ongoing attack (Krepinevich 2012:88-89). The cyber domain requires a constant allocation of new capabilities to withstand enemy disruption (DoA 2014:11).

US computer networks are under constant attack, many of which are thought linked to the Chinese government with the purpose of exfiltrating intelligence for its own benefits. China is also raising concerns about the safety of its cyber assets, and it is safe to assume that it experiences attacks on its cyber assets originating in the US (Chinese Ministry of National Defense 2015) The exfiltration of information can potentially foster first strike, as the skill set and resources required to do this is similar to those needed to launch an offensive cyber attack (DoD 2015:38-39). A cyber attack can be deemed successful when the attacker has achieved access to a network. Depending on the goal of the attack one can inflict damage from subtle manipulation, as changing financial data or medical results, to export or destruction of data (Krepinevich 2012:87). The PLA perceive that the key to gain superiority in cyberspace is to deter adversaries from developing offensive cyberspace capabilities.²⁴

Whilst most of the 23 reports accentuate the need for cyber control, 12 of them specifically address China's need to secure areas of asymmetric advantage, such as exercise control over the cyberspace domain to stand a chance against the US conventional capabilities as these outweigh those of China.²⁵ China has expressed that it will partake in the military competition and accommodate the cyber domain (Chinese Ministry of National Defense 2015). China might not stand a chance against the US if it cannot disrupt and distract US communication and maneuver through cyber and space dominance. A Chinese cyber attack will likely have the intentions to disrupt US computer networks (Watts 2011:9), or of launching an information blockade (DoD 2015:33). Both sides are likely to use offensive cyber operations (Van Tol 2010:35). Chinese cyber strategy – according to Chinese writings – entails that it

²⁴ See DoA (2014:13); DoD (2013:32, 2014:30-31, 2015:33); Van Tol et al. (2010:20).

²⁵ Chase et al. (2015:14-15); CSIS (2012:12); Cliff et al. (2007: 44-45); DoA (2014:13); DoD (2013, 2014, 2015); Easton (2013:7); Krepinevich (2012); Van Tol et al. (2010:35); Watts (2011:6, 9).

will use computer networks to defend China's sovereignty and territory, as well as use it against sophisticated adversaries that are highly dependent on the information provided by cyber capabilities.

In terms of physical destruction, the cyber domain is regarded as the least efficient (Krepinevich 2010:3, 2012:156-157). However, this is not to say that it will not hold an important role in a potential future war. Information superiority provides valuable intelligence as to how one can achieve the best results, given one's objectives. It can also provide states with a more legitimate way of hurting an adversary, than the use of firearms, or nuclear weapons would. The risk of retaliation is fairly low compared to other forms of warfare. This definitely complicates thinking about strategy. Cyber weapons cannot replace nuclear weapons, but they can disable power grids and other strategic targets rapidly and reliably (Krepinevich 2010:3). Cyberspace makes it possible to fight and win without the need for conventional military action. According to China, the use of cyberspace is an unconventional preemptive domain to access information (DoD 2013:10).

Vulnerabilities = Estimation Problems and Secrecy?

If little is known about the space programs of the US and China, even less is known about their cyber programs. These capabilities are not openly expressed and such attacks can be difficult to detect.²⁶ As little is known, and what is known is known mainly to enforce a deterrent effect it is difficult to discuss this domain confidently. One can say less about cyber weapons today, than following the introduction of nuclear weapons in the 1940's (Krepinevich 2012:171). Because of this secrecy it remains difficult to measure the cyber capabilities of each state and try to make comparisons to see who is the stronger party. Few states have expressed cyber strategies (IISS 2014:19).

²⁶ Although detection is difficult, there are some attacks that have been detected and proscribed China in the past decade. In 2002, in a matter of 20 minutes, Operation Titan Rain penetrated the US Army Information Systems Engineering Command, and other sites. Titan Rain is the name of a Chinese scanner that looks for vulnerabilities in national defense and high tech industrial computer networks. Everything on hard drives were copied and sent to computers in South Korea, Taiwan and Hong Kong. This attack was not discovered until 2007. In 2006 Operation Shady RAT, also believed to originate in China, targeted more than 70 organizations, including the UN and the International Olympic Committee (IOC). National secrets, SCADA configurations, source code and databases were among the information compromised. In 2009, in the Night Dragon attack, global oil and energy companies were targeted and the Aurora cyber attack is believed to have stolen the source code for the Google password management program called Gaia (Krepinevich 2012:67-74).

Governments have been less than willing to present information about their cyber capabilities and the activities linked to these. The production and testing of cyber arms does not require massive physical bases as it is normally an indoor activity that can be performed from any existing facility, allowing operations to be more hidden than something that has to be tested outside, such as missiles and submarines. Cyber space is not *independent* of geography, as one has to have a physical computer and a physical location to connect to cyber space from, but it is *less dependent* on geography in that the production and testing of cyber capabilities can be done from someone's living room (Krepinevich 2012:171).

Cyberspace has no national borders. This fosters secrecy as there are no clear guidelines for interaction, such as arms control or sovereignty. Anonymity can almost be guaranteed. There is no automated warning system, and that is a powerful effect, as it may allow for planning for the first striker, giving them the upper hand whilst the target will not be able to keep up pace as the new technology allows for speed in conflicts, less time to make decisions (Krepinevich 2012:30-31). It may allow for testing and failing of new technologies, without an adversary having to know, both when it comes to attacks, but also when one applies new technology to own systems. Damage in this domain is not easily detected unless an attacker announces it has performed an attack, or the attacked announces that it has been attacked, both scenarios quite rare. It can take years to figure out there has been an attack. In fact, those that have suffered an attack might benefit from not announcing an attack, to hinder others taking advantage of the same vulnerability and allow it to be fixed without ongoing danger. Should a state announce such a breach, it could be with the purpose to mislead. (IISS 2014:21-22).

The cyber competition favors the offense because it is easier and cheaper to conduct attacks on the flow of information than it is to detect and defend against such attacks. US cyberspace capabilities have been fairly uncontested, but the growing Chinese capabilities may threaten this. The US reliance on information is a strategic weakness (Krepinevich 2012:63). As with space China is perceived to have an advantage in cyberspace given that it is able to choose time and place and hence have the advantage of striking first, as it is less dependent on the cyber domain. Should one assume symmetrical cyber capabilities on both sides, the impact of an attack would likely damage the US more than China as China may defend its assets easier than the US because it relies more on closed networks than does the US, as well as most of the information and communication travel through buried fiber optics, making it difficult to

access for adversaries. The US is also likely to benefit from striking first by conducting offensive cyber operations. Who will benefit the most, however, may be a result of who that can best coordinate its cyber attacks with attacks in the other domains (Van Tol et al. 2010:28, 35). Chase et al. (2015:116) claims that China see itself as vulnerable to enemy cyber attacks. Chase et al. (2015:119) further stress that this is likely to become more apparent as China increase its reliance on information systems. As China has the option to disconnect itself awaiting retaliation (Krepinevich 2012:58), there might be an increased danger of escalation into one of the physical domains.

Minimizing Human Casualties = Cleaner Wars?

16 of 23 reports address the cyber domain and suggest that if the new technology fosters cleaner wars in the cyber domain is unclear.²⁷ First, isolated, cyberspace likely foster cleaner wars. This is because the weapons are virtual, and cannot cause direct physical harm (Krepinevich 2010:3, 2012:7). It also shows that it allows for the gathering of essential intelligence so that one can launch surprise attacks. It allows for precision strikes to effectively eliminate the desired targets, intelligence that may also allow for calculated human losses, (even though they in theory could be avoided with the implementation of the new precision and information technology), by attacking aircraft carriers, bases and the placement of targets in populated areas to deter an enemy from attack should it have casualty aversion.

As a possible effect of China being able to shut down its Internet from the outside world, cyber warfare may be seen as less effective against China, inviting to an escalation into the physical domains. With China possibly exploiting US casualty aversion by locating targets in heavily populated areas,²⁸ incapacitating the use of US precision weaponry, as well as denying US access to information, surveillance and reconnaissance (ISR) assets may render wars more similar to the wars of the past than the perceived high technology local warfare that the US and China is preparing for.²⁹

²⁷ See Chase et al. (2015); Cliff et al. (2007:41-42); CSIS (2012); DoA (2014); DoD (2013, 2014, 2015); Easton (2013); Khalilzad et al. (1999); Krepinevich (2010:3, 2012:7); Martinage (2014); Pollpeter et al. (2015) Stillion & Perdue (2008); Van Tol et al. (2010); Watts (2011).

²⁸ See Khalilzad (1999); Cliff et al. (2007:41-42); DoA (2014); Watts (2011).

²⁹ See Chase et al. (2015); Cliff et al. (2007:83); CSIS (2012) DoD (2013, 2014, 2015); Easton (2013:9); Krepinevich (2012:65); Martinage (2014); Pollpeter (2015); Stillion & Perdue (2008); Van Tol et al. (2010).

There is no evidence in the empirical data to indicate that cyber weapons can generate the catastrophic damage level of nuclear weapons. However, cyber attacks are more likely to occur than nuclear attacks as its attribution is not controlled solely by states, and are not as costly to develop as nuclear weapons. And as more have these capabilities, the more likely they are to be used (Krepinevich 2010:3, 2012:175-178).

The US and China seem to view the future of cyberspace in warfare in much the same manner according to 15 of 23 reports: As a crucial domain that needs to be controlled in order to secure information superiority, and hence increase the chances for victory, as discussed previously.³⁰ As nuclear weapons were the strategic tool of the industrial era, cyber capabilities are thought to play the same part in the information era. The deterrent effect of cyber weapons can be compared to that of nuclear weapons, but as cyber capabilities is precision based, it can enable attacks with far less human casualties. The threshold to launch a cyber attack is far lower than that of a nuclear attack, making cyber attacks more likely, and because of its non-destructive manner it is likely to be cleaner, and perhaps allow for escalation into the physical domains (Krepinevich 2010:3, 2012:177-178).

3.3.3 Air, Sea and Land

Air, sea and land will be treated together because, in war, all three domains usually complement each other and because the new technology is integrated into existing military structures. With the exemption of the two Chinese defense White Papers (Chinese Ministry of National Defense 2013, 2015), the general assumption of the empirical reports is that the future of regional peace in Asia – and for some, the future peacefulness of the world – depends on China's actions.³¹ In the event of war, the US advantage is linked to the use of advanced technology, whilst China's advantage is linked to the denying US use of this technology.³² US forces have always operated with the sea as a sanctuary, as no adversary has

³⁰ See Air-Sea Battle Office (2013:3-4); Chase et al. (2015: 34-41); Cliff et al. (2007:52); Chinese Ministry of National Defense (2013, 2015); CSIS (2012:12); DoA (2014:11-12); DoD (2013:36, 2014, 2015); Easton (2013:6-7); (IISS 2015a); Krepinevich (2012); Van Tol et al. (2010:28); Watts (2011:8).

³¹ See Table 3.2 for list of empirical reports.

³² See Chase et al. (2015:17,115); Cliff et al. (2007:28); CSIS 2012:19-20); DoA (2014:11, 13); DoD (2013:10 2014, 2015); Easton (2013:9,17); IISS (2015a); Khalilzad et al. (1999:77-79); Krepinevich (2012); Martinage (2014:1); Pollpeter et al. (2015:15); Stillion & Perdue (2008); Van Tol et al. (2010:27-30); Watts (2011:3-6,8).

had the necessary capabilities to counter it – although steadily increasing Chinese capabilities threaten to change this, at the same time threatening the US hegemony (Van Tol 2010:25).

In its assessment of China not being a hegemonic *global* competitor to the US by 2015, Khalilzad et al. (1999:59-60) predicted that by 2015 China could be a hegemonic *regional* competitor to the US where it could exercise sea denial, information dominance, aerospace superiority and present a strategic nuclear threat to the US, to protect Chinese territory, endangering US bases. Based on the more recent empirical material China still has a long way to go before they can win an informationized joint-operations war against the US (Chase et al. 2015:86-87). 16 of the 23 reports indicate that they believe the US is likely to win over China in a possible war, provided it remains conventional.³³ One reason for this is thought to be China's lack of combat experience (CSIS 2012:40-41), but more notably, 13 of the 23 empirical sources state that the US is thought to be militarily superior, if not in all domains, then definitely in the air, sea and land domains.³⁴

Behind US military operations the key assumptions are that the US can fight outnumbered and still win by having access to secure, close bases, that stealth will work, and that beyond visual range missiles will work. US qualitative advantages can be successfully countered by quantitative measures such as firepower and numbers. For example, US air superiority can be threatened in the Asia-Pacific if China can employ its quantitative measures through A2AD to hinder US accessibility to bases, as there are few airstrips in the Asia-Pacific (Stillion & Perdue 2008:7, 53, 67 Van Tol et al. 2010: 29-30, 51-52) China's rapid modernization may challenge US military supremacy and its long-standing military sanctuaries through the exercise of a number of capabilities that can make US military operations difficult, especially due to its offensive missile capacity and its emerging ASAT capabilities. Both of these sets of capabilities have the potential to cause a lot of damage at the onset of war, as they foster first strike, and they may potentially compromise the cleanness of war. Although the Chinese military transformation is incomplete, the US would certainly meet resistance against the rising Chinese military power (DoD 2014). For China to defeat a technologically superior US

³³ See Chase et al. (2015); Cliff et al. (2007:28); CSIS (2012:19-20), DoA (2014:11, 13); DoD (2013:10, 2014, 2015.); Easton (2013:9,17); IISS (2015a); Khalilzad et al. (1999:77-79); Martinage (2014:1); Pollpeter (2004); Pollpeter et al. (2015:15); Stillion & Perdue (2008); Van Tol et al. (2010:24-27); Watts (2011:3-6, 8).

³⁴ See Chase et al. (2015); CSIS (2012:15); Cliff et al. (2007: 2, 25-26); DoA (2014); DoD (2013, 2014, 2015); Easton (2013:7); IISS (2015b:40); Krepinevich (2012); Stillion & Perdue (2008:53); Van Tol et al. (2010:14); Watts (2011:8).

they have to strike first and seize the initiative – perhaps through preemption or a surprise attack, as a prolonged war is thought to benefit the militarily superior US, as their conventional capabilities surpass those of China (Van Tol et al. 2010:29-30, 51-52).

Information Superiority, Access Denial and Asymmetry = First strike?

15 of the 23 sources explicitly believe war to be triggered by a Chinese quest for Taiwan, and will revolve around each of the states' hegemonic status in the Asia-Pacific region.³⁵ China believes that peace is ensured through the control over sea that will translate into control over land (Chinese Ministry of National Defense 2013, 2015), and this is likely why China attempts to create a strategic buffer zone with its quest for the Senkaku, Paracel and Spratly islands, and why it invests in A2AD capabilities.³⁶ If this strategic buffer zone is successfully implemented, 13 of the reports claim that China might exploit the US dependency on deployment of aircraft by attacking US bases and aircraft carriers, hence making it difficult for the US to attack strategic goals and infrastructure, and to isolate important targets.³⁷ Cliff et al. (2007:111-114), CSIS (2012:17-18) and Van Tol et al. (2010:10) all assert that to maintain stability, and to stand equipped against China, the US has to be able to dominate any level of escalation. This includes to withstand first strike on bases, blind the PLA, attack battle networks, conduct campaigns against PLA missile and ASAT launchers, and seize the initiative – namely by striking first – in the domains of air, sea, land, space and cyberspace.

In a potential US-China conflict, based on PLA writings, Van Tol et al. (2010:21) assert that after an initial blinding attack on space and cyberspace, China is likely to proceed to attack air bases with ballistic missiles to deny the US access to its force assets and launch anti-ship missiles to US and allied warships to keep them out, and lastly perform attacks on US flow of supplies China is not a natural, strong sea power (Easton 2013:7), but it is investing in both defensive and offensive capabilities intended to achieve sea control over the near seas, and to

³⁵ See Chinese Ministry of National Defense (2013, 2015); Chase et al. (2015:24); Cliff et al. (2007:15, 26); DoA (2014:12-13); DoD (2013:55-59, 2014:53-57, 2015:57-61); Easton (2013:5); Khalilzad et al. (1999:6); Martinage (2014:47); Pollpeter (2004:1); Stillion & Perdue (2008:31); Van Tol et al. (2010:13-14); Watts (2011:7).

³⁶ For examples of direct statements see CSIS (2012:40); DoD (2013:3, 2014:3-4, 2015:4-5); Easton (2013:7); IISS (2015c:207); Khalilzad (1999:30).

³⁷ See Air-Sea Battle Office (2013:2-3); Cliff et al. (2007: Ch. 3-4); CSIS (2012:40); DoA (2014:10); DoD (2013:5, 66); 2014:7, 31); 2015:11, 35); Easton (2013:7-9); Khalilzad et al. (1999:77); Martinage (2014:24); Stillion & Perdue (2008:6-7); Thomas (2011); Van Tol et al. (2010:19).

project power into the far seas. China relies on offensive land based ballistic missiles and cruise missiles that can be employed against enemy airbases, communications, logistic facilities and other ground-based infrastructure (DoD 2015:34). China is attempting to control the region and deter potential neighbors by enhancing its medium range ballistic missile force so that it can strike regional targets, including Taiwan (DoD 2014:6). Given that it is unclear how far out China has the means to collect accurate targeting information, in order to launch effective strikes against US deployment, estimation gets difficult as it is not given where US deployment is safe from attack and where it is not (DoD 2015:35).

Because the US is judged to be militarily stronger in the air, sea and land domains, the empirical data highlights that China is likely to exploit its asymmetric advantages. As China enjoys more geographical access in the war theatre, it is likely to present challenges to US deployment (DoD 2015:33), as well as a to US air dominance and sea control (DoA 2014:11; Van Tol et al. 2010:24). If US access to bases is hindered, not only will deployment be difficult, but its regional credibility will also be threatened (Air-Sea Battle Office 2013:3). Because the new information and precision technology changes rapidly, transfers easily, and integrates effortlessly (DoA 2014:34), and more so than the technologies of other eras, combined with Chinas rapid military modernization, the US may ground to an increasingly stronger China, also in terms of conventional capabilities.

14 of the 23 sources suggest that growing operational changes may lead to heightened crisis instability, which decreases US deterrence credibility, making allies less secure on the US's ability to meet its commitments. Adapting to this comes with increasing costs, undermining the US's long-term role as hegemon.³⁸ Chase et al. (2015:18) advocates that this effect is not as strong as many believe. Either way, the US must take these challenges seriously, as many of its allies are reluctant to choose unequivocally between the US and China. Actually, it may be safer to bandwagon with China, because the US is perceived to be less of a threat, and therefore the consequences will likely be less severe (Martinage 2014:35). However, if they choose China and China win a potential war the long term effects may be brutal.

³⁸ See Air-Sea Battle Office (2013:3); Chase et al. (2015:18); Cliff et al. (2007: Ch.3-4, 113); CSIS (2012:19); DoA (2014:10,16); DoD (2013, 2014, 2015); Easton (2013:14); Khalilzad et al. (1999:59-60); Martinage (2014:33); Pollpeter et al. (2015:115); Stillion & Perdue (2008:6-7); Van Tol et al. 2010:3).

Having to operate from a distance is one of the main concerns for the US in a potential conflict in the Western Pacific (CSIS 2012:19). The theatre is large, allowing for the US to have an advantage given its air superiority. However, the land areas available to the US within the scope of the theater are limited (Easton 2013:8). The US relies on bases, access to air strips, safe deployment from aircraft carriers, and if China successfully employ its A2AD capabilities the US may be forced to operate from a far away base, rather than from the ones that are closest (Stillion & Perdue 2008:4-7). If the US is denied access to China's strategic buffer zone, it can prove difficult to respond to threats quickly. This ultimately has the potential to undermine the American way of war, especially combined with the US being cut off from its information, surveillance and reconnaissance (ISR) capabilities from the onset of a potential war (Easton 2013:8-9). China has challenges within its military organization that may translate into operational challenges for China in the event of war against the US, such as corruption (Chase et al. (2015:18). The US, regardless of China's efforts to stagger the US, would likely remain technologically superior in the militarily relevant areas (Khalilzad et al. 1999:86). China must therefore seize an early initiative, use surprise and preemption, precision attacks, achieve information superiority and raise the cost of conflict (human casualties) – as these are US vulnerabilities – to stand a chance, according to the empirical data, all tactics of which are considered offensive acts (Cliff et al. 2007:27-42).

Vulnerability and Secrecy = Estimation Problems?

In these domains it is not easy to hide one's actions, mainly because warfare has required large forces, large platforms as well as attacks being visual and audible. These three domains are being monitored with the help of space and cyberspace assets. With the advent of unmanned vehicles (both in air, in sea and on land), surveillance has become easier, and increasingly safe. Not only can these vehicles be operated a long way from the actual war theatre, they can also be equipped with munitions, potentially increasing their first strike value. In resemblance to the cyber domain it is easy to transfer the gathering of intelligence (surveillance) over to offensive attacks, as it is the same skill set required to do so. Defending against unmanned vehicles is difficult. One always has to be concerned with guarding oneself from unwanted surveillance, to find more secret locations to perform activities, to help avoid the enemy accessing information about one's every move (Easton 2013:13).

Whilst China claims to be a defensive power (Chinese Ministry of National Defense 2013, 2015), its projectile-centric A2AD strategy may have an offensive destabilizing effect in the region. Land based missiles and UAVs are first strike weapons with low defensive utility, possibly encouraging rapid escalation of conflict through surprise attacks. When attacks can be delivered within minutes or hours, little time is given for decisions to be made, increasing the risk of miscalculation as decisions may be based on faulty or daunting information about a given situation (Easton 2013:3,13,17). The fact that China is building a second aircraft carrier was discovered by mere luck in early 2015, as the local Chinese government in Changzhou were saluting that a local firm had won the contract for the electrical cabling of the aircraft carrier. However, after a short time the reports were deleted both from social media and on the local newspapers website. This denial and concealment fosters secrecy as there is no knowing what else China is hiding, especially considering that a lot of the new technology is easier to hide than an aircraft carrier (Denyer 2015).

China's plan seems to entail the quick launch of preemptive attacks on bases at the onset before the US can gather themselves (Martinage 2014:23; Van Tol et al. 2010:29). It can also risk giving the aggressor a false sense of security. For example, China's faith in own capabilities may increase based on the onset, without regards to escalation dangers of such attack. Hence the possibility of war occurring in a more conventional form can increase. Interestingly, and further adding to the first strike temptation, these projectile weapons allow for strategic effects similar to that of nuclear weapons (Easton 2013:13-14). For the US the consequences of such operational problems can be the fading of its regional credibility as hegemon, both towards allies, but also enemies, as well as heightened crisis instability. China has the potential of leveraging US technological advantage (Martinage 2014:72). These A2AD operational challenges has to be countered should the US wish to maintain its long-term role as hegemon in the region (Martinage 2014:23; Van Tol et al. 2010: 9-10)

One reason why is so difficult assessing the future of warfare is because the new technology provides weapons, such as unmanned strike weapons, with powerful physical and psychological disruptive effects. This alters the definition of victory. A victory for China does not require that the US be kept physically out of the Western Pacific, or that Taiwan and China be physically defeated. A desired victory would be that the US be unable to uphold its obligations to Taiwan and Japan, undermining US hegemony in the region and hence its

alliances. In fact, only leading Taiwan and Japan to think that the US will not effectively be able to defend them is sufficient (Easton (2013:12)).

Minimizing Human Casualties = Cleaner wars?

There are ambiguities in the empirical data regarding the prospect of cleaner wars in these traditional conventional domains. The cleanliness of these domains will necessarily be lower than that of the cyber and space domains, because the human element is more present, and hence more exposed. Whilst the technology in itself has the potential to render wars cleaner it is also possible to use the technology with the purpose of creating casualties, as the weapons' lethality has not decreased, although its overall precision level has increased. Exploiting US casualty aversion seems to be an option to China, according to the empirical data. Khalilzad et al. (1999:44) writes that: "China has in recent history demonstrated a willingness to absorb substantial casualties in military operations." According to Van Tol et al. (2010:29), China's plan is to launch quick preemptive attacks before the US can gather itself, to avoid further war by making the US public discontent and its allies wary. Easton (2013:11) also raises concern about China not being as constrained to norms as other states, and not as occupied by fighting a clean war.

5 of the 23 sources explicitly address the perceived US casualty aversion when giving descriptions of US warfare.³⁹ With its dependency on precision fire power the human risk is minimized, both for those operating the arms, as they can be launched away from target, but also for civilians, as it singles out specific targets (DoA 2014:10). More use and reliance of unmanned vehicles and robotics allows for safe access to areas otherwise unsafe, providing situational awareness with reconnaissance and surveillance, hence being valuable first strike tools (DoA 2014; Easton 2013) To hinder US use of precision strikes, an adversary may endanger people by using highly populated areas, threatening cleanliness (DoA 2014:10) This provides us with important information. China on the other hand is thought to have a much higher tolerance for casualties (Khalilzad et al. 1999:44) China may seek to raise the cost of conflict by exploiting US casualty aversion (Cliff et al. 2007). By attacking airfields (Cliff 2007:82) and aircraft carriers (Cliff et al. 2007:89), China not only hinder deployment, it endangers the lives of US soldiers. That China seemingly plans an offensive to exploit US casualty aversion, and that the US is emphasizing the need to counter this offensive tells us

³⁹ Chase et al. (2015); Cliff et al. (2007:41-42, 48); DoA (2014:10, 12); Stillion & Perdue (2008:2); Van Tol et al. (2010:52).

that the cleanness of war is perhaps believed to increase the more democratic the states are (Khalilzad et al. 1999:44), and China is not a democracy. Yet.

China should prefer not to get into direct confrontation with the militarily stronger US. As an attempt to avoid this, China, and other adversaries, may use the threat of civilian and military human losses to deter the US. If an adversary takes advantage of populous urban areas, it may hinder US use of its military advantages (DoA 2014:12). The American public – and hence the US leaders – have little to none acceptance of human casualties in military conflict. This increasing unwillingness is mainly directed to the endangerment of own soldiers and civilians (Cliff et al. 2007:48). One may argue that the US chose its battles, as it is not willing to risk too much. However, the US may have little option to choose if it wishes to engage in military action with China. Should China make a first move the US likely has to respond to preserve its regional status.

By the very nature of this relationship, where the empirical material believes that China has to use asymmetric means to stand a chance against the US, the element of surprise is increasingly important. Martinage (2014:33-34) writes: “Consistent with the emphasis given to maximizing surprise and seizing the initiative in PLA doctrine, China would have a strong incentive to neutralize forces deployed to close-in regional bases preemptively before they could mount damaging strikes against Chinese forces or territory.”

One question is whether the US is willing to exploit China’s dependency on manpower, as this is in direct contrast to its requirements for cleanness. As earlier stated, a prolonged war is likely to benefit the US as its military capabilities are superior to those of China, and its battle experience is greater (Van Tol 2010). But should the war be prolonged, the domains of space and cyberspace that offer the most cleanness is likely to be incapacitated at the onset, and we remain with the conventional domains of air, sea and land. A war might resemble total war rather than a limited one. Moreover, the adversaries might be tempted to use nuclear weapons. To show the basis of which the analysis has been conducted, in Table 3.6 I have categorized each of the sources and some of the analytical arguments that have determined if and how they relate to each causal mechanism.

Table 3.6: Empirical Sources and How They Relate to the Causal Mechanisms

Source	First Strike	False Expectations	Secrecy/Fear	Cleaner wars
Air-Sea Battle Office (2013)	(YES) - Space, cyberspace, ASB and A2AD foster first strike	(YES) - ASB/A2AD	(YES) - Operational challenges (vulnerabilities)	-
Chase et al. (2015)	(YES) - Asymmetry - Space and cyberspace for information superiority and blinding campaign - China see space as offense dominant – harder to protect than to attack	(YES) - Blinding Campaign = counter attack US conventionally stronger than China. (China knows) - Situational awareness vs. loss of situational awareness.	(YES) - Difficulties protecting space	(NO) - With blinding campaign and counter-attacks = less cleanness
Chinese Ministry of National Defense (2013)	(PARTLY) - Winning local wars under informationized conditions - Space and Cyberspace - Sea	(PARTLY) Defensive intentions (but weapons may be offensive)	(PARTLY) - Claim peaceful, but assert willingness to use arms if necessary	-
Chinese Ministry of National Defense (2015)	(PARTLY) - Seize the initiative. - Space and cyberspace key to situational awareness, enhance these capabilities - post-emptive strikes	(PARTLY) - Technology pose new challenges to China’s military security - Sea vulnerable	(PARTLY) - Fear the impact of new technology	-
Cliff et al. (2007)	(YES) - Seize initiative - Information superiority through space and cyberspace - Deployment at risk	(YES) - China use asymmetric capabilities on US vulnerabilities - US will likely win if deployment ok	(YES) - Surprise attacks or preemption on deployment assets	(NO) - Raise the cost of conflict by exploiting US casualty aversion
CSIS (2012)	(YES) - US needs control over space and cyberspace to effectively employ ASB	(YES) - US is dominant in conventional domains	(YES) - China’s military buildup closed	(NO) - Conflict between the two would be devastating.
DoA (2014)	(YES) - Seize initiative - A2AD challenge us air dominance and sea control. - Space and cyberspace to disrupt and distract US.	(YES) - Hinder US effective response and use of capabilities (Operational challenges).	(YES) - Strategic surprise with use of unmanned vehicles	(NO) - A2AD exploit US casualty aversion (make use of populated areas)

DoD (2013)	(YES) - China see cyber as preemptive weapon to win and fight without the need for conventional military action against sophisticated adversaries	(YES) - China's capabilities lesser than those of the US, but may overestimate power of space and cyberspace (34) - More vulnerable as space capabilities increase	(YES) - Secrecy = estimation problems	(PARTLY) - If china able to exploit US vulnerabilities, will not be clean
DoD (2014)	(YES) - China attempting control and deterrence by enhancing ability to strike regional targets.	(YES) - Although China's military transformation is incomplete, would meet resistance	(YES) - As China is gets more reliant on space, more vulnerable, more difficult to estimate, more secrecy	(PARTLY) - If china able to exploit US vulnerabilities, will not be clean
DoD (2015)	(YES) - Information superiority with offensive cyber operations - Counter-space to limit or prevent adversary use of space-based assets - Asymmetrical advantage	(YES) - China has prioritized land-based ballistic and cruise missile programs to extend its strike capabilities further from its borders - Deployment problems	(YES) - Secrecy regarding china ASAT programs blind and deafen the enemy -Deployment problems	(PARTLY) - If china able to exploit US vulnerabilities, will not be clean
Easton, Ian (2013)	(YES) - Asymmetric advantage: Space, missiles and UAV's= growing threat to American vulnerabilities -Offensive projectile strategy and weapons	(YES) - Risks miscalculation, rapid escalation, accidental war - Giving the aggressor a false sense of security.	(YES) - Chinas military build up destabilizing the security environment in the Asia pacific.	(PARTLY) - Us should expect to lose many of its ISR capabilities at the onset = less clean. UAVs = more clean
IISS (2014)	(YES) - Missile defenses and long-range strike capabilities to deter, pre-empt or respond to aggression	(YES) - Potential for accidental conflict and escalation in Asia	(YES) - With new technology more difficult to assess capabilities	-
IISS (2015 ¹)	(YES) - ASB will deny, disrupt and deter cyber threats - Space in favor of the offense – fostering blinding campaign	(YES) - Blinding campaign = estimation problems - China vulnerable to US air, land and sea dominance. Sea vulnerable domain.	(YES) - China secretive in all domains/ US secretive in space	-

Khalilzad et al. (1999)	(YES) - US deployment threatened with A2AD	(YES) - US capabilities better than China's	(YES) - Fear if US deployment threatened	(NO) - China show no casualty aversion
Krepinevich, Andrew F. (2010)	(YES) - Cyber weapons and long-range guided weapons are capable to disable certain kinds of strategic targets, such as electric grids.	(YES) - Cyber-weapons complicate thinking about strategy and the role of the nuclear weapon.	(YES) - Fear heightened when strategy more complicated	(PARTLY) - Cannot displace nuclear weapons destruction
Krepinevich, Andrew F. (2012)	(YES) - Developed countries are most prone to cyber threat - Can attack critical infrastructure, both civil and military.	(YES) - China can shut down internet - Can cause retaliation in other domains, domains where China not dominant.	(YES) - Cyber programs secretive - Anonymity = difficulties to defend	(PARTLY) - China's ability to close down internet may lead to escalation to other domains
Martineau, Robert (2014)	(YES) - Growing operational changes	(YES) - Aircraft carriers at sea and aircraft in air are becoming easier to detect, track and engage.	(YES) - Space is no longer a sanctuary from attack.	(PARTLY) - Operational challenges may work against cleanness
Pollpeter, Kevin (2004)	(YES) - Strategic intentions differ - transparency difficult to achieve. Element of surprise to deter	(YES) - China knows their military capabilities to be inferior to that of the US.	(YES) - China resisting to enhance transparency because they will not benefit from this	-
Pollpeter et al. (2015)	(YES) - Space to achieve information superiority Space as center of gravity. China for no arms control of space	(YES) - Blinding Campaign	(YES) - Fear attack on vulnerable assets	(PARTLY) - Operational challenges may work against cleanness
Stillion & Perdue (2008)	(YES) A2AD pose operational challenges to the US.	(YES) - Technological upper hand more elusive. - Air superiority at US core may be compromised.	(YES) - Vulnerabilities and exploitation of these foster secrecy.	(PARTLY) - Operational challenges may work against cleanness
Thomas, Jim (2011)	(YES) China making provocative moves, coupled with arms build up and development of naval power projection	(YES) - US projection at risk.	(YES) - projection at risk = fear	-

	capabilities.			
Van Tol, Jan et al. (2010)	(YES) - A2AD presents operational challenges, - Both US and China likely to conduct offensive cyber operations.	(YES) - A prolonged war would benefit the US due to overall capabilities - Blinding campaign =Estimation problems	(YES) - China lacks transparency regarding the basis for its ongoing defense buildup.	(NO) - Overall Chinese strategy seems designed to inflict substantial losses to the US forces.
Watts, Barry D. (2011)	(YES) - Space dominance (and cyber attacks) is important for information superiority.	(YES) - Chinas conventional capabilities far inferior to the US, and limited in that they are regional. - Blinding campaign= Estimation problems	(YES) - fear attack on US dependencies	(NO) - China understand US dependencies and is making effort to exploit them in future conflict.

¹The IISS (2015) is divided into 2015a-c where each source represents one chapter in *The Military Balance*.

As becomes apparent from Table 3.6, the literature seems to indicate that there is support for the three first proposed causal mechanisms, whilst not for cleaner wars. The first strike mechanism, the false expectations and the secrecy all have 21 yes and 2 partly, whilst the cleaner wars mechanism have 7 no, 9 partly and 7 which does not address this. The findings in the empirical analysis still need to be interpreted with caution. As mentioned in the methods section, there are severe challenges related to interpreting this material. These challenges include, amongst others: the same authors figure in different reports; the same institutions are behind several reports; and the reports are predominantly from an American point of view, perhaps interpreting China's technology and strategy overtly offensive, in order to map out possible war scenarios. This may hold part of the answer as to why the reports are in high correspondence with one another when it comes to support/opposition for the causal mechanisms. Further, the causal mechanisms are overlapping. If first strike is promoted, false expectations and secrecy may follow. If false expectations are fostered, namely making estimation more difficult, secrecy is thought to follow naturally, making the two somewhat similar measures. Because they are so intertwined, the four causal mechanisms must, with regards to overall conclusions, be treated together for there to be support for the research question. One cannot definitely say on the basis of this analysis that the implementation of new technology will increase the likelihood of great power war. What can be said, however, is that there are indications of this being the case.

Chapter IV

-Discussion-

In this discussion I will first discuss the prospect of war, and how war may still be an option both due to the international system of anarchy, and case specifically, how China and the US are seemingly in an arms race, something they would not be in if war was not still an option. I will discuss all four causal mechanisms as presented in Figure 2.2 to evaluate each of these and their possible impact on the likelihood of great-power war.

At least three explanations are offered as to the relative inter-state peacefulness in the last decades. First, many claim that why we have not seen recent great-power wars is due to the US hegemony, and the absence of a competitor (Layne 1993; Wohlforth 1999). Second, an increase in economic interdependence among the states is highlighted (Mandelbaum 1998/99). Moreover, Mueller (1990), Gaddis (1986), Glaser (1994/95) and Waltz (1993, 2003) emphasize that the nuclear threat has rendered war so destructive that the costs of waging war outweigh the gains. Great powers have taken measures to ensure the presence of military technology that promotes non-use of nuclear weapons (Cohen 2004). As world-views and perceptions of how peace is ensured differ, lasting peace is not guaranteed in an anarchical system (Gray 2002; Morgenthau 2006 [1948]; Mearsheimer 2014 [2001]; Waltz 1993, 2003). The empirical analysis show that although the unthinkability of war is a pleasant thought, the ongoing arms race between the US and China stand as an example of war not being unthinkable. Although the economic interdependence is ever present the empirical analysis shows that China may be a hegemonial competitor, and that the new technology have a neutralizing effect on the nuclear threat.

4.1 Does New Technology Promote First Strike?

The offense is thought heightened when those who strike first (the offense) has the advantage over the defense (Van Evera 1998, 1999). That all the empirical reports have statements in support of this causal mechanism is not surprising – and should be interpreted with caution –

as it is expected that states will regard all adversary assets as offensive. This is especially visible in reports produced to map out enemy capabilities and how they may be used in combat, and especially when the competition and the strain on the relationship is as tight as it is in the US-China relationship.⁴⁰

The promotion of first strike in the US-China relationship may be a product of strategy more so than pure technology, blurring the results of the analysis. It is difficult to assess whether promotion of first strike really is an effect provided purely by the new technology or if this is in fact as a result of the competition among the two. None of the reports write explicitly that the ASB and the general US capabilities foster first strike, but all accentuate China's A2AD strategy and especially Chinese ground-based assets such as its lasers and missile launchers. China claims that its A2AD program is purely defensive, and to China it is defensive as Taiwan is considered an integral part of the Chinese state.⁴¹ However, the empirical analysis indicates that for the US (and Taiwan), China's capabilities are offensive, as Taiwan does not consider itself part of China. Further, China's island-offensive in the South and East China Seas is viewed as offensive by those neighboring states that exercise control over those islands today, including US ally Japan which controls the Senkaku Islands, one of the most disputed island chains. As a function of being a Taiwanese ally, a Japanese ally (with regards to the Senkaku's), but also in its role as the regional hegemon, the US cannot perceive Chinese military modernization as strictly defensive.

4.1.1 Information Superiority

New technology allows for real-time access, transmittal and use of information over large territories. This information-access can be used to attack, confuse or mislead an enemy (Thayer 2000). For those who possess the access it can dampen the fog of war, and for those that are denied access it can deepen the fog. In the empirical material it is evident that the information superiority is deemed important. The empirical analysis shows that in all domains of war, the information superiority, which is thought to translate into situational awareness and ultimately the upper hand for those in possession of it, is likely to cater to first strike. According to 15 of the 23 reports, access to information allows for situational awareness,

⁴⁰ See Table 3.6 for all sources and how they relate to the causal mechanisms.

⁴¹ See Chinese ministry of National Defense (2013, 2015); The National Peoples Congress of the Peoples Republic of China (2004).

making it difficult to win for a potential adversary that has been attacked even though its conventional capabilities surpass those of others. This is so because the first striker has the upper hand and information that the adversary does not have.⁴² The reports seem to favor that for China (which has little dependency on information) it is essential to deny US flow of information to gain the upper hand. For the US (which has high dependency on information) it is essential to keep this superiority, and to hinder China from attacking information assets. This bears important implications for the future of great power war. It can make great-power war more likely as it may be perceived as easier to gain power at the expense of a potentially stronger power, as conventional weapons are not the only option. Should it be assumed that two equal great powers (in terms of conventional capabilities, and dependency on information and precision assets) were to be in an arms race, striking first is likely even more essential, as the offender will have an advantage over the defender should escalation occur. This may increase the preemptive effect of first strike further.

4.1.2 Difficulties Defending

The technological advance is difficult to keep as it is easier transferred to and developed by others. Therefore, one has to advance faster than before to maintain the upper hand (O'Hanlon 2000). This has at least two important implications; First, it means that the defense has to be dynamic as one does not know an enemy's next move, nor necessarily know what weapons the attacker may use. Second, and as an effect of the first, it means that the uncertainty is higher and the Clausewitzian "fog of war" is potentially thicker (or at least not thinner) than it has been (Stillion & Perdue 2008; Air-Sea Battle Office (2013)).

New technology favors the offense because it is difficult to defend against as the threats are versatile and constantly adapting, making an active defense nearly impossible. This is especially apparent in the new domains space and cyberspace, as there is no smoke, shots or explosions in a cyber attack, therefore the detection of such an attack may be difficult, and one cannot defend oneself from an unknown attack. Ground-based lasers, missile launchers and UAV's, can make more conventional assets in the conventional domains of air, sea and land, such as air-craft carriers and bases, difficult to defend as they can be targeted and

⁴² See Air-Sea Battle Office (2013:2-3); Chase et al. (2015); Chinese Ministry of National Defense (2013, 2015); Cliff et al. (2007:35,38-39); CSIS (2012); DoA (2014); DoD (2013:36, 2014:32, 2015); Easton (2013); IISS (2015a); Krepinevich (2012:3); Van Tol et al. (2010); Watts (2011).

attacked with greater ease and without risk, through precision and information technology (Krepinevich 2012, DoD 2013).

Developed countries are most prone to attacks by the new precision and information technology, as these rely more on computer-systems, both for communication and storage of information, as well as to control critical infrastructure (Krepinevich 2012:172). China is less developed, and hence less reliant on these assets, but as time pass, China will become increasingly dependent on these systems (Chase et al. 2015:119). Not only will these be accessible for great powers, they will be easily obtainable capabilities for all states having the economic capacity to procure them. This can have serious implications for the future, and the impact other smaller states can have. One may also think that other non-state actors can obtain such capabilities, and thereby have a powerful way to influence great powers, that smaller states, or non-state actors, have not had access to before.

4.1.3 Asymmetry

First strike capabilities are likely more important to those with the least conventional military capabilities, as they will benefit more from – and in certain instances be dependent on – the element of surprise more than conventionally stronger states (Van Evera 1998, 1999). Analyzing an asymmetrical conflict between the US and the Taliban, Biddle (2003) found that the information and precision technology was most important at the onset of war, while it decreased in importance as the US had to adapt its warfare to complement the Taliban way of war, which did not at all rely on high infrastructure. He assumes that it may play a bigger role in symmetrical wars between great powers. Taliban could not counter and exploit US dependency on precision and information. China, however, might be able to do this, as China's capabilities are far more symmetrical to the US' than were the Taliban's. Whilst the Taliban had a completely different way of war from the US, using the caves in the mountains to hide (Biddle 2003, China is preparing for a war similar to the one the US is preparing, and with similar capabilities. States that find themselves in an arms race with one another are likely to become more similar militarily. This means that their capabilities will become more similar, as states will seek to mimic stronger states (Waltz 1979). Chase et al. (2015:115) and Pollpeter et al. (2015:116) are among those who claim that China, while planning to deny the US use of information assets, is necessarily becoming increasingly dependent on these itself, potentially eradicating the asymmetric advantage proscribed to China.

Interestingly, the empirical analysis indicates that first strike seems as important to the more militarily capable US as it does for the weaker China. Whilst there is a high level of agreement on that the longer a war is to go on, the more likely the US would be to win, given that its conventional military capabilities surpass that of China, it seems important for the US to preserve its informationized way of war, including the ability to launch effective precision strikes, to avoid unnecessary human casualties. 16 of the 23 reports claims the US is likely to win over China in a possible war.⁴³ One reason is thought to be China's lack of combat experience (CSIS 2012). 13 of the 23 empirical sources explicitly state that the US is militarily superior.⁴⁴ The nuclear weapon allows for asymmetric use of violence without achieving victory. Victory is no longer a prerequisite to produce damage, and victory no longer assures a win (Schelling 2008 [1966]).

Although the new precision and information technology can have the potential of rendering great-power war effective again, the nuclear threat will not disappear. In fact, it is important to remember that should the new technology not provide the desired results, there is a potential for escalation, and at the top of the escalation ladder sits the nuclear weapon. If China and the US were to lash out with nuclear weapons they would likely not achieve the desired effect; the gains would be substantially lower than the costs, because the use of nuclear weapons holds a promise of Mutual Assured Destruction (MAD). Therefore, if one driving force behind war is fear, as this thesis suggests, the attacking state cannot achieve its objectives of stability with the use of nuclear weapons, because it would expect a counter attack. Whether the United States or China is willing to use nuclear weapons is difficult to assess. First, there is a distinction between using the nuclear weapon against a great power such as China or the US and against another state that may not possess the same capabilities. Further, both China and the US can be believed to have enough military capabilities besides the nuclear capabilities so that they would gain by using other capabilities than the nuclear option. Provided that both parties in a war possess nuclear weapons, the escalation danger is lower the more symmetrical the other military capabilities are. Officially, China has a nuclear

⁴³ See Chase et al. (2015); Cliff et al. (2007:28); CSIS (2012:19-20); DoA (2014:11, 13); DoD (2013:10, 2014, 2015); Easton (2013:9,17); IISS (2015a); Khalilzad et al. (1999:77-79); Martinage (2014:1); Pollpeter (2004); Pollpeter et al. (2015:15); Stillion & Perdue (2008); Van Tol et al. (2010:24-27); Watts (2011:3-6, 8).

⁴⁴ See Chase et al. (2015); CSIS (2012:15); Cliff et al. (2007: 2, 25-26); DoA (2014); DoD (2013, 2014, 2015); Easton (2013:7); IISS (2015b:40); Krepinevich (2012); Stillion & Perdue (2008:53); Van Tol et al. (2010:14); Watts (2011:8).

policy that states that it will never be the first to use nuclear weapons, nor threaten to use it against actors that do not possess nuclear arms. It has, however, been on a quest to ensure second-strike nuclear capabilities in order to secure retaliation against an attack. (Erickson 2013; DoD 2014).

Neither China nor the United States wants to find itself in a war with the other, but there are great advantages linked to attacking first, as the forces from both sides are targeted at eliminating or damaging their opponent's forces (Gompert & Libicki 2014). The US would benefit from striking first, before China's capabilities grow too strong and to hinder that China exploit US vulnerabilities. However, as the current hegemon it is content with the status quo, and therefore has lower incentives to initiate a war as it potentially has the most to lose. The empirical data indicate that all seem to believe that it will be China that is the potential initiator of a future war, and the more powerful it feels, the less of a threat China views the US. Both states can benefit from striking first, but this is complicated by the technology in that the estimation of relative capabilities has become more difficult.

4.2 Does New Technology Promote False Expectations of Capabilities?

Miscalculations occur more easily when the perceived situation differs from the actual situation. When situational awareness is lost, the gap between perception and reality is likely to increase. Technology might impact the expectations one has of own and other's military capabilities through an increase or a decrease in the gap between the perceived military capabilities and the actual capabilities. The new precision and information technology is thought to produce an increase in the gap between perceptions and the real world, making miscalculation more likely, and hence increase the possibility of great power war (Biddle 2004; Fordham 2004; Jervis 1976; Huang & Rifkind 2012; Thayer 2000; Van Evera 1999; Waltz 1993, 2003). False expectations of own capabilities often increase the risk of war, and as states' perceptions differ, war may be the only way to persuade the weaker party that it is weaker (Van Evera 1998, 1999). There is little evidence in the empirical analysis indicating that China is stronger than the US. On the contrary, China seems to be well aware of its weaknesses. However, both the US and China seems to wonder about the potential effect of the new technology, the asymmetrical tactics as well as the new domains.

Mearsheimer (2006b, 2014 [2001]) sees the balance of power to be based on the tangible military assets states possess, such as armored divisions and nuclear weapons. If the new technology is less tangible, how will this affect the estimation of power? Whereas military capabilities can be empirically verified, intentions cannot. If the new technology can make the process of measuring actual capabilities more difficult, it is likely that the intentions of states are even more difficult to estimate. If wars are a result of miscalculation, as presented by Waltz (2003), and that states often act based on perceptions of capabilities rather than the actual capabilities of an opponent, as Van Evera (1998, 1999) stresses, there may be trouble assessing the future prospect of war. This is of great relevance as miscalculation is a major cause of war (Waltz 2003), and the less information that is open, the more the risk of miscalculation increases, as one does not have access to the information needed to make an informed decision. For weak states it can be important to seem stronger than what they really are, making secrecy a powerful tool. In the US-China relationship it might be beneficial for China to remain secret, but it must find a balance as to where it is not too secret.

When a separation between offensive and defensive weapons can be made, Jervis (1978) claims that a state can make itself more secure by acquiring defensive weapons without entering the security dilemma. Offense-defense critics on the other hand, point out that it can be difficult to separate offensive from defensive weapons, and that all defensive weapons also have an offensive side (Lynn-Jones 1995). China will find itself balancing a thin line between being perceived as peaceful versus aggressive. And based on the tone of the empirical reports China is perceived as a threat, hence placing the US and China in a security dilemma as Jervis (1978) illustrates.

4.2.1 Vulnerabilities & Blinding Campaign

O'Hanlon (2000) finds that US vulnerability is its dependency on large ships and bases to project power, a finding supported by this empirical analysis. By exploiting adversary vulnerabilities, estimation becomes more difficult faced with the new precision and information technology. Whilst nearly all 23 reports accentuate the need for cyber control, 12 specifically address China's need to exercise control over the cyberspace domain (as well as space) to stand a chance against the US, as the US conventional capabilities outweigh those of

China.⁴⁵ 10 of 23 reports explicitly claim that the US sees space as its most vulnerable domain, both because it is heavily reliant on the domain, but also because Chinese capabilities are perceived to exploit that reliability.⁴⁶ 13 of 23 reports suggest China might be able to make difficult the US dependency on deployment of aircraft, and hence make it difficult for the US to attack strategic goals, infrastructure and isolate important targets.⁴⁷ The likely scenario presented by the empirical reports is that China will perform a blinding campaign against the US, leaving it to conduct warfare with less information, and hence less situational awareness.⁴⁸

4.2.2 Secrecy

Thayer (2000) fears that the knowledge provided by the easy access to information may lead the US decision makers to overestimate the military capabilities provided by the new technology, and therefore engage in war against another nuclear power believing it to be bloodless, and hence safe, as the retaliation will likely be in form of an unbloody war, and therefore the need to use nuclear weapons are perceived to have disappeared. Cyberspace appears to be an increasingly important domain that may ease the decision of escalation into armed conflict as it allows for cost-effective groundwork. This can allow for the perception of an upper hand in a conflict. It can also cause misinterpretations and miscalculations, in that the threat a possible adversary present can be evaluated as bigger or smaller than what it actually is (Huang & Rifkind 2012). IISS (2014:9) warns about overestimating the effect of technology alone:

⁴⁵ Chase et al. (2015:14-15); CSIS (2012:12); Cliff et al. (2007: 44-45); DoA (2014:13); DoD (2013, 2014, 2015); Easton (2013:7); Krepinevich (2012); Van Tol et al. (2010:35); Watts (2011:6, 9).

⁴⁶ See Air-Sea Battle Office (2013:3-4); Cliff et al. (2007:58); DoA (2014:11-12); Easton (2013:9); IISS (2015a:15); Krepinevich (2012:63); Martinage (2014:31-32); Pollpeter et al. (2015:13); Van Tol et al. (2010:19); Watts (2011:5).

⁴⁷ See Air-Sea Battle Office (2013:2-3); Cliff et al. (2007: Ch. 3-4); CSIS (2012:40); DoA (2014:10); DoD (2013:5, 66, 2014:7, 31, 2015:11, 35); Easton (2013:7-9); Khalilzad (1999:77); Martinage (2014:24); Stillion & Perdue (2008:6-7); Thomas (2011); Van Tol et al. (2010:19).

⁴⁸ See Air-Sea Battle Office (2013:3-4); Chase et al. (2015:17, 114-115, 135); Chinese Ministry of National Defense (2015); Cliff et al. (2007:14, 45, 57-58); CSIS (2012:12); DoA (2014:11-13); DoD (2013:9, 32-33, 2014:11, 32-33, 2015:14-15, 33-35); Easton (2013:9); IISS (2015a:13); Khalilzad et al. (1999:81-82); Martinage (2014:31-32); Pollpeter et al. (2015:10, 111-112, 116); Van Tol et al. (2010:21, 27, 56); Watts (2011:4-5). Let it be noted that both Chase et al. (2015) and Martinage (2014) are quoting the DoD reports in their analysis.

“(..) overtly high expectations of technology could leave military forces, both western and non-western, ill-prepared to deter conflict, respond to security threats as they emerge and cope with countermeasures that potential enemies may employ against them.”

States possessing greater military capabilities seem more likely to use force. In order to preserve the possibility to perform surprise attacks, states try to conceal their military capabilities to uphold tactical surprise (Fordham 2004). As a state's confidence in own technical skills increase, it aspires to increase its own role (Waltz 1993).

As China's best card is the secrecy of the PLA, it may very well be its worst card as it may agitate the US more than an open structure would. The new technology may allow China to have the secrecy, and perhaps be more closed. Rapkin & Thompson (2003) argue that China will rise in the near future, and this will be inevitable, there is reason to believe that the US will oppose this. If China, as Pillsbury (2014) suggests, does not follow through with its promise to become more open about its military, then the US may fear China more, which in turn can lead to a form of preemptive war as suggested by Van Evera (1999).

An error sometimes made by states is to believe that the same perceptions automatically produce the same responses. The responses are often the same, but difference in outlook can produce different responses, making it important to have common ground. It is easy to exaggerate threats presented by others. Cannot have unrealistic thoughts of when another state is threatening. Need to acknowledge what separates an aggressive state from a state trapped in the security dilemma (Jervis 1976).

Credibility is important, either show non-aggression if weaker, or willingness or ability to wage war if strong (Nye & Keohane 1998). The risk of war increase if the aggressor thinks that the status quo power has little capability, as this will lead the aggressor to test the status quo power. To avoid an unwanted war that both parties are pushed into by an agressor, the status quo power must display both willingness and ability to wage war (Jervis 1976). Misperception should not be treated as random accidents, but rather as patterned diverges that can be detected and analyzed (Jervis 1976) the empirical reports, being mainly American, over exaggerate the Chinese being dangerous.

To impact the onset of war, the instigator has to perceive its capabilities to be greater than that of the enemy: It has to believe it can win otherwise it is likely the cost will outweigh the gains. What the empirical data imply is that the new precision and information technology enables false expectations of own and others' capabilities as it is easier to hide, and its effect is still unclear as it has yet to be actively used in great power war. New military technology and its implications may alter the perceptions the parties may have of one another, and hence lead states to make different strategic choices than what they would otherwise do (Huang & Rifkind 2012). An overemphasis of the technology over training and readiness may cause under or overestimation of an enemy. On one side, the new technology allows for unprecedented situational awareness, and possibilities to map out the enemy more than ever, particularly with the cyber and space domains. However, it also makes it more difficult to assess situations as the impact of these technologies contra the more conventional technologies is more difficult to estimate (Biddle 2004).

If the new technology heightens fear, but increase faith in one's own capabilities, the expectance of war is not unlikely. It is difficult to assess the danger and the implications regarding this new technology, but with the help of the concepts and the theories of nuclear weapons one can easier arrange the threat. The nuclear technology enables total destruction (Morgenthau [1948] 2006; Waltz 2003). Faced with a nuclear threat, states take a high risk if they initiate war with a state that has nuclear capabilities, considering the argument that the use of conventional arms may lead to nuclear war given that the conventional warfare would be so devastating that to end it with the help of nuclear weapons would be a viable option. But the proliferation of nuclear weapons has not occurred at a time where more than one actor has possessed such capabilities. The deterrent effect has been greater than the offensive effect. The new technology presents a warfare that is considered more politically effective than the nuclear bomb and conventional arms, where the main goal is no longer to kill as many as possible, but to harm assets that will weaken the opponent. While one knows what nuclear bombs are able to do, the estimation of modern military technology remains unclear. One potential effect can be that the technology enhances the fear produced by self-help and strategy.

4.3 Does New Technology Promote Fear and Secrecy?

4.3.1 *Vulnerabilities & Estimation problems*

Hobbes (2000 [1651]) describes fear as the driving force for man in the state of nature. Gray (2001) sees fear as one of the driving forces behind war: The fear of losing state security. Fear is fostered through secrecy in an anarchical systemic structure because if an actor is hiding something, its intent is increasing its own power, and by necessity decreasing others. It is the same mechanism that fosters transparency: If an actor is willingly showing something, it is often in the name of deterrence, and often to show its strengths (Shelling 2006 [1966]). States conceal their military capabilities when there is a first strike advantage to preserve the element of surprise and the ability to perform surprise attacks. This secrecy may lead states to underestimate its opponent, making it overconfident. The goal is to avoid a preemptive attack from the enemy, as well as be able to perform such attacks on an enemy. One way to achieve this is by pretending to be weak to give the opponent overconfidence in own chances (Van Evera 1999). Offense is heightened the more secretive states appear, and in developing arms, states are often less than open, to protect their capabilities and ultimately their chances of success in a potential war, giving reason to believe that technology may heighten the offense or the defense depending on the traits of the technology (Van Evera 1998). As illustrated by the empirical analysis, China is deemed the secret and deceptive, whilst the US the transparent, however secret in the space and cyberspace domains. Pollpeter (2004) claims that China is resisting enhancing transparency because they will not benefit from this, but the US will as they are stronger. China knows that its military capabilities are inferior to those of the US, and revealing its full capabilities therefore presents a threat to China as it can give the US incentive to attack. Adding to this assumption is the US secrecy in the new domains of war, space and cyberspace.

Secrecy might foster false expectations of own and other's capabilities as the new technology is easier to hide. The low sustainability of having the technological upper hand makes it necessary to hide its capabilities to ensure the element of surprise, and the full effect of the technology in war is yet unknown, therefore the implications of such an attack is uncertain (O'Hanlon 2000; Saltzman 2013; Van Evera 1998).

There is an information asymmetry in the US-China relationship. China has more knowledge about the American military than the US has about the PLA. During the 1980's the US helped

modernize the PLA to deter their Soviet common enemy. The PLA was introduced to the American doctrine Air-Sea Battle's predecessor, Air-Land Battle, but as their common enemy evaporated the cooperation was no longer fruitful to the US, and China, with its growing economy, continued this modernization on their own (Pollpeter 2004).

This modernization, combined with China turning outwards, and expanding its presence in Asia, can heighten the risk of miscalculation or accidents (DoD 2014). When the US Department of Defense (DoD) writes this, they are essentially saying that China must be prepared for others to react. They are justifying that something may happen, in an attempt to deter China from altering the status quo. Further, the DoD state that they wish to develop a new model of military to military relations where one of the expressed goals is enhanced risk reduction through dialogue and cooperation. It acknowledges that the US-China relationship is both prone to competition and cooperation. More contact and openness between the two help foster communication, understanding, accurate calculations and ultimately cooperation, rather than heightened competition through miscommunication, misunderstanding and miscalculations

4.4 Does New Technology Promote Cleaner Wars?

4.4.1 *Minimizing Human Casualties?*

Some, like Waltz (2003) contend that one of the reasons we have not seen a great-power war since World War II is because the nuclear threat has made war so destructive that the costs is likely to outweigh the gains should two nuclear powers go to war. With the advent of information and precision technology, Luttwak (1995) propose that new technology may again render war an effective tool for democratic states, as it has the potential to make wars cleaner and hence surpassing casualty aversion. In theory, and if one is to inspect the purely technological aspects of the new military capabilities, this notion seems to hold ground. However, technology does not wage war, humans do (Gray 2001), and hence coupled with the human element, the empirical material seems to be in contrast to this causal mechanism offered. The empirical data points in the direction of first, such casualty aversion being exploited by adversaries, and second, the effectiveness of the weapons does provide the option of damage, and that virtual weapons, such as cyber weapons, although if isolated will make war more clean, can be used to further escalation. This particularly in the US-China case, as China is not a democratic state, as well as the state having control over the Internet,

and having the option of shutting it down from the outside world, making adversaries dependent on waging war in different domains, and hence make war escalate, as it is likely the adversary has yet to achieve its desired gains.

Huang & Rifkind (2012) writes that the new technology allows humans to operate from a distance and killing is not the main objective. However that does not matter if both states are not as occupied with the notion of clean wars. 5 of the 23 reports address that Chinese military writings and the A2AD strategy seem to accentuate exploiting US casualty aversion.⁴⁹ This makes the US casualty aversion a vulnerability as proposed by O'Hanlon (2000). The new technology appears more suitable to a democratic structure as the cleaner wars are perceived, the more likely it becomes, as the gains are thought to outweigh the costs. The prospect of cleaner wars are thought to have the greatest effect at the onset of war, as it is likely that a war will develop into more conventional forms when the gains cannot be provided by the use of only precision and information technology (Biddle 2003; Huang & Rifkind 2012; Luttwak 1995; Thayer 2000).

The mere attributes of technology do not tell us anything about the prospect of war (Gray 2001). Humans, not technology, wage war (Gray 2002; Saltzman 2013). Although the empirical analysis show that most perceive US capabilities to far outweigh the Chinese capabilities, especially in the air, sea and land domains, Boot (2003) finds the American way of war has become less destructive and more precise. Based on the empirical analysis one can contend that, whilst the attributes of the technology it self promotes cleaner wars, in that effective precision strikes, minimizing human casualties can be launched, seeking to avoid unnecessary damage, combined with strategy the new technology can also allow for calculated human losses, perhaps rendering warfare more similar to conventional warfare. China does not have the same reservations towards casualties that the US have, as it is not a democratic, but an authoritarian rule. Should the US find itself in a war with China, it should expect it to be less clean than if it was fighting against another democratic great power. In the event of war, 16 of the 23 reports highlight that the US advantage is linked to the use of advanced technology and the integration of this, whilst China's advantage is linked to denying

⁴⁹ Chase et al. (2015); Cliff et al. (2007:41-42, 48); DoA (2014:10, 12); Stillion & Perdue (2008:2); Van Tol et al. (2010:52).

US use and integration of this technology.⁵⁰ There is reason to believe that should two more symmetrically information dependent great powers meet, for example China and the US at a later time, as China is increasing its dependency on information, that the new technology might have a different role. It may be that neither wish to attack ISR assets, because both know that they are dependent on the flow of information, and fear retaliatory attacks should one initiate such strikes at adversary assets. This is accentuated by the low defensive abilities of the technology in space, which in essence controls the ISR assets, and is therefore vital.

An offensive weapon must have striking power, mobility/movement towards target and protective ability (Levy 1984). Saltzman (2013) claims that offense-defense theory as too founded in territory, making cyber capabilities and other modern technology difficult to put in the offense-defense context. Today one can imagine more limited conflicts that do not have the objective of territorial occupation, but rather capture central assets through precision and information technology. Mobility, mechanization and lethality no longer the best measures. Mobility, informationization and precision appear to be the new measures.

Nye & Keohane (1998) argue that the concept of power has changed with the implementation of new technology. The old technology no longer provides the desired outcomes, so therefore a total war is no longer a desired option regardless of a states' physical ability to conduct such a war. However, the result of a war where the idea is a swift victory and the technology is thought to bring the victory may in fact be a total war although this is not the intended effect. Thayer (2000) highlights this as an important possible consequence if decision-makers are of the perception that a war can consist with the use of new military technology alone, against a fairly equal opponent. How wars can be won with the use of this technology is not something that is known at this time.

⁵⁰ See Chase et al. (2015:17,115); Cliff et al. (2007:28); CSIS 2012:19-20); DoA (2014:11, 13); DoD (2013:10 2014, 2015); Easton (2013:9,17); IISS (2015a); Khalilzad et al. (1999:77-79); Krepinevich (2012); Martinage (2014:1); Pollpeter et al. (2015:15); Stillion & Perdue (2008); Van Tol et al. (2010:27-30); Watts (2011:3-6,8).

Chapter V

-Conclusion-

5.1 Does the Implementation of New Military Technology Heighten the Risk of Future Great-Power War?

This thesis has attempted to test whether the likelihood of great-power war increase with the implementation of new military technology. The hypothesis is that different types of technology offer a different relationship to the offense-defense balance at different times, and that with the military implementation of new precision and information technology, war may again be an effective option as this technology is thought to favor the offense, as war is thought to be more likely than when it favors the defense. The thesis has tried to outline that while war is always an option due to the anarchic structure of the international system, the technology that has been developed to escape the wars of previous eras, and to fit the contemporary international structure and national demands, again renders war a perceived effective tool in states struggle for power. However, if the technology lets one escape the total wars of the 20th century remains to be seen, as it is thinkable that it may lead to such a war if the desired effect is not reached by the use of the new military technology.

The technology and its effect on the offense-defense balance has been measured by 1) its promotion of first strike, 2) its cause of false expectations of own and other's capabilities, 3) its promotion of fear and secrecy and 4) its promotion of clean wars through the domains of war; space, cyberspace, air, sea and land. It is how humans chose to use and develop the technology that is important.

As the scholars of international relations agree that China will be a determinant of the peacefulness or the war-proneness of the future,⁵¹ 21 of the 23 empirical reports – either

⁵¹For examples, see Buzan (2010); Cohen (1999); Doran (1999); Ikenberry (2008); Kagan (1999); Jervis (2002); Mandelbaum (1998/99); Mearsheimer (2006a); Smith (2012).

implicitly or explicitly –, only with the exemption of the two Chinese Defense White Papers⁵², view China as the offensive party in the US-China relationship and hence assert that the future of regional peace in Asia (as well as peace in general) depends on China's actions.⁵³ 15 of the 23 sources explicitly believe war to be triggered by a Chinese quest for Taiwan, where the outcome will determine the future balance of power⁵⁴ 14 of the 23 sources suggest that growing operational changes may lead to heightened crisis instability, which decreases US deterrence credibility towards its allies.⁵⁵

The actual capabilities of others cannot be truly known. As transparency is likely to decrease the gap between the perceived and the actual capabilities of an enemy, it is problematic that the international anarchic structure fosters fear, and hence secrecy, making estimation even more difficult. As long as their strategic intentions differ, and in many aspects are in direct contrast to each other, transparency is difficult to achieve because the mutual trust is not there. China thinks that the US is treating them as a potential adversary. The US can be open about their military capabilities towards China, and anyone else, because they are the one with the most capabilities and therefore wish to deter anyone else from attacking by showing that they most likely will not win. China, on the other hand, is not in this position and has little to gain from promoting transparency, if they regard the US as a potential adversary rather than ally; assuming that the US might attack China if they think they are too strong. It can be difficult to separate the general fear of the anarchy from the fear produced, or accelerated by technology. What can be said is that the new technology appears not to dampen the fear level.

As Russia has been allowed (relatively uncontested) to annex Crimea, and in effect wage war against Ukraine, without being military sanctions by other states, this can lead other states with irredentism to pursue the same, such as China in Taiwan (IISS 2015a). As the new Chinese Defense White Paper hold that the US is loosing ground and multipolarity is rising,

⁵² See Chinese Ministry of National Defense (2013, 2015).

⁵³ See table 3.5 for all empirical sources.

⁵⁴ See Chinese Ministry of National Defense (2013, 2015); Chase et al. (2015:24); Cliff et al. (2007:15, 26); DoA (2014:12-13); DoD (2013:55-59, 2014:53-57, 2015:57-61); Easton (2013:5); Khalilzad et al. (1999:6); Martinage (2014:47); Pollpeter (2004:1); Stillion & Perdue (2008:31); Van Tol et al. (2010:13-14); Watts (2011:7).

⁵⁵ See Air-Sea Battle Office (2013:3); Chase et al. (2015:18); Cliff et al. (2007: Ch.3-4, 113); CSIS (2012:19); DoA (2014:10,16); DoD (2013, 2014, 2015); Easton (2013:14); Khalilzad et al. (1999:59-60); Martinage (2014:33); Pollpeter et al. (2015:115); Stillion & Perdue (2008:6-7); Van Tol et al. 2010:3).

this may indicate that China see the US as weakened, and may pursuit its claims in Taiwan on the basis of US perhaps not being willing to wage war in the Asia-Pacific as well. Although the US may regret having committed to defending Taiwan in the 1955 Formosa Resolution, they have no choice but to follow through if they wish to maintain their position as hegemon in the Asia-Pacific region (Schelling 2008[1966]), and the empirical material argue that the US seem prepared to wage war against China should it pursuit such a mission.

As new technology is employed to military organizations through concepts of A2AD and ASB, warfare changes. It is still mainly the same, but small components of the warfare change and they may have rather large effects. Throughout history, it has quite often been beneficial to go to war for the strongest power. To be the strongest has traditionally meant that you had superior capabilities. At first, superior capabilities meant manpower, then it became firepower, control over land, then control over the seas, control over the air, and then the nuclear bomb emerged and made war less beneficial to all parties (given that the adversary also had nuclear arms). It does not matter how many nuclear warheads, soldiers, aircrafts or guns one possesses, it only takes a handful of warheads to create detrimental damage. The size of the state and conventional measures of power no longer meant the same. Since the advent of the nuclear technology, further new technology has emerged, perhaps rendering war more “beneficial” again. China’s asymmetric advantage has been accentuated in areas of US vulnerability such as its reliance on space and information systems, as well as its aversion towards casualties. Whilst building a strategy based on asymmetry, China appears to making itself more and more dependent on many of the same aspects its strategy seeks to exploit.

Should the indications of this analysis hold true, it is not to say that war *will* happen, but that it *may* happen due to an increase in fear and by this a possible misperception of own and others capabilities. The intentions may be peaceful, but the result may be war. If the attributes of the technology, that it is precision and information based and that it may lead to quick victory, is emphasized by the decision makers they, as Thayer (2000) points out may fail to acknowledge that the war may develop into conventional battle in time, as the effect of this technology in a struggle for power between great powers is yet to be known. This implies that there are the decisions and perhaps coincident of the actors that actually determine whether a war will come. What the paper has shown is that the actions of the actors may be more based on their perception of an enemy rather than the actual capabilities and intentions of an enemy,

both because the intentions of another actor may never be known as well as the technology makes it more difficult to assess an opponent whilst increasing faith in own capabilities.

China is indeed a rising great power, economically as well as militarily. Whether its rise will be peaceful as intended or unpeaceful remains to be seen. However it is important in this context to remember that even though China is increasing its military capabilities, it has multiple disadvantages toward the US. First, they are building a military institution rapidly, whilst the US are employing the new technology to an already established and experienced organization. Second, the Chinese army lack the experience of war as the US has conducted a number of times, and it has no way to practice and enhance its experience before a potential great-power war with the us. It is likely to believe that the US would intervene in any Chinese attempt to use their military capabilities in any cause, for example taking the Senkaku Islands or Taiwan (Smith 2012).

Ultimately China (and the US) is investing in space, as well as the other domains to improve its power projection (DoD 2015). As can be seen from the empirical analysis, space is an important domain both in it self, but also to the conduct of warfare in other domains, as the satellites is used to make best use of the new technology, and it allows for information and communication to travel at an unprecedented speed, easing the situational awareness, or the Clausewitzian “fog of war”. The cyber domain seems prone to war, and it is offensive in that it is a high level of secrecy surrounding both ones capabilities, but also to the fact that attacks can be launched with a high level of secrecy, as an attack does not have to be detected until years later. Further, as one cannot actively defend against an ongoing attack, only rely on the existing defense, and perform damage control after the attack has been mounted, first strike is promoted because if the defender and the offender are given the same resources it is likely to favor the offense. Cyberspace, notably more so than space, fosters cleaner wars, by it being a virtual domain rather than a physical. No cyber weapons can directly cause physical damage outside of cyberspace, and their ability to do so in cyberspace is also limited. They cannot be used to inflict damage in terms of human losses and physical destruction of physical things, such as buildings or infrastructure. What they can do, however, is to cause effects that can indirectly contribute to physical damage and human losses. Cyber weapons are different from traditional arms in that their destructiveness cannot be quantified in the same manner as, for example, nuclear weapons. The frame of reference is unfamiliar. However, this does not mean that such “arms” are insignificant (Krepinevich 2012).

Through this case study it is difficult to know if or how technology fosters heightened offensive dominance. It is a case where heightened offensive dominance is present, but cannot with certainty say that it is due to the new technology, as opposed to the old. Perhaps heightened offensive dominance leads to implementation of new technology rather than the other way around. What can be said, however, is that the US and China seem to find themselves in a security dilemma, and the new technology appears to accommodate this state of fear rather than prevent it. Even though the US has had a decrease in its defense spending, it still has superior military capabilities.

War is not inevitable, albeit still an option. We have enjoyed a period of western sanctuary under the hegemonic rule of the US. The main adversaries have not been states, but terrorist groups. States have cooperated on deterring this US sworn enemy. Terrorism is bad for business, but when it comes to inter-state relations it may have had an effect of cooperation against a common enemy. Common ground is important to foster good and healthy interstate relations, even if it is a common enemy. If the common enemy is conquered, a common cause must be found. One has to actively acknowledge that war is a possibility, and hence try to counter this, if only to be on the safe side, instead of blindly hiding behind the principle of economic interdependence. Liberal ideas of peace through trade and democracy stand as great ideals, but due to the nature of the international system it may never be anything more than an ideal. If war is unthinkable due to democratic structures, economic interdependence or the threat of the nuclear bomb there would be no reason for China and the US, or any other states, to pursue or maintain military capabilities. A2AD would not be needed, nor ASB. Deterrence would be irrelevant. However, it is not.

5.2 Implications for further research

Further research on this matter is needed because we have yet to determine the effect the implementation of new technology has on warfare, as the technology differs for each period and hence its effect alters along the offense-defense balance. For decision makers this is important because if a potential consequence is that war can escalate into more conventional, perhaps even total forms, then the use of war may still be unthinkable amongst great powers. No state wants war, and if the result of war will be that of the first and the second World War

than once again the international structure may be a bipolar stalemate as was seen under the cold war, but this time between the US and China.

Another important aspect is that the information and precision technology of this era may be easier accessible to non-state actors than nuclear weapons. This is problematic in many aspects, but the most detrimental is the fact that these actors have shown even less considering of the rules and norms that states, to a higher degree, feel.

Precision and information technology will play a role for great powers with an already large military organization (Cohen 2004; Metz & Kievit 1994; Gray 1997/98; Gray 2001), but one can speculate if this will be true as the technology becomes more accessible for other, smaller states, something that may be of consequence for the balance of power in a sense that smaller states may be able to gain on great powers. This may also be highlighted by the world becoming more interconnected, and that the projection of power gets easier as the estimation of an opponents power gets more difficult.

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