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Title:
The Rise of China in Space

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Technopolitical Threat Construction in American Public Policy Discourse

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A dissertation submitted to the University of Bristol in accordance with the requirements for award of the degree of Doctor of Philosophy, Politics in the Faculty of Social Science and Law

School of Sociology, Politics, and International Studies

February 2018

79996 Words

Abstract:

Particularly since China's 2007 anti-satellite demonstration, China's "rise" in space has predominately come to be characterised as a national security threat within American public policy discourse. Yet American representations of China's space program as threatening, precluding cooperation, are an outlier in US-China relations, otherwise characterisable as comprised of a mix of cooperation and competition. Despite growing interest, however, this threat has been regarded as self-evident, with little research done on how and why China's space program came to be understood this way. This thesis seeks to understand this puzzle with the first systematic investigation of the construction of a threatening "rise" of China in space, undertaking a close reading of public US space policy including original archival research into policymakers' perspectives of China's Cold War space program. To do so, it outlines a 'technopolitical' approach to threat construction analysis, positioning threat and technology within a relationship of co-construction: the "threat" of China's "rise" in space is not pre-determined from Chinese space capabilities, so the thesis argues, rather they have been actively 'instrumentalised' in specific ways. A technopolitical approach to threat construction is required in this case because, equally, "threat" cannot be reduced to clashing identities, but is a product of interconnections between identities and technologies. The thesis' three parts each address a facet of technopolitical threat construction. Part 1 contextualises the "rise," theoretically and historically. Part 2 begins to analyse the "threat" of the "rise" after 2000, identifying key logics, objects and subjects. Part 3 explores to what extent threat discourses shaped American space technology and national identities. The thesis argues construction of the "Chinese space threat" was uneven: powerful enough to marginalise rival claims, yet failing to sanction an emergency response; and that this in itself can be best understood as technopolitical contestation within American public policy discourse.

To Sarah

Acknowledgements

Author's declaration

I declare that the work in this dissertation was carried out in accordance with the requirements of the University's Regulations and Code of Practice for Research Degree Programmes and that it has not been submitted for any other academic award. Except where indicated by specific reference in the text, the work is the candidate's own work. Work done in collaboration with, or with the assistance of, others, is indicated as such. Any views expressed in the dissertation are those of the author.

SIGNED: .... DATE:……………………..

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Part 3: Inscribing the "Chinese Space Threat" into American Space Technology and the National Self

List of Abbreviations

A2AD	Anti-Access, Area Denial
ABM	Anti-Ballistic Missile
AEHF	Advanced Extremely High Frequency (Communications Satellite)
AFSCN	Air Force Satellite Control Network
AFSPC	Air Force Space Command
ARC	Annual Report to Congress
ASAT	Anti-Satellite
ASB	Air-Sea Battle Doctrine
ASBM	Anti-ship Ballistic Missile
BMD	Ballistic Missile Defence
CIA	Central Intelligence Agency
DCI	Director, Central Intelligence
DIA	Defense Intelligence Agency
DoD	Department of Defense
DoS	Department of State
DSP	Defense Support Program
GEO	Geostationary orbit
GPS	Global Positioning System
JCS	Joint Chiefs of Staff
JFCC	Joint Functional Component Command for Space
JICSpOC	Joint Interagency Combined Space Operations Center
JWGA	Joint War Games Agency
MDA	Missile Defense Agency

MOKV	Multi-Object Kill Vehicle
NASA	National Aeronautics and Space Administration
NDA	National Defense Authorization
NRO	National Reconnaissance Office
NSP	National Space Policy
NSSS	National Security Space Strategy
OCX	Next-Generation GPS Control Segment
ONA	Office of Net Assessment
ORS	Operationally Responsive Space
PRC	People's Republic of China
SAFE	Strategy and Force Evaluation Game
SBIRS	Space-Based Infra-Red System
SIDC	Space Innovation and Development Center
SPARC	Space Planning Against Ranged Contingencies
STS	Science and Technology Studies
QDR	Quadrennial Defense Review
RAND	Research And Development (Thinktank)
SM-3	Standard Missile 3
USA	United States of America
USAF	United States Air Force
USN	United States Navy

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A chronology of China's space program

790	**Feng Jishen invents the rocket in China**
1956	**First Chinese government commitment to developing modern rocket technology**
1958	**First documentary evidence of American concern about China's space program**
1960	**First Chinese launches of Soviet-made R-2 (adapted from German V-2) and Chinese-made R-2 copy, dubbed Dong Feng 1**
1964	**First successful flight of Dong Feng 2 Medium-Range Ballistic Missile**
1965	**Tsien Hsue Shen/Qian Xuesen proposes a satellite launch to the Central Committee and receives support**
1966	**First Chinese dog in space, DF-2A used for end-to-end live nuclear test**
1970	**First Chinese satellite, Dong Fang Hong 1. China becomes the 5th country to independently launch a satellite.**
1971	**First Chinese science satellite, first selection of Chinese astronauts**
1972	**Abandonment of first crewed space program**
1975	**First recovery of a Chinese satellite after re-entry. China becomes the 3rd country to achieve this.**
1980	**First test of the Dong Feng 5 Intercontinental Ballistic Missile**
1981	**China becomes the 3rd country to successfully launch multiple satellites on one launcher.**
1984	**First Chinese satellite in experimental geo-stationary orbit**
1985	**Chinese launchers are made available on the global commercial market**
1990	**First commercial launch by a Chinese rocket (Hong Kong's Asiasat), China becomes 3rd country to place animals in orbit**
1992	**Approval of the crewed space program, Project 921**
1993	**The Chinese National Space Administration (CNSA) is established**
1996	**The satellite Intelsat 708, owned by American companies, is destroyed shortly after the Long March 3B launching it is destroyed. An American**

investigation later finds that technical data transfer had breached ITAR regulations.

1997	**The US Congress directs the DoD to begin producing annual reports on China's military power, specifically including space technology**
1999	**The US congressional Cox report alleges, in part, Chinese espionage of American space technology. Shenzhou 1 successfully completes an uncrewed orbital test.**
2000	**Beidou 1, the first of the regional positioning system, is launched.**
2003	**Yang Liwei becomes the first Chinese person in space, and China becomes the 3rd country to independently launch a citizen into orbit.**
2007	**China becomes the 3rd country to destroy a satellite in orbit. In response, the US lodges a formal diplomatic complaint. The Chinese satellites Chang'e 1 and 2 map the surface of the Moon.**
2011	**Tiangong 1 is launched, making China the 3rd country to place a space station in orbit.**
2012	**China successfully docks two spacecraft in Earth orbit, Shenzhou 9 with Tiangong 1.**
2013	**Chang'e 3 successfully lands on the Moon and deploys the rover Yutu. A Chinese technology test reaches an apogee of 30,000km, considered by American observers to be evidence of the development of a geo-stationary ASAT capability.**
2016	**Tiangong 2 is launched as a follow on to Tiangong 1.**

Chapter 1

Introduction

In January 2007, a Chinese payload launched from the ground collided with, and destroyed, the Chinese satellite, Fengyun-1C. This moment has become so emblematic of China's "rise" in space in American political discourse that little can be said of China's space program without mentioning it (see Clark 2016, DoD 2007, 2009: 27, 2011: iii, DoS 2007: 4, Forden 2008a, 2008e, Johndroe in Singer and Clark 2007, Johnson-Freese 2007: 215-217, Kan 2007, Mahley 2008, Moltz 2008: 296-299, NYT Editorial Board 2015, Rose 2011, 2012, Rose 2016b, Senate 2007a: S12502-12503, Stewart 2015, Tellis 2007a, Tellis 2007b, Hyten in Martin 2015, Weeden 2010). In its 2015 report to Congress, the US-China Economic and Security Review Commission (USCC) claimed that 'China's recent space activities indicate that it is developing co-orbital antisatellite [ASAT] systems to target U.S. space assets,' conflating them with 'dual-use' close-proximity capabilities used for 'China's manned space program' (USCC 2015b: 294-295). Yet, China achieved two great "firsts" in the 2000s, and while the 2007 test has come to overshadow the 2003 launch of China's first astronaut in policy debates – the USCC being an indicative example – the extent to which they are both framed in the same way immediately demonstrates the extent to which China's "rise" in space has come to be understood as a "threat" within American public policy discourse. The research question which therefore guides this project is "how was the "rise" of China in space constructed as a threat in American public policy discourse?"

The central original contribution of this thesis is to demonstrate how China's "rise" in space came to be understood as a threat in American security politics. The thesis argues that by the end of Barack Obama's presidency, the discourse of a "Chinese space threat" came to dominate all public policy debates on China's space program. A surface-level analysis misleadingly suggests that this process was rapid and dramatic. In 2003, when Lieutenant Colonel Yang Liwei became the first citizen of the People's Republic to orbit the Earth, there was barely an American response to speak of. Formal congratulations were sent, but there was almost no public consternation, while official discourse praised China's achievements (see Bush 2003, Larson 2003, Nelson in Senate 2003: S12579, McCormack 2005, John 2006). Then, the 2007 satellite shootdown seems to have been the galvanising moment when American observers "realised" that China was a "threat" in space – a 'wake-up call' as United States Air

Force General Hyten (in Martin 2015) described it. The more in-depth analysis in this thesis demonstrates that the politics surrounding these events was much more uneven, and had deep historical roots dating back to the early Cold War. Then, particularly after the end of the Cold War, the debates about the meaning of China's "rise" in space for the US had their greatest significance in how they played into debates about national identity and the shape of the US space technology.

The conventional American wisdom of the key elements of China's "rise" in space are encompassed within a short and simple narrative (briefly outlined here but analysed in-depth in Chapters 3 and 4). At its most basic this is simply that in the 21st century, China's space program has risen from obscurity to the top-tier within a very short period of time. The emblems of this "rise" are China's efforts in ASAT technology, crewed space missions and robotic Moon exploration, since 1999 (see House 2005b: H4749, House 2009a: H5553, DoD 2011: iii, Johnson-Freese 2007: 199, 203, 2017: 56, Moltz 2008: 260, Handberg and Li 2012: 3). The American narrative of China's "rise" in space is a component of the "China rising" story, which itself only began to gain traction in the 1990s (Zhang 2013c: 113, see also Yan 2001: 36, Yee and Storey 2002: 2). Correspondingly, contemporary American representations of China's space program rarely consider its 20th century history, despite its establishment occurring in 1956 (Harvey 2002: 2), instead focusing on late-20th or early-21st century developments.[1] The crux of the "rise" of China, in space or more generally, consists of American representations of *recent increases in Chinese power*, particularly military and economic power. Taking DoD reports on China's military power as only one example, its space program is referred to as 'expanding,' 'developing' or 'maturing,' but with evidence drawn from around 1999 at the earliest (DoD 2002: 33, DoD 2004: 41-42, DoD 2012: 8-9, DoD 2016: 36-37, *inter alia*). As previously indicated, the 2007 ASAT test is the most central event in the narrative, with China's crewed space program also figuring in as evidence of the rise, albeit more in congressional circles (see Chapters 5 and 6). These tendencies are, broadly speaking, reflected in English-language academic literature too, identifying the Chinese space program as part of the "rise" around 1999 (see Johnson-Freese 2007: 199, 203, 2017: 56, Moltz 2008: 260, Handberg and Li 2012: 3). The consistency of these American representations begins to indicate how self-evident the importance of China's "new" space technology has become.

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[1] For an overview of the events that this narrative tends to obscure, see the timeline in the frontmatter of this thesis.

Any more than a cursory analysis of American constructions of China's space program immediately raises questions about the seeming obviousness of the "rise." This thesis demonstrates that the assumption of a "Chinese space threat" became undeniable by the end of the administration of Barack Obama, with policy and military elites citing the 2007 ASAT test as a 'significant wakeup call,' and even claiming that China was 'aggressively building a navy in space' (Hyten in CBS 2015, Culberson in Roop 2017, see also Chapters 5, 6, 7 and 8). With such intense rhetoric cultivating a sense of threat and urgency, one might have expected a crash program in response. Yet calls to respond with the procurement of new technology (be it weaponry, upgrades to defences or new launch vehicles) were left unheeded – at least as far as the public record reflects. If the US really had no choice but to 'run and win' (Tellis 2007a: 7) a space arms race in response to China's "rise" in space, then how was it possible for the threat to fall short of forcing this decision, as it did (see also Johnson-Freese 2007: 231-232, 2017: 54)? In this light, the deterministic arguments within the "Chinese space threat" discourse appear problematic. The US has so far refrained from publicly pursuing further space weaponry. Similarly, if the threat of a Chinese crewed space program to American identities of "exceptionalism" was definitive, then why was the Space Transportation System (commonly known as the Shuttle) cancelled, followed by the cancellation of its proposed replacement (Constellation)? Even when a new replacement, the Orion program, was decided upon, the "Chinese space threat" was, at most, a marginal justification (House 2016: H2781, Senate 2016: S45-46, see also Matson 2011, Davis 2016). The research of this thesis demonstrates that the construction of the "Chinese space threat" was an uneven process, which remains unfinished. While advocates of the "Chinese space threat" narrative gained pre-eminence in space policy debates of the time, they failed to spread their narrative to the rest of American China policy, or to significantly shape American space technology. Lastly, the insecurity produced was not simply constituted as physical threats from Chinese space weapons to American military security, but also various formulations of a "Chinese space threat" to American national identity. In short, the "Chinese space threat" was more than just the appearance of Chinese anti-satellite technology. It encompassed the whole gamut of space technologies. Unpacking these links between technology, identity, and threat is the task of this thesis.

Despite a substantial amount of existing debate on Sino-US space relations, there are serious gaps in the literature which this thesis addresses. Firstly, no attempt has been made to investigate what American understandings of China's space program were prior to the supposed start of its wider "rise" in the 2000s. Studies have been conducted on the histories of

the Chinese and American space programs, often with a view to understanding the politics of their development, but they have left this historical dimension understudied (see Smith 2003, Johnson-Freese 2003, Harvey 2004, Solomone 2006, Sheehan 2007: 158-173, 2013, Kulacki and Lewis 2009). Chapter 4 addresses this gap with detailed and novel archival research, making use of declassified documents that, until now, have not been analysed in space policy literature. Secondly, while critical security and international relations scholars have studied the identity politics of the Sino-US relationship (Pan 2004, 2012, Turner 2014, 2015, 2016), the specific case of American reactions to China's space program has yet to be studied by critical scholars. This thesis makes a contribution to this literature throughout, building on existing scholarship to address this gap in the literature. Closely linked to this is the third contribution, which is introducing the concept of technopolitics to studies of threat construction. By applying a linguistic approach to the study of security with insights from Science and Technology Studies (STS), it highlights how the nexus of security and identity rests not only on what is said and done, but also on the politics of technology. This elaboration on the more micro-level processes of identity politics sheds new light on the links between identity, practice, and technology.

These gaps are worth addressing because they speak to larger issues in International Relations and Security Studies. Space technology is of growing importance for the security of the US, China, and increasingly many other states. The US is the most prolific satellite-launching state, and much of its modern military capabilities (including its nuclear weapons systems) are, to a significant degree, dependent on space technology to fulfil their intended functions (see particularly Chapters 6, 7, and 8). Critical scholarship on security understands policy discourse as providing the discursive building blocks which makes certain policies thinkable and possible, including perhaps most importantly the use of force (Weldes 1996: 12, Weldes et al. 1999: 12). The seemingly self-evident nature of the "Chinese space threat" makes it a prime target for engagement from a critical security perspective. The theoretical position of this thesis also makes it well placed to contribute to the growing call for International Relations scholarship to take the concept of technology more seriously (see Wyn Jones 1999: 133, Mayer et al 2014: 2, McCarthy 2015: 2, McCarthy 2018: 5). On the one hand, much of academic writing on the "rise" of China in space has reflected the same overwhelming focus on technology that official American discourse has displayed. These official and academic analyses foreground technology as an explain-all factor which conceals the social contingency of international politics. On the other hand, threat construction literature has problematised the

concept of culture, but has overlooked the important role that technology plays in co-constructing society and politics (see Chapter 2, Nathanson 1988, Hansen 2006: 22-23).

To understand the complex mix of identity politics and space technology in contemporary US space policy toward China, this thesis adopts the analytical lens of "technopolitics," an approach that recognises the relationship of co-construction between society and technology. The key argument I seek to advance here is that we cannot understand the construction of the "rise" of China in space (and the threat it supposedly entails) without looking at how it is constituted in both the discursive/linguistic and the technical/material. This argument is elaborated further in Chapter Two. Importantly, the recognition of the technopolitical character of US space policy towards China highlights the historical contingency of the production of both meaning and artefacts. Consequently, studying the "Chinese space threat" between 2000-2016 also raises the question of how similar dynamics have played out both in the past and in other China policy debates contemporary with the main period in question. This is why the thesis devotes a chapter to the wider context (beyond space policy) of Sino-US relations and another to the historical representations of China's space program before the year 2000. The remainder of the thesis is then concerned with different aspects of the "Chinese space threat" as it appeared in public policy discourse between 2000 and 2016.

This thesis consists of nine chapters organised into three parts, each addressing different research objectives. The first part provides theoretical and empirical context, encompassing the theoretical overview, the context of the wider "China threat" discourse, and the historical development of the "Chinese space threat" in American representations of China's "rise" in space. The chapters in Parts 2 and 3 then attempt to understand different aspects of the technopolitics of the "Chinese space threat" and track its development. Part 2 sets out the underlying logics and limits of the discourse, such as the meaning and significance of space technology, and the contributing elements of American national identity which are implicated. Part 3 then takes a more fine-grained approach by attempting to discern what practices and technologies, if any, were justified by the construction of the "rise" as a "threat."

The theoretical and methodological underpinnings of the thesis are introduced in Chapter Two. It identifies the under-theorising of technology prevalent in existing threat construction literature and proposes supplementing the discursive approaches with a critical theory of technology. The result is an elucidation of how the technopolitical lens of Science and Technology Studies (STS) and approaches to understanding threat construction can inform one another. Chapter Two provides elaboration on the key concepts of discourse,

construction, identity, technopolitics, and technology. It then moves to address questions of methodology, such as how to approach studying public discourse of an area of policy that is heavily classified.

The various "rise" and "space threat" representations are situated into a wider American foreign policy context in Chapter Three. Specifically, Chapter Three argues that the "Chinese space threat" is reflective and supportive of a wider and historically embedded "China threat" in US public discourse. The "China threat" is a dominant, albeit not the only, aspect of American discourse constituting China's "rise." As Chengxin Pan (2004, 2012) argues in his wide-ranging project, China's "rise" is effectively an indisputable "fact" confronting Americans, but "paradigms" (as he terms them) of interpretations differ primarily between the two (not mutually exclusive) positions of the "China threat" and the "China opportunity." This wider perspective helps to demonstrate the specificity of the construction of the "Chinese space threat." That is, the "rise" in space is unique in US policy debates on China because it contributes only to representations of a wider threatening "rise," providing almost no reproduction of the understanding of the "rise" as opportunity. Chapter 3 therefore provides the basis from which to contrast public, American approaches to understanding China more generally against the specific case of China's "rise" in space. As the analyses and investigations in this thesis demonstrate, the overwhelming dominance of representations of "threat" over "opportunity" is striking, making space policy an outlier in Sino-US relations. Wider American representations of the Sino-US relationship recognise (to varying degrees) the dialogue, interaction and even cooperation that have taken place even in the most contentious years (Office of the Press Secretary 2015a, Kennedy and Economy 2017: 13, Green et al. 2017: 25). Representatives from a range of American think-tanks recently argued that the positive and robust US-China dialogue on security, including military cooperation, is the most stable 'in decades' (Finkelstein et al. 2017: 26). Conversely, after the year 2000, American policymaking toward China in space has been characterised by the absence of dialogue, interaction and cooperation, with the constituting discourse laden with American anxiety. Chapter 3 therefore deepens the rationale of the research, namely the need to understand this outlier case.

The historical context of the "Chinese space threat," is explored in Chapter 4, asking how China's space program was viewed by American observers prior to the year 2000. Sino-US interaction in space was limited but significant during the second half of the 20th century and demonstrates how understandings of Chinese space technology have been historically contingent, with at least three main permutations between 1958 and 2000. The first of these was the initial fearful reaction to China's nascent space program. The second was to consider

Chinese space technology as merely spin-offs of the nuclear program. Finally, the third was to view the space program as an opportunity for cooperation, in sharp contrast to American representations after 2000. Assessing these dynamics in Chapter 4 is therefore essential context for the analysis in the remainder of the thesis. To make this case, Chapter 4 makes good use of declassified archival material obtained at the Library of Congress, as these policy debates had a limited public profile. The analysis of these archival materials reveals organic links between historical interpretations and more recent American public policy discourse, demonstrating an ongoing struggle for US policymakers to "make sense" of China's space program, and crucially how to come to terms with the various dimensions of power which China was perceived to have gained with space technology.

The threat assessment methodologies used by official and quasi-official American accounts of China's space program are identified in Chapter 5. The aim is to establish what knowledge is considered "good" knowledge about China's space program and how that is mobilised to argue that it constitutes a threat. Although there are some variations across departments and over time, the key finding of Chapter 5 is that American observers privilege capabilities as the "best" evidence for threat assessment, both specifically in the case of China's space program and more generally in security policymaking. This often goes further than simple statements that China possessed the capabilities to attack. China's space capabilities were deployed as objective evidence of China's malign intentions towards the US in outer space (see Chapter 5).

Chapter 6 analyses the content of the "China space threat" discourse in terms of *what* or *who* is threatened. Participants in space policy debates on China set out, implicitly or explicitly, what they thought was at stake in the Sino-US relationship in outer space. By analysing the contents of these claims, it becomes possible to piece together the constructions of both American national identity (and how national security might be achieved) and the construction of a Chinese adversary. Chapter 6 makes three interrelated arguments. Firstly, one stream of the "China space threat" discourse rests heavily on the role that space technology plays in enabling "the American way of war" and the threat that Chinese ASAT technology poses to the uninterrupted functioning of those systems. This creates a link between the physical security of objects and the security of (aspects of) American national identity. Secondly, another stream of the "China space threat" is concerned with national prestige and particularly the "exceptional" nature of American achievements in space. The possibility that China may be able to practice some previously exclusively American activities challenges the powerful overarching American identity of "exceptionalism." Lastly, China itself

is constructed in these claims of threat as a reckless, aggressive and expansionist power with an overriding goal of overtaking the US in space and every other domain of human activity.

The technical artefacts of American national security in space become the central objects of analysis in Chapter 7, which asks how (and if) they have been technopolitically shaped to address the "reality" of the "Chinese space threat." The secrecy of national security space systems makes the scope of this analysis rather modest, but even so it draws conclusions on the public dimension of the technopolitics of these artefacts. Despite the success of advocates of the "Chinese space threat" in public policy discourse, they were unsuccessful in instrumentalising changing American space technology as a recognition of, and response to, the threat. Even at the end of the Obama administration when the "Chinese space threat" discourse was most prominent, responses were formulated as organising ideas (future procurement strategy) rather than concrete, specific technical changes. Importantly, there were many technical changes which had the potential to be claimed as reactions to the new threat, such as demonstrating the ASAT capabilities of the Standard Missile and procuring a new civilian launch vehicle, which were not publicly claimed as a response to China. This points to some of the limitations that prominent public speakers may have had in non-public political contests. This conclusion, then, speaks to the value of a technopolitical approach, whereby a dominant discourse of threat is not automatically assumed to lead to changes in technology. Technopolitical disjunctures between public discourse and technical outcomes highlight both the technological construction of society and indicate the limits of a discourse which otherwise seems overwhelmingly dominant.

The "Chinese space threat" is a discourse which suggests historical momentum – a growing threat – a feature increasingly identified in the analysis in Chapters 6 and 7. To further develop this facet of the discourse, the analysis in Chapter 8 explores how visions of the future US-China space warfare are implicated in technopolitics, focusing on the wargames and exercises from which the most in-depth representations are produced and disseminated. Chapters 5 and 6 contain some American engagements with the future, but in Chapter 8 this phenomenon is explored in-depth. Unlike in press statements and Congressional debates, where short predictions can be made without supporting context, the format of wargames requires a comprehensive picture of a future scenario in order for it to claim "realism." After providing some context on the role of wargames in producing and disseminating knowledge, the chapter goes on to analyse the public aspects of the *Schriever* wargame series held by the USAF during the period. It is argued that these served the dual-purpose of producing "good" knowledge about the future of the "Chinese space threat" and in disseminating it – even

"teaching" it – to other elite audiences associated with American national security policymaking. In sum, wargames help the USAF practice (for) a space war against China in the future while also practicing the technopolitics of the present. Together with Chapter 7, Chapter 8 provides further evidence that, while the "Chinese space threat" has become increasingly taken for granted in US public policy discourse, it has not necessarily led to clear changes in the design of the US space programme to reflect the "threat."

Chapter 9 concludes the thesis. By undertaking this study, the thesis demonstrates that the tendency for American policy and academic literature to take the "Chinese space threat" for granted has obscured a historical record of both fear and cooperation. Perhaps more importantly, it also shows how arguments of a technologically determined threat of Chinese technology – both historical and contemporary – run counter to the empirical record. Growing Chinese technical capabilities have so far not determined an American technical response, a major deterioration in wider US-China relations, or armed conflict. Critiquing the technological determinism of the "Chinese space threat" discourse is greatly aided in the thesis by the use of the novel technopolitical approach to threat construction first set out in Chapter 2. The empirical analysis of this thesis then provides an applied case of threat construction for the lens of technopolitics, providing equal emphasis on the linguistic and the technical without falling into determinism of either kind. Chapter 9 concludes by considering the limitations of the study, with a particular focus on the further puzzle of explaining the disjuncture between rhetoric and technical design in space policy during the Bush and Obama years which was identified in the thesis. To explore this disjuncture further is necessary, but requires an assessment of the non-public aspects of US space policy which remain inaccessible to researchers at this time. Despite some limitations, however, the thesis successfully elaborates a new technopolitical approach to threat construction, and applies it to the under-studied case of American reactions to China's "rise" in space.

Part 1: Contextualising China's Rise in Space

If we are to understand how China's "rise" in space was constructed in a systematic manner, it is first necessary to establish a theoretical approach, and the historical and contemporary empirical context of the case. Part 1 addresses this need by laying the groundwork for the contributions of the thesis. Theoretical context is addressed in Chapter 2, adopting a critical constructivist approach to understanding threat informed by critical theories of technology. Chapter 2 critiques existing discourse analyses of threat due to its failure to recognise the mutual constitution of technology and politics. To redress this, the concept of technopolitics is introduced and tailored for use in research on threat construction. Chapters 3 and 4 then deepen the contemporary and historical empirical context of the case, respectively. Chapter 3 situates the space component of the "rise" within wider American representations of a "China threat," ultimately arguing that, since 2000, China's space program has been mobilised by American observers to support the narrative of a "rising China." Chapter 4 proceeds by developing the first assessment of historical American views of China's space program based on declassified records, arguing that the contemporary "Chinese space threat" is the second iteration of a narrative first established in the late 1950s. By establishing the precedents of both American alarm over China's space program, and the subsequent instrumentalisation of American and Chinese space technology which helped curtail the first iteration of the "Chinese space threat," Part 1 thus demonstrates how threat and technology have historically been co-constructed in the relationship.

Chapter 2

Technopolitical Threat Construction: Theoretical and Methodological Underpinnings

Introduction

The purposes of this chapter are to argue the case for introducing the concept of technopolitics into threat construction analysis, followed by an elucidation of a theoretical and methodological framework which integrates both approaches. Specifically, the form of technopolitics adopted in this thesis is a synthesis of elements of critical constructivism (from IR and security studies) with a critical theorisation of technology. Recognising the myriad interconnections between technology and politics is crucial for understanding security (and insecurity), and technopolitics is a useful concept for capturing these complexities.

A great deal of critical scholarship on security has proceeded from a "thick" constructivist theoretical position. Likewise, this thesis also adopts a broadly "thick" or critical constructivist approach, and so this theoretical point of departure is elaborated first.[2] In order to establish the importance of introducing a deeper conceptualisation of technology to the study of security, this chapter provides a critique of the existing threat construction literature in its treatment of technology, which posits that technology, just as any other social phenomenon, is constituted in discourse. While this position is a useful starting point, the critiques in this chapter show that this position has been inconsistently applied, and in so doing has obscured important aspects of politics that contribute to threat construction. The chapter then moves on to establish how a technopolitical lens (drawn from critical theories of technology) provides a corrective to this situation, by conceiving of technology and society in a relationship of co-construction. Under this view, technology is a social construct (or product) that helps to make some social outcomes more likely (or possible at all). The processes by which a given technology is constructed is dubbed, following Feenberg's (2010: 72) critical theory of technology, 'instrumentalisation,' i.e. the process by which something comes to be

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[2] The thick/thin, mainstream/critical distinction has been mutually recognised by scholars from both approaches (Weldes et al 1999: 9, Finnemore and Sikkink 2001: 398, Marsh 2009: 680). Due to constraints of space, the rival "thin" constructivism (most famously set out by Nicholas Onuf (2013 [1989]), Friedrich Kratochwil (1989), Alexander Wendt (1992), and Emmanuel Adler (1997)) is not discussed. While they too have engaged with threat construction, that area of research proceeds from the foundational claim that language and materiality are ontologically separate, and this chapter (and thesis at large) is not intended to contribute to that debate.

understood as a tool. This Feenbergian position is then related back to questions of identity and threat, to demonstrate its translation into methods for the study of security politics.

2.1 Discourse and the problematic status of technology

The discursive construction of social reality: practices and representation

The central theoretical and methodological starting point of this thesis is the contention that discourses constitute social reality. Norman Fairclough (1993: 3-4) argues that

> discourses do not just reflect or represent social entities and relations, they construct
> or "constitute" them … any discursive "event" (i.e. any instance of discourse) is seen
> as being simultaneously a piece of text, an instance of discursive practice, and an
> instance of social practice.

As such, discourse analysis can be said to be both theory and method, 'intertwined' to such an extent that the method cannot be used without accepting a set of 'basic philosophical premises' (Jørgensen and Phillips 2002: 4). As per Fairclough in the excerpt above, a discursive approach rejects the need to find "real" social entities "out there." Instead, social categories like "American," "Chinese" and "threat" can be nothing more than the discourses which constitute them. This approach is inherently critical in that it begins from a position of scepticism about the fixed-ness of social reality. This is important for the scope of the research question as it means we cannot "discover" whether China is genuinely a threat to the United States in any objective sense (as might be meant in realist foreign policy analysis, for example). Instead, this research project can only discover how China's "rise" in space came to be understood as a "threat" to the US in a socially contingent, intersubjective sense. As an influential group of critical constructivists argued in their work (Weldes et al 1999: 12), this perspective does not intend to convey the sense that threats are 'purely a fabrication' or that they 'did not in fact exist,' but rather that threats do exist, albeit specifically that their existence is discursively constituted.

Discourse analysts have answered the "so what?" question of the theoretical position outlined above by pointing to the role of power in these struggles over meaning (and ultimately the nature of reality itself). Because meanings are not inherently fixed, it is up to actors of all kinds to socially produce order. Discourses regulate social interactions, providing

rules and the boundaries of what can be said and done (see Jørgensen and Phillips 2002: 6, Mills 2004: 44, Salter 2013: 18). As Jørgensen and Phillips (2002: 6) point out, although discourse theory holds that meanings are highly contingent, it tends to recognise that 'they are always relatively inflexible in specific situations.' The stakes are therefore very high, with powerful discourses heavily determining the shape and content of the social and political world. Not all contributions carry the same importance or significance however, as some subject positions are more authoritative than others – and even these subject positions are constructed (see Doty 1993, Walters 2016: 654, 664). A particular set of power relations, like any other social phenomenon, must also be constantly reproduced in discourse, however – a process that Jørgensen and Phillips (2002: 32) term 'stabilisation.'

The research question at hand (see page 1) concerns states and matters of national security. How can discourse help us to understand these concepts? In her seminal work on the Cuban Missile crisis, Jutta Weldes (1996: 280-281) conceives of the state as an 'institution or bundle of practices.' Furthermore, the state is 'not only the object to be protected but the subject charged with doing the protecting' (Weldes 1996: 287). Most speakers are not endowed with the ability to speak on behalf of the state with any authority, restricting the production of foreign policy primarily to specific kinds of elites. Weldes (1996: 11) thus argues that 'those individuals who inhabit offices in the state play a special role in constructing the meaning of the national interest … [I]t is perhaps safe to say that the national interest is produced primarily, although not exclusively, by foreign policy decision makers' (see also Cohn 1987: 703, 705-706, Campbell 1992: viii, Hansen 2006: 8). Methodologically, this already slants research on national security to focus on elite policy discourses, because these subject positions can speak with authority on what matters to the state, and ultimately even the nature of the state "itself." Security politics should then be recognised as being concerned with preserving a particular status quo, including a particular formulation of power structures, specific identities (including subjects and objects), and a set of rules governing language and practice.

Specifically, this thesis is concerned with the discursive construction of threat. What, then, can threaten the state, and its constitutive identities and practices? How have critical constructivist scholars conceived of the process of threat construction? Roxanna Sjöstedt (2013: 145) describes threat construction literature as 'fairly limited' in size. Nevertheless, scholars have covered a wide variety of empirical cases. Military threats form one area, and this is the area of the literature to which this thesis contributes. The most similar studies to this project which have already been undertaken are Charles Nathanson's (1988) analysis of

the 'Social Construction of the Soviet Threat,' and Chengxin Pan (2004, 2012) and Oliver Turner's (2013, 2014, 2016) work on the broader notion of a "China threat" in US discourse. Similar studies have dealt with the construction of the threats of Iraq (Hughes 2007), Iran (Porter 2015) and the absence of a US-India threat (Hayes 2012). Studies have also dealt with wider notions of threats, including piracy (Shirk 2017), terrorism (Tsoukala 2008, Fisher 2011, Rychnovská 2014), crime (Emmers 2003), HIV (Elbe 2006), and immigration (see McDonald 2008: 583 fn.).

A major methodological difference within threat construction literature exists between those who attempt to track the acceptance of threat constructions by a wider public, and those who do not. Of the threat construction literature cited above, a significant portion fall into the first camp, adopting some variation of securitisation theory (see Emmers 2003, Elbe 2006, Hughes 2007). The theory was introduced by Ole Wæver (1995). A typical case of Wæverian securitisation would consist of a speaker attempting to convince an audience that something is threatened and therefore by extension, extraordinary measures should be taken to address the threat (see Taureck 2006: 54-55, Balzacq et al. 2016: 495). However, as Columba Peoples (2011: 92 see also Watson 2012) points out in his study of the securitisation of outer space,

> there are obvious issues with establishing and verifying the extent to which an
> audience consents … to the identification of an issue under the rubric of security.
> What can be more clearly established … however, is the extent to which these
> discourses … conceive of multiple relevant audiences at different times.

Rather than attempting to map how successful the organisers were in reaching and convincing their audience, asking what audiences or publics are constructed is a useful exercise in understanding the construction of China's "rise" in space.[3] For example, in the course of the analysis in this thesis it rapidly becomes clear that, in these debates, policymakers primarily address an audience of their peers, only appealing to a wider public audience when broader notions of the American national Self are invoked. This leads the discussion immediately on to questions of what, precisely, is "public" about US public policy discourse.

The phenomena of foreign and security policy commonly carries associated notions of secrecy and classification. Secrecy plays into public discourse in consequential ways. Hansen (2006: 8) argues that a major component of what lends certain subjects authority to speak on behalf of the state is 'built on *knowing* about a particular issue.' As has already been argued,

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[3] As such, this thesis does not seek to make a direct contribution to securitisation literature.

the construction of national identity and national security threats is an unequal process, in which some speakers have more authority than others. Making some kinds of knowledge secret exacerbates this set of power relations, because the holder of secrets is lent a rhetorical trump card: "trust me: you are wrong, but I can't tell you why you are wrong."[4] This is especially prevalent in American politics, where Joseph Masco (2014: 113) argues that 'The power of the secret … is difficult to overestimate.' As a result, 'state power rests to an unprecedented degree precisely on the ability of officials to manage the public/secret divide through the mobilization of threat' (Masco 2014: 113). Masco's (2014: 124, see also Galison 2004) ominous conclusion is that

> the national security state is increasingly structured … by the theatrical performance
> of secrecy as a means to power: secrecy now … stands in for governance, rationality,
> and evidence.

A further important ramification is that the extensive secrecy of the state 'creates the appearance that there is always perfect knowledge out there and that somebody has it' (Masco 2017). What is meant by public discourse, then, is to a large degree defined by what it is not: secret (see Ku 1998: 172). Crucially, the management of "secrecy" in public discourse is instead a powerful rhetorical device that can be invoked by powerful subjects, such as choosing which "secrets" to reveal to the public (Belcher and Martin 2013: 407, see also Taussig 1999, Horn 2012).

A discursive approach understands the construction of identity and threat as part of a cohesive process, with no "outside" audience which can be identified (and whose "consent" or agreement can be assessed as in securitisation theory). Identities are strongly defined by what they are not. As Jutta Weldes and her colleagues (1999: 15) write, 'as each subject seeks to perform its identity, it threatens others, whose identities are consolidated in response.' This position is drawn in part from William Connolly (1991: 67) who theorises that difference and otherness stand in a 'double relation' in that 'they constitute it and they threaten it' (see also Campbell 1992). Chinese-ness is one possible "other" which can potentially threaten the constructed identity and agent represented as the United States. Previous critical scholarship has explored this dynamic in Sino-US relations in its broadest sense. Oliver Turner (2013: 907) states that 'Across the history of Sino-US relations … when 'dangers' from China have emerged, they have always existed as dangers to [American] identity … a key purpose of depicting China as a threat has been to protect components of American identity.' Chengxin

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[4] See Ellsberg (in Drum 2010) for an insider's perspective.

Pan (2012: 44-45) adds that 'the autobiographical function of these China paradigms … is largely indirect' and that China is a threat to American identity because 'China's regional influence' is in turn a threat to the American requirement for 'universal dominion' and 'absolute security worldwide.' China is thus 'a valuable discursive site where the Western/American self can continue to be coherently imagined, constructed and enacted' (Pan 2012: 51). Likewise, Weiqing Song (2015: 164) also stresses that China is a threat in these discourses as the result of a 'struggle to impose authoritative interpretations of international events,' a long-standing phenomenon according to Yongjin Zhang (2013b: 254). The specificities of the "content" (i.e. what deemed as valuable) of these identity discourses then helps us understand why some "other" identities are more salient than others. Interpolating Pan (2012: 45) and Turner's (2013: 923, 932) arguments, we can understand how the possibility of Chinese "otherness" being more consequential than compared with, for example, Indian "otherness," is predicated on the state of American discourses about the US, China, and other nation states. That is, China is constructed as having far more regional and global power than India, making for a more suitable foil against American identities and security needs. The insights from this existing literature helps guide the inquiry of this thesis to ask what discourses of American and Chinese identity help constitute both the two states and the notion of a threatening "rise" of China in space.

Having discussed the concept of identity, it is worth elaborating on what this entails for the status of the "real" China (as it were) in this research project, because it is here that important limits of the scope of the research are drawn. It is not the task of this thesis to ask whether China is "really" a threat to the Unites States, or what Chinese interlocutors have had to say about China's "rise" in space. As this project does not compare Chinese and American discourse, but only analyses the latter, the extent of the inclusion of Chinese voices is defined by the content of American discourses. The result is that this thesis contains only small flashes of Chinese contributions to American policy debates on China due to the highly unilateral quality of American space policy discourse about China. This form of research focuses on only one side of what otherwise might be considered a "relationship," having roots in critical scholarship on discourses and identity. For example, Edward Said (2003: 5) writes that

> … Orientalism as I study it here deals principally, … with the internal consistency of
> Orientalism and its ideas about the Orient … despite or beyond any correspondence,
> or lack thereof, with a "real" Orient …

This point also carries to questions relating China's "rise" in space compared to the Russian or Indian space programs for example. Unless these comparisons are made

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within policy discourse on China's space program, invoked by American observers, they cannot be considered within the empirical case in question in this thesis (instead that kind of comparative analysis is discussed in the concluding chapter as a potential avenue for further research).

To further deepen the conceptualisations of discourse and identity, it is necessary to discuss the notion of practices, a topic of contention in constructivist literature (Adler and Pouliot 2011: 2-3, Epstein 2013: 514). Under the critical constructivist framework outlined so far, as Charlotte Epstein (2013: 515) argues 'The ontological premises of "discourse"' mean that 'practice is already part of "discourse."' Laura Shepherd (2008: 24-25) demonstrates this capably with her articulation of the twin status of practices within discourse as

> representation as an *instance* and representation as a *practice*. Representations can be seen as instances of discursive practice. … Conceiving of representation as practice is slightly different. … [D]iscursive practices are representations, and representations can be (inter)texts or articulatory practices.

Practices can be meaningfully conceived of as analytically (but not ontologically) separate from language. How different practices are used, and when, is an important topic of inquiry itself. For example, delivering a speech is one representational practice that a politician might use to simultaneously frame both their own subject position (e.g. "leader") and national identity (e.g. American). This might in turn seem "more" linguistic than say, the wearing of certain clothes or the adoption of certain gestures (e.g. wearing a flag-pin and saluting the flag), and while these differences are analytically important, both "speech" and "practices" have representational qualities which contribute to the establishment of a given discourse. In short, this line of argument recognises the 'Coconstitution' of 'language' and 'practice' (as Epstein (2008: 4) terms it) and this understanding is the foundation upon which to introduce the critical theory of technology later in this chapter. For clarity, following Weldes et al. (1999: 16-17), this thesis indicates a loose analytical distinction between the 'linguistic and non-linguistic' by referring to the former as *construction* and the latter as *production*. The question remains, however, of how these practices may be underpinned and enabled by certain technologies. This is dealt with in the following section.

The discursive approach set out so far might be sufficient for studying threat construction in less technological fields. However, as it stands this position does not provide sufficient conceptual depth to engage with technology, an argument that this chapter now proceeds to provide with reference to key examples from the literature. Specifically, threat

construction scholarship has typically fallen short in its conceptualisation of technology by ignoring or underplaying the relationship of *co*-construction between technology and society.

The problematic status of technology in threat construction approaches

Where does technology fit within a critical constructivist framework? It would seem from the discussion above that the only consistent answer is that, just as any with other concept, it is constituted in discourse (both language and practice). This is how we might imagine the influential discourse theorists, Laclau and Mouffe (2001: 108) would conceptualise technology. When arguing their case on the ontological status of objects, they use the example of a brick, holding that the meaning and consequences of 'the falling of a brick' could not be made meaningful 'outside any discursive condition of emergence.' It might then be imagined that, just like any other set of representations/practices, a given technology goes on to be invoked in, and to shape, other discourses. Yet, the examples from threat construction and critical literature on space policy analysed below show that previous engagements with threat and technology have recognised the social constitution of technology, but have struggled to also simultaneously understand the technological constitution of the social. Discussing the latter, it is assumed, inevitably "risks" technological determinism. Ian Hutchby (2001: 447, also see 449, emphasis original) provides one example of a more determinist argument against discursive approaches when he writes that 'different technologies possess different affordances, and these affordances *constrain the ways that they can possibly be 'written' or 'read."* Therefore, technology cannot be thought of as simply another kind of text in the sense meant in discourse theory. This might appear to be similar to the claim that discourses are both '*enabling'* and '*constraining'* (Epstein 2008: 13). However, Hutchby (2001: 446) is arguing that there are some aspects of technology which 'cannot be altered by social constructions' and 'go beyond discourse' (Hutchby 2001: 446). The "problem" in threat construction literature, such as it is, is that some approaches ignore the possibility of technological constraints, while others inconsistently vary between determinism and total indeterminism.

The critiques that follow draw upon Andrew Feenberg's (2002, 2010) framework, that classifies theories of technology as either 'instrumentalist' or 'substantivist.' These two positions can be summed up in the two statements that 'Technology is neutral' and 'Technology is determining,' respectively (Feenberg 2010: 6). The instrumentalist position conceives of technology as a simple tool that 'is indifferent to the ends it can be employed to achieve' (Feenberg 2002: 4). Daniel McCarthy (2013: 474), who draws on Feenberg, argues

that 'by suggesting that means do not affect ends, instrumentalist accounts stress agency in the use of technologies but not in their design and creation.' The substantivist position, in contrast, 'affirms that social institutions must adapt to the "imperatives" of the technological base' (Feenberg 2010: 9). Feenberg points out, however, that in practice it is possible to "waver" between the two mutually exclusive positions, making a theoretical approach internally inconsistent (Feenberg 2002: 65). It is this "wavering," rather than a dogged adherence to either extreme instrumentalism or determinism, which is exhibited in the examples below. Of these four examples, two are drawn from threat construction literature and two from critical approaches to space policy. Furthermore, these examples were chosen because they make some claims about technology. The work by Chengxin Pan (2004, 2012) and Oliver Turner (2013, 2016) on the "China threat," for example, does not engage with its technological aspects at all, discussing identity in a way entirely separated from any technological relationships.

Charles Nathanson (1988) provided one the earliest analyses of threat construction in his article 'The Social Construction of the Soviet Threat.' He frames his study as 'dealing with the sociology of knowledge and the politics of representation … how and why a society constructs an enemy' (Nathanson 1988: 443). Yet, while nuclear weapons understandably occupy a central position in his narrative they appear almost as an autonomous force, such as when he argues that 'the advent of nuclear weapons … brought these dilemmas [of national identity] to a head' and 'The atomic bomb changed all the calculations' (Nathanson 1988: 446, 450). On what basis does Nathanson make these claims? That is unclear, given that otherwise he discusses language, scripts, and interpretation (Nathanson 1988: 445, 457, 460, *inter alia*). Given the seeming ability for the technical to determine the social, Nathanson's conceptualisation of technology leans more towards the substantivist approach because he portrays the "appearance" of nuclear weapons as necessarily forcing changes in American domestic politics. Yet, simultaneously, he skirts over how and why nuclear weapons were constructed in the first instance, omitting the politics of their development.

Lene Hansen (2006: 22) in her influential *Security as Practice*[5] provides a clearer, but still flawed, understanding of technology in her description of a tank:

> A tank, for example, is not simply a material assemblage of metal and rubber but an
> object of warfare – or peacekeeping– whose material and social production is
> situated within an abstract discourse of national security ('states should be armed to

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[5] Hansen (2006: 30-31, 158, 190) engages directly with threat construction as part of her wider study.

> defend themselves') as well as a specific, local one ('we have been threatened by
> Soviet forces in the past …). To adopt a discursive approach to foreign policy is
> therefore not, as is sometimes claimed, to hold that materiality does not matter …

Two major omissions are immediately apparent. The first is how the tank came to be in the first place – how did it come to be configured the way it is? The second is that tanks can presumably be used to kill people and destroy objects – and this may have some political significance, the analysis of which might garner further understanding. Hansen's (2006: 23) stated goal in theorising "materiality" is to 'incorporate' what mainstream IR might consider

> material and ideational factors … The analytical intent is not to measure the relative
> importance of ideas and materiality but to understand them as constructed through
> a discourse.

Arguably her position in the extract above does not fulfil her stated goal because the material qualities of the tank, once established, do not continue to "feedback" into the social world, pushing her theoretical position towards a form of instrumentalism where the tank is constructed, but cannot construct "back."

The inconsistent theorisation of technology is also apparent within critical literature on space policy. Work by David Grondin (2012), and Raymond Duvall and Jonathan Havercroft (2008, 2012), shows how "wavering" can cause theoretical contradictions in critical analysis of space policy. David Grondin's (2012: 109) work on the power politics of space begins from a theoretical position which recognises the discursive constitution of concepts such as sovereignty. Despite this, he later claims that 'the technological takes over as the political is eclipsed by the military professionals … a logic of security – coupled with (military) technology – drives their analysis' (Grondin 2012: 122, see also 126).[6] This privileges technology as a causal, autonomous force, which conflicts with his overarching theoretical approach of discourse analysis (Grondin 2012: 109). Havercroft and Duvall (2012: 53) argue that 'we should focus on the bio-political aspects of space weaponization along two axes: the management of populations and the disciplining/subjection of individuals.' The weakness of Havercroft and Duvall's analysis is that no time is spent problematising how technology relates to power and discourse. They argue that 'the ability to project force to any point on Earth constitutes all the Earth's inhabitants as a single population to be governed' and that 'space weapons represent a powerful disciplinary capacity in the ability to target individuals with great precision' (Havercroft and Duvall 2012: 53). Firstly, this arguably presents a position on technology in

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[6] Grondin (2013: 191, 194) makes similar claims in later work about "drones."

which human agency cannot resist technological force: space weapons force the constitution of a single world population. The possibility for individuals and groups to discursively resist the classification is glossed over (the methods of resistance they suggest are instead 'ballistic missiles and advanced laser systems' (Havercroft and Duvall 2012: 57)). In short, they assume that technology can independently inform the constitution of identity. Secondly, their analysis is divorced from the empirical, and specifically material, qualities of the technology in question. They have not identified the affordances of the technology – if they had done so they would have quickly discovered that 'space-based lasers' are not capable of 'project[ing] lethal force at very precise targets, even individuals' (Havercroft and Duvall 2012: 53). As recently as 2017, even a US Army Colonel advocating the development of lasers admitted 'we're not seeing it at a maturity level to be a war-fighting capability at this point' (Opall-Rome 2017). Reportedly, lasers could be used to "blind" satellites, but not project lethal force as Havercroft and Duvall claim (Tucker 2014, Swarts 2016). In short, in the case of all three space scholars discussed here, an ostensibly discursive approach inconsistently flirts with a pronounced and uncritical technological determinism.

In the examples above, the conceptual problem is some variation of internal consistency. At first glance, a discursive approach to the study of security seems to demand a position that technology is much like any other social phenomenon, totally subject to discursive construction. Yet as we have seen, this position can only take us so far. Particularly, as critical scholars have attempted to include technology in their accounts of threat construction and space politics, internal theoretical inconsistencies have arisen. Daniel McCarthy (2013: 470) argues that in rejecting technological determinism 'we must be careful of not throwing out the power of technological determinations with the teleological bathwater.' By conceiving of technology under the rubric of "technopolitics," this chapter now moves on to propose a framework with which to recognise the simultaneous socially constructed, contingent qualities of technology alongside its strongly socially shaping tendencies.

2.2 Technology and threat

The concept of technopolitics in STS and this project

The preceding section has argued that the conceptualisation of technology in existing critical scholarship on threat has been inadequate. International Relations and Security Studies scholarship does not provide a solution, the two fields being historically weak on the analysis of technology despite its centrality in international politics (see Wyn Jones 1999: 133, Mayer et al 2014: 2, McCarthy 2015: 2). Conversely, since the 1980s STS literature has firmly established the social contingency of technology using reams of empirical data collected across numerous studies (Bijker, Hughes and Pinch 1987, Mackenzie 1993, Hecht 1998, Jasanoff and Kim 2009, Felt 2014 *inter alia*). What is proposed here is to adopt (and adapt) the lens of technopolitics developed by a subset of STS scholars, most notably Gabrielle Hecht (1998, 2003) and taken up by a handful of scholars in IR (McCarthy 2015, Peoples 2018: 190).

Technopolitics entails the consideration of technology as an analytically distinguishable social phenomenon, ontologically entangled with discourse, and thus inevitably "co-constituting" the social world by making some social outcomes more possible at the expense of others. By adopting the lens of technopolitics, so it is argued here, it becomes feasible for the researcher to be reminded of the two-way relationship in the construction of technology and society. It is in this sense that this thesis understands the concept of technopolitics. As such, it is insufficient to only ask how technology is socially constructed, without also asking how society is technologically constructed, thereby problematising culture and technology simultaneously. One of the original contributions of this thesis is the adaption of the concept of technopolitics (found particularly in the work of Hecht (1998) and Feenberg (2010)) to the study of threat construction. It is therefore necessary to differentiate the use of the concept in existing scholarship from its conceptualisation within this project, and demonstrate the rationale behind the conceptualisation used in this thesis.[7]

Technopolitics can be conceived within two mutually exclusive paradigms, only one of which is consistent with a critical constructivist approach. Maximillian Mayer, Mariana Carpes and Ruth Knoblich (2014: 2), who conducted an overview of technopolitically informed methodologies, provide one over-arching definition. They argue that '"Techno-politics" implies an understanding of science and technology beyond the framework of social constructivism on the one hand, and technological determinism on the other' (Mayer et al 2014: 2). The *interactional* form, however, takes social categories (like "international politics") for granted, and *a priori* distinguishes between technology/science and politics – an approach more appropriate for "thin" constructivism (Mayer et al. 2014: 2, see also 4-5). Taking an

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[7] Differences in method between this project and an STS approach are explored in the next section.

interactional approach is incompatible with a discursive, critical security approach. It implies what Robert Cox (1981: 128-129) would term a 'problem-solving' approach, taking the 'world as it finds it,' which is in turn incompatible with a view that 'all insecurities are culturally produced' (Weldes et al. 1999: 1). In contrast, *co-productionist* approaches see these two supposedly distinct "spheres" as 'inevitably intermingled and jointly produced' (Mayer et al. 2014: 2). Since only the latter is compatible with the methodological approach outlined so far in this chapter, this thesis rejects interactionalist technopolitics and now proceeds to develop a co-productionist conceptual position.

Gabrielle Hecht's (1998, 2003) co-productionist conception of technopolitics is an ideal starting point for considering the relationship between threat and technology because her work is concerned with the intersection of national identity and technology. As the preceding section of this chapter has argued, the interplay of identities is central to the construction of threat. Therefore Hecht's theory, with some development, is appropriate. Judith Schueler (2008: 28), for example, writes that 'Despite the growing interest, there is no clear-cut methodology available for studying the interrelation between national identity and technological development' but argues that Hecht's work is 'The most influential tryout.'

Hecht (1998: 11) places co-construction at the centre of her theory on culture and technology, arguing that 'the material world both derives meaning from culture and performs culture' (see also Schueler 2008: 29). It is here that the discussion returns to the question of practices raised in the preceding section of this chapter, specifically in the conceptual area of practices as processes, enabled by technical affordances. Hecht's (1998) work on French nuclear power, for example, is focused on the technologists who fought to advance *their* conception and vision of Frenchness by building certain types of nuclear reactors, rather than others. Thus, she argues, the EDF2 reactor was built to optimise raw power output over fuel efficiency, and so during its operational life it performed the narrative of growing French national power over any other competing versions of national identity (Hecht 1998: 96-98). Hecht's study is not concerned with threat or security, however (French engineers were not, by all accounts, fearing an attack by rivals), and so some work must be done to adapt her theory for the case at hand. Returning to a close parallel in Security Studies literature, Carol Cohn's (1987: 690) notion of "technostrategy" recognises that 'strategic thinking seems to change in direct response to technological changes' but simultaneously that 'nuclear strategic language and thinking are imbued with, indeed constructed out of, modes of thinking that are associated with technology.' This seems to capture some of the dynamics more specific to

questions of security but further theoretical depth is required, particularly in regard to the technological shaping of the social/political.

How can the technological shaping of society be theorised? The theory of discourse outlined earlier already provides some basis from which to conceptualise how technology is socially shaped, but the inverse requires a conceptualisation of technical affordances. That is, what are the aspects of technology that seem to shape society? Langdon Winner's (1980: 124) heavily-cited empirical example of affordances in practice is a suitable place to begin this discussion, especially given its centrality in STS literature. Winner (1980) asks whether artefacts "have politics," giving the example of bridges built in Long Island that discriminated against minorities and the poor by preventing buses they relied upon quickly accessing a park using the highway. The bridges were physically too low to accommodate the tall buses of the city. Bernward Joerges (1999: 1) responded by criticising the deterministic account Winner seems to provide, turning the question on its head by asking 'Do Politics Have Artefacts?' Ultimately, he argues that '*Only rarely and in the most trivial senses can one show that such constraints are coupled to building form*' (Joerges 1999: 19, emphasis original). Broadly, he contends that the bridge in Winner's example was only discriminatory in a wider social context, but as Hutchby (2001: 446) would argue, this argument still does not dismiss the determining effect of the shape of the bridges. Whether it was intended or not, the shape of the bridges made it more difficult, both in terms of monetary cost and time, for particular people in a particular socio-historical context to access the park. Perhaps this is a "softer" determinism than Winner and Hutchby might advocate, but the point stands that affordances narrow social possibilities and help '*mobilize bias*' (Dotson 2015: 99, emphasis original). Thus they cannot be seen to be ambiguous in the sense that they are not endlessly interpretable and ultimately make reproducing some norms – specifically for our purposes, identities – easier than others (Feenberg 2010: 67, Dotson 2015: 99).

Technopolitical affordances have major ramifications for the specific case of space policy and threat, particularly in consideration of practices. For example, without considering affordances, it is difficult to imagine how Joerges (1999) would explain how some states can access outer space, while others cannot. Perhaps politicians from a state with no rockets or satellites could claim to be representing a space-faring nation, but assumedly it would be more difficult to establish a dominant discourse to this effect. The stakes also seem higher when discussing security politics and would-be weapons. Can Joerges' (1999: 19, see also Grint and Woolgar 1992) claim that cases in which the form of technology constrain outcomes are rare and trivial stand scrutiny in matters of security and space technology? This thesis argues it

cannot. As Kling (1992a, 1992b) and Hutchby (2001: 446) argue, a gun makes it much easier to kill in nearly all circumstances – unlike a bunch of roses. Likewise, some rockets can take people to the Moon, while others cannot reach orbit. In discursive terms, this means that some practices are enabled by technical artefacts, due to the content of the discourse itself. Whether the US landed its astronauts on the Moon depends, to a large extent, on how the requirements for a Moon landing to be achieved are constructed. When Kennedy (1962) famously said 'We choose to go the Moon in this decade,' he set socially contingent requirements, such as 'putting a man on the moon' (not a robotic probe) and returning that man 'safely.' Affordances can therefore never be "outside" of social context in some way, but discourses can demand certain technical requirements that, if not met, prevent those representational practices being enacted at all. Epstein (2008: 13) argues that discourses are both '*enabling*' and '*constraining*,' but likewise technologies can constrain or enable practices, and by extension the discursive formulation of identity. Posing a threat to certain practice-enabling technologies, under some circumstances, could therefore pose a specific kind of threat to the identity which that practice constructs. These dynamics are worthy of delineation. In cases where identity producing practices are technologically infused, then, a close analysis of the technology in question is equally as important as a close analysis of the language and practices.[8]

Technology and culture on the 'social battlefield'

The approach introduced above draws heavily on the philosopher of technology, Andrew Feenberg (2002: 15), who argues that 'technology is not a thing in the ordinary sense of the term, but an "ambivalent" process of development suspended between different possibilities … technology is not a destiny but the scene of struggle. It is a social battlefield.' The discussion so far has raised a number of conceptual elements involved in various processes relating to technology. To approach the study of these processes in a systematic way, this thesis adopts Feenberg's conceptual frame of "instrumentalization," explored in greater depth below. First, however, it is necessary to introduce his critical theory of technology, which aims to occupy a middle ground between instrumental and substantive theories (Feenberg 2002: 5), seen in his claim that

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[8]For more on the 'physical security' of the state, see Jennifer Mitzen (2008: 352) who argues that 'assuming ontological and physical security-seeking alike can be theoretically productive.'

> *what human beings are and will become is decided in the shape of our tools no less*
>
> *than in the action of statesmen and political movements*' (Feenberg 2002: 3,
>
> emphasis original).

Feenberg argues that 'subjects and means are dialectically intertwined … the army is not merely accidentally related to its weapons, but is structured around the activities they support … The agent is its means of action viewed from another angle' (Feenberg 2002: 63). Social and political struggles over the shape of technology therefore inevitably also become struggles over identity.

According to Feenberg (2010: 15-16), these struggles are suffused with power because '*What* the object *is* for the groups that ultimately decide its fate determines what it *becomes.*' The role of discourse, then, is that 'current technical methods or standards were once discursively formulated as values and at some time in the past translated into the technical codes we take for granted today' (Feenberg 2010: 77-78). Taylor Dotson (2015: 99) provides a helpful rephrasing of this position when he claims that technologies 'help *mobilize bias*' (emphasis original).[9] Necessarily, then, 'all technologies incorporate the results of such decisions and thus favour one or another actor's values' (Feenberg 2010: 78). This is the theoretical basis from which the claim is made that technology makes certain formulations of identity possible at the expense of others (Feenberg 2010: 14). Translated into technical form, values can then more easily appear natural, objective, and unchallengeable. Herbert Marcuse (1998 [1941]: 57) warned that

> the objective and impersonal character of technological rationality bestows upon the
>
> bureaucratic groups the universal dignity of reason. … as if men, in obeying them,
>
> obey the dictum of an objective rationality.

In so doing, the non-material becomes 'unrealistic' and 'incorporated into the rationality of that which is and that which can be within the given reality' (Marcuse 2001: 54). The resulting effect is a world of limited social possibilities, or as Marcuse dubs it – 'a one-dimensional universe' (Marcuse 2001: 54, see also 2002). Daniel McCarthy (2013: 476), drawing on Feenberg, thus adds that 'the ability to control technological design and development is a significant facet of social power relations.' He gives examples to demonstrate his point, writing that

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[9] This is somewhat less fatalistic than Feenberg's intellectual forebears, Max Horkheimer and Theodor Adorno (1972: 35) who claim that 'technical and social tendencies, always interwoven, converge in the total schematization of men.'

> …prisons are highly determining, biased technological institutions. Their barbed wire, gates, fences, towers, gun emplacements, concrete walls, cells and searchlights make prisons suitable for detaining people and not very much else. … Barbed wire, however, is a relatively simple object that, on its own, does little to determine social outcomes in any specific direction. It may be used to fence in people, to protect cattle, to secure military positions or to be tied around the mic stand of a Scandinavian death metal band. … Ambivalence, and the opportunity for agents to exploit it, fades according to the level of technological complexity. Technological institutions are thereby best conceived as 'biased but ambivalent', alerting us to the causally determining qualities of technology, yet also pointing towards the ever-present potential for change (McCarthy 2013: 489).

This ambivalence is what allows technology to have multiple meanings, which are analytically distinct from function (Feenberg 2010: 168, see also Fairclough 2007: 134). Feenberg's (2002: 15) notion of ambivalence is not the same as neutrality however, due to the recognition that social values have a role in the 'design and not merely the use' of technology. A critical theory of technology therefore avoids the totalising claims of the instrumental and substantive theories, in which particular social action is either totally contingent on actor agency or inevitable.

Instrumentalisation: the social co-construction of "function"

Having introduced Feenberg's critical theory of technology, it is now possible to fully explore the conceptual frame of instrumentalisation. The argument that technology and society are co-constructed complicates inquiries into "function." Feenberg (2010: 174) argues that function lies 'at the intersection of causality and teleology. Every such function can be described in both terms: "the purpose of X is to Y" is roughly equivalent to some form of "X causes Y."' To revisit a prior example, the purpose of American Moon rockets was to take American astronauts to the Moon (and perhaps further to "win the space race") which simultaneously demanded that the rockets have the causal power to take them there, as defined in the wider 'world of meanings' (Feenberg 2010: 173). This is reflected in the interaction of function and meaning over time, which Feenberg (2010: 18-19) argues 'interact externally in historical time. They enjoy what might be called a "relationship of double ingression,"' influencing each other sometimes 'in a paradoxical way' in which conflicts between function and meaning are addressed by changing 'one or both of them.' McCarthy's (2013: 489) example above demonstrates an applied example: the function of the prison can

be changed either by establishing a new dominant definition of "prison," or physically re-arranging its walls, say, so that it no longer fulfils its previously defined function.

Function is not produced or constructed in an instant, then, but is rather a technopolitical process which is theoretically, but not always politically, open to intervention. Feenberg proposes two analytically separable stages of instrumentalisation, primary and secondary, with the first relating mostly to physical manufacture and the second mostly to the establishment of meaning. Correspondingly, the terms *artefact* and *technics* can be used to indicate when an object or device is being temporarily considered in isolation (analytically speaking) from its wider political context (see Fairclough 2007, McCarthy 2013, 2015, Dotson 2015). Primary instrumentalisation 'initiates the process of world making by de-worlding its objects in order to reveal affordances' in a process of reduction to 'functional characteristics' (Feenberg 2010: 72). Because the simple elements which build up a device have 'a wide variety of potentialities,' secondary instrumentalisation re-contextualises the resulting artefact, imposing limitations by embedding the object in reference to a wider 'world of meanings' (Feenberg 2010: 72, 173). This process is socially contingent because it is guided by the decisions of social actors (usually elites who control the creation of technology) (Feenberg 2010: 73). Secondary instrumentalisation is increasingly important as an artefact is developed and continues after its 'release,' as users and governments further transform the object without rearranging its form (Feenberg 2010: 74). The Saturn V was originally instrumentalised as a means to land astronauts on the lunar surface, and the primary instrumentalisation entailed arranging fuel tanks, engines, and electronics to that effect, with increasingly complex systems built up from simple circuits and mechanisms. Simultaneously, the rocket was constructed as a symbol of national pride and superiority over the Soviet Union, and implicated in all manner of domestic and international politics. Three complete examples are now on display as museum pieces in three of the key locations of the Apollo Program (the Kennedy, Johnson and Marshall Space Centers), with important components also displayed in Washington D.C. at the National Air and Space Museum (Wright N.D.). In these locations, they serve a new primary function as symbols of national memory and tourist attractions, the new function having been established without changing the shape of the artefacts.

2.3 Methods for studying technopolitical threat construction

Thus far, this chapter has attempted to provide an account of how a critical security approach to the study of discourse (broadly located in relation to critical constructivist

scholarship) and a technopolitical lens (broadly located in relation to critical theorisation of technology) can be integrated on a conceptual level. The task which remains, however, is to elaborate on how this should inform the choice of methods to fulfil the aims of the research.

Assessing the dominance of discourses in texts

This thesis asks "how was the "rise" of China in space constructed as a threat in US public policy discourse?" Resultingly, the task is to assess which American discourses constituting the "rise" in space have been extant, and which of them have become dominant, at different times. The focus on threat and identity leads to a number of sub-questions in this regard (the aspects relating to technology are elaborated later in this section):

- How are different Chinese and American national identities constructed in US public policy discourse on China and space? What specific qualities are these identities endowed with?
- Within these discourses, which space technologies are invoked and how? (As a precursor to the final sub-question below).
- How are these identities constructed in relation to one another?
- What are the underlying logics or knowledge which must be presupposed for these constructions to "make sense?"

To answer these research questions, this thesis analyses the content of around 300 primary sources dating between 1942 and 2017.[10] These consist of executive branch policy documents such as unclassified summaries and fact sheets from the White House, Departments of Defense and State; Congressional debate transcripts and statements to the press; public-facing US military sources such as websites and press releases; and space policy legislation and regulation. These were then contextualised with American journalistic and academic accounts of China's "rise" in space. Sources were selected in accordance with the theoretical framework outlined so far in this chapter. One of the most important questions faced by researchers undertaking discourse analysis is which texts to study (Mutlu and Salter 2013: 115). "Discourse" can be considered a kind of data in its own right (Neal 2013: 43), but a more detailed consideration is required for the practical questions of research design. Contributions to discourse can be textual, visual, or semiotic in some other sense (Mutlu and

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[10] This amounted to roughly one million words of text. Additionally, several hundred further sources were surveyed but not included after an initial analysis showed they did not fulfil the criteria outlined below (such as not mentioning China's space program).

Salter 2013: 115). As Roxanne Lynn Doty (1993: 310) wrote in her influential article 'Foreign Policy as Social Construction,' her 'data is the ensemble of statements found in the documents surrounding this particular site of U.S. foreign policy.' The number of possible sources was narrowed down by focusing on those endowed with the authority to speak on behalf of the state (see Cohn 1987: 703, 705-706, Weldes 1999: 11, Hansen 2006: 8). This was further narrowed down by predominantly including sources which explicitly mentioned China's space program, although these required contextualisation from wider US China and space policy. For example, the *Congressional Record* is an exhaustive collection of every word spoken on the floor of the House and the Senate, but to contextualise what is said requires the analysis of other texts that elected officials reference (Neal 2013: 125). The majority of the documents from before 2000 were at one stage officially secret or confidential, and have now been declassified. No declassified sources were obtained for the main period focused on in the thesis, 2000-2017, because they were not "public" at the time and are therefore beyond the scope of the research question.

Discourse analysts have adopted a systematic approach to guide their analysis of texts, ensuring a degree of consistency for each reading (see Doty 1993, Hansen 2006, McCarthy 2015, Turner 2016, Walters 2016). Adapted from these authors, the following is the process which was utilised when reading the primary sources selected for analysis:

1. An initial assessment of the context of the text: what "type" of document (e.g. congressional debate, Air Force advertisement), who is the author (e.g. named politician, institutional author such as DoD), for whom is the text intended (elected officials, service personnel)?

2. Which Chinese and American identities/subjects are constructed in the discourse, and how? What background knowledge does it assume to be true (presuppositions), what qualities does it lend them (predication) and how does it relate them to one another (subject positioning)?

3. Which technologies are represented in the discourse and how are they instrumentalised at either the primary or secondary levels?

All three steps were undertaken throughout, but the project was organised so as to emphasise different aspects of technopolitics in each Part of the thesis, progressively becoming more granular in scope. Part 1 focuses on identifying the context, both historical and contemporary, of American debates on China's space program. Part 2 is primarily concerned with exploring the identity politics of the 2000s and 2010s and the establishment of a dominant "Chinese

space threat" discourse, which provides the foundation for Part 3 by identifying what identities and objects China supposedly threatens with its space program. Part 3 then emphasises technopolitical struggles over the shape of present and future American space technology, asking to what extent the threat was reflected in instrumentalisation of specific systems (e.g. the Global Positioning System).

The "how much" question is a pressing one in regard to the analysis of social constructions. Recognising intertextuality might initially appear to require almost endless study, as texts refer to texts *ad infinitum*. Yet this is not necessarily the case. It is possible to discern the extent to which a discourse is contested by assessing the 'diversity of the representations argued' (Hansen 2006: 7). There are a finite number of subjects constituted in a discourse, and the more dominant particular representations are, the fewer competing values, attributes, and subject positions we should expect to find during the analysis. When the analysis began to consistently produce repetitive findings, then, it was taken both as evidence that a dominant discourse had been identified on China's "rise" in space, but also in a methodical sense that "enough" analysis had been undertaken. Although the aim was not to quantitatively assess "how much" dominance a discourse had, previous studies of extremely dominant discourses such as Orientalism (Said 2003) and Cold War nuclear technostrategic discourse (Cohn 1987) provided rough comparators and exemplars for the research. In these cases, the discourses were so powerful that it was impossible to speak or act in contradiction to them (Cohn 1987: 711, Said 2003: 3). Therefore, a final evaluative stage of the project is required, asking to what extent the discourses constituting China's "rise" in space as a threat were sufficiently dominant *vis-à-vis* rival formulations to effectively marginalise them.

By adopting a technopolitical lens, however, it is necessary to utilise a further indicator of the dominance of a discourse, namely to what extent it is deployed in instrumentalising existing or new technological systems. Part of the rationale of adopting a discursive approach, and indeed posing the research question of this thesis, is to understand what kinds of practices are sanctioned in the American discourses that constitute China's "rise" in space. As already indicated in Chapter 1, American concern about China's "rise" in space is often accompanied with calls to procure certain technologies, or adapt existing ones. By analytically separating technology, it becomes possible (indeed, necessary) to distinguish between dominance of public rhetoric, and a corresponding re-contextualisation of technological systems. If technology is a "social battlefield," how can we know who is "winning" the struggle? Immediately it would seem to require a discussion of how we might "measure" the success of one set of values over another in the shape of space technologies. This is a particularly thorny

methodological question given the shifting, (inter-)subjective nature of the values in question, the large degree of freedom of interpretation which can still take place even after a given technology is supposedly "finished," and the issue that the shape of technology itself can only be reiterated through representational practices which makes affordances ontologically inseparable from discourse. It is in this sense that the thesis seeks to address the final research sub-question:

- How are Chinese and American space technologies instrumentalised, and what role do they go on to play in subsequent American public discourse?

Understanding the instrumentalisation of technology should not be taken as a requirement to focus only on "new" technologies. STS literature provides a nuanced indicator of a truly dominant discourse in technopolitics, that of a technopolitical "rupture." A criticism that has been levelled at STS is that it is merely "innovation studies," that is to say, only concerned with studying how "new" technologies were developed (Pursell 1995: 9, Edgerton 1999, 2010: 681, 687). Those wishing to make this kind of criticism could highlight heavily-cited studies in STS as diverse as investigations into the bicycle or missile guidance systems, all of which are concerned with "new" technologies (Bijker, Hughes and Pinch 1987, Mackenzie 1993). Hecht's (2003: 2) work provides the nuanced concept of 'technopolitical rupture-talk.' She defines this as 'the rhetorical invocation of technological inventions to declare the arrival of a new era of a new division in the world,' her prime empirical example being the 'repeated political proclamations that nuclear weapons had produced a new world order' (Hecht 2003: 2). The study of technology need not be solely concerned with innovations and ruptures, however. Indeed, inverting the concepts of innovation and rupture can provoke interesting questions. Ulrike Felt's (2015) study of Austria's technopolitical choices shows how the *absence* of certain technologies shaped national identity. She criticises Hecht's suite of concepts as not 'captur[ing] in a satisfactory manner the messy, long-term process through which national technopolitical identities are created and maintained through the (non-)uptake of certain technological developments' (Felt 2015: 104, see also 119). Hecht's own concept of rupture-talk is more subtle than it first appears, however. She argues that

> Such assertions of rupture and the polarities they invoked masked a more complex
> reality … colonial practices and structures were appropriated—not overthrown—by
> the nuclear age, and proved central to its technopolitical success … Nuclear rupture-
> talk masked … local, regional, and national complexities while repeatedly invoking
> colonialism, decolonization, or post-coloniality in order to produce a vision of the
> world in which particular kinds of nuclear technopolitics served as the final arbiter of

> global status and power. … [N]uclearity appeared to provide imperial states with a geopolitical solution to the loss of status threatened by decolonization (Hecht 2003: 3).

Rupture-talk is therefore not tantamount to far-reaching technological change. Rather, it can be a rhetorical strategy to repurpose (re-instrumentalise) existing technopolitical artefacts and practices with a view to cementing a "new" technopolitics. The dialogue between Felt and Hecht above directs researchers of the technopolitical not only to ask what is "new" about technology, but to carefully scrutinise how language, practices and technical artefacts occupy different positions over time; and to watch for technopolitical disjunctures between what is said and what is done.

A limitation of the research design is that a focus on public discourse necessarily excludes private or secret language and practices. Archives like the *Congressional Record* or the *Digital National Security Archive* do not capture behind-the-scenes interactions or the way in which the expected reactions have figured into the content of the archives (such as pre-enacted accommodations) (Neal 2013: 126). Added to this are the constraints of secrecy in security politics, explored earlier in this chapter. Obviously, this means that some discourse is beyond the scope of this project. Immediately this situates this research project as distinct from much of the classic works of Science and Technology Studies, in which decisions taken by engineers, bureaucrats and politicians led to technological innovations and the shaping of technopolitics. Donald Mackenzie's (1993) *Inventing Accuracy*, for example, took a historical sociological approach involving interviewing the participants in the research, design, and manufacture of missile guidance systems. At the time of writing this project, however, access to similar sources on American space technology were not available. This substantially limits the ability of the project to analyse primary instrumentalisation. However, as is demonstrated in Chapters 7 and 8, some elements of the primary processes are publicly represented and are subject to secondary resinstrumentalisation in public discourse as technical change is justified, framed and explained. Furthermore, in correspondence with the discussion of the status of the "real" China in the analysis which follows, no attempt was made to research Chinese instrumentalisation of their space technology. Equally, the American subjects studied had no ability to physically redesign Chinese technics. Instead, American observers engaged solely in the secondary instrumentalisation of Chinese space technology as they struggled to fix the meaning and function of Chinese (but relatedly also American) rockets and satellites in their own security discourses. The analysis of this process is a common thread which runs throughout this thesis.

Conclusion

This chapter has introduced a novel technopolitical framework to a critical constructivist discourse analysis methodology. In the first section, it was argued that discourse analysis provides a constitutive approach to understanding identity, threat, and power relations. Yet within threat construction literature, technology has been either understudied or undertheorised, resulting in a tendency to obscure the technological construction of the social. To address this, the second section introduced the concept of technopolitics. Technopolitics builds on the constitutive view of the social world but draws extra attention to the complex intermingling of technologies and identities in political processes. Technologies, then, are not just things or representations, but processes which are contested on a 'social battlefield.' On this view, the construction of the function of technologies is a never-finished process in which artefacts and meanings are rearranged by elites, facilitating the practice of certain identities while closing down other social possibilities. Space technology is then simultaneously a site and a tool for the construction of threats and identities. The third section then extrapolated methods and research sub-questions in light of these theoretical claims. Drawing on prior studies in critical security literature, a process of textual analysis was proposed to interrogate discourse produced by subjects endowed with the authority to speak on behalf of the US in matters of space policy toward China with a particular focus on assessing processes of the instrumentalization of technology.

In order to achieve the research objectives of this thesis in line with the theoretical framework introduced in this chapter, it is first necessary to establish the wider context, both contemporary and historical, of China's "rise" in space. The remaining chapters of Part 1 are therefore entirely concerned with establishing this context. It is only through this initial inquiry that the more complex facets of technopolitics can be analysed in Parts 2 and 3 of this thesis.

Chapter 3

The "China threat" in American Political Discourse

Introduction

The "China threat" has been a consistent presence in American representations of China since before the beginning of the 20th century. The task of this chapter is to historicise and contextualise the "China threat" discourse in order to establish its relationship to the more specific discourse of a "Chinese space threat." This first stage of threat construction analysis is necessary in order to provide points of comparison for the analysis which follows in the remainder of the thesis. Particularly, Chapter 3 provides the wider context for Chapter 4's narrower analysis of archival materials on US-China space policy.

Chapter 3 makes two related arguments. First, that the "China threat" is a powerful, yet historically contingent, discourse in US politics. That these constructions have been uneven – varying over time in content and intensity – supports the over-arching argument of the thesis that the threatening "rise" of China in space has been unevenly constructed in US public policy discourse. Second, Chapter 3 argues that the "rise" of China in space is an outlying element of the wider "rising China" narrative in US public policy discourse. The clearest demonstration of this is the presence of a "China opportunity" counterpart to the "China threat" in wider US-China policy, whereas by comparison US space policy discourse only reproduces the "threat" component.

To make these arguments, this chapter identifies three strands of the "China threat" in American political discourse. These are inter-related, and have temporal crossover, but are nevertheless distinguishable elements. The first is the "yellow peril" discourse, which was the first articulation of a "China threat" in American political discourse. The "yellow peril" was not predicated on the kind of technological, military, or economic capabilities which later incarnations of the discourse would focus on. Instead, this first iteration was explicitly racial and colonial in logic and content. The second major strand is the "China threat" (or "Red Menace," see Goh 2005) which started to be articulated as the United States' struggle with the Soviet Union spread from Europe to Asia. The fortunes of this second iteration of the "China threat" were closely aligned with events in the Cold War, as the US stood at first against, and

then later in alignment with, China. China's support for revolutionary insurgencies in Asia, and later the procurement of a thermonuclear arsenal alarmed the American foreign policy elite. However, this articulation was eventually almost totally quashed by successive American presidents, starting with Nixon, who constructed China as a useful tool to counter Soviet power and crucially as a way to negotiate an American exit from the Vietnam War. Despite the almost total success of this narrative shift, a third, (and at the time of writing, ongoing) resurrection of the "China threat" took place sometime in the early 1990s. Yan Xuetong (2001: 36), for example, identifies the beginning of the modern idea of a "China threat" as beginning in 1992. Yee and Storey (2002: 2) argue it began in 1993. The articulations of this third strain of the "China threat" discourse have one major component in common, distinct from earlier articulations because of the narrative of "China's rise" it provides, supposedly predicting China overtaking American national power. By tracing this development, we can see both the similarities and importantly the major differences between the "China threat" writ large, and the relatively recent development of a narrower, powerful "Chinese space threat" discourse.

3.1 The "China threat" as the "Yellow Peril"

The United States and China have interacted for centuries. As Dean Cheng (2012) notes, 'the first ship to sail under an American flag … was the merchant ship *Empress of China*, bound for Canton (now Guangdong), China.' When this occurred, around the time the US declared its independence, China had already faced a relative decline with Europe in economic and technological terms (Xia and Wang 2014: 3). China was in a position of weakness, in historical terms (Yan 2001: 33). Western intervention took advantage of this with colonial, paternalistic and exploitative practices[11] (Pan 2012: 119-121). Since the US did not have the same sprawling colonial interests as the empires of France and the United Kingdom, the American experience of China was distinct, with a good deal of interaction in the 19th century taking place primarily on the West coast of the US[12] as 'massive migration' from China took

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[11] Racist Western colonial practices in China are sometimes represented by an infamous sign in Shanghai's Huangpu Park, proclaiming "Chinese and Dogs Not Admitted," but no documentary evidence of the sign exists (Bickers and Wasserstrom 1995: 444-447). Regardless, the example has a 'totemic position' as a 'protean political symbol' (Bickers and Wasserstrom 1995: 444-445).
[12] The US had "concessions" in both Shanghai and Tianjin during the 19th century from which they could take advantage of trade (Marinelli 2009: 399, Head et al. 2015: 269).

place (Lee 2007: 546). Chinese migration to the US was understood to a large extent through the lens of the "yellow peril" (which had historical roots as a European idea), the fear that the 'Chinese could outwork white men' and were therefore 'superior' (Vincent 1982: 662, see also Lee 2007: 537-538, Breslin 2010: 54, Zhang 2013a: 1409). The racial stereotype of Asian people in the US included portrayal of the group as 'Hardworking, studious, unassuming, thrifty. Inscrutable, sneaky,' and 'competitive' – stereotypes which long outlived the 19th century (Saito 1997: 71). The threat that Chinese and other Asian workers posed to white men was met with the 'series of Exclusion Acts' in the US which sought to restrict Chinese migration (Vincent 1982: 662). In American public and political discourse, however, this history has remained marginalised. Instead the dominant reading of this period's history is of the US as a benevolent influence in Chinese affairs (Pan 2012: 119). The more explicitly racist elements of the "China threat" narrative, particularly in official discourse, would soon be side-lined.

The "yellow peril" was countered by official propaganda during the Second World War, as China and the US found themselves fighting on the same side against the Imperial Japanese. Pro-Chinese propaganda included magazine articles (Chiang Kai-Shek was on the cover of *Time* magazine in 1938 and 1942), film, and posters (Tiezzi 2015). The best example of this is in the striking way in which US propaganda posters represented Chinese in an identical way to English, Australian, Canadian, Dutch, Ethiopian and Russian soldiers (Office of Facts and Figures 1942, New Hampshire State Library N.D.).

Figure 1: US WW2 propaganda posters (Office of Facts and Figures 1942, New Hampshire State Library N.D.).

The official suppression of a "Chinese threat" would be quickly reversed, as the end of the War came to be replaced with the Cold War, and with the victory of the Communists in the Chinese Civil War.

3.2 The Cold War comes to Asia and the second "China threat"

With the declaration of the People's Republic in 1949 the US had, in a sense, symbolically "lost" China. Noam Chomsky (2012) calls the "loss of China" the 'first major step in "America's decline"' discourses, and it is here that we can locate the meanings which the "loss" and America's "decline" were supposed to speak to: the Cold War struggle with the Soviet Union and International Communism. The condition underpinning the "loss of China" was the unravelling of the long-standing domination of Asia by capitalist and imperial powers (France and Britain in Indochina, various European powers, along with the US, in China). While China had been lauded in Western propaganda during World War II as one of the democratic Allies, the victory of the Communists in the Civil War left the "good" China merely ruling Taiwan. American constructions of a good, democratic China could be projected onto the now tiny Republic of China, while scorn could be poured on the Communists now in control of the mainland, in line with the intensification of anti-communist discourse in American politics in the late-1940s.

American policy makers (along with some journalists) constructed an explanatory narrative of the Chinese Civil War which fed into anti-Communist paranoia and McCarthyism, and eventually the notorious "Domino Theory." The idea that China had been "lost" to the Communists had begun around 1945, notably with the publication of 'The Fate of the World Is At Stake in China,' an anti-Communist essay in Reader's Digest (Newman 1992: 131). The failure of the US to prevent the establishment of communist government in China had to be explained in some way (never mind that sub-state Communist government had existed in China since the late 1920s (Leng 1967)). A communist conspiracy was one prominent "explanation," with some specific individuals held up as evidence of its veracity. Owen Lattimore (a China advisor to the US government and Chiang Kai-Shek in the 1940s) and Secretary of State Dean Acheson were both attacked at the McCarthy hearings along these lines (Newman 1992: 202, 288, 299). China's entry into the Korean War only facilitated an intensification of this rhetoric, the logic being that Communists must have infiltrated the State Department, otherwise US forces could not have been driven back after Chinese intervention (Newman 1992: 311). Evelyn Goh (2005: 18) argues that China's entry into the Korean War cemented it in American discourse as a "Red Menace." Already at this early stage of US-PRC

interaction, what would become recurring tropes of the self-portrayal of America as unquestionably superior are identifiable, and the dismay that any Chinese success caused in Washington. The second iteration of the "China threat" discourse had thus already gained prominence only a few years after the foundation of the PRC.

The main component of the "Chinese threat" in the 1950s was China's military capabilities and the understanding that it was more than willing to use them to harm American interests.[13] As far as mainstream American policy discourse in the middle of the Cold War was concerned, China's aggressive nature was self-evident. Secretary of State Dean Rusk compared Chinese 'transgression[s]' with the behaviour of fascist Germany and Italy (Goh 2005: 23). Furthermore, China and the US had been in a *de facto* state of war in Korea. As such, the American foreign policy makers were on the lookout for the next conflict they would have with "Red China."[14] This could take the form of regular or irregular warfare. China was known to be supporting communist insurgencies throughout Asia, contributing to the spread of revolution, feeding American fears of the "domino effect." Just days before the start of the Korean War, the Secretary of Defense and the Acting Director of the Mutual Defense Assistance Program at the State Department were corresponding on the topic of 'Military Assistance to the General Area of China' (DoD 1950). The document laid out a plan to use military assistance to counter the rise of communism in the region (DoD 1950: 1). The first objective in regard to Indo-China was to 'halt the smuggling of arms across the border by Chinese Communists to Ho Chi Minh' and the last 'to assist the forces of the French Union in the defense of Indo-China against any Chinese Communist aggression' (DoD 1950: 1). There is also strong documentary evidence that the US was prepared to fight a conventional war with China in the 1950s. In 1958, the State Department, NSC, DoD and Joint Chiefs were involved in producing contingency plans for 'US objectives in the Event of War with the Soviet Bloc' (State Department 1958a, 1958b, 1959, NSC 1959). The possibility of 'Major War Initiated by Communist China' was the second scenario considered (Department of State 1958a: 3). An advisor to the Secretary of State noted that 'the study assumes a destruction of targets throughout China' because it was expected that North Korea would invade South Korea (Department of State 1958b: 1). As the policy debate continued, Gerard Smith mentioned that there had been disagreement about how to

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[13] China's economy remained a subsidiary, but still important, aspect at this stage. US policy was aimed at limiting technology transfer and the means to support China's military (see DoD 1956: 2-4, DoS 1956, Tucker 2012: 131).

[14] As Zhang (2013b: 254) indicates, this was the 'politically correct' American term for China until about 1970.

address the 'question of Communist China' (State Department 1959: 1). The Joint Chiefs were adamant that

> it must be presumed that the Chinese Communists will be in any general war as an
> active ally of the USSR, or will be a power center capable of assuming world
> leadership when the U.S. and the USSR … cannot maintain their power positions (NSC
> 1959: 2).

These documents indicate that within the US government there were serious differences in rhetoric, even in a classified context, on China and Communist states generally. Importantly, they also demonstrate how embedded the assumption that China was willing and able to harm American interests had become, within only 10 years of the declaration of the People's Republic.

Historians and documentary evidence from the period warn us not to place too much emphasis on the "China threat" discourse. There is a case to be made that these constructions of China as a foreign policy problem served other purposes. Despite the fiery rhetoric of some policy makers, Nancy Bernkopf Tucker (2012: 11) argues that China 'never captured Eisenhower's imagination nor struck him as an urgent problem compared with Europe.' This was despite the fact that the "loss of China" had featured in Republican rhetoric attacking the Democrats, helping to secure Eisenhower's electoral victory (Tucker 2012: 12). He knew of and hoped for the coming Sino-Soviet split (Tucker 2012: 105), but publicly the "Chinese Communist" rhetoric maintained a representation of China as subsumed under a singular Communist movement[15] throughout the 2nd Taiwan Strait Crisis (State Department 1958). Thomas Christensen (1996: 242-243) argues that this move was aimed at creating a publicly intelligible narrative which could link together smaller events – as he titles his book, China and the US were *Useful Adversaries.*

China's procurement of nuclear weapons in the 1960s came to occupy central importance in the "China threat" narrative. Since this development had strong links to how American policymakers understood the Chinese space program at the time, the next chapter analyses this case in much more detail. For now, it is enough to note that Chinese technological success forced a rupture in the American discourse of a technologically "backwards" China. The intelligence community had repeatedly underestimated Chinese technical expertise and some policymakers went so far as to propose a preventive war to

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[15] Considering China as strategically tied to the USSR was also common in a classified context in the late 1950s (see State Department 1958a, 1958b, 1959, NSC 1959).

disarm China (Richelson 2006: 143, 146, DoS 1964c: 6, 28). By 1965, the official position of the State Department was firmly against military intervention and privately recognised China's nuclear power (Dos 1965: 7). Little attempt seems to have been made to convey this understanding to China, however, and Jeffrey Lewis (2017) argues that the failure of the US to communicate that it recognised China's new nuclear power led to the Chinese demonstrating a live warhead on a missile in 1966. By the end of the 1960s, China's nuclear power had, to some extent, been recognised by US government officials. However, the prospect of a Chinese ICBM capability then became a useful justification for an Anti-Ballistic Missile program that otherwise seemed to have a weak rationale (Senate 1970: 278, 1972: 63, Reiss 1992: 28, see also CIA 1968a). The "China threat" discourse seemed to have strong new evidence to maintain its prominent position in US foreign policy making, yet the Nixon Administration's diplomatic efforts were beginning to take a radical change of direction even as the threat of a Chinese ICBM was being debated in the Senate in the late 1960s. Even so, the intensity of the "China threat" discourse during this period is easy to overstate. Michel Oksenberg (2002: 18) points out that during the late 1960s, only a handful of officials at the State Department, DoD, NSC, CIA, White House, and Congress, took much 'interest' in China. Nixon, then, perhaps did not face overwhelming opposition to the rapprochement which would follow.

American fears of Chinese support for Asian communist insurgencies were realised when China supported the forces of North Vietnam during the 1960s and early 1970s (CIA 1974: 2). China was therefore a contributing factor to the ongoing quagmire in Vietnam, providing a significant proportion of the foreign aid that the North received, both in terms of money and weapons (CIA 1968b: 4). On occasion, Chinese aid even outstripped that given to North Vietnam by the Soviet Union (CIA/DIA 1971: 2). While Chinese aid to the Northern cause had clearly been a national security issue for the US for over a decade, this state of affairs also meant that for American policymakers like Henry Kissinger and President Nixon, rapprochement with China could help to end the Vietnam war by negotiating with China to withdraw its support (Vogel 2002: 7, Oksenberg 2002: 17). A further, perhaps even larger strategic benefit could be gained in positioning China as a prospective partner in countering Soviet influence. The official history of the State Department cites rapprochement as a 'Milestone' which 'fundamentally altered' the Cold War and 'influenced the subsequent movement towards détente' in US-Soviet relations (Office of the Historian, DoS N.D.).

Through the 1970s, the prominence of the "Chinese threat" in American public policy discourse was markedly reduced. Despite the scepticism of some US policymakers, the Nixon administration signed the Shanghai Communique in 1972, which helped end the Vietnam War

and codified US pursuit of a "One China Policy" as one of the major 'concessions' to the PRC (Tucker 2013: 35-36). What followed was something of a 'China craze' in American popular culture (Tucker 2013: 36). For the remainder of the decade US-China relations were, as American scholar Robert Ross (1986: 261-271) puts it, 'Quiet.' Towards the end of the 1970s, the Carter administration made efforts to normalise US-China diplomatic relations, in effect institutionalising the end of this permutation of the "China threat" discourse. On the American side, what made the normalisation of relations a possibility was in part the lack of military threat China was thought to pose to the US and Taiwan (DoS 1978: 3, 6). China was portrayed by the State Department as a rational – and therefore also presumably a predictable – actor. One report claimed

> China's self-interest lies in constructive relations with the United States …
> Furthermore China has major concerns for military threat elsewhere (DoS 1978: 6).

The combination of the threat the Soviet Union posed to China and the assumption China would act rationally allowed the report to draw a fairly optimistic assessment of the immediate future of US-China relations (DoS 1978: 6-7). Having sufficiently quashed the "China threat" discourse, the Carter administration proceeded to pursue cooperation with China in a number of areas (including space policy, as is explored in much more depth in the following chapter) a state of affairs that survived into the 1990s.

The most important feature of US-China relations after 1972, and especially after 1978, was the establishment of a 'de facto strategic partnership to oppose Soviet power in East Asia' between the two states (Ross 2002: 79). Simultaneously, Deng Xiaoping's leadership began to introduce market reforms to China, beginning a new phase of "opening up" from 1979, considered by some scholars to be the catalyst of China's economic growth since (Ralston et al. 1995: 2, Yan 2001: 34, Lin 2013: 261, see also Overholt 1996: 66, Pei 1998: 69, Hsiung 2009: 32). A major component of this process of economic change entailed closer economic ties with the US. China gained "Most Favored Nation" status with the US in 1980, allowing "normal" trade relations, which remained uncontroversial until 1989 (Noland 1996). Coupled with Chinese assistance balancing against the ongoing Soviet threat, the 1980s were a period for optimism in US-China relations as China was cemented as a source of military and economic opportunity (Yan 2010: 267, 269, Tucker 2013: 37).

In June 1989, however, protests at Tiananmen Square were met with violence by the Chinese government. According to David Shambaugh (2013: 15), this caused 'revulsion' in the United States. Chinese perspectives on the development of the domestic politics of the

People's Republic were not represented in American political discourse of the time.[16] Throughout the 1990s, Chinese leaders made efforts to advance a self-portrayal as moderates when dealing with the US. Official government rhetoric portrayed China as improving its human rights practices, and Jiang (in Faison 1999: 143) made pains in the US to correct the perception that he was a dictator (Information Office of the State Council 1991, 1995, Zhu in Wachman 2001: 266). Given the content of American public discourse in the 1990s, these efforts seem to have failed. The understanding of domestic Chinese politics in the 1990s was drastically different in the US. The events at Tiananmen square made China policy controversial once more in American politics – with the focus on the Chinese government's positions on civil and human rights. Tucker (2013: 37-38) argues that while the 1980s had been a period for optimism in Sino-US relations, after Tiananmen relations were in 'Disarray.' Another possible (and complementary) interpretation is that Tiananmen provided the context for a revival of the "China threat discourse." President Bush ended arms sales to China (Gerstenzang 1989, Smith 1990: 8), presumably to show toughness against China's human rights abuses. Tucker (2013: 39) argues that Bush 'dreaded' a 'possible rupture'. Yet his actions were insufficient to protect him from political vulnerability on China policy in the 1992 presidential election.

Attempts by the American (and Chinese) political elites to 'pretend to be friends' (as Yan Xuetong (2010: 269) characterises the immediate post-Tiananmen relationship), were seriously compromised by the disintegration of the Soviet Union. Through the 1970s and 1980s, countering Soviet military expansionism had been the most central mutual concern (Yan 2010: 272). In constructivist terms, it was the most important narrative component which ensured that US-China cooperation "made sense." When the Soviet Union ceased to exist,[17] however, this narrative was suddenly missing its most crucial component, and US-China friendship was open to reinterpretation in a manner unthinkable since the early 1970s. This was drawn into sharp focus during the 1992 Presidential election when, in the words of one Democratic staffer, trade policy towards China was used 'as a tool to bludgeon George Bush' (in Lampton 1994: 597). Clinton (1991, 1992) had announced his campaign promising to focus

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[16] For example, a new generation of leaders had come to prominence after Tiananmen, and the Chinese political elite had portrayed the use of state violence as, regrettably, the best of a set of poor options (Sathyamurthy 1990: 1758, Overholt 1996: 64, 74, Pei 1998: 68, Nathan 2001: 731).

[17] When this process began is debatable. Nathanson (1988: 443) quotes the Director of Moscow's Institute for the Study of the USA and Canada, Georgi Arbatov, as telling an American audience that 'We are going to do something terrible to you – we are going to deprive you of an enemy. Assumedly Arbatov did not then realise how prescient his remarks were. The Berlin wall came down in November 1989, with the Soviet Union formally ceasing to exist on Christmas Day, 1991 (Gaddis 2005: 241, 257).

on democracy promotion in matters of foreign policy and during his nomination-acceptance speech he envisaged an 'America that will not coddle tyrants, from Baghdad to Beijing.' The key policy issue in which this rhetoric played out was the "Most-Favored-Nation" (MFN) status of China as an American trade partner, the continuation of which was dependent upon China's performance on human rights issues (Lampton 1994: 597, Goldman 1995: 2, 16, Dietrich 2004: 281). MFN was a component of the "normalised" relations the US and China had experienced since the late 1970s, in that despite the "most-favored" terminology, the status simply facilitated normal trade relations (Nathan 1994: 638). Ultimately, this attempt to coerce China into liberalising on human rights was reversed with the White House admitting that the Chinese government had made little to no concessions on human rights (Clinton 1993a, Clinton 1993b, Clinton 1993c, Clinton 1993d, Lampton 1994: 620, Clinton 1994a, 1994b, 1994c, Clinton in Goldman 1995: xv, 5). Ultimately, Clinton's policies to justify friendly trade relations with China remained contested by his opponents until the end of his administration.

The so-called "Taiwan Strait Crisis"[18] of the late-1990s has come to have significant importance in American narratives of post-Cold War US-China relations. It was one of two[19] 'perilous showdowns,' as one American scholar put it, and it continued to resonate through the 2000s and into the 2010s (Gries 2001: 27-28, Goldstein 2013: 136, Li 2014: 128, Kastner 2015/2016: 57). In 1995 and 1996, the PRC conducted military exercises, including missile tests, near Taiwan (Li 2014: 128, Kastner 2015/2016: 57). Pan (2004: 320) argues that the events of 1995-1996 'has been a favorite starting point for many pundits and practitioners to paint a frightening picture of China.' At the end of the 20th century, US-China relations remained in an uncertain position. One the one hand, American Presidents George H.W. Bush and Bill Clinton had attempted to maintain friendly diplomatic relations with China, but on the other they had faced criticism from political rivals and the media who portrayed China in a negative light. With the grand narrative of the Cold War, and the compelling perennial enemy of the Soviet Union gone, the status and meaning of China was ripe for re-interpretation in American political discourse. Indeed, attempts to do so were already in progress.

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[18] By one measure this was the "Third" Taiwan Strait Crisis, with the previous two during the leadership of Mao Zedong (see Yang and Mao 2016).

[19] The second is the American bombing of the Chinese Embassy in Belgrade (Goldstein 2013: 136). During the Balkan Wars in 1999, an American plane used precision-guided bombs to destroy the Chinese Embassy in Belgrade (Parsons and Xu 2001: 51, Tucker 2013: 41). The US government claimed the bombing was an accident, also playing into Chinese nationalist narratives (Tucker 2013: 41, see also Parson and Xu 2001: 51-52, Gries 2001: 25, Shen 2004: 126, Li 2014: 137-138).

3.3 The resurrection of the China threat: China's "rise"

The most recent permutation of the "China threat" is inseparable from the "rising China" narrative. As the Clinton administration ended and the 21st century began, the search for a new explanatory narrative to replace that of the Cold War was still ongoing. The "rise" of China and the "China threat" collectively were one possibility, but at one point so was the "rise" of Japan, and other potential future adversaries were mooted too.[20] For most of the 20th century, Christensen (2015: 1), expressing a view not atypical for American scholars, states that China was 'poor, backward, and vulnerable'. Chinese leaders may have also used the phrase, but ultimately the "rise" of China dealt with in this chapter and this thesis is more specifically the construct used by Americans to constitute the nature and meaning of China's changing circumstances (Zheng 2005). This process of "recognition" dates back to the early 1990s, as has already been suggested in the preceding section.[21]

This section specifically looks at how American observers understood China's "rise" from 2000-2016 to provide the context which was contemporary to the events in space policy analysed in the rest of this thesis. As has been argued previously, the "China threat" narrative had not achieved dominance by the end of the 1990s, so the change in presidential administration around the year 2000 provides a reasonable point of departure. Republican presidential candidate George W. Bush (in CNN 2000), as he was then, positioned himself as a future president who would be tough on China, and recognise them as a 'competitor' rather than partner.

China's "rise" was the dominant paradigm used in the United States to understand China's domestic and foreign policies after 2000. It follows that one cannot begin to understand the narrower concerns of American space policy without exploring the wider discursive context. Characterising the US-China relationship is a difficult task, given the

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[20] In 1988, for example, Clyde Pretowitz (1988) published *Trading Places: How We Allowed Japan to Take the Lead*, described by journalist Jonathan Rauch (2005) as 'influential.' For an academic view see Layne (1993). Indicative of the cultural milieu, the hugely popular techno-thriller author Tom Clancy (1994) published *Debt of Honor* in 1994, imagining a future war between the US and Japan. For an academic analysis see Campbell (1994). The critical scholar Oliver Turner (2014: 154, 156) notes that India had many of the same characteristics as China in the same period (nuclear arsenal, growing economy, intellectual property theft) yet was not considered a threat due to the differences in American representations.
[21] Yan (2001: 36) identifies the beginning of the modern idea of a "China threat" as beginning in 1992, Yee and Storey (2002: 2) argue it began in 1993. It is not the task of this section to determine when this iteration precisely began, however.

complexity and political contention surrounding the topic. The fact that the People's Republic of China has been growing, and continues to, grow in power seems to be a rare element of consensus (as we will see, all of the prominent means of characterising the relationship take China's rise as a given). The discussion which follows is divided broadly into two: the "means" of China's "rise" (in the sense of what is thought to constitute the "rise"); and the American debate over what "ends" China will put these "means" to. As Yongjin Zhang (2013a: 1408, 2016: 795) writes, these contentious debates are centred on what China's rise *means* and what to do about it. Answers to these questions vary enormously. Despite the relative heterogeneity of the answers created for the questions posed by the "rise," key commonalities can be found across most of the public policy and academic discourse. That China's "rise" is indisputably "real" is the essential common component. This recognition of the "truth" of China's "rise" is then a point of departure for the discourse at large, and therefore worth unpacking. Having done this, this section moves on to look at what China's "rise" meant in the US from 2000 until the end of the Obama administration. Specifically, per Chengxin Pan's[22] (2012) characterisation of the discourse, he identifies two 'paradigms' of interpretation. The first is that China's "rise" is an opportunity for the United States, the second that the "rise" is a threat. These are not mutually exclusive, as Pan (2004: 305, 2012: 20, 22-28, 31) argues. Notably, this context allows us to observe a key difference between understandings of China as a whole compared with specific representations of China's space program: the "threat" paradigm is omnipresent, while the "opportunity" paradigm is left almost entirely unarticulated. As such, the purpose of this section is to explore the relationship between China's "rise," the "China threat" and American constructions of China's space program.

The "means" of China's "rise:" economics, the military, and soft power

There are three recurring components which supposedly constitute China's "rise." The first is increasing economic power; the second increasing military power; and the third (less commonly cited) element is increasing "ideational" (or "soft") power. Thomas Christensen (2015: 13), for example, declares that 'China's rise in wealth, diplomatic influence, and military power since 1978 is real and it's stunning.' These arguments necessitate configuring the subjects "China" and "the United States" in a specific relationship: either China is "rising" relative to the relatively stable position of the US, or (more fatalistically) China is "rising" while the US experiences an absolute decline in power. The "fact" of these increases can then be

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[22] Oliver Turner's (2013, 2014, 2016) work also builds on a similar approach.

interpreted as a threat, an opportunity, or some mixture of the two, which is explored later in this chapter.

The economics of China's "rise" was (and remains) a favourite source of evidence for charting the "rise." As Daniel Russel (2014), Assistant Secretary of State for East Asia, told the Senate Foreign Relations Committee, 'China's economic success has added to our growth ... our two-way trade has almost quadrupled since China joined the WTO' and 'our ongoing bilateral investment treaty negotiations hold the potential for even more mutually beneficial ties.' Towards the end of the Obama administration, the White House position was that

> the United States and China recognize their shared interest in promoting a strong and
>
> open global economy ... the United States welcomes China playing a more active role
>
> in ... the international financial architecture, as well as expanded bilateral
>
> cooperation (Office of the Press Secretary 2015a).

China's economy grew consistently through the 1990s up until the present. This has been considered to be the period of the most 'dramatic,' 'rapid' and 'consistent' period of China's economic "rise" (Xia and Wang 2014: 1). The economic "rise" also inherently represented (either explicitly or implicitly) a technological "rise." China successfully adopted 'the most advanced technology and management systems' during the 1990s and into the 2000s (Chow 2014: 43). This means that China's economy was not only becoming more powerful in a quantitative sense but in a qualitative sense as well. A common understanding among American "China watchers" was that the economic component of the "rise" is fundamental to the phenomenon as a whole, enabling the increase in military and "soft" power (see Yee and Storey 2002: 2, Kristof 2003, Mearsheimer 2006: 160, Friedberg 2011: 9, Gompert and Saunders 2011: 1). Narratives concerning the improvements in Chinese technology and buying power have then seamlessly linked the economic "rise" of China to its military "rise."

The increase in China's economic power has commonly been connected by American observers to a corresponding (and perhaps inevitable) increase in China's military power. Pan (2004: 308) cites the example of one "China watcher," who explicitly claimed that 'If China continues its rate of economic expansion, absolute growth in Chinese nuclear capabilities should be expected to increase.' China's increase in military power can, and has been, measured in the number of new warships, the qualities of advanced missiles, and the increasing professionalisation of the PLA (to name only a few metrics). Between 2000 and the end of the Obama administration, the Department of Defense produced four Quadrennial Defense Reviews (QDRs) and fifteen Annual Reports to Congress on Military and Security

Developments Involving the People's Republic of China (ARCs).[23] These outputs, especially the latter, carefully catalogue China's rising military power. The ARCs were produced by the DoD at the legislative behest of Congress (see PL No. 106-65, Sec. 1202), including both a classified and unclassified version. A major portion of the official advocacy of a "Chinese space threat" was advanced in these documents, as is discussed in Chapter 4. More generally, however, they used the evidence of new developments in weaponry and training to show that China's military power was increasing year on year (see DoD 2002, 2003, 2004, 2005, 2006b, 2007, 2008, 2009, 2010b, 2011a, 2012, 2013, 2014b, 2015a, 2016). One way to understand how far China "rose" in military terms during the period was summed up by Dean Cheng (2011), who argues the PLA went from being a force for fighting defensive land wars with a heavy guerrilla component to becoming forces capable of fighting 'Local Wars Under Informationalized Conditions.' China's military "rise" is not solely measured quantitatively, it is rather about qualitative, primarily technological, improvements. The size of the PLA is not of as much consequence to American China watchers as the kind of weapons it is equipped with, particularly its "reach" (for examples see Wortzel 2013, Heginbotham et al. 2015: xx).

According to the RAND corporation (2015: xx), China began the process of military 'Modernization' in the 1980s and 'accelerated after the Taiwan Strait crisis of 1996.' During the period, 'Annual real (inflation-adjusted) growth in China's defense spending averaged 11 percent per year.' China acquired its first aircraft carrier and began construction of a second indigenous hull (Zhang 2013a: 1412, Heginbotham et al. 2015: 2, Yang in BBC 2015). China also introduced five new classes of submarine in the 2000s and new guided missile destroyers (Yoshihara and Holmes 2010: 2, see also Heginbotham et al. 2015: 29). The first Chinese stealth aircraft, the J-20 and J-31, were under development including test flights (Zhang 2013a: 1415, Heginbotham et al. 2015: 3). ABM tests were conducted and various cyberspace capabilities likely developed (Gompert and Saunders 2011: 62-63, Zhang 2013a: 1415). New missiles of all kinds were developed, including anti-aircraft, nuclear and the infamous "carrier killer" ASBMs (the first of their kind in the world) (Heginbotham et al. 2015: 29). China has built artificial islands in the South China Sea, providing logistical support for its Navy, firing positions for missiles, and perhaps even shoring up territorial claims (Gracie 2015, Hernandez 2015, Wong 2015, Tian 2015). And finally, the topic of this thesis, China's military space capabilities, from support satellites to ASAT missiles, were developed and publicly unveiled. China's "rise" in space has primarily been conceptualised as contributing to the increase in the military

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[23] Scholars began to pick up on this early in the 2000s. Jonathan Pollack (2002: 44) wrote in 2002 that the "China threat" trend was beginning to attract more attention.

power and prestige of China. Chapters 5 and 6 develop this in more detail and demonstrate the sharply varying emphases different groups within the US government place on the significance of China's "rise" in space.

Two important and interrelated metrics of China's military "rise," used by some American observers, indicate the extent to which China increased its military power during 2000-2016. The first is the perceived military balance in the Taiwan Strait, which the RAND corporation determined had shifted further in China's favour in the 2000s, leading to a potential 'fundamental strategic dilemma' in the future (Shlapak 2009: xviii-xix). The second is the larger geographical reach that Chinese military forces had at the end of 2016 compared to the beginning of the century, understood in academic and military circles as a suite of "Anti-Access/Area Denial" technologies, which could "deny" American naval access to the South and East China Seas.

China's increasing ideational or soft power is a lesser used source of evidence for China's "rise," but worth considering as part of the context of China's "rise" nonetheless. The noted liberal international relations scholar, Joseph Nye,[24] has portrayed soft power as part of the story of the "rise," and some American legislators have expressed concern at similar phenomena too without invoking the exact phrase (Nye 2016: 59-62, see Congressional statements in Chapter 5). This included the commissioning of two Congressional Research Service Reports (Lia 2009a: 2). Overall, the idea of increasing Chinese soft power is more prevalent among academics and analysts than elected politicians, as Zhang (2009: 46) identifies. Again, China's "rise" in soft power is considered to be relative to historical levels in the 20th century. For example, Zhang (2016: 797) writes that 'Until very recently, [China] has always been a rule/norm taker rather than a rule/norm maker in the expanding institutional networks for global governance.' However, China's rising power, including in the realm of norms, now means that it must be taken seriously as an actor 'at once defending, contesting and negotiating with the liberal global order.' During the 2000s and 2010s, China engaged in what could be considered to be activities aimed at increasing its soft power. The Confucius Institutes established across the globe are a particularly prominent example (Li 2009b: 29-30). China also gained international attention when it deployed ships to assist in anti-piracy operations in the Gulf of Aden in 2008 (Yoshihara and Holmes 2010: 149).

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[24] Nye (2010) has argued that although China's soft power is growing, the preponderance of American soft power means that (among other factors), US decline has been overstated.

The "ends" of China's rise: opportunity and threat

This thesis argues that Sino-US relations are both cooperative and competitive, with the two states often cooperating and competing simultaneously within the same policy area. David Shambaugh (2013: 4) has termed this trend 'coopetition.' With such a complex international relationship, there is a wide range of material for politicians, journalists and academics to draw upon. This leaves ample room for different observers to emphasise differing aspects, and ultimately to draw fairly disparate conclusions about what China's "ends" – its goals, rationales, and ideologies – might be. This chapter now turns to briefly set out some of the non-threatening representations of China's "rise," as context for then returning to explore the representations of "threat" in greater depth.

China's "rise" has been understood as an opportunity for the US, primarily in economic matters but also in matters of security. Optimistic arguments about the significance of China's "rise" to the United States can point to successes in cooperation, such as the mutual benefits of trade outlined by Daniel Russel (2014) above; joint military exercises; cooperation on piracy and counter-terrorism; and even a tentative 'arms deal for cyberspace' (Sorensen 2014, Maass 2015, Office of the Press Secretary 2015a, 2015c, Sanger 2015, Xinhua 2015). China's economic "rise" is a 'market bonanza' for the US, according to some China watchers (Pan 2004: 305). It has also been described as an 'opportunity' for nations across Asia, such as in one RAND project (Medeiros et al. 2008: xvi). The same project also intimated that any latent concerns in the region about China were an opportunity for the US to maintain favourable relations with China's neighbours (see Medeiros et al. 2008: xvii).

As this thesis demonstrates, however, optimistic, cooperative or 'opportunity' characterisations have had little to no sway in recent US space policy towards China. Thus, for example, calls for space cooperation by academics and NASA and attempts by the Obama administration to relax the export ban remained unsuccessful during the Bush and Obama years (Johnson-Freese 2011, Sample 2013, Morring 2014, Morring 2015, DoS 2014c: 27181-27182) even though China publicly showed interest in cooperation (Sheehan 2007: 164-166, de Selding 2015). Repeated attempts by China to advance a treaty limiting space weaponisation have seen consistent US disinterest (and opposition) (Meyer 2011). China and Russia funded United Nations research into the 'Prevention of an Arms Race in Outer Space,' but the US took no part in proceedings (UNIDIR 2005). The only prominent portrayals of US-China cooperation in space during the period were in fiction, such as in the Hollywood films *The Martian* and *Independence Day: Resurgence*. Some critics pointed out that including China on the side of

the "good guys" in these science fiction films was likely more motivated by the profits to be made in the burgeoning Chinese box office revenues than a comment on the state of Sino-US relations (see Lang 2015, Lubin 2016). From 2000-2016, American policymakers actively blocked cooperation with China in space. A clause was consistently added to the National Aeronautics and Space Administration's (NASA) appropriations bill which prohibited NASA cooperation with China without Congressional approval (US Congress 2012 §539, Leone 2015, Smith 2015). Well-placed advocates used the "Chinese space threat" to justify these policies, such as Representative Frank Wolf (in Tiezzi 2014) who compared cooperating with China to making a deal with Stalin. Space politics were argued to be *Neither Star Wars nor Sanctuary* (O'Hanlon 2004), 'increasingly congested, contested and competitive' (Joint Chiefs 2013: 1) or even 'the next battlefield for World War III' (Singer and Cole 2015a). China's "rise" in space has thus overwhelmingly been understood through the lens of the 'threat' paradigm that Chengxin Pan (2004, 2012) identifies in his more wide-ranging studies. The question nevertheless remains of how to understand the "China threat" discourse as a context for the construction of the "Chinese space threat."

The "China threat" cottage industry as context for the "Chinese space threat"

There are different ways one could arrive at the conclusion that China is a "threat" to the United States. Perhaps the simplest reasoning is that China is (some combination of) an outright aggressive, revisionist and possibly even reckless power with malign intentions towards the US. More structural accounts of a "Chinese threat" are also prominent in American discourse, not only by academic China watchers but also from US policymakers. This distinction shows that the "China threat" discourse is not a monolithic bloc. The conclusions, however, are fairly complementary: China's "means" and "ends" add up in such a way that China poses a threat to the United States. There are many facets to what has been termed (by those sceptical or critical of the idea) the "China threat theory." Zhang (2013b) identifies a 'cottage industry of the 'China threat' literature,' and this characterisation can be broadened to encompass not only the academic literature but also policy and journalistic outputs.[25] From this perspective we can term the wider phenomenon the "China threat" discourse.

We will begin with the most clear-cut formulations of this understanding of US-China relations, in which China is portrayed as definitively having both the material means to do

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[25] See Pan (2004, 2012) and Yi and Liu (2012) for examples of wide-ranging studies of American representations of the "Chinese threat" by policymakers, journalists, lobbyists and academics

damage to the US (as outlined above) and the malign intentions to use them to that effect. In 2000, the journalist Bill Gertz (2000) published *The China Threat: How the People's Republic Targets America*, a book which is an early indicative example of the representations of a Chinese "threat" in the 2000s. It baldly states that 'The great threat of the twenty-first century – to the United States and the world – is the nuclear-armed communist dictatorship in the People's Republic of China' (Gertz 2000: xi). Since then, other authors have followed this very direct approach, such as Jed Babbin and Edward Timperlake's (2006) *Showdown: Why China Wants War with the United States*. Gertz (2000: 33-40, 59-74, 101-170) uses China's acquisition of technologies, including satellites and missiles and also its practices in matters of technological espionage, to "prove" that China has malign intentions. These ideas were mirrored in official discourse, such as in a Department of Defense (2015: 16) report which argued that China's technology 'acquisition strategy' is really aimed at 'improv[ing] its defense industries.' Chapter 5 of this thesis explores the use of China's material capabilities as proxy indicators of Chinese intentions in greater depth. Portrayals of China's aggressive intentions are often not accompanied with evidence of the fact, however. In public political discourse, it is common for speakers to talk as if China's malign intentions are obvious and indisputable (for example in Congressional statements in Chapters 5 and 6).

Closely related to the portrayal of an outright aggressive China are constructions of China as a reckless or incompetent power. Zhang (2016) draws on Hedley Bull's argument that great powers have 'special privileges … as 'great (ir)responsibles,' justified by their 'contributions to the achievement of common purpose' in international politics. It is not in this sense that American observers typically portray China as irresponsible, invoking the idea instead that China is aggressive and/or incompetent. After all, when 'Washington' has tried to persuad[e] China to become a 'responsible stakeholder' in the 21st century (Glaser 2013: 173, Rigger 2013: 305), the logical implication is that China is not responsible (enough) at the moment – that is to say, irresponsible. One American journalist wrote in *The New York Times* that 'China is an irresponsible power … It's true that China's mishandling of SARS, for example, allowed the disease to spread worldwide. And it has often cheated on agreements' (Kristof 2003). Subtler portrayals in the media have also been made, such as the claim in the *Diplomat* that China's energy policies had played into perceptions that it is an 'irresponsible stakeholder,' which implicitly portrays China as incompetently managing its international image (see Lee 2012). Looking to American academia, Aaron Friedberg (2011: 262), raises concerns that China might miscalculate and fail to recognise American military superiority, meaning that American attempts to 'restrai[n]' would become a 'very dangerous policy

indeed.' His overall thesis is that China is aiming to "win without fighting," so in this context a war between China and the US would be representative of Chinese policy failure (Friedberg 2011: 5-6). Whether this would be an "honest mistake" or not is left for the reader to decide. The former Chinese Ambassador to Britain, Ma Zhengang (in Kaufman 2010: 14) argues that these characterisations aim to make China "responsible" according to the West's definition and therefore according to its preferences.

A characterisation that is both critical of some elements of the "China threat" theory while supportive of others is a US-China "Thucydides trap" or "security dilemma." The Thucydides trap is a simple idea, in that it is a re-purposing of a few lines in Thucydides' *Peloponnesian War*. Graham Allison (2017: xiv) sums the idea up as 'the most frequently cited one-liner in international relations: … "It was the rise of Athens and the fear that this instilled in Sparta that made war inevitable."' This idea does not require China to have malign intentions towards the US, differing from Gertz's (2000) argument that China deliberately "*targets*" the US. Instead, it logically requires China to be a rational actor, or at the very least an unremarkable great power, whose calculations may interact with those of the US in such a way as to lead to war. Joseph Nye (2016: 47-48) has used this characterisation since the late 1990s, and this idea still had prominence at the end of the Obama Administration (see Allison 2017, Senate 2017). The Thucydides trap has also been publicly used by American policymakers to characterise the relationship, unlike the more academic idea of a security dilemma explored later in this chapter. Allison seems to have been the impetus behind policymakers' familiarity with the metaphor, since one Senator referenced him specifically by name (Senate 2015b: S6952).

A similar, but more complex idea when compared with the Thucydides trap, is the "security dilemma." This has seen use when characterising US-China relations almost exclusively in academia, with only a few appearances in journalistic writing and no public uses by American policymakers (Drezner 2012, Browne 2014). These applications reach varying conclusions on how dangerous the security dilemma might be, with the concept itself enjoying a long pedigree in international relations scholarship (see Herz 1950, Butterfield 1951, Jervis 1976, 1978, Glaser 1997, 2010:8, Snyder and Jervis 1999, Booth and Wheeler 2008, Tang 2009). The idea can broadly be defined as a situation in which attempts to increase one state's security decrease the security of others (Herz 1950: 157, Jervis 1978: 169, Snyder 1984: 461, Tang 2009: 594, Glaser 2010: 8). The "material" aspects of China's rise are thought (by China watchers making use of the theory) to create a structural situation in which conflict is possible

or likely. Aaron Friedberg (2005: 22, 42-43), for example, argues that the nature of Sino-US relations depends on how strong the dilemma becomes. In his words,

> the competition-inducing mechanism identified by the pessimists will continue to exert a strong influence. The two most important factors … will be the rate of growth of China's material power and the developmental trajectory of its domestic political institutions (Friedberg 2005: 43).

Friedberg is certainly not arguing that China has malign intentions here, but rather that the security dilemma is clearly a concern for the US. The idea was still prevalent after the Obama administration's "Pivot," with Wang Dong (2013) arguing that both sides had interpreted events, such as 'bolstering' alliances, with suspicion due to an 'underlying' security dilemma. Security dilemma readings of Sino-US relations have also led to fairly optimistic conclusions on the Chinese "threat" to the US, citing the large distance between the two states and the presence of nuclear weapons (Glaser 2011: 83, see also Liff and Ikenberry 2014: 88).

Finally, a related middle ground in "China threat" discourse is the idea that China is a "challenge" to the US, relying on an analysis of the structure of international politics, but without the specific theories of the Thucydides trap or the security dilemma. The reason these ideas are still supportive of the "China threat" discourse is that they identify China's ends as leading to conflict with the US, and thus by extension China logically poses some kind of threat. Larry Wortzel (2013: 163), for example, holds that economic relations are too close for the US to engage in a strategy of containing China's 'military growth.' Due to the risk of a crisis, particularly over Taiwan, and the uncertainty of China's future intentions, however, the United States must engage in a military "hedging" strategy (Wortzel 2013: 163-165, 173). Thomas Christensen (2015: 2-3), author of *The China Challenge*, situates himself in a position wherein he takes the best components of both optimistic and pessimistic arguments about the ramifications of China's "rise" for the US. Rather than an outright structural account of the danger, he takes a more ecumenical approach summed up in his fear that 'The combination of ambiguous and contested political claims, geography, and military technology make managing East Asia while China rises a complex task' (Christensen 2015: 113). Like the security dilemma, this is a primarily academic way to characterise the US-China relationship and to explain its significance for American security.

American representations of China's "rise" in space feature a mixture of all of the strands of the wider "China threat" discourse, outlined in the preceding paragraphs. As we see in this thesis, members of Congress have argued that China's space program is aimed at

overtaking America's military power or prestige (see particularly Chapter 5). American military leaders and senior defence civil servants have publicly aired their fears of China's true intentions in outer space and the risks of miscalculation and war (in Chapters 4-7). Academic China watchers have argued that there is a security dilemma driving Sino-US interaction in outer space (see Johnson-Freese 2007: xviii, Handberg and Li 2012: 4, 19, 21) and Johnson-Freese (2017: 54) recently argued that 'The Thucydides Trap metaphor holds especially true for space.' Others simply argue that China has designs on Taiwan and needs space weaponry to achieve its territorially revisionist goals (Tellis 2007a: 12).

Although there is a great deal of disagreement over what China's goals in space might be, there is enough of a consensus to identify American characterisations of China's "rise" and its corresponding "rise" in space. In short, China's "rise" in space fits primarily under American perceptions of China's increasing military power and the threat it poses to the national security of the United States.

Conclusion: China's space program as a component of the "rise/threat"

US space policy towards China cannot be conceived of as a separate phenomenon to wider American China policy and the dominant constructions of China used to practice it. As Yongjin Zhang (2013c: 113) writes, 'China's ascendancy as a space power has now become an integral part of the China rising story.' This chapter has attempted to provide a contextualisation of both the "China rising story" and how it frames American understandings of China's space program.

Portraying US-China relations in a negative light has been a potentially useful political tool for American policymakers since the "Loss of China." The noted historian of US-China relations, Nancy Bernkopf Tucker (2012: 181, see also Christensen 1996) argues that 'Eisenhower recognized the value that the portrait of an aggressive and irrational China offered … But actions toward and attitudes about China also hinged on values.' However, the public portrayal of a "China threat" was side-lined after Nixon and Kissinger's efforts in 1972. By historicising the "China threat" (and also the "rise"), their social contingency becomes unambiguous. From this historicised understanding, it becomes possible to track the differences and commonalities between the fortunes of the "China threat" in the 20th century compared with its manifestations in space policy. Specifically, the following chapter proceeds

to historicise the "Chinese space threat," for which Chapter 3 has provided the wider historical context. Furthermore, the context provided in this chapter, combined with the analysis in Chapter 4, provides a picture of the context of American space policy towards China from 2000-2016.

In some ways, however, this chapter has deepened the research puzzle in question. American policymakers have been faced with a question in wider China policy: what to do about China's "rise"? In wider American China policy, there was room for debate and interpretation in answering this question. The Bush and Obama years saw dialogue, formal and informal cooperation, but also competition in the areas of both military security and the economy. In matters of space policy, however, the "threat" framing was overwhelmingly dominant. How did this come to be, and how was the "Chinese space threat" constructed from 2000-2016? The next task in order to address this question is to investigate the historical context of the US-China space relationship.

Chapter 4

Historicising the "Chinese Space Threat" 1958-2000

"The launching by Communist China of an earth satellite … would tend to enhance the prestige of the Chinese Communist regime throughout Asia … and could further undermine the reputation of the west for technological leadership" (White House 1958: 1).

Introduction

China's space technology was a concern for American policymakers almost from the very beginning of the Chinese program in 1956 (White House 1958, Harvey 2004: 2). Yet by the 1970s, China's space program was no longer represented as a threat. Indeed, from the late 1970s and throughout the 1980s (and to a lesser degree, into the 1990s) both Republican and Democratic Presidents pursued cooperation with China in matters of space policy. Building on the preceding Chapter, the first point which must be made is that these developments coincide with broader profound changes in Sino-US relations, especially after the Shanghai Communique in 1972 and the eventual normalisation of relations in 1978-79. That being said, this chapter argues that American space policy, while clearly subject to larger systemic political dynamics outside of its remit, did not automatically change in correspondence to them. This can most clearly be seen in the use of public discourse by the executive branch to side-line the first iteration of the "Chinese space threat" in the 1970s, and later in the long delay between American outrage over the 1989 Tiananmen crackdown and institution of sanctions to end Sino-US space cooperation. To understand the shifting American understandings of China's space program, this chapter deploys the analytical lens of technopolitics, framing the policy debates of the time as processes of instrumentalisation, in which competing American constructions of Chinese and US space technology clashed on the 'social battlefield of technology' (Feenberg 2002: 15). In doing so, this chapter highlights the parallels between US-China relations in space both during and after the Cold War and demonstrates that the "Chinese space threat" of the 2000s was in fact the second major iteration of the discourse.

This chapter divides its analysis into three sections. The first looks at the discourse constituting the "Chinese space threat" between 1958, when the "threat" is first recorded, and 1972, when the Shanghai Communique was signed. During this period, Chinese space technology was instrumentalised and re-instrumentalised in American discourse, first as a

threatening space program in its own right, and later subsumed under a wider rubric of a Chinese nuclear threat. Second, this chapter argues that, from the Nixon administration onwards, the executive branch made sustained discursive interventions in US-China space technopolitics to counter previous representations of a "Chinese space threat," and frame space technology (mainly Chinese, but also American) as a positive force to check Soviet power and generally strengthen US-China relations. Finally, this chapter argues that this framing of space technology came under threat after the Cold War, as voices in Congress attempted to assert their constructions of Chinese space technology as a military and economic threat, and American space technology as open to Chinese exploitation. This takes the analysis up to the very beginning of the Presidency of George W. Bush, with subsequent chapters dealing with the establishment of the dominant second iteration of the "Chinese space threat."

Existing analyses of Sino-US relations in outer space have exhibited a tendency to focus entirely on events over the past decade, specifically the impact of China's ASAT testing (Tellis 2007a, 2007b, Johnson-Freese 2007, Handberg and Li 2012). Where historical analyses have been done in English, the tendency has been to think about the history of the Chinese and American space programs, but not the way in which they interacted (for examples of Western histories of China's space program see Harvey 2004, Sheehan 2007: 158-173, Kulacki and Lewis 2009). Historicising the "Chinese space threat" contributes to the research objectives of this thesis in two ways. First, this chapter makes an original contribution to space policy and Cold War history literature by looking at the interplay between the Chinese space program and American space policy, and the technopolitical discourse which resulted. The result is a narrative of how China's space program gradually emerged as an issue in US foreign policy, made possible by analysing documents unconsulted by existing studies (Harvey 2004, Sheehan 2007, Kulacki and Lewis 2009, Reddy 2017). Second, it provides a counterargument to the ahistorical American policy analyses in contemporary literature (see Tellis 2007a, 2007b, Johnson-Freese 2007, Handberg and Li 2012, Reddy 2017). Historical US-China relations in space are not, for example, as Vidya Reddy (2017: 236, 238, 240) argues, best characterised by three periods proceeding from the 'good,' to 'bad' and then 'ugly.' Reddy's (2017: 236) supposedly 'objective' (as they term it) analysis begins in 1972, omitting important historical context and assuming (incorrectly) that US space policy automatically responded to wider China policy. The archival research in this chapter therefore sheds new light on the shifting American perceptions of China's space program before the year 2000.

4.1 From "Chinese space threat" to "Chinese nuclear threat" 1958-1972

China's space program officially began in 1956 (Harvey 2004: 2, Kulacki and Lewis 2009). Almost from the start, Qian Xuesen, the famous "father" of the Chinese space program, had proposed simultaneous development of satellites and rockets (Erickson 2014: 145). Much like the Soviet and American programs, this meant that the technics of the Chinese space program were forged in a way that invited classification as suitable for both civilian and military ends. When Americans constructed Chinese space technology, they were in effect asking the interrelated questions "what does it do" and "what is it for?"

In Feenbergian terms (as introduced and discussed in Chapter 2), we can firmly locate the analytical category of 'primary instrumentalization' of Chinese space technology in a specific time and place (Feenberg 2010: 72-76): mid-20th century China. That is to say, we can theorise that Chinese engineers and technocrats must have been the ones to 'simplif[y] objects for incorporation into a device' (metal into fuel tanks, fuel tanks into rockets) – in layman's terms, manufacturing (Feenberg 2010: 73). According to Feenberg (2010: 72, 75), this process is not fully distinguishable from a simultaneous process of secondary instrumentalisation which provides much of the socio-cultural content of the technology, producing an understanding of function and grounding it in a wider social system. Unlike primary instrumentalisation, this secondary form cannot only have taken place in China, because technology can be repeatedly recontextualised, and the 'impact' of secondary instrumentalisation increases the longer the process goes on for a given artefact (Feenberg 2010: 74, 76). It is here that we must go a little further than Feenberg (2010) in geographical terms, because he does not explicitly provide a framework for understanding processes of instrumentalisation across state boundaries. The political and geographical separation of China means that US constructions of Chinese space technology were (and are) represented solely through secondary instrumentalisation, having no ability to materially shape Chinese technics. American instrumentalisation of Chinese space technology is therefore in parallel to, but almost totally disconnected from, its Chinese counterpart. This theoretical outline corresponds with the analysis which follows in this chapter: American policy elites constructed their own representations of the function of Chinese space technology, and were almost totally unconstrained by Chinese technopolitics. There is, in other words, a unilateral American construction of Chinese technopolitics encapsulated within American technopolitics.

The first American construction of the function of Chinese space technology was as a threat: more specifically as a means for harming American national interests by advancing

international communism. In 1958, the secret White House document, 'Report on a Proposed Cooperative Scientific Satellite Launching Project,' discussed the propaganda impact of a Chinese satellite launch and planned responses to a potential success (White House 1958). The group which produced the report was the Operations Coordinating Board, set up in 1953 by Executive Order 10483, its members consisting of the Under Secretary of State (also chairman of the board), Deputy Secretary of Defense, Director of the Foreign Operations Administration, the Director of Central Intelligence and a 'representative of the President' (White House 1953). The establishing executive order directed the board to organise the required agencies to enact national security policy, such as providing 'detailed operational planning responsibilities' (White House 1953). Perhaps most importantly, the board was also charged with 'initiat[ing] new proposals for action within the framework of national security policies in response to opportunity and changes in the situation' (White House 1953). This gives some indication of how to consider the 1958 report. Additionally, the US and many of its allies had established the Co-ordinating Committee for Multilateral Export Controls (COCOM) in 1949 to restrict technology transfer to the Communist Bloc, and after the start of the Korean War, China was subject to the most severe controls until 1957 (OTA 1979: 153-154, Cupitt and Grillot 1997: 363-364). Communist procurement of a variety of high technologies was therefore already an "obvious" security concern, with China being an especially sensitive case. In this light, the contingency plan can be seen as an attempt to not be caught unprepared in the event of a Chinese launch.

The central concern of the 1958 report was the damaging impact a Chinese satellite could have on US national interests. It constructs Chinese space technology as an instrument intended for advancing Communism in Asia. The report reveals a variety of assumptions made by the board about space technology and the two countries. The report states that

> the launching by Communist China of an earth satellite, which could only result from
> USSR assistance, would tend to enhance the prestige of the Chinese Communist
> regime throughout Asia … and could further undermine the reputation of the west
> for technological leadership (White House 1958: 1).

Earlier that year the US had launched their first satellite, *Explorer 1*, several months after *Sputnik*. The report proposes countering the potential prestige China would gain by launching a satellite by ensuring it was 'matched by a Free World ally' (White House 1958: 1). This implies an assumption of rough equivalence in matters of prestige, framing China as a less-than equal ally of the USSR. The report considers Japan as a possible candidate to be placed

'ahead of, or at least equal to, Red China as the scientific leader of the Afro-Asian world'
(White House 1958: 5). Due to this contingency plan, the report suggests that

> for obvious reasons should we assist another country in launching a scientific
> satellite, care should be taken that no official U.S. spokesman deprecate Soviet
> assistance in launching of a satellite, for example to Communist China (White House
> 1958: 6).

Although no explicit connection is made, given the policy context and the logic of American
foreign policy making at the time (explored in the preceding chapter) it seems likely that the
propaganda effect in Asia would be considered to pose a serious threat to US interests. The
White House analysis also excludes other potential implications of a Chinese satellite (such as
nuclear capability[26] or internal political stability) and instead contextualises a potential space-
faring China within the existing representations of an expansionist Communist power.

The report goes into detail on the mechanics of the Chinese propaganda benefits
expected after a satellite launch, indicating what the writers of the report considered most
important. The report argues that 'the propaganda impact of a satellite launching from China
may be expected to vary from country to country in accordance with the country's degree of
sophistication on scientific and technical matters' (White House 1958: 8). China is represented
as having little in the way of its own scientific capacity, but clearly has enough that it could
create problems for the US. For example, the report writes that 'in nations where Chinese
inability to produce such a technological achievement is apparent, a ChiCom satellite launch
could even be counter-productive' (White House 1958: 8). Whereas,

> in nations where ChiCom "progress" already has created a suitable atmosphere,
> satellite launch may be greeted as positive evidence of the ability of the Communist
> systems to produce fast and appealing technological results (White House 1958: 8).

The quotation marks around "progress" seem to indicate discomfort at recent events, in turn
assuming that any "progress" is inevitably a concern for the US. It proposes advising US
officials to 'avoid appearance of insult or derogation of Chinese science, while emphasizing the
major Soviet role' (White House 1958: 8). To this end, it even suggests trying to encourage
other countries to call it 'the satellite the Russians are launching from China' and the
production of cartoons 'for unattributed use after a launching, depicting the "made in Russia"

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[26] Given the nuclear implications of *Sputnik* and the shift to interpreting China's space efforts through
the lens of nuclear policy, it also would be unlikely that nuclear matters were far from consideration in
this case.

character of the satellite' (White House 1958: 8). Another proposed tactic for countering the propaganda value of the potential launch is to imply that China is under the influence of the USSR, including the advice that the Chinese satellite be given the Russian designation 'Sputnik IV' (White House 1958: 8). This approach is again consistent with the portrayal of China as a part of the monolithic "Communist Bloc." Policy makers were clearly able to make the distinction privately, but conflating the two countries seems to have been part of the planned public response to a launch. There seems to have been some continuity in the kind of thinking represented in the 1958 report, with a similar document from the following year drawing comparable conclusions and stressing the propaganda benefits for Communism in the wake of Soviet space probes (White House 1959).

Sputnik and the discursive conditions of the 1958 "Chinese space threat"

The single report constituting the earliest evidence of an American-constructed "Chinese space threat" clearly needs to be placed in a wider context. By comparing American constructions of *Sputnik* and its aftermath with those of a potential Chinese satellite, this discussion indicates an important parallel between them. Namely, the fearful tone of the 1958 report on the threat of a potential Chinese satellite seems to reflect an elite anxiety about the public perception of the technological standing of the US.

The shock of *Sputnik* looms large in the 1958 China report, and the foreign policy elite charged with understanding the Chinese space program only had a handful of examples of space flight to extrapolate its significance to national security. It is worth, then, briefly providing some context on the US reaction to *Sputnik*.[27] There seems to have been a consensus, across the policy elite, on the significance of the launch of *Sputnik*. Writing twenty years later, James Killian (1977: 1), ex-science advisor to the President, summed up the mainstream, popular history account of events when he wrote that 'Today it is hard to believe that such a panicky reaction could have occurred, but there were few Americans who were not caught up in the mood of chagrin and concern.' Lyndon Johnson, then Senate Majority leader, and Edward Teller, "father" of the H-bomb, both publicly compared the launch to the disaster of Pearl Harbor (Wang 2008: 72). Secretary of State Dulles told the Senate Subcommittee on American Republics that

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[27] There is a great deal of literature on *Sputnik 1*, which this thesis cannot do justice to. Michael Neufeld (2013: 998) goes so far as to write that the US reaction to *Sputnik* is 'a well-worn topic.'

there is no doubt that the scientific achievement of the Soviets in launching the two

satellites has had a considerable adverse effect in that it has enhanced the prestige of

the Soviet Union and has lowered that of the United States in much of the world

(Dulles in Senate 1980 [1958]: 9).

He argued specifically that '*I think that is due more to our failure to launch a satellite shortly after the Soviets did than the fact that the Soviets launched it*' (Dulles in Senate 1980 [1958]: 9), emphasis added). However, this admission raises further questions about what purposes the public establishment of a *Sputnik* "shock" were intended to serve. As Kenneth Osgood (2000: 198) puts it, the "shock" is only 'part of the story.'

The "shock" of *Sputnik* was positioned, albeit in elite circles, as a productive phenomenon. That is, although it had some negative aspects, *Sputnik* was a call for action within the context of the Cold War struggle. In the same Senate hearing quoted above, Dulles (1980 [1958]: 118) simultaneously put a positive spin on Sputnik, telling the Senate that 'you need something which gives you a shock from time to time.' Senator Fulbright (1980 [1958]: 118) added 'Unless we can take advantage of Sputnik and fear and apprehension we are not going to do it now, unless we have very strong and effective assistance from people like yourself [Dulles], General Twining and others.' This may seem quixotic, but only if one does not consider that the public representation of a panic over *Sputnik* may have been a deliberate discursive strategy on the part of the US foreign policy elite. Nor does this strategy seem to have only been deployed in the Senate. Dwayne Day (2000: 170) quotes a contemporary CIA source:

The psychological warfare value of launching the first earth satellite ... may make it a

crucial event in sustaining the international prestige of the United States ... the

successful launching of the first satellite will undoubtedly be an event comparable to

the first successful release of nuclear energy.

He writes that 'one year before *Sputnik*, the NSC's official position was that the United States could lose prestige *even* if it launched a satellite first but the Soviets developed a better science program. Science, therefore, was a higher priority than schedule' (Day 2000: 180). Questions of the content and timing of the response followed, rather than directed, the overall concern of preserving or gaining prestige. Likewise, this has clear parallels to the thinking in the White House plan for a Chinese satellite outlined above – limit damage to prestige with a quick response of similar symbolism.

Further depth can be added with the inclusion of Saki Dockrill's (1996: 210-234) argument that the 'shock of Sputnik' had more traction with the American people than with the Eisenhower administration (see also Peoples 2008: 60). Indeed, it eased the legal concerns of a portion of the foreign policy elite for America's own satellites because Sputnik set a useful precedent (Divine in Peoples 2008: 60). In this light, the post-*Sputnik* atmosphere does go some way to explaining the alarmism of the 1958 White House plan and the overwhelming focus on damage to prestige over any other potential concerns. Yet, it would seem that a sharper framing would see the 1958-1959 concern about a Chinese satellite more specifically as an elite concern about public reactions than a deep-seated fear they held themselves.

Adding weight to this characterisation, the archival evidence shows that the prestige threat of a Chinese satellite seems to have disappeared from US policy discussions relatively quickly as the public "shock" of Sputnik receded. Modern historically-minded scholars agree that prestige was central to the Chinese satellite program (Harvey 2004, Sheehan 2007, 2013, Johnson-Freese 2007: 203, Kulacki and Lewis 2009: 5, 12-14). Yet during the 1960s, available documents do not show much American concern about the prestige of a Chinese satellite. After all, the CIA 'Special Report' on 'The Race for Third in Space' implies some prestige benefits for the next space-faring nation, predicting that 'a successful satellite launch by any of these countries … would undoubtedly be exploited to show that that country was approaching the scientific abilities of the US and the USSR' (CIA 1965a: 1). Yet, the section analysing China's prospects are not alarmist in tone (CIA 1965a: 3-5). The report merely suggests "Shuang-Cheng-Tzu" as the 'probable launch site for earth satellite' (CIA 1965a: 2). How and why had the Chinese satellite threat to American prestige receded?

By 1966, the prestige threat of China's space program was overtaken by American nuclear fears. In 1964, China had successfully tested its first atomic bomb, and was well on the way to demonstrating a thermonuclear capability (eventually demonstrated in 1967) (Lewis 2014: 48, 52). Now that China was a nuclear power, the "space threat" articulated in the 1950s fell by the wayside. The CIA's (1966) general 'Intelligence Handbook' on 'Communist China' does not include China's space program in the military section, instead considering it as a spin-off from China's MRBM program (CIA 1966: V-2). In 1967, the CIA predicted that China might launch a satellite that year 'for political effect' but there is no evidence that this 'political effect' posed much of a threat in the CIA's analysis (CIA 1967: 2, 11). With the successful Moon landings of Apollo 11 and Apollo 12 in 1969, the US had cemented its position as the preeminent space faring-nation and arguably won the "Space Race" (such as it was). American fortunes in space were vastly different in 1957/1958. China's space technology would be re-

contextualised and re-instrumentalised as a supporting and subsidiary element of the new Chinese nuclear threat.

Dongfanghong-1 subsumed under the rubric of a "Chinese nuclear threat"

The preponderance of the "Chinese nuclear threat" discourse over the first articulation of a "Chinese space threat" is readily apparent when analysing American reactions to China's first satellite. When China finally successfully launched its first satellite, Dongfanghong-1 (DFH-1), on 24th April 1970 (some twelve years after the first American fears), the response in the US was muted, and (most importantly) couched in terms of a "Chinese nuclear threat." The White House did not release a statement on the launch and the next Presidential Press Conference on May 8th did not cover DFH-1 (Nixon 1970b). Subcommittees in the House and the Senate, however, both heard evidence on the launch. On the House Subcommittee on Department of Defense, Congressman Mahon asked Dr John Foster (the DoD's Director of Defense Research and Engineering) to begin his testimony by commenting on China's first satellite (House 1970: 1). Foster (in House 1970: 1-2) told the subcommittee that 'it really did indicate rather strongly … the Chinese commitment to a large space program.' He added that he thought that the Chinese had realised 'the enormous political impact that such a launch has around the world' and that 'the Chinese statement made it rather clear that they associate this space effort with their future needs from a military point of view' (House 1970: 1-2). Crucially, however, the context of the testimony was firmly in nuclear matters: the discussion then immediately proceeded to discuss the 'Chinese ICBM threat' with no concerns raised by the Congressmen on the significance of DFH-1 in its own right[28] (House 1970: 1-2). Similarly, a Senate subcommittee on the 'Internal Security Act' had met before the launch of DFH-1 and heard evidence on China's missile program along with the threat posed by Sino-Soviet tensions (Senate 1970: 1-49). The witness, Dr Stefan Possony, an academic at the University of Pennsylvania, submitted additional material to update his evidence in May (Senate 1970: 1, 49). His analysis of DFH-1 focused on the implications for China's capabilities to deliver nuclear weapons, and included a denigration of the accuracy of their missile, using the orbital trajectory as evidence (Senate 1970: 49-51). During a 1971 hearing held by the House on NASA's forthcoming Authorization, Congressman Fulton drew on ideas of American decline by raising concerns that the US might fall behind China in space launch capability, saying that the US

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[28] Although some of the discussion did occur "off the record," so there may have been some further elaboration.

must not allow Red China to overtake this country in launch rates and frequency of

space exploration. Communist China is emerging as a third competitor, a new entry in

space and technology competition (House 1971: 144-145).

The Acting Administrator of NASA, Dr George Low, played down the Congressman's concerns saying that 'I think they still have a great deal of catching up to do before they approach what we have done in the last decade' (House 1971: 146).

It seems that the somewhat McCarthyite rhetoric in Congress was not present in classified circles. Perhaps the best evidence for a relaxed attitude at the CIA on the national security ramifications of China's space program is displayed in a memo for Henry Kissinger from Director Richard Helms. Helms suggests 'encouraging them [China] to acquire and rely on a [satellite] reconnaissance program of their own' including 'making it easy for the Chinese to get necessary information and equipment for a useful, but not very high quality, capability' (Helms in White House 1971: 2). A handwritten note on the memo seems to indicate openness to the idea (White House 1971: 1). This foreshadowed eventual US-China space cooperation, which had a major component intended to provide the Chinese military with improved space intelligence capabilities to increase their effectiveness against the Soviet military. In the meantime, public American discourse and much of the classified debates maintained that China's space program was a threat because of its supporting role in Chinese nuclear ambitions.

The most powerful American foreign policy elites may well have privately abandoned the notion of a "Chinese threat" (and this is explored in greater depth in the next section of this chapter), but publicly the conflation of the Chinese nuclear and space programs continued to be a major component of the public construction of a "Chinese threat." As was argued in Chapter 3, the threat of a nuclear China caused acute American concern even in classified circles, with the suggestion of the use of military force to disarm the PRC indicating just how alarming these developments seem to have been (Richelson 2006: 153, White House 1963, DoS 1964c: i, 1). President Nixon and his administration may have been quietly planning a major shift in policy, but publicly the construction of a "Chinese nuclear/space threat" continued. Under President Johnson, Secretary of Defense McNamara had used the 'China Bomb' to justify American spending on Anti-Ballistic Missile (ABM) technology (Reiss 1992: 28). Nixon's secretary of Defense, Melvin Laird (in House 1969: 11), continued along the same lines, telling Congressmen that 'the Chinese Communists have not yet launched their ICBM (or space shot).' He used DFH-1 as further evidence, this time for the Senate in 1970, of the 'potential capability of Communist China's ICBM technology' (Senate 1970: 278, see also for SAFEGUARD

Senate 1971: 1208). During this time period, Nixon and Kissinger were already engaged in fairly successful (informal) diplomacy with PRC officials (Burr 2002, US-China Institute 2011), yet as late as 1972, Laird (in Senate 1972: 63) was still using the Chinese space program as evidence of a "Chinese nuclear threat." This disjuncture between public and classified discourse requires further analysis if we are to understand how the Nixon administration managed this rather dramatic discursive move to marginalise the "China threat," including both the space and nuclear dimensions, so comprehensively that only a few years later, all government agencies would concur that space cooperation with China was in the national interest.

4.2 From the Shanghai Communique to the beginning of space cooperation 1972-1986

President Nixon's early efforts to engage China in diplomacy were initially conducted in a very clandestine manner (Kissinger 1979: 163, Burr 2002). It was primarily not, therefore, a matter of public discourse, although Nixon had made some public comments which hinted at his interest in this area (US-China Institute 2011). Nevertheless, with access to some of the documents in the archives it is possible to some extent to reconstruct the discursive conditions within classified circles under which Nixon and his chosen advisors, notably Kissinger, had to operate. In the preceding section, we have seen that through the 1960s and into the 1970s, much of the discourse in classified circles constructed some variant of a Chinese threat. Yet, comments at the very highest levels of leadership, such as those by DCI Helms and McNamara quoted above, show that in less formal settings the civilian leadership was fairly agnostic about a Chinese threat – nuclear, space, or otherwise. According to William Burr (2002), whose analysis is based on declassified documents, Nixon himself had been interested in establishing relations with China even before his presidency began in early 1969. To that end, Nixon seems have used the power of the presidency to direct the organs of state to produce new knowledge about China which supported his policy aims. This took the concrete form of a National Security Study to assess the state of US-China relations and to produce 'Alternative U.S. approaches on China and their costs and risks' (Kissinger/NSC 1969). After the events of 1971/2, the discourse in classified documents slowly became less strident in its construction of a "Chinese threat," beginning to construct China and its leaders as rational actors wary of Soviet power. A report for internal Department of State use, for example, is remarkably blunt

when contradicting the old "China threat" discourse: 'Peking does not have the military power to seize Taiwan' and 'they presumably would like us to be against … the expansion of Soviet power' (DoS 1971: 1, 3). Nixon (1971) could tell other senior policymakers (and the Taiwanese government) that there would be 'a more normal relationship with … the Chinese mainland. Because our interests require it. Not because we love them, but because they're there.' The once powerful pro-Kuomintang lobby did not, and perhaps could not, respond to Nixon's secretive and fast-moving strategy (Tucker 2005: 112, Harper 2017: 199).[29] Under these discursive conditions it became possible, almost necessary, to re-contextualise Chinese space technology.

The Nixon administration began the work of re-contextualising Chinese space technology, by producing the necessary wider discursive conditions and favourably entertaining some space technology transfer. However, events in American domestic politics – namely the Watergate scandal – gave Presidents Nixon and Ford little room to manoeuvre when it came to China policy. John Lewis Gaddis (2007: 177) quotes Kissinger in 1975 as saying 'Our domestic drama … first paralyzed us, then overwhelmed us.' The Shanghai Communique contained no timetable for the normalisation of relations (Chang 1986: 36). It would fall instead to the newly elected President Carter to continue the process. As was argued in Chapter 3, Carter's China policy was (eventually) framed in terms of creating strategic relationships to hedge against the Soviet Union (at least for the Brzezinski wing of the administration, see Ross 1995: 94, Tyler 1999: 94, 109). Inside the administration, normalisation of Sino-US relations was portrayed as the culmination of Nixon and Ford's efforts to engage China (State Department 1978: 1). High level, 'exploratory talks' between Secretary Vance and the 'new Chinese leadership' began in 1977 (State Department 1978: 2). According to a memo from Frank Press, the President's Science and Technology adviser, it was Carter's idea to send a delegation of 'science and technology officials' to China (White House 1978a: 3). Kissinger had already facilitated the technology of transfer of computer chips and jet engines to China – with the latter flaunting the export rules of COCOM – meaning there was precedent for the Carter administration's exchanges of space technology (Ross 1995: 89).

'All Agencies Concur' - Normalisation comes to Sino-US space relations

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[29] Carter also identified a powerful Taiwan lobby, but equally managed to outmanoeuvre it (Chai 2002: 131).

Space cooperation with China was a product of prior American foreign policy discourse, but also helped to reproduce a new American technopolitics. This was both in terms of American representations of its own space technology, but crucially of China's space program too. While it was only one area of a wide variety of bilateral deals, in a sense the lack of controversy on the issue demonstrates the relatively non-threatening status of China's space and missile technology at that stage. The threat posed by technology transfer to China did not dominate the discussion or prevent space cooperation (as it would in the 2000s and 2010s). This chapter therefore argues that existing arguments to the effect that 'the United States has been markedly negative in its attitudes toward the Chinese space programme compared to other key actors,' as Sheehan (2007: 164) argues, or that competition has primarily characterised the relationship to date, as Johnson-Freese (2004: 287) argues, should be revised in light of evidence in the archives.

The archival documents clearly demonstrate that the Carter administration sought to recast both American and Chinese space technology as a non-controversial, literally "normal" aspect of a bilateral relationship. On May 21st 1978, Benjamin Huberman (a staffer on the NSC and Assistant Director of the OSTP) along with a representative from the State Department and the US Liaison Office met with three Chinese officials. Huberman began by setting out the Frank Press' proposed science and technology exchange and 'explain[ed] briefly our thinking on the mutual benefit of this proposed visit' (NSC 1978a: 1). He drew on the Shanghai Communique to frame the proposal, stating that 'our relationships in science and technology have been growing in a mutually beneficial manner consistent with the Shanghai Communique' (NSC 1978a: 2). He stated that

> we believe such cooperation would be a logical next step in our expanding science
> and technology relationships. … wide-ranging cooperation … is as inevitable as it is
> highly desirable (NSC 1978a: 3).

The first specific field he named was the LANDSAT deal and 'cooperation in remote sensing,' followed immediately by 'cooperation in the field of satellites; for example, by having the U.S. provide reimbursable launch services … or room on U.S. satellites for Chinese scientific experiments' (NSC 1978a: 4). Export controls were also mentioned, with Huberman saying that 'we will attempt to have this [remote-sensing equipment] export approved by exemption from the [COCOM] regulations' (NSC 1978a: 6). The Soviet Union was mentioned in direct relation to this, saying that this 'would give us more flexibility in dealing with export cases to China without at the same time undermining the export controls to the Soviet Union which both you and we want to maintain' (NSC 1978k: 6). Despite this fairly wide-ranging set of proposals, it

should be noted that overall, space is not mentioned nearly as much as general scientific and technological cooperation. A Chinese official, Chiang Nan-Hsiang, is recorded as having received Huberman's offers favourably and the talks continued (NSC 1978a: 7-8).

Carter approved Frank Press' plan around June 26th 1978 (before the formal recognition of the PRC), writing back 'I do not want you to go as Santa Claus. Be sure exchanges are equitable & mutually beneficial' (White House 1978a: 3). The plan did not mention any threats posed by China, nor the risks of technology transfer (White House 1978a). Brzezinski was briefed by Michel Oksenberg (a member of the NSC) before his meeting on June 27th 1978 with 'the Frank Press delegation' in order to 'place the trip in its appropriate foreign policy context' (NSC 1978b: 1). Oksenberg reminded Brzezinski that

> our relations with China consists of three dimensions: (1) the global, strategic; (2) the
> diplomatic … and (3) the bilateral, commercial, cultural, scientific and technological.
> We are committed to advancing our relations with China in all three dimensions … we
> approach China with a long-term appreciation of its historic and strategic importance.
> We desire to expand our consultative relationship … so that our separate actions
> might be mutually reinforcing (NSC 1978b: 1-2).

Oksenberg broke the bilateral points into two. The first was that that 'we note China's current drive for modernity – a development we welcome, for a strong and secure China is in our interest. We seek a China which confidently pursues an independent policy in world affairs' (NSC 1978b: 3). The second dealt with the areas in which cooperation could take place, which included space. He wrote that 'the S&T relationship we seek with China must be mutually beneficial and reciprocal. There are areas where can gain from China … and we expect the Chinese to be as forthcoming as we are' (NSC 1978b: 3). China's meaning had clearly changed from even a few years before – the threat posed by China was a distant element of internal policy discourse during this decision. Instead, China was consistently represented as an opportunity for the US by the Carter administration. By extension, this tacitly recast American space technology as an instrument for cooperating with China – a sharp departure in comparison to its use to catalogue prospective targets for American weapons. While the immediate inner circle of the Carter administration were clearly advancing a single coherent discourse on space cooperation with China, the wider foreign policy elite had not always been as flexible on the question of the "Chinese space threat." The Carter administration therefore had a significant task in advancing the new technopolitics of space technology to the rest of the federal government.

Securing a consensus on China's role in US foreign policy, and specifically in S&T policy, was considered by the Carter administration to be essential to enacting a policy of cooperation. In technopolitical terms this meant achieving secondary (re-)instrumentalisation in two areas. The first in recontextualising American space technology as something to be shared, and the second in recontextualising Chinese space technology as supporting, rather than harming, American national interests. By October 13th, 1978, the first explicit sign that this was being achieved had arrived. Frank Press informed the President that 'all the agencies concur in this action plan' (White House 1978a: 1). The interagency meeting is also referred to in an NSC memo to Brzezinski, informing him that 'Frank Press chaired a PRC sub-committee meeting on science and technology exchanges' and included 'State, DOD, CIA, OMB, NSF, HEW, DOI, DOE, DOA, DOC, JCS, NASA, ICA, OSTP, and the NSC' (NSC 1978c: 2). The State Department, DoD, CIA and JCS had all previously expounded arguments that China posed a threat to the US, often due to its space and missile technology (as was discussed earlier in this Chapter and in Chapter 3). On October 18th, 1978, Zbigniew Brzezinski summarised Frank Press' activities for US-China scientific cooperation thus far. According to Brzezinski (White House 1978b: 1), Press had 'managed to secure total consensus among all agencies concerning the road immediately ahead … hence, no inter-agency disputes require your attention.' Again, the program proposed space to be one of a number of areas, including 'students,' 'energy,' 'agriculture,' and 'health' (White House 1978b: 1). This framed space technology as simply another element of uncontroversial, non-threatening technology. Brzezinski's recommendation to Carter was 'that you endorse Frank's approach and authorize him to proceed at a measured pace in correspondence with his Chinese counterpart' (White House 1978b: 1).

The LANDSAT transfers are particularly valuable for understanding just how deep the change in American representations of China's space program had become, because they constituted not only a linguistic shift, but also a change to the technics of US space technology. LANDSAT was, by both the logics of the time and the 21st century, a clear "dual-use" technology because it could not only aid agricultural production, but could also provide a basic military mapping and reconnaissance capability. Indeed, the CIA (1973: 1) had already warned that China was 'attempting to exploit' the 'reconnaissance potential' of a similar system, the Earth Resources Technology Satellite. The report suggested that the data was ultimately 'useful to missile targeting' and also large-scale maps of the Sino-Soviet border (CIA 1973: 2). On October 30th 1979, Brzezinski sent a memo to NASA's administrator (copying in the Secretaries of State and Defense, and the Directors of the CIA and OST), dealing with the

LANDSAT component of the exchange (White House 1979). He informed the Administrator that 'in developing a LANDSAT ground station appropriate for Chinese needs, it is imperative that we take no unacceptable risks to our own security, particularly risk to our intelligence systems' (White House 1979: 1). Once again, the importance of interagency consensus was highlighted, with Brzezinski writing that the 'interagency review of the proposed ground station should take this consideration into full account as it prepares the detailed offer we intend to make to the Chinese … you should identify any dissenting view on significant issues' (White House 1979: 1). Whatever concerns there may have been were clearly overcome, and the LANDSAT deal went ahead.

The US and China cooperated extensively on the LANDSAT Earth observation program, and it was formally agreed that two LANDSAT ground stations would eventually be built in China (OST 1979, Fang 1979, USGS 2016).[30] This final development is particularly notable, because it inscribed US-China cooperation into the materiality of American space technology, involving some new elements of primary instrumentalisation (i.e. assembling new technical artefacts) which reflected the new US-China technopolitics. This was a radical shift compared with the previous technopolitical regime around American satellite ground stations, the geography of which had reflected the Communist/Free world divide as argued by Ruth Oldenziel (2011: 27-28). Importantly, LANDSAT cooperation would survive the Carter administration, and be continued under President Reagan. This goes some way to showing how durable the new technopolitics of Chinese and American space technology was by the end of the Carter administration.

The Reagan administration continued Carter's exchanges with China. Before the Challenger disaster in 1986, US-China space cooperation remained technocratic, with little to no public profile. The justification for cooperation became more focused on the Soviet Union – at first privately, and later publicly. In 1980, a draft memo was produced for the Secretary of Defense for his trip to China – the author is unknown (Unknown 1980). The memo states that the secretary should 'indicate that we are undertaking to differentiate in COCOM between' technology transfer policy for the US and China, and 'that LANDSAT D is an example. However, any public linkage of the LANDSAT D decision to Soviet aggression against Afghanistan should be avoided' (Unknown 1980: 1). Importantly, the US-China space relationship remained dialogical in the 1980s. The science and technology relationship was supplemented with

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[30] It is likely further modifications may have been made. Pamela Mack (1990: 154) indicates that a Lockheed study in 1975 identified problems Landsat might have in distinguishing Chinese crops due to differing agricultural practices.

additional conferences and fora for discussion, although without further technology transfers (CAE & NASA 1983, 1985, 1986; DoD 1986). The State Department forwarded questions asked by 'U.S. Government experts regarding China's space launch capabilities' to Minister-Counselor Lu Jingting and by extension Jing Zhaoqian, who had 'offered to carry the questions to Beijing and provide answers at the briefing he is planning for October at your embassy' (State 1986: 1). These questions were primarily technical and commercial in nature, asking pricing, processes and 'China's views of the technology transfer aspects of launch of a US satellite' (State 1986: 3). A more symbolic gesture was President Reagan's suggestion in 1984 to fly a Chinese citizen on the Space Shuttle (OTA 1985: 391). The Challenger incident likely side-lined this as a possibility (Moltz 2012: 84) and provoked a public debate on US space policy, a part of which involved Sino-US space relations. The technopolitics of US-China space relations was beginning to have a more significant presence in public policy discourse.

4.3 The return of the "Chinese space threat" 1986-2000

After Challenger: China as a threat and opportunity

On January 28th, 1986, the Space Shuttle *Challenger* was destroyed by a faulty booster engine shortly after launch (NASA 2013). This did not result in a total halt in Sino-US space cooperation, and instead further cooperation was pursued as a way to address the shortfall in launch capability caused by the grounding of the Shuttle fleet. This constituted a recontextualisation of Chinese space technology as a tool to support the US national interest, both in terms of security and economics.

After *Challenger*, the White House, State Department, DoD and some members of Congress continued to portray Sino-US space cooperation as a balance against Soviet attempts to strengthen their commercial space capabilities. For example, in 1986 the Director of INMARSAT, Olof Lundberg, wrote to the Under Secretary for Security Assistance, Science and technology of the State Department to thank him for his advice on potential INMARSAT launches (Lundberg 1986: 1). The choice was between the Soviet Proton or the Chinese Long March rocket and it would seem that the State Department's advice had been to look at the Long March option, which INMARSAT then pursued (Lundberg 1986: 1). The implication of this letter is that China was a preferred alternative to Russia for hosted payloads. The same year, the Department of Defense informed Ambassador Holmes, the Director of the Politico Military

Affairs Bureau at the Department of State, that 'the DoD has no objection to the export of the technical data' to facilitate the launch of WESTAR VI-S on a Long March III rocket (DoD 1986: 1). One of the provisos for agreement was that the US would be under 'no commitment' to help in 'improving Chinese launch vehicle performance' or 'otherwise enhancing Chinese launch capabilities' (DoD 1986: 3). A report from the Congressional Office of Technology Assessment from the preceding year had been similarly relaxed in tone when describing Chinese membership of INTELSAT, unlike the more alarmist tone taken at the prospect of Soviet entry to the same organisation (OTA 1985: 173). Much as in the Carter administration, then, the maintenance of Sino-US space cooperation was driven by the executive branch, but also did not seem to be facing opposition in Congress.

The post-*Challenger* deals began to draw the attention of Congress, who debated China's role in space. In this context, the consensus understanding of China as a partner which had been built under Nixon, Ford, and Carter, started to be challenged in public and the number of interlocutors contributing to the technopolitics of the relationship sharply increased. The discourse included representations of China as a space competitor, an economic threat and an opportunity to keep US launch rates up while damaging growth in the Soviet commercial space sector. On September 23rd and 27th 1988, the House Committee on Science, Space and Technology (SST) met for a hearing on 'The Administration's Decision to License the Chinese Long March Launch Vehicle' (House 1988). The witnesses called to give evidence included space industry executives from Aussat, Hughes, Ford Aerospace Satellite Services, McDonnell Douglas and Arianespace alongside Representatives from New York and Colorado (House 1988). Robert Roe was the Chair of the hearing, and he began proceedings by stating that 'this is an issue of great long-term importance not only to America's role in science and technology but to the very foundation of our foreign policy' (House 1988: 1). Roe highlighted the aim to 'rebuild the technological competitiveness that has been the source of this nation's strength … a major thrust of this rebuilding effort … is the area of international cooperation' (House 1988: 1). The transcript of the hearing contains a wide variety of arguments about how the US should approach space and specifically how China fits into these structures of meaning prior to Tiananmen.

Chairman Roe's (in House 1988: 2) opening statement set out a narrative context of Sino-US relations which represented them as highly cooperative and beneficial to US national interests: China's status was that of a partner. His comments on the US-China relationship, and particularly of the space relationship, are absent of a discourse of threat (House 1988). He stated that 'it is of the utmost importance that we define and assert our technological pre-

eminence not only through competition but also through our leadership in cooperative international and domestic relations' (House 1988: 2). He pointed out that 'the only way we can rationally discuss the Long March issue is in the broad context of U.S.-China relations' and said that the two countries 'can be proud of the cooperative relationships we have developed in science and technology. … the United States has more cooperative agreements with China than with any other country' (House 1988: 2). When discussing space specifically, his remarks move on to the International Space Station, saying that 'there is no doubt that China as a space-faring nation could also bring something to the table … I look forward to the future, when China becomes an active user-participant in this program' (House 1988: 2). His arguments in favour of granting export licenses focused on the economic opportunities that China afforded the US, much in line with Pan's argument about the discourse of opportunity in later American China discourse (House 1988: 3, Pan 2012: 20, 31-38) Theses arguments were echoed by other members of the committee, reflecting the dominance of the technopolitical dynamics which successive presidential administrations had been crafting since 1972 (House 1988: 7).

The *Challenger* incident was prominently used in the discussion as a framing device to make sense of, and to justify, certain responses. Representative Schroeder (in House 1988: 210) stated that 'the beginning of the commercial launch industry is in many ways the result of the Challenger accident.' In this sense, China's potential contribution to the commercial space sector was an opportunity for the US to maintain its space preponderance, again casting Chinese space technology as a useful tool for the United States. Indeed, Chairman Roe's opening remarks quoted above reflect this too – international cooperation was a way to 'rebuild … technological competitiveness' (House 1988: 1, see also 10). Reflecting Reagan administration discourse, members of the House agreed that the Russians moving into emerging commercial markets was a 'threat' (House 1988: 117). A witness from the business community used the Soviet Union as an identity with which to contrast with a representation of China, saying that 'the Soviet Union is considered a country which threatens the national security of the United States' whereas 'China, by contrast, has been designated by the President as a "friendly, non-allied" country' and that there were 'no valid technology transfer issues involved in the Long March launch' (House 1988: 248-249). The favourable comparison with the "Soviet threat" was made repeatedly, both in terms of China's capabilities and intentions (House 1988: 19, 24-25, 249, 255). In these first major public debates on US-China space cooperation, then, China was constituted in the discourse as a special case for technology transfer that did not pose a threat to the US.

Although the post-*Challenger* debate was predominantly positive in its representations of China and its space program, there were challenges to the discursive line of the Reagan administration and its supporters in Congress. Six Congressmen had sent a letter to Colin Powell, then National Security Advisor, citing the 'Challenger tragedy' as the reason why 'the United States has been struggling to get its space program back on track,' much as the pro-cooperation policy makers were arguing (House 1988: 220). In contrast to the pro-cooperation rhetoric, however, the letter invokes Russia and China as economic threats to the emerging commercial domestic launch sector (House 1988: 220). There were two roughly distinguishable strands to these early rumblings of a revived "Chinese space threat" discourse, namely the economic and military aspects of threat. One Representative said that 'we need to be very careful in our consideration of this license request because of the serious potential harm we can do to our own launch industry and the implications of our national security if the commercial launch industry should fail' (Lujan in House 1988: 5). China's non-capitalist identity was a threat because it was not 'governed by the same market forces that govern U.S. industry' and would therefore engage in unfair business practices (House 1988: 7). This discourse was somewhat echoed by other members of the committee (House 1988: 9). This included comments that 'the idea of transferring technology … to the Chinese has to be the dumbest [idea]' (Walker in House 1988: 9). Representative Schroeder linked both the economic and security threats together in her challenge of the Reagan administration's policy of cooperation. She said that

> all I can see this doing is threatening national security and costing American jobs …
> my constituents aren't going to understand the benefits of this "sweetheart" deal if
> Martin has to close down its plants … so that sensitive American technology can be
> transferred to … China (House 1988: 211).

Collectively these economic concerns can be understood as relatively coherent counter-discourse which advanced fears of Chinese 'predatory pricing' (House 1988: 15-16). Despite the novelty of a sustained public rebuttal of US-China space cooperation, it is noteworthy that the arguments of the "Chinese space threat" did not draw on prior representations of the "Chinese threat" of spreading Communism in Asia or provoking a major war, which had historically been present in policy debates. The technopolitics forged over the preceding three presidencies was proving to be durable. The criticisms outlined above were vigorously rebutted by the advocates of space cooperation with China, including representatives from the Department of Defense, aerospace business, and the Office of Technology Assessment (House 1988: 10, 19-30, 36-37, 131, 255, 355).

Post-Tiananmen: China threat in Congress, China opportunity in the White House

The events on June 4ᵗʰ 1989 at Tiananmen Square resulted in President Bush ending arms sales to China (Gerstenzang 1989, Smith 1990: 8). Due to existing trade regulations, satellites were legally considered arms and a small number of US satellites which would have been sent to China for launch could no longer be legally exported (Smith 1990: 8). The reaction to Tiananmen in space policy was very different in the White House compared to that of Congress. Initiated by members of Congress, after Tiananmen the issue of human rights became a part of the policy discourse on cooperation with China in space. Attempts were also made to use rhetoric to portray pre-Tiananmen policy debates as including human rights (which the currently available documents show was not the case, see above). The Committee on Foreign Affairs submitted an accompanying report to the Omnibus Export Amendments Act of 1991, which included 'minority, dissenting, and additional views' (House 1991). Importantly, the report recommended a change in export policy to China. It stated that China had enjoyed 'special licensing preferences' in the Export Administration Act of 1979 'based upon a consensus that the People's Republic of China posed a reduced national security threat' and the aim of this policy was 'to encourage democratization and economic reform in that country' (House 1991: 17). The report recommended that

> the assumptions underlying past policy must be reevaluated [sic] in light of massive
> abuses of human rights … and evidence that the Chinese Government has assisted in
> the proliferation of missiles and nuclear technology (House 1991: 17).

Consequently,

> export licensing preferences for the People's Republic of China should be eliminated,
> … and access to dual-use goods and technology representing proliferation concerns
> should be restricted (House 1991: 18).

This was a clear challenge to the technopolitical status quo of the preceding decade or more. The instrument which the report proposed seemed designed to force the executive branch to be more explicit in public about the logic of cooperating with China. Specifically, the report called for an amendment which forced the President to explain the justification for any future to 'liberalize' licensing to the Congress (House 1991: 18). On matters of space, the

report proposed an amendment that 'no satellite of United States origin that is intended for launch from a launch vehicle owned by the People's Republic of China may be exported' (House 1991: 18). This could be waived by the President 'on a case-by-case basis' if China is 'in full compliance' with the memorandum of agreement between the US and China 'Regarding International Trade in Commercial Launch Services' (House 1991: 18). This motion was adopted, and Presidents were henceforth forced, at least to some extent, to explicitly and publicly claim each export was in the national interest.

The Presidential response to this legislation demonstrated the divide in understandings of China in the White House and Congress, and the corresponding technopolitics of the two countries' space technology. Both Bush and Clinton made us of section 902(b)(2) of the Foreign Relations Authorization Act to waive export restrictions for certain cases. Bush waived the restrictions for 'AUSSAT communication and FREJA scientific satellite projects' because 'it is in the national interest of the United States' on April 30th, 1991 (Bush 1991: 1). He then waived restrictions for six satellites to be exported to China, including Asiasat 1 and Dong Fang Hong 3 on September 11th, 1992 (Bush 1992: 1). In 1992, two Chinese experiments flew aboard the space shuttle (Moltz 2012: 84). Clinton waived the restrictions on July 13th and September 1st, 1994, again stating that 'it is in the national interest of the United States' to waive the restrictions for EchoStar and INTELSAT and INMARSAT respectively (Clinton 1994d: 1, 1994e: 1). In 1995, it was announced by the Office of the United States Trade Representative that the US and China had concluded a 'New Commercial Space Launch Agreement' which renewed the 1989 deal (Office of the US Trade Representative 1995: 1). The agreement was justified by Trade Representative Michael Kantor by saying 'it will provide effective safeguards against disruption of the market for commercial space launch services while allowing for disciplined Chinese participation in the market' (Office of the US Trade Representative 1995: 1). The rhetoric from the White House thus incorporated and countered the existing arguments that China posed an economic threat to the US commercial launch sector. Congressional critics of space cooperation with China had seemingly not done enough to make the relationship controversial, and the executive branch's discourse of the value of cooperation remained preponderant.

In response, Congressional critics of cooperation leveraged legislation to continue to restrict executive branch efforts, both legally and rhetorically. The National Defense Authorization Act 1998 instituted an annual report on China's military modernisation to be produced by the Secretary of Defense, including the 'probable course of military-technological

development' in the PLA (Congress 1997: 313). There was a particular requirement for the inclusion of analysis of

> efforts by the People's Republic of China to develop a capability to establish control
> of space … including programs to place weapons in space or to develop earth-based
> weapons capable of attacking space-based systems

and the possibility that China could use GPS for its own missile guidance (Congress 1997: 313-314). It explicitly called for the report to contain 'the potential threat of developments related to such effects to United States strategic interests' (Congress 1997: 314). As we will see in the remaining chapters of this thesis, these Annual Reports became one of the main sources of "good" knowledge which constructed the "Chinese space threat."

The "China threat" discourse was further strengthened in Public Law the following year, with a specific rebuttal to the Presidential use of the "national interest" clause in the Foreign Relations Authorization Act. A major change which the Strom Thurmond National Defense Authorization Act for Fiscal Year 1999 initiated was thickening the content of presidential waivers, of which Bush and Clinton had made use. Sec. 1515 deals specifically with satellite exports to China, and specifies that when Presidents invoke section 902(b) that the report

> shall be accompanied by a detailed justification setting forth … (1) a detailed
> description of all militarily sensitive characteristics integrated within .. the satellite. …
> (3)(A) a detailed description of the Unites States Government's plan to … ensure that
> no unauthorized transfer of technology occurs … (4) the reasons why the proposed
> satellite launch is in the national security interest of the United States (Congress
> 1998: 2177).

The remainder of the provision in the "detailed report" requirements specify statements about jobs and economic impacts of proposed export waivers (Congress 1998: 2177). Of greatest relevance to discussions of China's identity are the labels that China is a 'nonmarket' economy and a stipulation to include an assessment on whether the export will impact upon China's 'willingness' to 'modify its commercial and trade laws … and make United States-made goods and services more accessible to that market' and 'to reduce formal and informal trade barriers' to US goods (Congress 1998: 2177-2178). In this sense the intended effect of the act seemed to be to raise the political costs for a President to waive restrictions, since the rather short responses of the past were now legally insufficient. Instead, waivers required a lengthy, explicit and public engagement with potentially controversial features of each deal.

The Strom Thurmond Act included a number of sections on Satellite Export Controls which specifically related to China (Congress 1998: 1931). It returned to the discourse of China as a Communist state (Congress 1998: 2161). The law specifically stated that the 'business interests' of the US 'must not be placed above United States national security interests,' that the US must conduct policy in regard to the Missile Technology Control Regime (MTCR), and that 'the exportation or transfer of advanced communication satellites and related technologies … to foreign recipients should not increase the risks to the national security of the United States' (Congress 1998: 2173). The "special case" of China as a beneficiary of relaxed trade restrictions was closed down, with the law claiming that 'due to the military sensitivity of the technologies involved, it is in the national security interests of the United States that … satellites and related items be subject to the same export controls that apply … to munitions' and stated that the US should not 'issue any blanket waiver of the suspensions' (Congress 1998: 2173). The section then conflates China's space and missile program somewhat (recalling "China threat" discourse in the 1960s), by stating that the US 'should not export' to the PRC 'missile equipment or technology that would improve the missile or space launch capabilities' of the PRC (Congress 1998: 2174). The law confirmed that the President had to give advance warning to the Congress of the export of such technology, to ensure that the export 'is not detrimental to the United States space launch industry' and that the transfer 'will not measurably improve the missile or space launch capabilities' of China (Congress 1998: 2174). It also confirmed that all satellites that were currently on the 'Commerce Control List' would be moved to the United States Munitions List (Congress 1998: 2174). The restriction of exports to China through the International Trade in Arms Regulations (ITAR) with the USML provided the regulatory framework for Sino-US space relations in the 21st century, and is the legal context for the material analysed in the remainder of this thesis.

Conclusion

Historicising the "Chinese space threat" reveals its historical contingency and its changing fortunes in American technopolitics. In undertaking an analysis of hitherto unused archival materials, this chapter has made an original contribution to knowledge in space policy and security literature. In part, this chapter has shown that arguments to the effect that US-China relations in space have always been primarily competitive (see for example Johnson-Freese 2004: 287) do not reflect the historical record. If anything, this evidence makes the return of a "Chinese space threat" to US public policy all the more surprising, and strengthens

the need for an analysis of how it was constructed after 2000 – a task addressed by the remainder of this thesis.

For the first time, this chapter has demonstrated that China's early space program was secretly greeted with alarm in Washington, but this was rapidly subsumed and incorporated into fears of a nuclear-armed China. While the Chinese continued to make slow progress in space technology through the 1960s, the simultaneous and related development of a nuclear weapons program became almost the sole concern of US policy makers in matters of Chinese technology. China had become a nuclear threat as well as a nuclear target, scrutinised by American spy satellites (NRO N.D.a, Waltrop 2014: 20, Charles and Adamo 2015: 5, Charles 2015, CIA 2015). As the Vietnam war dragged on, however, the focus of American foreign policy shifted sufficiently for President Nixon to make his historic gamble to re-establish relations with China. Very quickly, the "China threat" was no longer official policy, and throughout the 1970s China's space program was increasingly portrayed as a potential opportunity for cooperation as part of efforts to normalise Sino-US relations. This culminated in the most extensive Sino-US space cooperation on LANDSAT, bilateral agreements on commercial practices and China hosting US payloads on Long March rockets. The Reagan, Bush and Clinton administrations then continued these policies, albeit with increasing challenges from other elements of the US government. In the wake of the Challenger disaster, a handful of Congressmen attempted to shift China's status in US policy from a "friendly, non-allied" country to a predatory economic threat to the domestic commercial launch industry. The rhetoric of human rights was then introduced into the debate after Tiananmen, with Congress passing statute to limit Presidential discretion on Sino-US trade in space technology. By the end of the 1990s, the current regulatory framework which rendered many kinds of cooperation illegal was mostly in place.

By providing this context, this chapter has shown that representations of China in US space policy discourses have varied over time, often incorporating conflicting understandings of threat and opportunity simultaneously. China's space program was repeatedly recontextualised to fit with these evolving meanings, demonstrating the social contingency of both the context and of the understanding of the space program. Most significantly of all, the cooperation on LANDSAT required re-shaping US space technology to reflect and accommodate the new discursive formulation of US-China relations. In short, the significance of China's space program to US security has never been discursively fixed in an entirely immutable way. By comparison, as indicated in Chapter 1 and as will be argued in the

remainder of this thesis, China's space program was almost solely viewed as a threat (not as an opportunity) after 2000, further underlying its outlier status in US-China relations.

This chapter, along with Part 1 as a whole, has provided a contextualisation of the technopolitics analysed in the remainder of this thesis. Collectively, Part 1 has argued that the prevalence of a "Chinese space threat" has varied over time. The most salient point for the beginning of Part 2 is that, by the end of the Clinton administration, the "Chinese space threat" had made a return, and more publicly than ever before. As George W. Bush entered the Oval Office, recognition of (and responses to) the "Chinese space threat" had been inscribed into law, although this formulation was still in flux, as part of a powerful "rising China" narrative. The two most crucial legislative interventions in this regard were the end of China's special exemption to ITAR regulation, and the congressional direction for the DoD to annually report on China's progress in space. Indeed, after congressional intervention the regulatory and legal environment governing US space policy toward China had come to bear a great deal of resemblance to the conditions half a century before. The events of 2003 and 2007 would then become even more compelling evidence for advocates of the "Chinese space threat" than had hitherto exited and would further build on the wider narrative of a "rising" China explored in Chapter 3.

Part 2: Constructing the "Chinese Space Threat" after 2000

Part 2 undertakes an initial discourse analysis of American space policy towards China in the early 21st century, beginning to demonstrate how China's rise in space increasingly became understood as the "Chinese space threat." The objectives are to determine the underlying logics, and identify the key subjects involved. Chapter 5 is concerned with unpacking the logic of "capabilities as intentions," arguing it is a common thread throughout American public policy discourse on China's space program. Adherence to this logic is consistent across departmental and party-political divides. Crucially, adopting the logic of "capabilities as intentions" prevents debate about China's intentions in their own right, with the result that all Chinese space technology is commonly represented in public discourse as a threat to national security. Chapter 6 builds upon this analysis by asking which aspects of national security are supposedly threatened within this discourse, and therefore how the identities of China and the US are constructed in these debates. Chapter 6 argues that the "Chinese space threat" specifically imperils two dominant discourses of American national identity: first, the virtuous "new American way of war" and second, "American exceptionalism." By creating rich, mutually constitutive technopolitical links between Chinese and American space technologies and identities, policymakers were successful in establishing the discursive dominance of the "Chinese space threat."

Chapter 5

Conceiving the "Chinese space threat:" The Logic of "Capabilities as Intentions"

Introduction

This chapter makes the argument that contemporary representations of the threat of China's "rise" in space are both underpinned and dominated by the conflation of technical capabilities and intentions. Crucially, this linguistic move pre-emptively precluded debating Chinese intentions in space. This structural constraint on knowledge is understood here as a commitment to "capabilities as intentions," which is found across American public policy discourse with contributions from various organisations, departments, and sub-departmental offices. The purposes of exploring the question of what counts as "good" knowledge about China's space program are twofold. The first is to map out the divides in American space policy discourse in the early 21st century, that is, the basic questions of who is saying what. The second is to set out before the reader what we might call the basic underlying "rules" (or logics) of the "Chinese space threat" discourse analysed further in later chapters.

First, this chapter devotes a short section to establishing how the White House recognised China's "rise" in space but was effectively aloof from assessing a "Chinese space threat," and therefore by extension did not express public support or criticism of any particular logics of threat assessment. The separation of the White House from the questions of "good" evidence was an important boundary for the debates analysed in the rest of the chapter because it left space policy elites a large degree of freedom in terms of what could be said. The public quiet of the White House, despite its status as producer of *the* "National Space Policy," underlines the need for the analysis in the remainder of the chapter of the more diverse linguistic work done to establish the specifics of American space policy towards China.

Second, this chapter analyses the supporting elements of the logic of "capabilities as intentions." Support for this logic can be found in claims made by elements of the DoD, the State Department, and in Congress. It is here that the logic established not only the meaning of China's space program in terms of its supposed intended (malign) purposes, but also an

implied causal narrative which authoritatively predicted future damage to American national security.

Third, this chapter looks at the limited attempts to produce a rival logic of threat assessment. Again, these can be found in elements of the DoD, the State Department and Congress, but did not displace the logic of "capabilities as intentions" in the early 21st century. A major reason for this lack of success seems for the more likely rival logic, that of Net Assessment, seems to be that its roots lay in classified circles, meaning that its public profile was limited almost by definition.[31] A further reason seems to be that ultimately these rival approaches still drew the same conclusion: that China was a threat to the US in outer space. Although they may have disagreed on what evidence supported this conclusion (i.e. how certain they were), they hardly challenged – indeed they supported – the wider discourse of the "Chinese space threat."

Finally, this chapter concludes by unpacking the ramifications of the dominance of the logic of "capabilities as intentions," further deepening the context of the technopolitical wrangling explored in the remainder of the thesis. The most important of these ramifications is the way in which the logic pre-emptively discounts evidence which would challenge its instrumentalisation of China's space program. That is, it renders its construction of the (malign) function of Chinese space technology irrefutable. Furthermore, as Feenberg (2010: 174) argues, causality and teleology are interchangeable within debates over the "function" of a given technology. For the case at hand, then, the power of the "capabilities as intentions" logic is not just to establish a single, durable public understanding of the meaning of China's space program, but also to impart a causal narrative that the conflated Chinese capabilities/intentions will, or even do, *cause* damage to American national security.

5.1 The public quiet of the White House

From 2000, the White House contributed very little to public policy discourse specifically relating to China's space program. Resultingly, White House rhetoric played little public role in conceiving the "Chinese space threat." While the administrations of George W. Bush and Barack Obama both produced national space policy documents, they do not mention

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[31] The most recent DoD net assessment of which unclassified information was released was in 2000 and related to Taiwan (DoD via AiT 2000).

China (White House 2006, 2010). It is still worth providing a brief overview of what *was* said, however, in order to provide context for what follows, but more importantly to demonstrate how developing the finer points of American space policy toward China were left to other arms of the government. This discussion is brief, because throughout the Bush and Obama presidencies, very little was released by the White House on the topic of China's space program. China's "arrival" as a space power was recognised to some degree but framed in a neutral manner. President Bush sent President Hu Jintao a letter of congratulations on the occasion of Shenzhou 5 in 2003, writing that 'the United States of America warmly welcomes the People's Republic of China's achievement in becoming only the third country to launch an astronaut into space' (Bush 2003). The Bush National Space Policy, released in unclassified form in 2006, makes no specific reference to any other countries or specific threats (White House 2006). In response to the 2007 ASAT test, the White House released a statement via the National Security Council spokesman, Gordon Johndroe (in Singer and Clark 2007), who said that 'The United States believes China's development and testing of such weapons is inconsistent with the spirit of cooperation that both countries aspire to.' Although not enough was released to be able to fully contextualise these comments with further material from the White House,[32] they are an example of using evidence of capabilities as evidence of intent. In this case, the reasoning goes that the development of ASAT weapons cannot be consistent with cooperative intentions in space. The White House may have been publicly "quiet" on China's space program, but its few comments after 2000 tentatively reproduce the logic of "capabilities as intentions."

After 2000, the practices related to space policy undertaken by the White House seemed to be even more relaxed than their pronouncements on China. The following month, President Bush exempted export restrictions on two pieces of technology intended for China's railways and commercial aircraft. This was accompanied by a statement which framed the export as 'not detrimental to the U.S. space launch industry' and that it would 'not measurably improve the missile or space launch capabilities of the People's Republic of China' (Bush 2007). Both the actions and accompanying rhetoric do not seem to indicate strong support of the "Chinese space threat" thesis, and therefore unsurprisingly does not reproduce the logic of "capabilities as intentions." The Obama White House similarly released very little on China in space. The 2010 National Space Policy made no references to China, instead making general claims that space was now a realm of international competition (White House 2010: 13-14).

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[32] The US also made a formal diplomatic protest against China (Kan 2007: 1).

This left a large degree of freedom for both elites and the public to substitute their favoured candidate(s) for America's rival in space, not limited to China. The same year, when giving a speech on space policy, Obama made no comparisons to the Chinese space program, focussing entirely on the achievements, past and future, of the American space program (NASA 2010). The White House was never drawn into making public claims about a specific "Chinese space threat," nor did the Bush or Obama administrations enter the public debate on the issue or arbitrate between rival space policy approaches. The result of White House space policy discourse during the period in question was to create very little top-down structuring of the debate on how to understand, and react to, China's space program. Instead, variations of the "Chinese space threat" discourse were articulated by a wider array of institutions.

5.2 The production and reproduction of the "capabilities as intentions" logic

'While one of the strongest immediate motivations for this program appears to be political prestige, China's manned space efforts almost certainly will contribute to improved military space systems in the 2010-2020 time frame'

– Annual Report to Congress on the Military Power of the People's Republic of China (2002: 33)

A supposed re-focusing on capabilities was written into American defense and security policy from at the beginning of the Bush administration. Donald Rumsfeld (in DoD 2001: iv) claimed that there was a conscious and explicit move to make security policy decisions centred on capabilities at the beginning of the George W. Bush administration. He wrote that

> "A central objective of the review was to shift the basis of defense planning from a "threat-based" model that has dominated thinking in the past to a "capabilities-based" model for the future. This capabilities-based model focuses more on how an adversary might fight rather than specifically whom the adversary might be … adversaries who will rely on surprise, deception, and asymmetric warfare to achieve their objectives."

As was evident in Chapter 3, American constructions of a "Chinese threat" during the 20th century also tended to focus on China's technical capabilities. What is notable about

Rumsfeld's comments, and later Obama administration-era statements which supposedly heralded a return to a "threat-based" approach is that they both expounded the logic of "capabilities as intentions" (Kendall 2016). This strongly implies that beneath the surface level of rhetoric, there were deeper logics adhered to by a tacit, bipartisan consensus. By exploring the wider discourse around these supposed shifts in threat assessment policy, it is possible to discern the enduring continuity of this logic throughout the Bush and Obama years.

The logic of "capabilities as intentions" was reproduced in a variety of official fora. Two DoD outputs produced since the year 2000 consistently assessed (in part) whether there was a "Chinese space threat." These were the Quadrennial Defense Reviews (QDRs) and the Annual Reports to Congress on Military and Security Developments Involving the People's Republic of China (ARCs). The ARCs and QDRs are important because these documents can be seen both as a communication of a "DoD view" on strategy, policy and capabilities to Congress but also the public at large, due to the release of unclassified versions (see DoD N.D.).[33] In the early 2000s, China's space capabilities were initially not included in these DoD assessments, yet by the end of the Obama administration they were consistently given their own section. Although between 2000 and 2016 the ARC did include more discussion of non-capability factors, in practice the QDR and ARC focused on capabilities to such a degree that they constituted a stand-in for China's intentions.

The ARC is congressionally-mandated by the National Defense Authorization Act for Fiscal Year 2000, and includes provision for both classified and unclassified versions. Thus far, only the unclassified versions are available to the public. Congress directs the compilers of the report to 'address the current and probable future course of military-technological development of the People's Liberation Army and the tenets and probable development of Chinese security strategy and military strategy … over the next 20 years' (DoD 2016: frontispiece). Reports have reliably contained short, dedicated sections for Chinese space and counterspace capabilities, including both civilian and military endeavours (see DoD 2016: 36-37, 61, 2015a: 13-15, 35, 2014: 10-11, 32, 2013: 33, 2012: 8-9, 2008: 27-29, 2007: 20-21, 2006: 31-35, 2005: 35-36, 2004: 41-43, 2003: 36-37, 2002: 32-33). Where this was not done, reports have included space alongside other capabilities, such as anti-access/area denial (DoD 2013: 32, 2010: 29), cyber (DoD 2011a: 5-6, 2010: 7, 2008: 1) and general 'Strategic Capabilities'

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[33] See also statements included in these documents which seem directed at both Congressional and public audiences, such as 'the risks would grow significantly if sequester-level cuts return in Fiscal Year 2016' (DoD 2014: 2, also DoD 2014a). With the power of the purse this seems to be aimed primarily at Congress.

(DoD 2009: 25-27). As well as this focus on capabilities, the reports also provide some discussion of Chinese space policy, strategy and intentions. Another notable difference from the QDRs is the (admittedly rather limited) discussion of China's space capabilities from the very first ARC onwards (DoD 2002: 4).

The logic of "capabilities as intentions" was most pronounced in the United States Congress. It was rarely qualified or even made explicit, strong evidence itself that its validity was truly taken for granted knowledge. Claims tended to be unsupported with evidence, and where it was offered, capabilities were often offered up to those listening as *prima facie* evidence that China was a threat in space, and since these claims usually went unchallenged, it is clear that these explanations were uncontroversial. The content of the arguments which articulated the meaning of the Chinese space program stayed remarkably consistent both before and after the events of 2003 and 2007, and many of the Chinese anti-satellite tests went unnoticed in the Congressional record.[34] This may be in part because some discussions took place in closed hearings, but it is still remarkable that the public congressional statements on China's space program remained so consistent throughout the Bush and Obama administrations, despite the various shifts in the composition of Congress and the leaders of the executive branch.

The State Department was also a powerful contributor to the logic of "capabilities as intentions," specifically in its important regulatory role in defining the legal boundaries of military and non-military space technology. Although far less bombastic than congressional rhetoric, the technopolitics espoused by the International Trade in Arms Regulation (ITAR) provided no grounds for Chinese intentions to be taken into account in American space policy. Once again, this state of affairs was consistent through both the Bush and Obama administrations.

Comparing capabilities: the threat of China catching up and relative decline

After 2000, the constant comparison of Chinese and American space capabilities was a recurring element of the "Chinese space threat" discourse. These comparisons played into debates over the function and qualities of both Chinese and American space technologies. Within these comparisons, American speakers invariably identified growing Chinese

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[34] According to the Secure World Foundation, there were six other tests, in addition to the 2007 kinetic test, before 2015 (Weeden 2015: 2).

capabilities as a threat, and simultaneously conflated capabilities and intentions. That is, the implication in these comparisons was that China was developing specific capabilities to exploit weaknesses in American technology. In this light, the "obvious" explanation was that China intended to challenge the United States in space.

Comparison of capabilities regularly formed a central component of official DoD discourse on China and its space program. The QDRs published 2000-2016 exhibited a mixture of comparative and non-comparative elements. The two Bush-era QDRs (in 2001 and 2006) were primarily non-comparative, tending to consider the inner workings of the US military. For example, the 2001 QDR eschewed close comparison between specific states (discussing more in terms of regions – notably China was never mentioned) (DoD 2001, see 13-14). The 2006 QDR had sections which were primarily geared towards introspection such as 'Fighting the Long War,' 'Operationalizing the Strategy,' and 'Reorienting Capabilities and Forces,' among others (DoD 2006: i). Comparisons with adversaries, (such as terrorists, North Korea and Iran) and 'potential' military competitors (like Russia and China), were implied and not supported with in-depth discussion. Although there were hints of a comparative approach, comparison was not central to the line of reasoning, which fitted well with the more introspective function the Bush-era QDRs appeared to have been aimed at fulfilling. This is why it is unsurprising that the two Bush-era QDRs did not present China as a threat in outer space.[35] Regardless, the QDRs from period maintained a heavy focus on capabilities.

Comparison in the QDRs became much more explicit in the Obama-era QDRs. They also engaged more directly with China as a topic, including specifically its identity as a space threat. The 2010 QDR had a stronger, but still implicit comparative element in relation to capabilities. It stated that

> the 2010 Quadrennial Defense Review advances two clear objectives. First, to further
> rebalance the capabilities of America's Armed Forces to prevail in today's wars, while
> building the capabilities needed to deal with future threats (DoD 2010: iii).

China was definitely more of a central concern compared with the 2001 and 2006 reports, although it was only listed as a threat after Afghanistan, Iraq, the Taliban and Al Qaeda (DoD 2010: iii). Sections such as 'Deter and Defeat Aggression in Anti-Access Environment' and 'Sizing and Shaping the Force' were strongly related to China, with analysis that consisted of

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[35] Rumsfeld had chaired a commission on National Security Space which had warned of the possibility of a "Space Pearl Harbor" although the report only directly referenced China as a space threat once, the source of information being Xinhua News (Rumsfeld at al. 2000: 8, 14). These concepts are not referenced in the 2001 QDR.

the comparison between US and rival capabilities. With no explicit discussion of intentions, the reader was left to assume that China's developments in these areas were coupled with anti-American goals. A call for the maintenance of 'U.S. capabilities to project power,' for example, logically requires an element of comparison to the corresponding enemy anti-access capabilities (DoD 2010: 31). It also heavily implies that the purposes of these A2/AD (Anti-Access/Area Denial) capabilities are to damage American power projection capabilities. Technologies were discussed in terms of rather broad categories, such as 'advanced medium-range ballistic and cruise missiles' (DoD 2010: 31). The discussion of China's space capabilities was then discussed within this context: the implication was that Chinese capabilities are powerful enough in comparison to US capabilities to pose a security concern. The 2014 edition also had some comparative elements, such as seeking to 'maintain our technological edge over potential adversaries' but this was again delivered quite indirectly (DoD 2014: 1). For example, China's collective A2/AD technologies are stated to pose a 'challenge' to US and allied forces, but this is not explained further. The comparative element remained only implicit, specifically that A2/AD capabilities are of sufficient quality in comparison to the countermeasures of US forces that they pose a problem, and by extension that China (and other rivals) have the malign intentions to develop and (perhaps) use them.

Comparison of capabilities was also a recurring feature in ARCs, albeit in a weak and implicit form. Regardless, the way in which capabilities were foregrounded left these unfavourable looking comparisons as evidence of China's malign intentions. In the inaugural ARC, the discussion of China's 'asymmetric methods' presented China as having a 'thorough knowledge of U.S. and foreign space operations,' implying also that China "knows" the space-based portion of US advanced weapons are the most vulnerable (DoD 2002: 14-15, 32, for a similar congressional example see House 2004: H3776). The section drew no explicit conclusion on whether the Chinese military is "correct" to draw these conclusions, but invites comparison, specifically in terms of vulnerability, between Chinese and US technology. A more common direct comparison was between China and Taiwan. The question of Taiwan (and the associated "contingencies" of potential crises and conflicts) was consistently a strong organising concept in the ARCs, tying together disparate military developments into an overarching narrative. The 2006 report, for example, baldly stated that 'In the near term, China's military build-up appears focused on preparing for Taiwan Strait contingencies' (DoD 2006: 1). An example from the Obama-era can also be found in the 2012 report, which devoted an entire chapter to 'The PRC's Taiwan Strategy,' serving in part as a conclusion and warning that the military balance continues to 'trend' in the PRC's favour (DoD 2012: 18).

Space made only a limited appearance in this discussion, however, in the form of Chinese 'precision strikes against [Taiwanese] air defense systems' which included 'space assets' (DoD 2012: 19). Developments in space were not always linked directly to the Taiwan Strait, however. A notable example of this is the 2007 report, the first to be published after the Chinese hit-to-kill technology test earlier that year. The test was contextualised as part of China's 'multi-dimensional program to generate the capability to deny others access to outer space' (DoD 2007: 21).[36] Whether Taiwan is the focus or not, these claims imply a comparison between Chinese and friendly forces, and an unfavourable comparison at that. The reader is left with little choice other than to assume that this state of affairs was due to a sustained Chinese intent to counter American military power.

Discussions of the Chinese space program in Congress rarely gave direct evidence for their claims about Chinese intentions. Much like official DoD discourse, congressional discussions were nearly entirely concerned with capabilities which served as stand-in indicators of Chinese intentions. Where explicit claims were made about intentions, the qualities of the capabilities China was developing were used as evidence of intentions (rather than say, Chinese government statements). This differed somewhat from the DoD approaches analysed above, which tended to avoid making direct claims about Chinese intentions and made some occasional efforts to place Chinese capabilities within a policy context. The focus on capabilities also differed from the rhetoric from congressional leaders. For example, when advancing a narrative of a "Chinese threat," Senate Minority Leader Mitch McConnell (R-KY) (in Senate 2014: S3827, see also McCain in Senate 2011b: S8115-8116) argued solely in terms of malign Chinese intentions, and did not mention capabilities of any kind (including no mention of space technology). The public debate in Congress on China's space technology thus seemed to be relatively free from rhetorical interference by the most senior legislators, while benefitting from the general acceptance of the wider "China threat."

In congressional circles, arguments that China's space program was intended to harm American national interests were uncontroversial, and were frequently supported by comparing technologies. The logic of "capabilities as intentions" was a consistent foundational element of this discourse. Senator Kyl (R-AZ) gave one of the most sustained and lengthy narratives of how Chinese space capabilities and intentions were related. It is worth quoting him at length in order to see how these claims fit together:

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[36] The 2008 report reproduced this conclusion almost verbatim (DoD 2008: 28).

My colleague from North Dakota talked about a threatometer-- hypothetical,

perhaps, but a rational way to examine prioritization for defense spending … I

received a … highly classified briefing that, frankly, scares me to death. But there is

enough we can talk about that is unclassified to make the point. As I said, almost

everything we do in military fighting these days in one way or another depends upon

our satellites. … There are a lot of ways of attacking them. … The Chinese recently

demonstrated to us a brute force way. They simply sent a missile up and blew up a

satellite. … I don't mean to disparage any particular nation by engaging in a little bit

of hypothetical war-gaming here, but it has been no secret that the Chinese

Government would like to see Taiwan reunited … it is very clear that the Chinese have

thought about how to keep the United States out of such a war for at least 2 or 3

days, giving them the time they would need to actually take over Taiwan. How do you

do that? Well, we won't discuss all the ways it could be done, but the Chinese have

developed certain weapons that would be problematic for the United States to deal

with, one of which is an ability to attack our electronics and our satellites. Right now,

we have very little in the way of defense against that. (Senate 2007a: S12502-12503,

see also Senate 2001: S3208-S3211).

The narrative presented here connects assumptions that China has revisionist aims (to

"reunite" with Taiwan) and that its space capabilities are strong evidence of this.[37] Invoking the

source of a "highly classified briefing" lends an air of authority to the claims without providing

evidence of how great an anti-satellite capacity the Chinese military has, for example. Kyl's

rhetoric is a particularly explicit example of the assumption that the acquisition of capabilities

is an unproblematic indicator of intentions.

Technology transfer was one of the most commonly recurring contributing factors to

the "Chinese space threat" invoked in Congress, itself laden with the anxious comparison of

American and Chinese space capabilities. The concern was successfully enshrined in law

before, and during the Bush and Obama years (see US Congress 1998: 1931, Senate 2005c:

S83333, US Congress 2012 Sec. 539). This legislation, coupled with ITAR (discussed later) aimed

to prevent damage to US national security by heavily restricting the transfer of technology

between China and the US. Congresspeople claimed that US assistance with China's civilian

space capabilities led to negative consequences for national security, framed in terms of a self-

evident comparative loss of advantage as Chinese capabilities increased. Senator Wayne Allard

(R-CO) (in Senate 2008b: S10636-10637) argued in 2008 that 'space technology is rapidly

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[37] Predictive aspects of the logic of "capabilities as intentions" are discussed later in this chapter,
wargames are discussed in Chapter 8.

proliferating to all corners of the Earth, and America is not keeping up with its space competitors' which 'has taken its toll on our competitive edge with China and other emerging nations'. Representative Dana Rohrbacher (R-CA) (in House 2009c: H11105) stated that Clinton-era assistance had 'ended up perfecting Chinese rockets' which had then undercut American space launch providers (see also House 2012b: H6337). He also alleged that China had hired a US Senator to help avoid and oppose technology transfer regulations because they sought to 'make us even more vulnerable and to take away even those advantages, that technology advantage that we have' (House 2009c: H11106, for similar arguments see also House 2001: H1548-1549, 2010a: H1155-1161). This line of reasoning rests on using evidence of Chinese capabilities and the methods used to acquire them as evidence that China's "real" goal was to make American insecure.

The prospect of relative decline compared to China was a common motif in Congressional debates on Chinese space technology during the period in question. Rather than solely appeal to a sense of growing military insecurity, however, many congressional statements portrayed the "Chinese space threat" as targeted at supplanting the US as an exceptional nation. Whereas the DoD analyses focused primarily on military space capabilities, statements made in Congress tended to focus on crewed space flight and the Moon. These were accompanied by comparisons of prestige and predictions of "falling behind." A good example of this approach in practice can be found in the Congressional record from 2006. When Representative Anthony Weiner (D-NY) (in House 2006: 4748) attempted to amend the 'Science, State, Justice, Commerce, and Related Agencies Appropriations Act, 2007' to increase funding for local policing by $476,574,000 while decreasing funding for science, aeronautics and exploration by the same sum he was heavily opposed. Many of the counter arguments made rested on comparisons between US and Chinese manned space capabilities and predictions of the future prestige damage the Weiner amendment would cause. Noted "China hawk" Representative Frank Wolf (R-VA) (in House 2006: 4749) argued that 'If you are opposed to the space program or you do not like the space program or you do not want America to be number one, you ought support this amendment' (see also House 2014: H4869).[38] Representative Feeney (R-FL) argued that

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[38] Wolf (in House 2013b: E1478-E1480) is notable for championing a restriction on bilateral interaction between NASA and the Chinese government, first implemented in this specific form in 2011. Wolf's (in House 2013b: E1479) later remarks clarified his position, dissatisfied with NASA's 'mischaracterize[ation]' of the law.

> They are 35 years behind us in time, but they are remarkable in how fast they have
> caught up in their human space flight program … They are trying to get space
> predominance so that they can potentially incapacitate all of our communications
> satellites … that allow our military to be the most capable in the world … be prepared
> for when the Chinese beat us to outer space (House 2005b: 4749).

Unlike Feeney's argument, which seemed to imply damage to prestige, Representative Calvert (R-CA) (in House 2005b: 4749), argued that 'this amendment will transfer the pre-eminence that we presently have in space to India and others and China especially… China is investing significant amounts of dollars in their program, and their program is not a civil space program.' In these debates, the technopolitical constructions of China's crewed space program was firmly instrumentalised in such a way as to limit the possibility of considering China's intentions as anything other than malign.[39]

Despite the congressional focus on competition in the field of crewed space flight, elected representatives also unfavourably compared US and Chinese *military* capabilities. Once again, these claims exhibited the underlying logic of "capabilities as intentions." Chinese anti-satellite capabilities were specifically constructed in opposition to American vulnerabilities. Senator Inhofe (R-OK) argued in favour of funding for a space-based interceptor study for ABM purposes by comparing China's capabilities with the lack of US defensive capabilities. Inhofe (in Senate 2008a: S10053) told the Senate that China 'has proven its ability to attack satellites' and that it could damage 'military and intelligence systems … the Internet backbone, financial systems' and a long list of other 'systems' which could be affected.[40] To address this disparity, Kyl (in Senate 2008a: S10053) argued that

> a layered missile defense capability provides us with the best defense against ballistic
> missile delivered weapons of mass destruction as well as a defense against attacks
> against our satellites which have become so necessary to what we do militarily and
> economically (see also Senate 2002: E360-E361).

These examples collectively show that in both the House and the Senate, and both before and after China's major "firsts" in space, comparative claims that the US was in relative decline

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[39] For further examples see Senators Hutchinson (R-TX), Nelson (D-FL), Shelby (R-AL), and Inouye (D-HI) (Senate 2005d: S8638, 2007b: S12725-12726, 2009a: S7688, 2009b: S10104, 2010a: S7712 and House 2004: H3774). For the sole example of congressional praise of China's crewed space program, see Nelson (in Senate 2003: S12579). Note this was still used to call for redoubling American space efforts.
[40] Kyl's testimony was notable as one of the few instances in which a Chinese source was used in Congress, in this case that 'Wang Hucheng, an analyst for the People's Liberation Army has called our space systems the "soft ribs" of the U.S. military,' also used in Tellis' (2007a) post-test analysis.

were a recurring feature of congressional debate on space policy. With no explicit discussion of Chinese intentions, unfavourable comparisons of capabilities were the only evidence presented to convince listeners that China intended to use its military space capabilities against the US.

The logic of "capabilities as intentions" was written into American laws and regulations on technology transfer, and reproduced and defended by the State Department. The State Department was (and remains) responsible for implementing the 1976 Arms Control Export Act (by dint of two executive orders), doing so via the International Traffic in Arms Regulation (ITAR) (Obama 2013, Ford 1977, DoS 2013, US Congress 1976). ITAR remains central to US-China space relations because it defines which technologies can and cannot be transferred from the US to China. China is one of the states ITAR explicitly aims to prevent technology transfer to because the US has maintained an arms embargo against China (ECFR 2015b §126.1). ITAR was lent authority via President Ford's executive order, which President Obama updated using his own executive order in 2013 (Ford 1977, Obama 2013). ITAR defines what 'significant military equipment' (SME) is considered to be and includes the 'United States Munitions List' which lists 'defense articles and defense services pursuant to sections 38 and 47(7) of the Arms Export Control Act' (State Department 2014b: 476). This exhaustive list legally defines what is, and what is not, military technology. "Significant military equipment" (SME) is defined as 'articles for which special export controls are warranted because of their capacity for substantial military utility or capability' (ECFR 2015a also see DoS 2017: 467). Category XV of the United States Munitions List, dealing with 'Spacecraft system and associated equipment,' labelled 'spacecraft, including communications satellites, remote sensing satellites, scientific satellites, research satellites, navigation satellites, experimental and multi-mission satellites' as SME, along with various supporting technologies such as ground control (DoS 2014b: 495). ITAR therefore provides a kind of threat assessment, defining what space technology is militarily relevant and what is not. To do this it engages in a kind of instrumentalism, focusing entirely on capabilities defined solely in terms of quantification. ITAR provides standards by which one could *measure* the capabilities of a piece of technology (range, strength of signal etc.) and determine whether they are a threat (or not). These quantifiable aspects include qualities like range, radiation resistance and wavelength – not intentions (see DoS 2014b: 487). The conclusion was always the same: space technology was indistinguishable from military technology, and so any transfer to China was a national security threat regardless of it's intended final purpose.

Intentions are considered in the regulations, but the way in which they are defined means that there is no potential for intentions to be used to justify an exemption from ITAR's restrictions. The effect is that intentions are virtually irrelevant under ITAR. A clarification in Category XV states that 'commercial communications satellites, scientific satellites, research satellites and experimental satellites are designated as SME only when the equipment is intended for use by the armed forces of any foreign country' (DoS 2014b: 495). How this is to be established is not included in the regulation however, and this point is of great importance given how problematic it is for "true" intentions to be established in international politics. Another clarification, this time on the meaning of SME, exacerbates this by stating that an article can be designated a defense article if it 'provides the equivalent performance capabilities of a defense article on the U.S. Munitions List' and goes on to say that 'the intended use of the article or service after its export (i.e., for a military or civilian purpose), by itself, is not a factor in determining whether the article or service is subject to the controls of this subchapter' (DoS 2014b: 465). Not only does this seem to conflict with the loophole for technology not intended for military use, it also makes clear that dual-use technologies are, for regulatory purposes, military technologies. In this sense, within ITAR, capabilities are more important in determining what is a threat than intentions.

Notably, China's two space "firsts" in 2003 and 2007 did not correspond with any changes to ITAR regulation.[41] The logic of threat assessment in ITAR outlined above, then, was an enduring feature of US space policy toward China in the 2000s. President George W. Bush (2001) had simply continued the provisions of the Export Administration Act, making no changes to the content of the regulations. Indeed, according to the introduction to ITAR, the content of the regulations is primarily derived from a version produced in 1993 (DoS 2017: 463). The Order contains very strong language (foreign 'unrestricted access' to US technology constitutes 'an unusual and extraordinary threat') on the policy of arms regulation, but does not make reference to China or space (Bush 2001). In 2006 the State Department made a further update to the wording of ITAR, but these changes were very minor and China remained unmentioned (DoS 2006: 20539). Changes relating to space technology consisted of modified thresholds for radiation shielding that a piece of technology could have before being considered "Significant Military Equipment" (DoS 2006: 20539).

Under the Obama administration, ITAR continued to classify virtually all space technology as military technology, despite some attempts by the White House (in a rare

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[41] One might observe that it would be difficult for them to have become any more restrictive.

intervention) to slightly relax restrictions. Category XV was revised in 2014, and with it came a brief explanation of why this had occurred (State Department 2014c). Some articles were moved to the Department of Commerce's Export Administration Regulation (EAR), but

> the [State] Department notes that although the Administration sought the authority
> to decide the export licensing jurisdiction for spacecraft … the Department, along
> with the Department of Defense, reported to the Congress that currently only three
> broad types of articles are appropriate to control on the [Department of Commerce's]
> CCL [regulation] (State Department 2014c: 27181-27182).

These three types were communication and remote sensing satellites which contained no classified components and had 'performance parameters below certain thresholds' (State Department 2014c: 27181). Commercial-end use was explicitly confirmed as being insufficient to take them off the munitions list (State Department 2014c: 27182). These (arguably very minor) adjustments were justified with reference to the possibility of measurement of capabilities:

> While nurturing the civil and commercial space industry is a laudable goal … the
> technologies on which this industry may develop and operate are of critical military
> importance and … therefore must remain controlled on the USML (State Department
> 2014c: 27182).

A concluding remark notes that 'as technologies develop, and as there may come to be a greater differentiation between military-critical and commercial technologies, their licensing jurisdiction will be reassessed' (State Department 2014c: 27182). This sentiment was echoed by congresspeople who argued that satellites themselves were not the problem and could one day be removed from the USML (House 2011a: H3649-H3680). There was one important caveat to this proposal, however, i.e. that China be excluded from future exemptions (House 2011:a H3668).   The efforts of the State Department to maintain this specific form of technopolitics were clearly very successful during the 2000s and 2010s.

Capabilities as predictions

'[I]f and when we get back to the Moon under the Weiner amendment, we will be looking at

Chinese flags and maybe even Chinese bases when we get there …'

– Representative Tom Feeney (R-FL) speaking against a proposed budget cut to the space

program (House 2005b: 4749)

A second and overlapping element of the logic of "capabilities as intentions" is the deployment of capabilities as evidence to bolster the credibility of predictions. These predictions were sometimes explicitly concerned with future developments of further Chinese capabilities, but some also used present capabilities as evidence of future Chinese intentions. Both variations of these predictions helped reproduce the "Chinese space threat" thesis and made use of the logic of "capabilities as intentions," often exhibiting a tendency of technological determinism.

The QDRs contained attempts to make predictions based on a cursory analysis of "trends." Reviews made claims such as 'China is likely to continue making large investments in high-end, asymmetric military capabilities, emphasizing electronic and cyber-warfare; counter-space operations …' (DoD 2006: 30). Capabilities and intentions were readily conflated in predictions made by the QDRs. This is evident in the way that the 2014 review made predictions about China in space, such as 'China will continue seeking to counter U.S. strengths using anti-access and area-denial (A2/AD) approaches and by employing other new cyber and space control technologies' (DoD 2014: 6). Crucially these predictions are expressed in terms of capabilities, and are also based on an analysis of capabilities. The logic seems to run that China is pursuing counterspace capabilities now, so will continue to do so in the future. Yet, the implication must also logically be that China intends to do this – it is 'seeking.' The prediction is therefore also a tacit prediction that these malign intentions will not change. Establishing the future capabilities and intentions of China serves a technopolitical purpose, namely shaping the policies, particularly in procurement, that the US should take in response. For example, in discussions of the size of US forces, the 2010 QDR explicitly contends that it is 'establishing sizing criteria' for 5-7 years and 7-20 years (DoD 2010a: 43, see also DoD 2014: 6).

The focus on the use of capabilities to make predictions was, at times, defended explicitly by DoD sources by claiming that China's intentions were unknowable. The 2006 QDR claimed that 'The outside world has little knowledge of Chinese motivations and decision-making or of key capabilities supporting its military modernization,' indicating that not much evidence is available (or can be shared with the public and Congress) (DoD 2006: 29). This trend continued in later reports (see DoD 2010a: 31). Where reasons were given, they were rather cursory. For example:

> These capabilities, the vast distances of the Asian theater, China's continental depth,
> and the challenge of en route and in-theater U.S. basing place a premium on forces
> capable of sustained operations at great distances into denied areas. (DoD 2006: 30).

When the 2010 review explained why non-capability factors are absent from its discussion of China's 'counter-space systems' (among other weapons systems), it implied that China's opaque intentions were themselves, in fact, evidence of malign intentions (DoD 2010a: 31). It stated that 'China has shared only limited information about the pace, scope, and ultimate aims of its military modernization programs' which lead to 'legitimate questions regarding its long-term intentions' (DoD 2010a: 31).

The relevant statute which calls for the production of the ARCs explicitly directs the DoD to make predictions about China's military. Every report during the period in question included such predictions. The 2015 report went so far as to include a separate section on 'Space-Lift Capabilities and Launch Trends' as a 'Special Topic' (alongside missile defence and land reclamation in the South China Sea) (DoD 2015a: 69-72, see also similar sections in DoD 2014: 65 and 2013: 65). The 2002 report successfully predicted that China would launch a manned space mission in 2003 or 2004 but did not discuss what the significance of this might be (DoD 2002: 33). As with the QDR, these predictions used capabilities as evidence in order to make predictions primarily about capabilities. However, the portrayal in the 2015 report focused on China's increasingly global ambitions – claims which touched upon questions of intentions – using descriptions of China's 'priority' on 'remote sensing' and the completion of its 'worldwide satellite navigation constellation' as evidence (DoD 2015a: 70). The final Obama-era ARC was even more explicit in predicting continued malign motivations for China's acquisition of more space capabilities. It argued that 'China continues to develop a variety of counterspace capabilities *designed* to limit or to prevent the use of space-based assets by the PLA's adversaries during a crisis or conflict' (DoD 2016: 36, emphasis added). Overall, the effect of such predictions in the ARCs was to establish a coherent DoD instrumentalisation of China's space technology which identified future nefarious anti-American intentions primarily through analysis of China's space capabilities of the present.

Predictive claims about Chinese Moon exploration capabilities were used by elected representatives to argue that China's crewed exploration program was motivated by malign intentions.[42] These capabilities were presented as a threat because they would contribute to a

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[42] A subset of congressional claims, both Republican and Democrat, predicted China using space technology to bolster America's enemies, such as with Iran and Chavez' Venezuela (see Senate 2005a: S3116, House 2005b: H6127).

decline of American prestige, and that this result was desired by China. Claims made along these lines varied in explicitness. An example of a more implicit approach can be found within Representative Culberson's (R-TX) (in House 2005a: H4441, see also H4444) argument in 2005 that cuts to NASA would be

> allowing the Chinese to continue to move rapidly ahead in space exploration. The Chinese are not slowing down. They are going to be launching a lunar rover. They are going to be launching a lunar orbiter' (see also House 2009a: H5553).

Culberson does not seem to have needed to explain the ramifications to his colleagues, rather it is presented as enough evidence to simply outline capabilities and imply future, unspecified damage to the US. Congressional attention did not shift from the Moon, even after China's 2007 technology demonstration. Senator Mikulski's (D-MD) (somewhat incongruous) comments argued in favour of greater NASA funding in 2007 by saying 'We cannot let China get to the Moon before the United States does' were again rather implicit in extrapolating China's intentions from its capabilities (Senate 2007b: S12724, see also Senate 2011a: S3419). Generally, however, congresspeople seem to have become more explicit in predicting continued Chinese malign intentions after the events of 2007. Representative Posey (R-FL), also arguing for a higher level of funding for NASA, ominously asserted that

> Friends and foes alike acknowledge that the United States is truly the leader in space. So it is astonishing to me that we are so near the brink of yielding this military and economic high ground to Russia or China, or someone else. … [T]he Chinese are not going to the moon solely to collect moon rocks (House 2009a: H5553).

The loss of the exceptional status was then even more explicitly addressed by Representative Carter (R-TX) in 2010, who stated the Chinese 'Moon exploration program' showed that 'not only are we giving up the fact that we're exceptional, but those people are trying to show how exceptional they are' (House 2010b: H4660). This kind of claim was repeated after the final flight of the Space Shuttle (West in House 2011b: E1275). The congressional rhetoric therefore clearly constructs China's motivation to pursue crewed spaceflight as aimed chiefly at damaging American prestige, pointing solely to evidence of Chinese capabilities, not intentions.

5.3 The counters to the logic of "capabilities as intentions"

Not all American space policy discourse reproduced the logic of "capabilities as intentions" during the period in question. The purpose of this section is to assess the dominance of the logic by comparing it with two strains of discourse that contested the logic, attempting to understand how they failed to gain traction in policy debates. The first can be found in contributions from the same organisations analysed so far in this chapter – Congress and the Departments of State and Defense. A minority of contributions from these organisations did attempt to engage with Chinese intentions in their own right, and at times went so far as to publicly claim China had benign intentions in space. Only statements from the State Department seemed to conform to this type with any consistency, however, in stark contrast to the logic expressed in ITAR. These views did not have the prominence or the repetition of those employing the logic of "capabilities as intentions," however, and had all but disappeared from the discourse by the end of the Obama administration. The second stream of discourse contesting the logic is somewhat more puzzling, because some observers have claimed that it is a powerful analytical approach taken by the Department of Defense (Cohen 1990, Bracken 2006, Krepinevich and Watts 2015). This approach, known as "net assessment," seems to have been hamstrung by its lack of a public profile, perhaps inevitable given its historical use as a tool for classified, specialised studies intended only for the most senior officials (see for example Krepinevich and Watts 2015: 121).

"Intentions as intentions" in public rhetoric of the State Department

State Department rhetoric on China's space program rested on different assumptions to the logic of "capabilities as intentions" underpinning ITAR. Whereas ITAR focused on the measurement of capabilities, claims by State Department officials often relied on a mix of less specific claims about Chinese capabilities and intentions. Although intentions were sometimes discussed, they were usually subsidiary to discussion of capabilities. What differentiates these statements is that intentions were, to some extent, considered in their own right.

State Department rhetoric during the Bush administration portrayed China's intentions in space as benign, or at the very least not irredeemably malign. That these statements clearly did not expound the logic of "capabilities as intentions," is clear because they did not draw the conclusion that China's space program was *inevitably* a threat. State Department officials congratulated China's Shenzhou 5 and 6 missions (Larson 2003, McCormack 2005). Eric John, then Assistant Secretary of State for the Bureau of East Asian and Pacific Affairs stated that 'We applaud China's success as only the third country to launch people into space. China has

told us that '[its space research] is devoted to the peaceful use of space' (John 2006). The statement provides a rare example of the public acceptance of a Chinese statement on the purposes of its space program, separate from an American analysis of the technical capabilities. Even after the 2007 test, this position was maintained to some extent. Paula DeSutter (2008), Assistant Secretary for Verification, Compliance, and Implementation in 2008, only *asked* whether China's 'ASAT interception constitutes a threat,' and concluded that it only 'clearly demonstrated a capability to destroy an object in space' (DeSutter 2008). Despite the lack of a position on Chinese intentions behind the development of the technology, DeSutter was still logically separating the questions of "what are the capabilities?" from "what are the intentions?"

When arguing that China was a threat to American national security, some State Department rhetoric still separated the questions of capabilities from those of intentions. A few months after the Chinese ASAT test in 2007, the State Department published a report on US space policy which stated that the event 'should be a wake up [sic] call' because of the potential impact on 'U.S military capability and security' (DoS 2007: 4). It added that 'China, largely due to the recent demonstration of a physically destructive ASAT, may be the most dramatic example of threat to US space assets, but it is not the only one' (DoS 2007: 4). The report remained agnostic on the intentions behind the various developments in foreign space capabilities however, framing the need for concern as a separate the question of intentions (DoS 2007: 4). It effectively argued that the US should recognise the risks and improve its own capabilities regardless of whether these risks are created 'intentionally or unintentionally' (DoS 2007: 4). In this report, then, intentions remained a separate yet subordinate question to capabilities even after the 'dramatic' Chinese ASAT test. This line of reasoning did not provide a robust challenge to the "Chinese space threat" discourse, and rather moderately contributes to it with its characterisations of risk. Furthermore, placing the question of intentions into a subordinate position does not strongly contradict the overarching logic of "capabilities as intentions" because it similarly foregrounds the analysis of capabilities.

The same hierarchy of assessing capabilities first, and intentions second, seems to have continued to be the line of reasoning in official State Department rhetoric through to the end of the Bush administration. Ambassador Donald Mahley, then Acting Deputy Assistant Secretary for Threat Reduction and Export Controls, told a University audience in 2008 that 'China is pursuing a multi-dimensional program to develop counter-space capabilities that could be used to deny others access to … outer space' (Mahley 2008). He provided a justification for why manned space technology should be considered militarily relevant,

arguing that China was using its manned and lunar programs as a justification to improve 'its ability to track and identify satellites – a prerequisite for effective, precise physical attacks in outer space' (Mahley 2008). These points clearly rest on an assessment of Chinese space capabilities. Yet Mahley did not only consider capabilities, but also intentions. On this point he argued that Chinese motivations and intentions for the test had raised questions which had not received 'satisfactory answers' from China, describing the situation as a 'continued lack of transparency' (Mahley 2008). Again, this cannot be understood as a significant challenge to the logic of threat assessment explored earlier in this chapter. The question of intentions was logically separate in Mahley's reasoning, but by remaining agnostic about them it provided no grounds on which to seriously question the "Chinese space threat" or the preponderant importance of analysing capabilities.

During the Obama Administration only two State Department officials publicly spoke at length on China's space program,[43] both of whom seemed to maintain a separation between the analysis of China's capabilities and intentions. The first was Frank Rose, Deputy Assistant Secretary, Bureau of Arms Control, Verification and Compliance. The earliest Rose (2011, see also 2012) publicly identified a Chinese space threat was in November 2011 when he described the 2007 ASAT test as 'intentionally destructive,' although he framed this within the wider 'issue' (rather than threat) of orbital debris. Frank Rose was later promoted to Assistant Secretary, taking over from Rose Gottemoeller who appears to have never publicly commented on China's space program during her tenure. Later in his tenure, Rose (2016b) told a conference audience that China and Russia's space 'weapons systems … will present a threat, not just to the United States, but to the safe operation of satellites by all countries.' Using his own diplomatic interactions with Chinese officials as evidence, Rose took a measured tone on the issue later in the talk, stating that

> I was blunt about our concerns regarding China's anti-satellite weapons. I will say, I
> thought we had a very good dialogue. … rather than just an exchange of talking
> points. It was clear that China is concerned about the threat from debris … Our
> efforts in this dialogue were acknowledged at the Obama-Xi bilateral meeting in
> China on September 2 … (Rose 2016b).

At times, Rose (2014, 2015a, 2016a) was clear in framing debris itself as the threat, rather than specifically China or that debris was a shared threat alongside the threat of ASAT technology. This fits well with the State Department line taken during the Bush administration explored

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[43] Obama's nominee for Ambassador to the PRC did not mention outer space in his confirmation hearing testimony, for example (Huntsman 2009).

above, in which intentionality is separate, and unintended effects are significant in their own right. Rose's comments are also notable for constructing the Chinese government as reasonable and open to dialogue. It would appear that this relatively optimistic rhetoric was maintained until the end of the Obama administration. Mallory Stewart (2015), who took over Frank Rose's role after his promotion, presented an optimistic picture in 2016 (after further Chinese technology tests), arguing that international pressure and diplomacy was the primary reason that China had not undertaken any further destructive tests (see also Stewart 2016 for similar comments). Once again, these comments hardly constitute a major challenge to the public dominance of the logic of "capabilities as intentions" because they were made infrequently and remained focused on capabilities.

Net Assessment

Conventional wisdom around the intersection of American academic and policy literature posits that "net assessment" is one of the main approaches to threat assessment in US security policymaking (Cohen 1990, Bracken 2006: 90, Swaine et al. 2013: 6). This chapter now argues that net assessment has almost no discernible public presence in American debates on China's space program. This is significant because the DoD is legislatively mandated by Congress to use net assessment, defined as comparative, qualitative and predictive threat assessment, since 1962 (10 U.S.C. § 113). It has been claimed to be a distinctly American approach to threat assessment, a DoD *lingua franca*, and a 'major' influence on US policymaking (Cohen 1990, Bracken 2006: 90, Swaine et al. 2013: 6, see also Karber 2014: i). Net assessment potentially contests the logic of "capabilities as intentions" by attempting to be reflective and ecumenical in questions of methodology. Additionally, its longevity in statute and vaunted position among a group of DoD analysts would initially seem to indicate that it would be a powerful rival logic of threat assessment but, as will be demonstrated later, this was not the case within US public space policy. The main reason for this seems to be the long-standing secrecy around the approach and its use to communicate with a highly elite, high-security clearance audience. It was therefore a much weaker public influence than the powerful logic explored thus far in this chapter. Some proponents of net assessment called for its use for analysing Sino-US relations, including specifically in space, but these voices remained marginal. Indeed, the only explicit public use of net assessment in regard to China's space program was a report from the Carnegie Endowment (Swaine et al. 2013). Asking what role net assessment played in these debates is therefore required to accomplish the central

objective of this chapter of addressing how the "Chinese space threat" was conceived in US public policy discourse.

Net assessment is capability focused, but according to its proponents good practice demands that capabilities must be heavily contextualised with other factors. Phillip Karber (2014: i), who was previously involved in producing net assessments at the DoD,[44] emphasises the explicit call in the relevant statute that the Secretary of Defense must specifically provide Congress with a 'comprehensive net assessment of the defense capabilities and programs of the armed forces of the United States and its allies as compared with those of their potential adversaries' (see also 10 U.S.C. § 113). The relevant statute specifies that this report should examine 'trends' of the preceding five years and 'expected trends' and among other capability-related assessments, 'identify the deficiencies in the defense capabilities of the armed forces of the United States' (10 U.S.C. § 113). A contemporary DoD definition states that net assessment is

> the comparative analysis of military, technological, political, economic, and other factors governing the relative military capability of nations. Its purpose is to identify problems and opportunities that deserve the attention of senior defense officials (DoD in Swaine et al. 2013: 7).

The "net" of net assessment refers to comparing one state to another with the goal of producing an answer on which state is the most powerful after taking all possible factors, actions, and variables into account (Bracken 2006: 93, Swaine et al. 2013: 8). One of the states will therefore have more power "net" of the other. Arguably at a theoretical level this dovetails with a theoretical assumption that inter-state relations are inherently competitive (Skypek 2010: 3). At first glance, then, the comparative and predictive elements of the approach would seem to have little conflict with the prevailing logic of threat assessment in US public policy.

The fundamental difference in assumptions between the mainstream of public policy discourse on the "Chinese space threat" and net assessment is what Skypek (2010: 24) calls the latter's 'tolerance for uncertainty.' The approach is much more cautious and heuristic than the statements reproducing the logic of "capabilities as intentions." Decisions about the methodology of net assessment research projects are (supposed to be) driven by the main goal of producing predictions about national security affairs (see Bracken 2006: 96, Skypek 2010: 3,

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[44] Karber has previously been heavily criticised for his own issues with analytical rigour. See Lewis (2015) and Parker (1978).

10 U.S.C. § 113). To this end, for example, Paul Bracken (2006: 92) advocates distinguishing between perceptions and the reality of what is being perceived, and Karber (2014: 45-46) advocates leaving room for unknown factors. In Thomas Skypek's (2010: 6) view, it is up to the net assessor to judge what mix of 'materiel and non-materiel factors' to consider. It is within this context that the intentions of rival states are considered. Indeed, advocates of net assessment have argued that the forces which shape a state's security strategy are products of a multitude of bureaucratic politics and thus no single 'carefully optimized strategic intent' of rivals really exists (Bracken 2006: 96). Taken as a whole, the content of the approach advocates greater nuance and subtlety in attempting to understand potential rivals which stands in stark opposition to the powerful simplicity of the logic of "capabilities as intentions."

Net assessment had little to no influence on public threat assessment of China's space program because its advocates were too unofficial, too few in number and too secretive about their work. In 2013, the Carnegie Endowment published *China's Military & the U.S.-Japan Alliance in 2030*, which dealt with some of the implications of China's counterspace capabilities (Swaine et al. 2013: 74, 193, 298). Of course, this cannot be considered official government discourse. The most official public endorsement of net assessment on this policy area was in 2015, when the US-China Economic and Security Review (USCC) called for a congressionally-mandated net assessment of US-China counterspace capabilities, but it is unclear whether this was undertaken (USCC 2015a: 565). Of course, the USCC was only semi-official itself, and even if an assessment had been undertaken, it would likely have been heavily classified. A central figure in more precisely defining net assessment was Andrew Marshall, head of the Office of Net Assessment from its creation in 1973 until 2015. One foreign policy journalist argues that Marshall was successful in attracting a 'devoted' following of 'acolytes' who continue to advance his ideas (Stefan-Gady 2015). Marshall's followers describe his power as being based on access to senior leaders and his ability to spread his ideas within a classified context (Krepinevich and Watts 2015: 132, 162-163, 177). In one case, Marshall's briefings were purportedly so secret that only he and the Secretary of Defense were cleared to hear them (Krepinevich and Watts 2015: 162-163) – hardly a sign that the practices of net assessment were suited for contributing to public debate. Indeed, since 2001, Marshall himself seems to have been one of the figures predicting a Sino-US rivalry, but any outputs from the time of his tenure remain secret (Krepinevich and Watts 2015: 236). A Freedom of Information Request revealed the titles of some DoD net assessments, although the content remained entirely classified. Two of the titles were *The Chinese Penchant for Surprise* and *Chinese And Russian Asymmetrical Strategies For Space Dominance (2010-2030)* (Elliott 2009). With such high levels

of secrecy, it is unsurprising that net assessment barely contested the logic of "capabilities as intentions."

Just how far removed the DoD's public threat assessments of China's space program are from net assessment can be seen in the lack of engagement with the kind of murky bureaucratic factors which Marshall and his "acolytes" advocate. Public DoD reports during the Bush and Obama administration only occasionally made reference to 'PLA writings,' Chinese state news or government sources, (such as Defence White Papers) (see DoD 2016: 14, 36). If anything, the logic of "capabilities as intentions" seems to have increased from 2000, while the influence of the net assessment approach decreased. In earlier DoD reports, statements were more cautious and probabilistic (see for example DoD 2002: 32-33, DoD 2003: 4-5). The 2002 report dedicated its introduction to a 'cautionary note,' drawing explicitly on material from the Office of Net Assessment to warn the reader of

> …how little is known about the most significant aspects of Chinese military power.
> Chinese secrecy is extensive. China reveals little in its Defense White Paper about the
> quantity or quality of its military forces (DoD 2002: 1).

This was repeated almost verbatim in a later report (see DoD 2003: 4). The 2002 report called for more research on Chinese and Taiwanese 'ideas of statecraft' and 'intangible PRC capabilities' such as training and attempted to unpack Chinese strategic concepts, such as "comprehensive national power" and "*shi,*" an attempt much more in line with the ideals of net assessment (DoD 2002: 2, 5-6).[45] Later reports were more confident that White Papers were reasonable indications of Chinese views (see DoD 2005: 1). As the years went by, however, the selection criteria for evidence even on capabilities seem to have been far from the ideal desired by net assessment advocates. This was acutely apparent when the ARCs were criticised by an academic, Gregory Kulacki (2004), for repeating a claim made in the press that China was (perhaps) developing a "parasitic micro-satellite" (DoD 2002: 32-33, DoD 2004: 42). The original source of this information later transpired to be a blogger (Kulacki 2004). The political weakness of net assessment in public discourse is difficult to doubt under such circumstances, because the DoD faced no public criticism for such circumspect data analysis from Congress, the State Department, the White House or the DoD itself. The authority of the ARCs went unchallenged, and thus by extension the logic of "capabilities as intentions."

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[45] The report claims that the concept of "*shi*" has 'no Western equivalent' – it is uniquely Chinese (DoD 2002: 6, f.n.). This is the most direct engagement with Chinese culture in any of the QDRs or ARCs.

Conclusion: ramifications of the logic of "capabilities as intentions" for US space policy discourse

The logic of "capabilities as intentions" subsumes and conceals the discussion of the latter. It therefore constitutes a logical sleight of hand which closes down possible countervailing discourses, and in so doing entrenches a very particular technopolitics. Across the US government during this period, there was little attempt to reflect on why China might seek space capabilities. When this was done, capabilities were usually unproblematically taken as indicators of intent, and almost unfailingly, ill intent. Later chapters attempt to establish the identity politics which mutually support this logic, but it is already clear that this is indicative of normative assumptions about the superiority, moral and military, of the United States. The preponderance of the logic of "capabilities as intentions" provided an epistemological foundation for speakers from both parties, and multiple key institutions, from which to speak about China's space program. This consensus shaped official American rhetoric on China's space program by focusing the debate only on what China was building, allowing American policy elites to mostly avoid the explicit articulations of China's intentions. The corresponding element of consensus, that China had malign intentions, could then remain almost entirely unchallenged and taken for granted. Together, these elements meant that any other rival instrumentalisation of China's space program – that it was intended for domestic prestige, for example – was almost unthinkable.

The logic of "capabilities as intentions" had a few major ramifications for the construction of the "Chinese space threat" which are relevant to analysis later in this thesis. By setting the terms of debate so firmly around questions of capabilities, American policy makers created a situation in which increasing Chinese capabilities could not be anything other than a threat, which in turn set a very high standard of what security in space really meant. Indeed, it is difficult to imagine what level of Chinese space technological sophistication American policymakers *would not* consider threatening. Extrapolating from the claims examined in this chapter, it seems China would have to maintain a very low level of space capabilities in order to satisfy American onlookers – a highly impractical prospect. Even at this early stage of analysis, this state of affairs seems to indicate why cooperation with China in space was unthinkable to US policy elites, at least in public. It also helps to frame how and why American policymakers responded to China's rise in space the way that they did.

American public approaches to assessing the Chinese space threat can also be criticised for their lack of historical context. As was argued in the preceding chapter, American

cooperation with China was fairly uncontroversial after 1972, but as China's capabilities increased and the Cold War ended, this began to change. China's significant level of sophistication in space technology had been publicly cemented in the 2000s. It is under these circumstances that strange, ahistorical comments like Senator Mikulski's (in Senate 2007b: S12724) make some degree of sense: China's rise as a space power challenged a long-standing status quo that America was the premier "space power." Ahistorical claims also served partisan purposes, as it was no longer convenient to remember the space cooperation pursued by Carter, Reagan and Bush (see for example Inhofe in Senate 2005a: S3115 and Kucinich in House 2005b: H6123). Focusing on the space capabilities of the present helped to obscure the relatively dialogical and productive relationship the two countries had in the past, and in turn helped to close down the possibility that the two states would cooperate again in the future. China was not only a space threat in the present, but was also represented as posing a growing threat which would last well into the future.

The overwhelming focus on capabilities to discern Chinese intentions also advanced a form of instrumental thinking, which simultaneously claimed unassailable objectivity while also implicitly advancing deeply subjective constructions of China. As argued in Chapter 2, the materiality of technology can be mobilised to underscore the supposed objectivity of discourse, facilitating outcomes such as the dismissal of Obama administration's attempts to reform ITAR in which 'laudable' intent was positioned as regrettably incompatible with the harsh, material realities of "dual-use" space technology (State Department 2014c: 27182). Taken as a whole, the state of affairs explored in this chapter ensured that in the struggles over identity and technology analysed in the remainder of this thesis, the validity of the "Chinese space threat" could almost never be in doubt.

Chapter 6

Identity and Technology in the Construction of the "Chinese Space Threat"

Introduction

Chapter 6 argues that Chinese and American space technologies were positioned within the "Chinese space threat" discourse as tools for either jeopardising or reproducing American national identity. Whereas the previous chapter was concerned only with what was *said* about the US and China in space, the purpose of this chapter is to begin to delve deeper into the technopolitical co-construction of identities and technologies within the "Chinese space threat" discourse. The analysis in Chapter 6 then sets up the efforts in Part 3 to assess how the "Chinese space threat" was used to shape American technics and national identity. To achieve these objectives, this requires analysing utterances, practices and artefacts, and the tangle of mutually supportive relationships that exist between them. China's "rise" in space and the accompanying "threat" was first and foremost an opportunity for Americans to construct America. The advocates of the "Chinese space threat" thesis examined in this chapter sought not only to fix what America "is" in space but more broadly also to constitute the US as a foreign policy actor which *must* possess space technology in order to exist. It is within these debates in which space advocates not only situate space security into broader US foreign policy, and in doing so construct space security as an essential part of *national security* broadly conceived. By establishing these relationships, the "Chinese space threat" to the physical security of specific space technologies became tantamount to an existential threat to the nation.

To make the argument that space technologies and identities were positioned in this way, this chapter organises its analysis into three sections, the first sets up the scope of the analysis in relation to the concept of technopolitics. Then, each of the latter two sections explores one of the aspects of American national identity supposedly threatened by China's "rise" in space. The second section of the chapter unpacks the threat China was assumed to pose to "the American way of war." To establish the content of "the American way of war" the chapter makes use of a mix of policy documents and academic literature. This chapter

conceptualises the "American way of war" as a bundle of practices and articulations which sanction how the American state is supposed to conduct warfare. Broadly this can be seen as a demand for quick, qualitatively preponderant violence with global reach. Chinese space technology presents a potential disruption to these functions, and therefore by extension the values which they underpin. These discourses are therefore both autobiographical (of the US) and biographical (of China) and were the most prominent and pressing component of the "Chinese space threat" during the period in question.

The third section looks at the "Chinese space threat" to "American exceptionalism." This element of the "threat" was more prevalent in congressional circles. While it did not explicitly draw on the narratives of threat to "the American way of war," the two elements were mutually supportive. American exceptionalism is a recurring feature of the nation's "space culture," and has been researched by a number of historians, sociologists and cultural critics, identifying activity in space as supporting American ideas of exceptionalism, the frontier spirit, individualism, and faith in (technological) progress. Proponents of the "Chinese space threat" positioned these values as under threat from China's space program. The prospect of a Chinese Moon landing, for example, disrupts the settled status of the US as the only state to have sent people to the Moon, which has come to be a major supporting plank of American exceptionalism in the 20th and early 21st centuries. The possibility of certain Chinese technical artefacts – the equipment required to put a Taikonaut on the Moon – was therefore a threat to the US because they would afford practices which, until then, could only have been American. The task of the advocates of the "Chinese space threat" was to convince other members of the US foreign and space policy-making elite to adopt their conception of the exceptional US national Self in light of the "Chinese space threat."

6.1 Technopolitics and the national Self

Building on the theoretical outline in Chapter 2, this chapter follows Gabrielle Hecht (1998), in holding that the question of what aspects of American national identity the "Chinese space threat" actually threatens cannot be answered exhaustively, and instead provokes more questions. This is useful for our inquiry, however. Questions such as "what is American about the American space program" (and likewise for the Chinese space program) become, as Hecht

(1998: 3) argues, "objects" of inquiry, raising questions of what purpose invoking American identity serves in policy debates. As Chapter 2 already argued, because there is no essential content to identity, it must be fought over and constantly reproduced.

Although Chapter 2 broadly set out the theoretical relationship between discourse and technology, further clarification is required before proceeding. Technical artefacts can be involved in identity construction in a few ways. First, it must be remembered that they are themselves products of political struggles. Second, artefacts afford certain practices, facilitating an avenue for reproducing identities.[46] Third, the artefacts can be, and often demand, constant interpretation and re-interpretation. Together, these technopolitical dynamics help to create and maintain 'national technopolitical identities' through the presence, but importantly also the absence, of certain technologies (Felt 2015: 104, see also 119). Sheila Jasanoff and Sang-Hyun Kim (2009: 120, see also 121-122) conceptualise this variant of technopolitics as 'national sociotechnical imaginaries' which are 'collectively imagined forms of social life and social order reflected in the design and fulfilment of nation-specific scientific and/or technological projects.' Indeed, the empirical example they use to illuminate this point (in a paper otherwise concerned with nuclear power) is Barack Obama's use of the Apollo program as a shorthand to invoke 'the claimed US capacity to plan and execute superhuman technological feats,' in this case in relation to a program of energy self-sufficiency (Jasanoff and Kim 2009: 120). What this chapter can show, then, is how different national Selves are produced and reproduced within the "Chinese space threat" discourse.[47]

Those attempting to advance the thesis of a "Chinese space threat" rarely faced explicit and direct opposition to their claims. Instead, their constructions of the US, China, and their space technologies, were situated in opposition to what they portrayed as a lack of recognition of the essential role space technologies played in American security (and the threat which China posed to them). The White House and some DoD documents, which together laid out the most official and authoritative components of space policy, by comparison merely claimed that space technology was important to the US. The 2006 National Space Policy claimed that 'Freedom of action in space is as important to the United States as air power and sea power,' for example (White House 2006: 1). While they, recognise China's "rise" in space, these documents did not reproduce the discourse of the "Chinse space threat"

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[46] See Chapter 2 for more. Practices 'set out to change or maintain a set of existing social relations through collective mobilization,' analytically distinct from speech (Glynos and Howarth 2007: 121-122).
[47] This chapter follows Lene Hansen (2006: 77) in capitalising "Selves" so as to flag the constructed and contested nature of the concept: as she argues, even the 'official national Self' is constantly being re-articulated.

and constructed China in much more neutral terms. The National Security Space Strategy released in 2011 rarely mentioned China, and although it discussed the 2007 ASAT test, it did not describe China itself but rather that the test 'increased congestion' (DoD 2011c: iii). The National Space Policy, a White House document, did not mention China at all (White House 2010) and senior leaders from NASA continued to express an interest in cooperating with China (see for example Klotz 2015). The Obama administration also oversaw the beginning of a US-China dialogue on space security issues (Office of the Spokesperson 2016). Drawing on these interactions, Frank Rose (Assistant Secretary for Arms Control) portrayed China in a somewhat positive light, arguing that 'It was clear that China is concerned about the threat from debris and that they take it very seriously' (Rose 2016, see also Rose 2015b). This kind of response does not attempt to deny what technical capabilities China has, but rather implicitly counters the more alarmist constructions of China which constitute an attempt to "sound the alarm" about a "Chinese space threat." Through most of the Bush and Obama administrations (at least in the White House, State Department and DoD outputs outside STRATCOM and AFSpC), official discourse constructed China as a fairly responsible actor in space, often not worth explicitly mentioning in public discourse (see Chapter 4, DoD 2001, 2006, Larson 2003, McCormack 2005, Bush 2003, 2007, White House 2006, 2010). The more moderate positions outlined above meant that, first, the technopolitics analysed in this chapter were partly built on the common assumption that space technology is good for the US. Second, and perhaps more importantly, where proponents of the "Chinese space threat" differed from the White House rhetoric seems to have been on the identity of China and that space technology was *essential* and not merely "good." In short, the constructions analysed in the remainder of this chapter attempted to overturn these more moderate constructions.

6.2 The "Chinese space threat" to "the new American way of war:" constructing China and the US through technical relationships

"You plug in, take it for granted, and don't even think about where the services came from … Space is foundational capability for all military operations, yet we don't really plan for anything but success" – General Shelton, then Commander of US Air Force Space Command (in Freedberg 2014)

This section contends that the discourse of a "Chinese space threat" positioned Chinese technical affordances as jeopardising the possibility of the practices of "the American way of war" during the 2000s and 2010s. A specific, new permutation of "the American way of war" was a discursively formulated set of principles which supposedly guided US activity in matters of conflict during the period in question (Boot 2003: 42, Linn 2010: 22-23, Echevarria 2014). This "way of war" called for fast, low-risk, low (American) casualty warfare with a global reach. Under the formulation which prevailed during the Bush and Obama administrations, this was realised by utilising space technology as a key part of infrastructures for global communications, intelligence and precision-guided weaponry. For advocates of the "Chinese space threat," China's anti-satellite technologies were a seemingly obvious threat to the physical security of the American satellites in question.[48] Given that the affordances of these satellites underpinned certain military practices, this in turn threatened the possibility of practicing "the American way of war" and thus by extension the possibility of the existence of their vision of an American national Self.

In order to establish the discursive context for the analysis in the remainder of the chapter, this section first attempts to identify the most prominent elements of the prevailing "American way of war" during the period in question. This is done by reviewing both traditional and critical scholarship on the topic. Second the section assesses the technical relationships between space assets (as technical artefacts) and wider conventional American warfighting practices by engaging with the concept of the "kill-chain." Proponents of the "Chinese space threat" then attempted to construct a Chinese threat to the physical security of these artefacts by referring to Chinese technical affordances and practices. Third, this section looks at American nuclear warfighting posture in its manifestation as part of "the American way of war." Prevalent American ideas about nuclear warfighting called for a high level of precision and speed in order to provide the President with maximum power over the use of nuclear weapons. In this area, China was also constructed as constituting a threat to these ideal practices because of the technical affordances of its space technology.

The general thrust of those attempting to draw attention to the Chinese threat to US warfighting practices was against a perceived taken-for-granted status of the role of space technology held by other members of the American foreign policy elite. The contest, at least as far as the advocates of a "Chinese space threat" are concerned, framed this as an attempt to

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[48] It is notable that, although many forms of ASAT technology are technically feasible (Weeden 2014), the discourse rarely explicitly describes the specific form of ASAT. Where it does, the overwhelming focus is on kinetic methods.

supplant the idea that critical space technologies were secure and replace it with the idea that they were imperilled by China's "rise" in space. Rather than being drawn into an explicit conversation with identifiable interlocutors, those space advocates who drew attention to the "essential" qualities of American space technology were arguing against a general mind-set which did not (sufficiently) consider space to be a site of political or strategic contention.

"The (new) American Way of War"

The concept of "the American way of war" was introduced by Russell Weigley (1973: xxii), who theorised that historically the US had dabbled with strategies of attrition in its early history (until about 1815), but that 'the wealth of the country and its adoption of unlimited aims in war cut that development short, until the strategy of annihilation became characteristically the American way in war.' Mainstream security scholars and modern American historians have tended to conceptualise the "American way of war" as real, concrete and objectively knowable (see for example Milner 2007: 1151, Avant and Nevers 2011, Echevarria 2014: 1-2). Brian McAllister Linn (2010: 22) helpfully provides a review of the literature produced by academics, analysts and military personnel, and in so doing identifies four approaches to "explaining" the "American way of war." These are the "strategic culture" of the armed forces, the "national culture" of the US, the changing policies over time, and finally the 'techno-doctrinists' (such as Boot and Cebrowski) who coined the notion of the 'New American Way of War' (Linn 2010: 22-23). It is this latter vision of a "New American Way of War" which was dominant during the 2000s and 2010s, and as such is the bundle of practices which the "Chinese space threat" was framed as endangering. Max Boot (2003: 42) writes that while Weigley's characterisation had 'stood the test of time,' that a new "American way of war" had arisen after the end of the Cold War. He conceptualises it as follows:

> [T]he U.S. military has adopted a new style of warfare that eschews the bloody slogging matches of old. It seeks a quick victory with minimal casualties on both sides. Its hallmarks are speed, maneuver, flexibility, and surprise. It is heavily reliant upon precision firepower, special forces, and psychological operations. And it strives to integrate naval, air, and land power into a seamless whole.

For Boot (2003: 42), this goes beyond simply changing weapons, but that it also calls for a 'change of mindset' to 'allow the military to harness the technological advances of the information age to gain a qualitative advantage over any potential foe.' Thomas Mahnken

(2008: 2) argues that this reflects a longer standing feature, in which 'technological optimism[49] has historically animated U.S. defense planning' aimed at 'clear[ing] away the fog of war.' Interviewing Vice Admiral Cebrowski (one of the advocates of network-centric warfare), James Der Derian (2009: 136) was told that the American way of war was to 'see the opposition swept off the field of play' just like the 'absolute blowouts' of the Super Bowl. Some critics of this "new" "American way of war," along with its associated concepts such as the "Revolution in Military Affairs" (RMA) and "network-centric warfare," claimed that the rhetoric was divorced from reality (see Linn 2008: 21-22, Echevarria 2014: 1-2). Whether this was the case or not is beside the point for the purposes of this chapter. What is clear is that official American discourse on warfare, supported by academic arguments from authors like Boot (2003) and Mahnken (2008), did in fact powerfully reproduce a discourse of an American military which benefitted from 'unprecedented speed, precision, maneuverability, information, and cooperation,' becoming a small but 'effective group of "superimpowered [sic]warriors" able to serve in a "global cop role" (Linn 2010: 23). Writing towards the end of the Obama administration, Antulio Echevarria (2014: 1-2, 148-149, 167-168) argued that despite its forays into counterinsurgency warfare, American doctrine remained, in line with Boot's 2003 arguments, concerned with deterrence, global power projection, minimising collateral damage, winning while outnumbered, and emphasising air power over ground forces. It is this "new" variant which was supposedly under threat from Chinese space technology in the 2000s and 2010s.[50]

US Air Force identity and technical affordances

According to the homepage of the US Air Force, 'The mission of the United States Air Force is to fly, fight and win in air, space and cyberspace. Our rich history and our vision guide our Airmen as we pursue our mission with excellence and integrity to become leaders, innovators and warriors' (USAF N.D.a). The mission of the constituent command which deals with space, US Air Force Space Command (AFSpC), is to 'Provide Resilient and Affordable Space and Cyberspace Capabilities for the Joint Force and the Nation' (AFSpC N.D.a). The 'Vision' of

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[49] There has also been criticism of this approach within what we might term "orthodox" security studies. See for example Keir Lieber (2005) and Thomas X. Hammes (2006) who are critical of the shaping force of technology generally, and in Hammes' case specifically in US procurement.

[50] Critical literature on the "new American way of war" is concerned with "drones," not space technology. However, it supports the characterisation that there are tensions between the boundless (temporally and geographically) demands of the "new" way of war and its simultaneous call for quick and low-risk conflict (Der Derian 2009, Gregory 2011a, 2011b, Grondin 2013: 191, Shaw 2013: 537).

the Command is 'Global Access, Persistence and Awareness for the 21st century' (AFSpC N.D.b). In terms of the systems which the Air Force uses to deliver these "Missions," AFSpC manages several satellite systems (including much of the associated ground-based infrastructure to control them). These include the Advanced Extremely High Frequency (AEHF) and Milstar systems, used for communications; the Defense Meteorological Satellite Program (DMSP), for global weather monitoring; the Defense Support Program (DSP) and Space-based Infrared System (SBIRS), used for early warning of ballistic missile launches; the Geosynchronous Space Situational Awareness Program (GSSAP),[51] for collecting information on activity in Earth orbit; and the Global Positioning System (GPS) which provides precise timing, navigation and nuclear detonation detection capabilities (see AFSpC 2017). As one Air Force video put it, these systems provide a "foundation" for American deterrence and define both a new "warfighter" identity which does not use weapons and shape a broader, novel form of national security:

> For more than 40 years, we have kept watch from the skies, providing the foundation
> for America's deterrence. We have redefined what it means to defend our nation.
> And we don't use bombs or bullets. … we are American airmen. (Buckley Air Force
> Base 2015).

The imagery of the video includes the Space Shuttle, a precision strike somewhere in the Middle East, "high-tech" holographic screens, and a stern-looking group of ethnically diverse male and female airmen (Buckley Air Force Base 2015).

We can see from these claims that the space technologies in question are central to the defining practices of the identities which relate to them. The global reach of most of the AFSpC systems afford a kind of global, perpetual observation which can then be constructed as vigilance. There is a strong normative dimension to these claims. The Airmen are "sworn to protect," and are thus honour-bound. They are also helping to develop a kind of warfare that does not seem to rely on bombs or bullets – thus implying a need to avoid killing. This is reminiscent of James Der Derian's (2009) argument that the American way of war is an attempt at "virtuous" war. Of course, these technical and discursive relationships do not exist separately to other areas of American security policy. It is in these relationships where China and constructions of its technology threaten both the physical security of space-based technical artefacts and therefore by extension the possibility of "the new American way of war."

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[51] Regrettably, GSSAP's public profile is so limited as to prevent analysis in this thesis.

The "Kill-Chain"

Although the term "kill chain" is not in the DoD's official dictionary, it is widely used by practitioners and academics (DoD 2017). This standard definition obscures the enmeshing of technical relationships with notions of identity and practice. By the prevailing definition, the "kill-chain" consists of four 'operational areas:' 'target sensing, attack decisions, target engagement, and post-strike assessment' (Schneider 2004: 19). Admiral Jonathan Greenert (2013), writing to men under his command in 2013, explained what he meant by "kill chains:"

> [T]o execute a successful attack, you have to: 1) Find the target; 2) Determine target's location, course and speed; 3) Communicate that information coherently to the platform launching the weapon; and, 4) Launch the attack … For our own capabilities, we use this model to determine the most efficient and effective way to complete our kill chains … when we build a new weapon or improve an existing system, we need to understand how the kill chain will be affected or implemented (Greenert 2013).

Barry Schneider (2004: 20) provides this diagram to help expand on the steps involved in the "chain:"

Figure 2: Barry Schneider's (2004: 20) "Kill Chain"
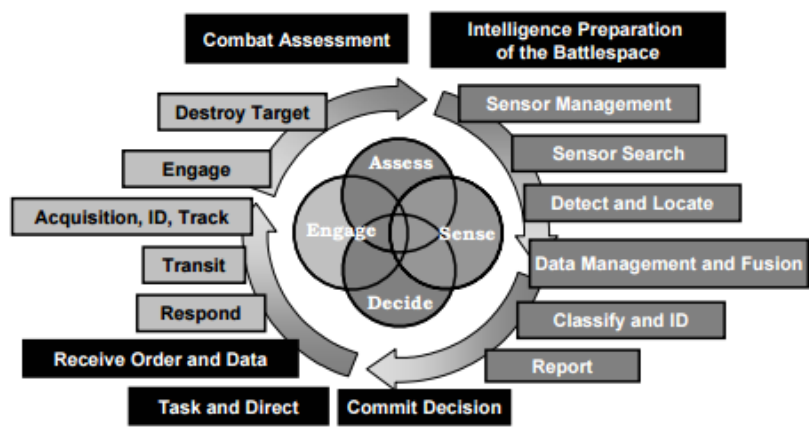
What aspects, then, of this chain are afforded by space technology? It must be pointed out that there are other ways to acquire, track, and communicate without using space technology. Instead of using space-based communications, it might be possible to bounce communications between ground-based installations. Instead of acquiring a target with a satellite, it might be

possible to observe it with an infantry reconnaissance team. However, these potential alternative methods do not fulfil the demands of efficiency which the US military requires – speed, global reach and low casualties. In the example of the infantry team replacing a satellite, deploying the team takes time, the area may be inaccessible to the transport means available, and perhaps most importantly deploying infantry directly risks American lives. By the standards set out in the prevailing form of "the American way of war" (outlined earlier), space assets are qualitatively superior for many of the processes outlined in Figure 1.

The "problem" for the US military is that the "essential" space-based components of American kill chains are vulnerable to interference. Major Andrew Knoedler of the USAF (2005: 105-106) maps out potential C3ISR "gaps" in the kill chain, that is, in which components a failure would result in a failure of the entire chain – a "break." Each shaded cell represents an element in which failure would result not just in an advantage for the enemy but a total break in the chain:

C3						
I						
S						
R						
	Find	Fix	Track	Target	Engage	Assess

Figure 3: "Correlation Matrix for Persistent C3ISR Gaps vs. Kill Chain" (Knoedler 2005: 106)

US space assets provide affordances in all of the categories Knoedler identifies (Command, Control, Communications, Intelligence, Surveillance and Reconnaissance) even if we narrow our analysis to the systems managed by AFSpC. General Hyten, then commander of AFSpC, ominously stated that without these space capabilities, US warfighting would be left fighting wars in the manner of the Second World War – a return to attritional war, and thus an older, undesirable form of the national Self (Hyten in CBS 2015). During the latter years of the Obama administration, Hyten attempted to construct US national security as impossible without space assets, summed up in his claim that there 'is no such thing as a day without space' (Hyten in CBS 2015). The implication is that key space technology artefacts become referent objects of security almost in their own right. By instrumentalising satellite systems as essential to the new "American way of war," as opposed to the (undesirable) old, attritional form, advocates like Hyten created a situation in which the physical security of individual artefacts became synonymous with the proper practice, and even the very possibility, of US national security. Without these satellites, the US was represented as being unable to undertake the practices which were essential to the most desirable forms of the national Self. Hyten's claims, and the

similar claims made by other military space advocates, are an attempt to gain recognition for the *essential* (in a practical and by extension ontological sense) role of the space technology for which they are responsible.

US space technology has a number of unique affordances that are only approximated by other technologies. These artefacts and their affordances are single points of failure. Colonel Alan Rebholz (in Freedberg 2014), then Chief of the Space Operations Divisions, gave a short narrative of how the loss of a capability would have knock-on effects that would be difficult to mitigate:

> when it comes to communications, "a space guy will say, 'well, if your UHF [ultra-high frequency] is getting jammed, just move it to SHF [super-high frequency]. If SHF is getting jammed, move it to EHF [extremely-high frequency]," he said. But a frontline tactical user has a very different perspective, he said: "I can't migrate from UHF to SHF because I don't have the terminals. I can't migrate to EHF because nobody has those terminals because they're too darn expensive."

In order for this to be a problem, a threat has to exist to these systems. China fulfils the requirements to be considered a threat to US space assets – because of its assumed possession of the technical capability to destroy satellites and sufficiently malign intentions to use them against the US. As we have seen in preceding chapters, although American policymakers focus their public utterances on describing and comparing Chinese and American capabilities, in order for these claims to "make sense," one must also assume ill-intentions from China. As we saw in the preceding chapter, this is primarily achieved in US space policy discourse by adopting the logic of "capabilities as intentions." Senator Kyl's (R-AZ) (Senate 2007a: S12502-12503) remarks embodied this logic when he claimed that

> it has been no secret that the Chinese Government would like to see Taiwan reunited … the Chinese have developed certain weapons that would be problematic for the United States to deal with … we have little in the way of defense.

The claims of vulnerability are autobiographical claims about the national Self, specifically in what technologies enable its survival. Yet these claims are also biographical accounts of China, armed with certain technologies and intending to damage American standing. The discussion of Chinese "threats" to US space systems, must therefore be understood as simultaneous moves to construct autobiographical and biographical technopolitical accounts of the US and China (Pan 2012: 44-45).

The Chinese space program was positioned by some space "hawks" as threatening the nuclear security of the United States. To understand how this portion of the "Chinese space threat" was constructed, however, it is first necessary to understand some of the basic, relevant nuclear technopolitics invoked by these claims of threat. Senior leaders from the US security establishment have stressed the need for the US nuclear arsenal to respond reliably and quickly to the orders of the Commander in Chief. For example, Michael Hayden (in NTI 2016), who held a number of senior positions in American security, stated that 'The system is designed for speed and decisiveness. It is not designed to debate the decision.' Secretary of Defense Ashton Carter (2016) similarly told service personnel at Minot Air Force Base that

> … all of you and all of these capabilities – comprise a system of systems that enables
> us to see what's happening in the world, … so we're able to give the one person
> whom our nation has entrusted with this immense responsibility – our Commander-
> in-Chief, the President of the United States, President Obama – with the best possible
> picture of information, so that he can make the most well-informed decision possible
> to keep our country safe, and so that we can carry out that decision with precision,
> excellence, and reliability.

Arguably the most important qualities that the American nuclear command and control system was supposed to embody were reliability and speed. Within the discursive context already established in Chapter 5 and thus far in this chapter, Chinese ASAT technology had already been constructed as a threat to American satellites by advocates of the "Chinese space threat." As will now be argued, the values of speed and decisiveness in nuclear operations were embedded in, and reliant upon, satellites that were supposedly under threat, therefore threatening the practices of American nuclear deterrence.

Space-based assets support American ideals and practices of nuclear deterrence. American doctrine aims at bolstering the deterrent effect of its nuclear arsenal by maintaining an extremely high level of readiness and capability (see Carter 2016). China's anti-satellite technology threatens the possibility of the desired level and form of nuclear command and control. Specifically, the desired model for American nuclear deterrence during the Obama and Bush administrations was for as much Presidential control as possible, which would be technically impossible without satellites.

The 2010 Nuclear Posture Review outlined the need for nuclear command, control and communications in order to 'enabl[e] informed and timely decisions by the President … and execution of Presidential nuclear response options' (DoD 2010c: 26). This involves keeping missiles on high alert, allowing the possibility to launch on warning or launch under attack

(DoD 2010c). Space-based early warning satellites from the Defense Support Program (DSP) and Space-Based Infrared System (SBIRS) constellations pick up missile launches almost anywhere on earth once they have cleared cloud level. Their ground-based equivalents detect missiles as they come over the horizon, shortening the reaction time by a few minutes (Carter 1987: 580, NTI 2016). Communications down the chain of command would require satellites, especially after nuclear detonations had occurred in the CONUS in which case only space-based systems such as Milstar and AEHF would be expected to function (this system was also likely used during the September 11th attacks because of the overwhelming chatter on less restricted systems) (Graff 2016). As General Shelton (in Tucker 2014) put it 'This is the constellation that the President would use in *existential* circumstances, to command and control nuclear forces and to ensure continuity of the United States government.' The system is portrayed as fragile, however. Shelton (in Tucker 2014) argues that "If an adversary were to take out one, just one satellite in the constellation, … we potentially have a situation where the president can't communicate with forces in that part of the world.' As has already been argued, within US space policy discourse it is indisputable that China has the capability to disable or destroy a single satellite, and so Shelton's comments can also be interpreted as a claim that China could use ASATs to paralyse US nuclear systems. By threatening the physical security of just one AEHF satellite, China threatens the possibility of Presidential control in "existential circumstances" and therefore by extension the existence of the US.

Constructing China through technical relationships

According to advocates of the "Chinese space threat," like General Hyten, America's space assets are essential to national security. China has the capability to destroy or interfere with these assets, so by extension poses a threat to national security. This requires constructing Chinese identity in a particular formulation, however – a China that can be reckless and aggressive.

One avenue by which to uncover constructions of China is to compare the qualities of the technical artefacts in question with the claims of those "raising the alarm" about a Chinese space threat. The construction of China as willing to use any military force to achieve its goals, even if it entailed highly escalatory behaviour is a recurring theme. This is particularly apparent in discussing American satellites' vulnerability to nuclear attack. This can be done in a fairly direct manner, such as when Sydney Freedberg (2014), a defence journalist, recalls that 'Nothing short of a nuclear missile could pull the plug on a satellite constellation as robust as

the Global Positioning System (GPS), Gen. William Shelton said, semi-reassuringly.' This kind of comment from Shelton immediately moves the conversation into considerations of nuclear use, and in the course of his interview China was repeatedly named as a specific space threat, associating the two on some level. Elsewhere, Shelton (in Tucker 2014) made it clear that one of the most serious threats America faced in space was tactical nuclear weapons. Brian Weeden (2008: 145) (of the Secure World Foundation) points out that the Milstar, and follow on AEHF satellites, are the 'only known geosynchronous communications satellites designed with survivability in a nuclear environment.' For "Chinese space threat" advocates like Shelton to continue to imply that China would be willing to paralyse US nuclear command systems is therefore tantamount to claiming that China would be willing to use nuclear strikes in a US-China space conflict. This helps to construct China as a reckless and dangerous rival.

The construction of a "reckless" China can also be seen in discussions of kinetic ASAT strikes. China's 2007 test, now a quintessential point of reference for any American discussion of space security, is a particularly useful example for portraying China as reckless. The test produced over 3000 trackable pieces of debris with perhaps 32000 estimated non-trackable pieces (Weeden 2010: 2). *The Washington Post* reported that 'China's action drew sharp protests from other nations with satellite programs – a predictable response that experts said dramatically illustrates *Chinese willingness to face broad international criticism when it comes to space*' (Kaufman and Linzer 2007, emphasis added). This kind of criticism is often not explicitly repeated in official US discourse. Instead, space advocates within the US government make general claims that China has the capability to 'limit or prevent the use of space-based assets' (as one DoD (2009: 27) report described it). Less alarmist observers have attempted to extrapolate what China would need to do to inflict serious damage on US space power, drawing the conclusion that China would have to launch scores of anti-satellite missiles to be sure of success, resulting in a catastrophic amount of orbital debris (see Forden 2008a, 2008b, 2008c, Sankaran 2014). Claiming that China is willing and able to "prevent" American use of space by extension therefore necessarily implies that China is willing and able to cause catastrophic and indiscriminate damage.

These prospective clashes between US and Chinese military forces are rarely fleshed out[52] (although as we will see in Chapter Eight, wargames provide one venue for much more

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[52] The prospect of China disrupting American nuclear deterrence discussed earlier also implies a reckless and aggressive China. For the claim that China poses a threat to nuclear command and control to make sense, it must be assumed that China is willing to undertake this kind of action in pursuit of some foreign policy goals. This project encountered no official discourse which "fleshes out" this scenario, however, and so it would be unwise to speculate.

"complete" causal narratives of US-China warfare). As we saw in the previous chapter, official or quasi-official discourse often links a future Sino-US conflict with a Taiwan crisis (see for example DoD 2006:1, 2012: 18-19, Senate 2007a: S12502-12503).[53] Discussions about space vulnerabilities in relation to China take place under a context of assumed general conflict with China, not necessarily inevitable but certainly at least "realistic." When further specifics are provided, the question of Taiwan and American intervention are much stronger explicit attempts to tie together specific US foreign policy objectives, how they clash with Chinese objectives, and the ways and means by which this clash could/would play out in "reality." The 2007 US-China Economic and Security Review Commission Report to Congress was quick to point out that 'Space and counter-space capabilities have considerable implications for carrying out disruptive missions in Taiwan Strait contingencies' (USCC 2007: 101). "China watchers" outside of the US government have gone further, such as John Pike (an analyst at GlobalSecurity.org) who told journalists that 'The Chinese stage these big amphibious exercises off Taiwan all the time. One day, maybe it'll be real … Those satellites are low-hanging fruit. It's a no brainer' (in Hoffman 2009). A key point can be drawn out here: a prevailing component of the discourses which constitute the new American way of war call for global American reach, the possibility of which is threatened by China's development and deployment of A2/AD technologies. If America cannot project power into the Taiwan Strait in a reliable manner, and without taking heavy casualties, then it cannot really "be" the desired form of national Self.

6.3 The "Chinese space threat" to American exceptionalism

'Our space program is an integral part of American exceptionalism' – Presidential Candidate

Mitt Romney (in Rucker 2012)

The "Chinese space threat" was positioned by its advocates as threatening an important component of the national Self: American exceptionalism. Given the long-standing prominence of the idea of American exceptionalism, it is worth asking first what "contents" of American identity in foreign policy have previously been identified by scholars and policymakers. Both scholars and policymakers have drawn on America's past to understand its identity as a foreign policy actor. David Campbell (1992: 251) argues that 'America - wanting a land which always bore its name or a people who always identified themselves as 'Americans' -

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[53] For an academic account see Michael O'Hanlon (2004: 91-104).

is the imagined community par excellence.' Chengxin Pan (2004: 310-311) quotes the 'City upon a Hill' trope picked up on by various American policymakers, notably including President Reagan (1980). Scholars have highlighted recurring components of these imagined histories. It is possible to think of American exceptionalism as just one of a few powerful discourses constituting American national identity, such as Amy Skonieczny (2001: 440) who identifies three "myths": the American Dream, American Exceptionalism, and Populism. These discourses have a positive, normative bent. For example, Nabers (2009: 204) argues that post-9/11 discourses constructed the US as 'a rather homogenous, peace-loving nation.' Yet they rely on a particular understanding of history. The "American Dream" implies both a past and a future of progress, and "Populism" implies a democratic past, present and future (Skonieczny 2001: 440-441). At times, these various aspects of the American Self have competed with one another. Donald Pease (2009: 7, 9) argues that although American exceptionalism was the dominant 'horizon of intelligibility' for 'American events' during the Cold War, policymakers were quick to reconfigure it if elements became incompatible. That being said, an enduring feature from the earliest days of the Republic to the present day are the superlative qualities the US is meant to possess, and sufficient flexibility in the definition of exceptionalism to ensure it is always applicable (see Madsen 1998: 37).

Exceptionalism remains a potent discourse of American foreign policy and has been reproduced at the highest levels of government even in recent history. President George W. Bush had made use of the discourses of American exceptionalism during his presidency, conceptualising it as 'a beacon to the world … a fully formed manifest American virtue ready for export' (Toal 2009: 381). According to Richard Jackson (2005: 35-6), this was used to construct America as 'an exceptional kind of victim' of terrorism, which in turns helps 'divest the nation of the moral responsibility for counter-violence.' Both Gerard Toal (2009) and Georg Löfflmann (2015: 309) argue that President Barack Obama 're-appropriated' the 'uniqueness of the United States, the belief in the superiority of American values, and the preeminence of American power.' Seemingly paradoxically, 'Under Obama, American exceptionalism functions as a discursive device that augments a largely un-exceptional foreign and security policy' – which in part entails 'leading from behind' (Löfflmann 2015: 309). Similarly, Luiza Bialasiewicz and her colleagues (2007: 416) argue that the US has 'construct[ed] itself as the undisputed leader in the new global scenario' although 'its "right" … relies on its amplification and support by allies.' Moments such as the 2012 Presidential election, by this reading, were contests over the meaning of American exceptionalism (Löfflmann 2015: 312) – and the prominence of the idea was also a particularly strong element in American space policy discourse.

According to polling by the Pew Research Center, '58% of Americans said it is *essential* that the U.S. be a world leader in space exploration' (Kennedy 2015, emphasis added). Mitt Romney set out a similar position when campaigning to be President in 2012, saying that 'Our space program is an integral part of American exceptionalism' (Romney in Rucker 2012). Daniel Sage (2016) went so far as to claim in his book title that *Outer Space Made America*. These are all reflective of attempts to construct an American identity in such a way that it would be incomplete without outer space. As argued in Chapter Two, critical security scholarship points to the importance of identity and directs us to study the processes by which they are produced and reproduced, including the practices which help constitute them. How then are we to conceptualise American activity in outer space, and American constructions of Chinese activity in outer space?

Whereas the preceding section dealt with the intersection of discourses of identity and concrete technical relationships, this section has a broader scope. American space advocates made various claims about how essential the US space program was to America in non-military terms. Proponents of the "Chinese space threat" adapted this and intensified the sense of decline found in wider American political discourse.[54] These claims can broadly be sorted into two categories, although they are mutually supportive of one another (and also help support notions of military security analysed earlier). The first line of reasoning holds that the American space program is essential to American prestige, and more broadly the ideals of America such as exceptionalism, optimism and the frontier. The second line of reasoning is that the space program is essential to the US economy. Much as in the case of military security, the space advocates making these claims do not often face direct opposition but rather are railing against what they perceive as a lack of recognition and ambivalence towards the space program.

The "Chinese space threat" to exceptional American prestige

'Recreating Apollo is doomed to fail, in no small measure because of the myths and nostalgia surrounding it…' – Roger Launius, ex-Chief Historian, NASA (2005: 138)

American notions of prestige in space are fragile and rarely, if ever, fully articulated. At one extreme, members of Congress claim that China could "beat" the US to the Moon, but

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[54] Seymour Lipset (1996: 267) identifies the last third of the 20th century as the beginning of a widespread sense of "decline" among the American public.

even the more measured claims that a Chinese Moon landing would harm the US in some way rely on highly consequential yet implicit notions of national prestige. Two interrelated "positive" discourses of American identity seem to be at stake in this field: exceptionalism and the "frontier."

The Moon landings are central in US space policy discourses, especially in Congress. The power of the image is so strong that it is a trope used elsewhere – from the National Cancer Institute's "Cancer Moonshot" and President Obama's push for energy self-sufficiency, to the more mundane Hewlett Packard "Moonshot Servers," which boast 'workload-optimised solutions for better business outcomes' (NCI N.D., Jasanoff and Kim 2009: 120, HPE 2017). The US is the only state to have put its citizens on the Moon, an idea which complements wider discourses on the exceptional nature of the country and its history of thriving at the frontier. US space discourses have drawn on colonial narratives, manifest destiny and calls for the country to dominate outer space (Launius 2005). Chinese manned space capabilities create the possibility that American achievements on the Moon are not finished, that they can yet be challenged by "others" – with their own flags and desires to be exceptional (see Chapter 5). It is the combination of the dichotomy of Chinese and American identities in addition to the prospect of "new" Chinese technical affordances (heavy lift rockets and crewed moon landers) and the absence of comparable American capabilities which threaten an aspect of US identity as exceptional.

The Moon landings are one supporting symbol of broader discourses of American exceptionalism,[55] to the point that the Apollo program can be seen as a 'mythic event' in American history (Launius 2005: 129, see also Tatarewicz 2009: 535-536). Much as Hecht (1998) argues that nuclear technology became quintessentially French (in France at least), the Moon landings are quintessentially American. The American space program of the 1960s was consciously a kind of "spectacular" used as 'an indicator of world leadership,' in the words of Howard McCurdy (1997: 97). This seems to have worked as intended, at least as far as a domestic audience was concerned. Drawing on tropes from American popular culture in the 1970s, Roger Launius (2003: 164) argues that the landings were a powerful example of government success and that it demonstrated 'what set the United States apart from every other nation in the world, success in spaceflight.' Daniel Sage (2014: 72, see also 2008) similarly writes that 'Project Apollo, NASA's technocratic triumph, was always bound up with something beyond itself… Sublime mythologies of American exceptionalism.' The time in which

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[55] See also Roger Harrison (2013: 127-128) for exceptionalism and space control.

American technical affordances were required to carry out the feat of the Moon landings is over, but the symbolic power of the technological achievement remains even as NASA no longer possesses much of the equipment required to return. This points to a conclusion that the identity of the US as an exceptional space power does not require constant reproduction by practice, with reproduction in wider discourse seemingly sufficient to maintain the prominence of the symbolism.

It is these prevailing discourses which set the terms for how American exceptionalism might be invalidated or threatened, as they provide the frames of reference and standards of assessment. The anxieties expressed by members of Congress about Chinese technical capabilities constitute attempts to cement the role of space in relation to exceptionalism. The requirements to preserve this element of identity are set out by congressional voices, who indicate that it is necessary for the US to *remain* the only country to land on the Moon. For example, one Congressman framed the prospect of Chinese *flags* on the Moon as a problem (House 2005b: 4749, see also Chapter 5). Yet these constructions of America's lunar achievements as highly fragile go against the grain of decades of subsequent understandings of the Apollo program. As Johnson-Freese (2015: 95) points out, 'the last three Apollo missions were canceled with little notice or objection' – there was little public or political interest in repeating the feat more than a few times. This is fairly compelling evidence that the *prevailing* discourses of American exceptionalism, when they intersect with the Moon landings, did not and do not call for constant 'space spectaculars.' Indeed, McCurdy (1997: 97) argues that JFK saw the *announcement* as the most spectacular element and that 'the actual mobilization for the voyage was anticlimactic to the decision to go.' Joseph Tatarewicz (2009: 536) calls Apollo 'an aberration that saddled NASA with dysfunctional expectations and obsolete infrastructure' but this is framed in terms of internal NASA organisational politics ('NASA … took the Apollo experience for the norm'). He points out that in mainstream politics, 'President Kennedy got "buyer's remorse" within months,' 'even Johnson lost interest … when he became president' and 'the political system continually interfered' (Tatarewicz 2009: 536). In light of this historical context, it is clear that congressional claims in the 2000s and 2010s sought to modify older expressions of American exceptionalism in space.

Those who conjure the legacy of Apollo and then claim it is threatened by China necessarily also implicitly claim that American exceptionalism in space will be damaged by a Chinese Moon landing. This position adopts a kind of ahistoricism: it would not matter that the US had been first on the Moon, decades before China. One member of Congress went so far as to say that China could "beat" the US to the Moon (see Chapter 5). The proposed solution to

this "threat" to American exceptionalism is a return to the Moon, presumably to demonstrate to China and the world that the US *is* still exceptional. This threat, then, is a product of technical, practical and linguistic components, both Chinese and American. The following chapter will investigate what political goals are served by conjuring a Chinese threat to American prestige. Now this section turns to notions of the American frontier and how China's space efforts supposedly threaten that aspect of American identity.

The "Chinese space threat" to the "frontier" of American exceptionalism

> *'From the voyages of Columbus – to the Oregon Trail – to the journey to the Moon itself – history proves that we have never lost by pressing the limits of our frontiers' – President George H.W. Bush (in McCurdy 1997: 158)*

Historians and cultural theorists have argued that there is a strong link between American space exploration and the long-standing power of frontier metaphors in American society. The crux of the image of the "frontier" was economic. As David Wrobel (1993: 5) argues, 'In the minds of many, the frontier of free or cheap land had always been the wellspring of American democracy … the frontier facilitated the continued existence and growth of democracy.' In terms of the construction of national Selves, then, the representation of a "frontier" created a place in which America could continue to possess the democratic aspects of its Self. This link to the democratic aspects of the national Self is also a point of convergence with the discourse of American exceptionalism explored earlier (see Hunt 1987: 23, Madsen 1998: 37, Pease 2009: 7).

With such long-standing narratives linking American exceptionalism to the frontier, and importantly the utopian economic promises that it supposedly provided, the articulation of space as the "new" frontier was built on sturdy discursive foundations. De Witt Douglas Kilgore (2003: 1-2) identifies what he calls a 'tradition' of "Astrofuturism" which is

> Devoted to breaking the limits placed on humanity by the surface of this planet, astrofuturism forecasts an escape from terrestrial history. Its roots lie in the nineteenth-century Euro-American preoccupation with imperial expansion and utopian speculation.

He notes attempts in the past to construct outer space as a natural and essential extension of American identity, with the American frontier playing an important discursive role (Kilgore 2003: 74, 84). Howard McCurdy (1997: 53) likewise argues that at the start of the Space Race,

advocates 'had to conjure images that would promote the will to act. For this purpose space advocates found a ready supplement in public anxiety about the Cold War … Public fears played a critical role in unleashing the billions of dollars necessary to begin the conquest of space.' It was not only fear which American policymakers drew on to justify the space program, however, but also dreams and positive myths. The idea of Americans as a nation which had conquered frontiers in the past was one of the tropes which space advocates drew upon. When John Glenn became the first American to orbit the Earth, *The Washington Post* compared the flight to 'Columbus's discovery of America' (McCurdy 1997: 96). For McCurdy (1997: 139), space advocates created a narrative which ran as follows:

> Government support of space exploration would maintain the pioneering spirit by opening new frontiers, without which, space advocates argue, Americans would become indistinguishable from other nationalities

This invocation of a frontier metaphor continued in official public rhetoric through the 1980s and 1990s (McCurdy 1997: 140-141).

More recent constructions of space as ripe for benign American leadership, and the narrative of a "Chinese space threat," complements these wider representations. Prominent cultural figures have argued that human/American history (not necessarily fully delineated in such discourses) is characterised by expansion, exploration and the conquering of frontiers. Perhaps most famously, the original 1960s *Star Trek* declared space to be the "final frontier." In his popular *Pale Blue Dot*, Carl Sagan (1994: xiv, xxi) states that 'For 99.9 per cent of the time since our species came to be … The frontier was everywhere' concluding his pocket history of human kind (taking in exploration and the conquering of the New World) by arguing 'a central element of the human future lies far beyond the Earth.' Educational sources produced by space advocates draw on the frontier metaphor to frame their work. Space Command titled their own academic journal *High Frontier*, for example, which is filled with dreams and nightmares about humanity's future in space (AFSpC N.D.c) and Joan Johnson-Freese (with Handberg 1997), who teaches at the Naval War College, entitled one of her books *Space: The Dormant Frontier*. Everett Dolman's (2002) *Astropolitik* provides one vision of Americans' natural suitability for frontier life resulting in a *laissez-faire* utopian future for humanity in space. Dolman (2002: 181, see also 179) calls for a new regime of free trade in space, and that 'As the great liberal democracy of its time, the United States is preferentially endowed to guide the whole of humanity into space, to police any misuse of that realm, and to ensure an equitable division of its spoils.'

The prospect of China gaining an economic foothold in space imperilled the possibility of unfettered American exploitation of the economic frontier of space. The American frontier, coupled with American exceptionalism, envisage an America which can (and must) be eternal. Roger Launius (2015) provides a more moderate vision of the economic aspect of American exceptionalism in space in terms of 'Economic leadership,' because the US is 'as an agent of economic growth.' Yet there is also a more explicitly utopian strain to American ideas of space and economics. Andrew Gasser (2017), a Tea Party campaigner, argued that 'the economics of space exploration and settlement are truly infinite.' The promise of an untapped frontier was also the promise of infinite expansion both territorial and economic (McCurdy 1997: 161). While the Tea Party might be considered to have been a somewhat fringe voice at the time, these same sentiments were expressed in official discourse on the floor of Congress and specifically articulated as a component of the "Chinese space threat" (see House 2010b: H4658, H4660, 2011b: E1274-1275).

The notion of a "space economy" and an "American space industry" became objects to be secured, even as these categories remained ill-defined. More widely in US space policy discourse, a stark contrast was constructed between the image of a technologically advanced, world-leading American economy, compared with the technical affordances space assets provide for the US economy. Rather than provide details of the rather mundane benefits which space technology lends the American economy, advocates preferred to aggregate and quantify overall economic benefit and appeal to ideas of technological progress. For example, a space industry pressure group, the Space Foundation, reported in 2016 that the "Global Space Economy" was worth $323 billion the preceding year (Space Foundation 2016). By comparison, US GDP in 2016 was $18.56 trillion (CIA 2017). The OECD (2014: 3, 9) reported that 'The space sector plays an increasingly pivotal role in the efficient functioning of modern societies and their economic development.' A notable example of the economic benefit of space assets is that of GPS, which the relevant national advisory board (for Space-based Positioning Navigation and Timing) claims provides $55 billion of benefits annually (Stenbit 2016). NOAA (2015) concluded that of the estimated $55.7 billion of the economic benefit from the GPS system, 13.7 billion was in 'Precision Agriculture – grain,' $5 billion in machine guided 'earthmoving' in construction, $11.6 billion in surveying, and $25 billion in vehicle guidance (Leveson 2015: VIII). NASA frequently "sells" itself by highlighting the technologies which have been "spun-off" from space research (see for example NASA N.D, Wilson 2008). These benefits take the form of relatively mundane technological benefits, however, far-removed from the soaring rhetoric of space policy advocates inside and outside of the US

government. The specifics of these rather mundane technical aspects are not invoked by space advocates when linking space technology to American identity, seemingly unnecessary for making the case that space technology is essential to the US economy. The image of the frontier was far more powerful, and presumably more compelling.

While its advocates attempted to link the "Chinese space threat" to broader damage to American preponderance, their more specific claims relate to the US space industry. Elected representatives called for the protection and development of the US space industry from "unfair" Chinese competition beginning in the 1980s (see Schroeder in House 1988: 210, Congress 1998: 2177, Chapter 4). Representative Kevin McCarthy (R-CA) stated in 2014 that 'Support for U.S. commercial space will lead to American astronauts flying on American-made rockets from American soil … That is exceptionalism that both parties can get behind' (in Munsil 2014). This line was then favourably repeated by Charles Bolden, then NASA Administrator (Bolden 2014). For some American officials, China threatened these visions of the US "space economy" by being a non-American entity obtaining the same technical capabilities as the US in areas like space launch and satellite services. Yet Bolden's (2014) endorsement elided his own scepticism of the "Chinese space threat," demonstrating the appeal of exceptionalism in space beyond debates about China (Klotz 2015). In the debates in the 1980s, the fear was that the Chinese government would subsidise their nascent commercial launch industry to the point of destroying its American counterpart. America was portrayed as a competitive, technologically savvy nation which could only be undone in the new frontier of the space economy because of malicious and "unfair" Chinese government policies (see House 1988). The adherents of the "Chinese space threat" effectively "won" the debate inside the US government on how to address this threat with ITAR, making it extremely difficult for US payloads to be hosted in China. As previously indicated, since the Bush Administration, coupled with pressure in Congress, these rules effectively ended American corporate access to the Chinese commercial launch industry. These successful policy interventions which reflected the existence of a "Chinese space threat" could not help but draw on the more widespread, and dramatic, accounts of the threat to American military power outlined in Section 1. Yet, the "Chinese space threat" was also successfully posed in its own right to American exceptionalism, a narrative so prevalent that even the "space threat" sceptics (such as they were) ended up reproducing some of the same reasoning.

Conclusion

As we have seen in this chapter, proponents of the "Chinese space threat" have attempted to overturn what they see as a dangerous lack of attention for space matters relating to military and economic issues. To do this, American policy elites have built up two fairly distinct, yet mutually supporting narratives of specific Chinese "threats" to specific aspects of the American national Self. Together these narratives provide the linguistic elements that could be deployed in debates on the technological decisions the US faced in response to China's "rise" in space.

The most important aspect of the national Self which the "Chinese space threat" is positioned as jeopardising was the new, clean and 'virtuous' (Der Derian 2009) "American way of war." American policy elites have built on existing, prevailing formulations of "the new American way of war" in order to highlight the crucial roles of space technology in enabling the desirable practices of American warfighting. At times, this is done in a way which explicitly compared the 'virtuous' "new American way of war" with the old, undesirable practices of warfare during World War II (Der Derian 2009: 136). In matters of conventional war, they warn that China could destroy satellites and transport American back to a time when casualties were unavoidably high. Advancing a specific vision of how America *should* fight its wars did not always require direct comparison, however. Military and political elites also warned that the US would not be able to project power wherever it wanted and needed. Their most catastrophic visions of all warned that Chinese space technology jeopardised the President's ability to control the nuclear stockpile, and therefore by extension the stability of American nuclear deterrence and the existence of the American homeland. All of these claims involved complex, mutual relationships between identity and technical artefacts. The overall effect was the successful supplanting of the prior discursive representation of unchallenged American military space power, with constructions of an America reliant on space but with no defense against the new "Chinese space threat." These struggles over the meaning of space technologies and national identities also played into debates on military technology procurement, explored in the next chapter.

The second major component of the technopolitical identity politics of the "Chinese space threat" related to notions of American "exceptionalism." This manifested under two main themes: national prestige, particularly around the legacy of the Moon landings, and utopian economic visions under the rubric of the American "frontier." Although less dominant than the discourse positioning China as a "threat" to the "new American way of war," the "Chinese space threat" to American "exceptionalism" was an important supporting component of narrative of a threatening "rise" of China in space. In matters of economics and prestige, the

"threat" advocates had some moderate success. The conventional, prevailing understandings of Apollo as an unassailable national achievement was a powerful opponent for the "Chinese space threat" advocates to overturn with their countervailing visions of Chinese flags on the Moon. The greatest success, built not only on the discourse of the utopian vision of an endless American "frontier," but also favourably positioned to draw on the strength of the military and prestige components of the wider "Chinese space threat," was in the implementation of specific anti-Chinese trade regulations for space technology. Much as in the case of the military threat, the threat to "exceptionalism" was also significant because it played directly into debates about grand national technological programs such as the Space Shuttle, Constellation, and Orion.

By simultaneously problematising the concepts of technology and culture, it is possible to recognise in these debates over identity that, at least on one level, those sounding the alarm on China are "correct." The "new American way of war" does indeed require certain technical affordances in order to be realised, and China possesses the capability to destroy or disable those artefacts. What is missing from this argument is the recognition that this position also relies on technopolitical constructions of both China and America, and crucially that these constructions are socially contingent. Whether it was the military, prestige, or economic components of the American national Self which was supposedly threatened by China's space program, analysis of the discourse reveals that these linguistic moves were attempts to contest or reproduce wider, powerful discourses constituting national identity. Collectively they portray a nation that is much more fragile than their imagined audiences realised. Proponents of the "Chinese space threat" are therefore involved in creating new technopolitical relationships between China, the US, and their space technologies. While we can see their attempts at supplanting older representations of the state and space technology as broadly successful, the question remains of how successful they are in translating this success in rhetoric into transformations of American technics themselves. It is this question of the power of the "Chinese space threat" discourse on the American 'social battlefield of technology' which must be addressed.

Part 3: Inscribing the "Chinese Space Threat" into American Space Technology and the National Self

The purpose of Part 3 is to assess to what extent the "Chinese space threat" discourse was inscribed into American space technology and conceptions of national identity. The need for this assessment results from the conclusions of Parts 1 and 2. Specifically, Part 1 demonstrated the historical contingency and uneven construction of the threat of Chinese space technology. Most notably, rhetoric on US-China space cooperation was reflected and reproduced with physical changes to American space technology. Part 2 then explored how the discourse of threat returned and intensified after 2000, mapping which identities and technologies were invoked in the relevant policy debates. Based on a comparison to the findings of Part 1, a powerful discourse would be expected to be reflected in publicly discernible technical change and wider constructions of national identity. If the analysis were to stop at Part 2, the dominance of the "Chinese space threat" would seem all-conquering because of its uncontested position in US public policy discourse. Yet, the analytical lens of technopolitics allows for a more complex analysis. By considering the technics and identities invoked in the "Chinese space threat" discourse as sites of political struggle, Part 3 demonstrates that a disjuncture existed between the intense rhetoric of threat on the one hand, and the limited public interventions into the shaping of American space technology and national identity on the other.

Chapter 7

Not designed with China in mind: inscribing the "Chinese Space Threat" into American space technology

Introduction

For those who advocate the existence of a "Chinese space threat," it is not sufficient to simply persuade policymakers of its veracity. The "threat" must also be actively countered with sanctioned practices. As was argued in Chapter 6, the physical security of specific artefacts is demanded by prevailing formulations of American identity. Reflective of this, at the end of the Barack Obama administration, the DoD's official line on space technology acquisition was firmly located within the discourse of "resilience." The contention of the "Chinese space threat" advocates had come to be that these artefacts were 'not designed with threats in mind' (Hyten in AFSPC Public Affairs 2016a), a problem that could be addressed by re-designing them to be more "resilient." This built on wider prevailing discourses of techno-optimism in American defence policy, reflected in the centrality of the notions of the "new American way of war" and "American exceptionalism." To put it another way, whether it was advocates of new space weapons to counter China, or added "resiliency," advocates of the "Chinese space threat" set themselves the task of inscribing their conceptions of China into the materiality of American space technology. Importantly this also included setting success criteria for specific physical changes required for them to reflect the "new" threat.

The efficacy of the "China space threat" advocates' efforts can be questioned, however. Changing the rhetoric proved to be simpler than changing the technics. Ultimately both the Bush and Obama administrations made only incremental changes to key strategic space systems, the same systems underpinning the practices analysed in the preceding chapter.[56] The "resiliency" discourse drew on older technological projects, particularly Operationally Responsive Space (ORS). It also contended with the rival proposal for the US to build space weapons to deter China in space. These proposed responses both took the existence of a "Chinese space threat" as a starting point and both proposed to institute new

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[56] Specifically: GPS; Milstar and its replacement AEHF system; and DSP and SBIRS EW systems.

technopolitical arrangements to address the threat. Yet ultimately they both fell short of their stated goals.

First, this chapter assesses the failure of the "call to arms" discourse to gain a hegemonic position in American space policy. Although not totally extinguished, this defeat was cemented after the release of the Bush administration's National Space Policy (NSP), and later the election of Barack Obama. By the end of the Obama administration, there were no official voices publicly calling for American space weapons. By analysing the technopolitics in question, it is clear that it was not simply the change in administration that was the proximate cause of the lack of dominance of the "call to arms." Rather, the crucial point seems to have been the inability for unofficial voices to make official discourse reproduce the former's proposals. Second, the chapter analyses the "resilience" discourse and argues that it successfully became the dominant favoured "solution" in US space policy. Despite the rhetorical success of the "resilience" discourse, however, by the end of the Barack Obama administration it had not been accompanied by corresponding changes to the materiality of US space technology.[57]

As discussed in Chapter 2, questions of the design and "function" of technologies can be understood as processes of instrumentalisation. The purpose of Chapter 7 is to examine how American technology was, or was not, re-instrumentalised to reflect the dominance of the "Chinese space threat" discourse. What sets Chapter 7 (and later Chapter 8) apart from the rest of the thesis is the specific engagement with the primary instrumentalisation of American space technology – where objects are 'simplifie[d]' for 'incorporation into a device' (Feenberg 2010: 73). This chapter, more than any other in this thesis, draws most heavily on the

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[57] The previous chapter highlighted the Chinese threat to American exceptionalism through its development of crewed space technology. Somewhat surprisingly, these vivid constructions of threat were not used to advocate very often for new crewed capabilities, but as seen in the previous chapter used to oppose policies such as spending cuts. Representations of threat were used reactively, not proactively. For example, see Representative John Carter (R-TX) (in House 2010: H4659-4660) using the spectre of China to attempt to preserve the Constellation program (see also Wolf in House 2012a: H2361). "Jobs" feature more prominently than the threat of China (even to those jobs) (see Matson 2011, Davis 2016). Indeed, Representative Culberson (R-TX), did not use the "China threat" to advocate for Constellation's replacement, Orion (see House 2016: H2781). See also Senator Nelson (D-FL) (in Senate 2016: S45-46) on SLS.

    A few examples of the deployment of the "rise" to advocate for "new" technologies do exist in the public record. For example, Representative Sheila Jackson Lee (D-TX) (in House 2015a: H892) referenced China's space program as evidence that space remained a realm for America to preserve its leadership, but without invoking threat. These examples are too few to deploy the methodology outlined in Chapter 2. What can be said is that invoking China was clearly insufficient to save Constellation, or to proceed at any great speed to replace the Space Shuttle (since at the time of writing, the US has been unable to independently launch astronauts since 2011).

analytical approach of Donal Mackenzie (1993) in *Inventing Accuracy*. A claim which cuts to the core of his approach is that 'how accurate one strives to make one's missiles is related intimately to the targets one envisages' (Mackenzie 1993: 19). The final section of this chapter explores an inverted version of this sort of relationship: American satellites are envisaged as targets, and a contest took place over how "resilient" they should be in relation to the "threat" of Chinese ASAT missiles. Then, just as Mackenzie (1993: 6) argues that we can dispute how accurate a missile is, the "resilience" of a component of space technology can also be disputed. Yet, in these sorts of political struggles over the shape of technology, it is possible to discern to what extent rival conceptions of values like "accuracy" and "resilience" are inscribed into technics, because ultimately technology enables some social outcomes while closing down others (Marcuse 2001: 54, Hutchby 2001: 447, Feenberg 2010: 15-16, McCarthy 2013: 489). Indeed, there seems to have been little debate as to what "resilience" meant in US space policy relating to the "rise of China" in space, therefore it is fairly certain what success criteria the "resilience" advocates set for themselves. However, this is only one aspect of the political struggle: establishing a dominant understanding of the concept only goes so far. The second aspect of the struggle, and the question that is most pressing in this chapter, is how well the technics which are ultimately manufactured correspond to the dominant articulation of the value (for example, "resilience") that is supposedly embodied in the "finished" artefacts.

7.1 China and the "call to arms" in space policy

At the start of the Bush administration, a fairly coherent discourse calling for the procurement of American space weapons was identifiable, albeit mostly from non-official sources. This chapter uses the label of a "call to arms discourse" to characterise this phenomenon. The task of this section is to explore how these ideas fared during China's supposed "rise in space" as some groups attempted to use the "Chinese space threat" as a justification, sometimes for "old" technologies such as Ballistic Missile Defense (BMD). Ultimately, despite their success in funding research and pilot programs, the advocates of new American space weapons failed to establish a dominant position for their rhetoric, particularly in respect to the failure to justify the deployment of space weaponry. Indicative of this, the wider American foreign policy elite, broadly speaking, did not engage with the proposals (López 2012: 51).

The Bush Administration inherited a small number of exploratory research projects in to potential space weapons. What this thesis identifies as the contemporary iteration of the "Chinese space threat" discourse was still nascent in the early 2000s, before the twin foundational events of China's "rise" in space in 2003 and 2007. In official public discourse, the military was not calling for space weapons in the early 2000s.[58] Writing after the launch of Shenzhou-5 but before the "technology demonstration" of 2007, Theresa Hitchens, Michael Katz-Hyman and Jeffrey Lewis (2006) undertook a study of extant "space control and space force application" programs in unclassified budgets. They argued that although there were myriad small research projects, these constituted 'little evidence of a coherent spending plan to implement the articulated space war-fighting strategy' (Hitchens et al. 2006: 37). The prospect of American space weapons had seen opposition in Congress, seemingly restricting what Congressional space weapon advocates could articulate in response. An attempt to legislatively bind the US to negotiating a treaty banning space weapons was justified in part by the lack of credible space threats and the prospect that the Bush administration could later pursue space weaponisation (House 2005: H6123). The author of the amendment calling for the ban, Representative Dennis Kucinich (D-OH), specifically challenged a foundational assumption of the "call to arms" discourse, namely that American satellites were under threat. He stated that

> no nation has deployed destructive weapons in space[59] or destroyed the satellites of another nation ... Space assets of the United States have received no national security threats. Our national security threats are far from outer space. (House 2005b: H6123).

The opponents of the ban did not respond by openly calling for the deployment of space weapons, perhaps because of the controversy that would attract, but rather opposed the treaty with the softer claim that it would 'tie our hands from the ability to freely and peacefully operate in space' (House 2005: H6124). Kucinich's opponents did not attempt to explicitly claim that US space assets were under threat now, rather they implied that they *could* be in the future (see Everett, Cramer and Smith in House 2005b: H6124). Crucially, this was hardly a substantial and official endorsement for the acquisition of American space weapons. By 2006,

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[58] Although see Spacy (1999) for a pre-2007, mid-ranking officer's perspective. Sheehan (2007: 110) also points out that the US military saw the deterrence potential of space-based weapons as early as 1982. For a retired officer's perspective see Rendleman (2010: 230-231). These do not constitute official discourses, however.

[59] This is empirically incorrect. The Soviets had deployed co-orbital ASATs during the Cold War (Weeden 2014).

this iteration of the case for American space weapons remained unsuccessful, at least in the public sphere. The fears in Congress and of Hitchens et. al (2006: 36) that the Bush administration would change course went unrealised in the 2006 National Space Policy which ultimately did not publicly change the policy of non-deployment of weapons in space (White House 2006).

In this light, it seemed that the space weapon advocates had lost a major contest over the overarching rhetoric of American space policy. The "Chinese space threat" was insufficient to save their case. Even after the 2007 test, policymakers who had previously advocated space weapons increasingly began to use the "Chinese space threat" to justify the continuation of programs. A small group of Senators, who had historically also advocated BMD technology,[60] explicitly linked the Chinese ASAT test to the need for research into space-based BMD interceptors (Kyl, Allard and Inhofe in Senate 2007: 12503, 12505, 2008: S10052-S10053). Again, potential evidence of the rhetorical constraints space weapon advocates faced can be seen in the careful framing of their attempts as calls for research rather than outright deployment (see Kyl in Senate 2007: S12502). Non- and semi-official discourse helped support these efforts, particularly from think-tanks (Tellis 2007: 65, and his piece in Krepon et al. 2008: fn. 198) and universities (Saunders and Lutes 2007: 43, Steinberg 2012: 255-258). These voices were less constrained and could explicitly call for US space weapons. Together these advocates put forward a *de-facto* military strategy and foreign policy towards China in space – to prepare to fight a potential space war. This strategy called for certain practices, in turn which required certain affordances. Although they had been successful in manufacturing technical demonstrators (see Hitchens et al. 2006 above), these were not sufficient to practice their proposed strategy. Further technological change would have been required for them to realise their stated goals.

At the start of the Obama administration, then, an explicitly articulated policy of the deployment of space weapons seemed to be unlikely. This was compounded by the cancellation of the Multiple Kill Vehicle (MKV) (officially for joint technical and budgetary reasons) in 2009 in the context of focusing on tactical BMD systems and a reduction in funding of $1.4 billion (Gates 2010). The MKV was a program which started in 2004 with the aim of contributing to the 'layered approach to BMD' pursued at the time (Masters 2014). This was a similar technology to those identified by Hitchens and her colleagues (2006) which were also slowly side-lined. However, the MKV seemed to be revived in 2015 under the guise of the

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[60] For a more detailed account of the justification of BMD in US security politics, see Peoples (2010).

Multi-Object Kill Vehicle (MOKV) (Wasserbly 2017). American ASAT capabilities were also vividly demonstrated in 2008 with the shootdown of USA-193 with an SM-3 missile, and the experimental X-37b vehicle was assumed by some aerospace journalists to have space weapon applications (Burghardt 2010, Davis 2016). These examples, however, do not constitute sufficient grounds to argue that the "call to arms" discourse was successful in achieving a hegemonic status. Instead, it is necessary to ask how these technologies were contextualised in public discourse. To achieve this, this section now proceeds to argue that the ambivalence of artefacts like the SM-3, MOKV and X-37B meant that without the accompanying context established by secondary instrumentalisation, the existence of these potential "space weapons" cannot be equated with the success of the "call to arms." Although it possessed affordances which *could* have been instrumentalised as space weapons, ultimately this possibility was not realised because the US retained an official public policy of non-deployment.

The "call to arms" discourse

If we are to assess how close the "call to arms" discourse came to achieving a dominant position during the Bush and Obama years, we need to be able to unpack its internal logic and goals. Broadly speaking, the "call to arms" discourse espouses logic(s) which are reminiscent of what Nancy Kanwisher (1989: 658) terms the 'homeopathy heuristic.' This is 'where countermeasures are frequently matched to threats' (Kanwisher 1989: 658), the Cold War example of which is 'the notion that the most effective way to deter the Soviets from using a certain kind of weapon is to deploy a similar weapon.' It is precisely this logic which can be seen in calls for the US to build new space weaponry to deal with China's own "space weapons." For example, the US already possessed what would later be termed "Prompt Global Strike" capabilities, which could have destroyed Chinese ASAT launch sites (Easton 2009: 10). What advocates of space weapons were seeking, then, was not *a* counter to enemy ASATs but rather a weapon closely connected to space whose affordances symbolically mirrored those of enemy ASATs. This observation helps to draw out the symbolic aspects of the proposed techno-strategy, in what otherwise purports to be purely rational and objective. Kanwisher's approach is psychological, and does not draw on the concept of technopolitics. By combining the two insights, it becomes clear that the "call to arms" discourse was aiming to code the 'homeopathy heuristic' *into* the materiality of American space technology. In concrete terms, this meant the manufacture of new artefacts which lent similar technical affordances to the

technology of America's rivals in order to provide (presumably) a kind of counter-symbolism. In a sense, the SM-3, MOKV and X-37B fulfilled these requirements – but only in a strictly technical sense (that is to say, only if we arbitrarily strip the technics of their proper political context). Their instrumentalisation into a social and political context shows ultimately how little power the "call to arms" discourse had in public space policy. Rather than become successes for the advocates of space weapons, these systems were instead "claimed" by the Missile Defense Agency (MDA) and Air Force Space Command (AFSPC) as something other than space weapons.

The US publicly confirmed the anti-satellite capabilities of the Standard Missile 3 (SM-3) in 2008 (MDA N.D., Mackey 2009: 88). This was officially presented as an exception, both technically and politically. It was a technical exception because the SM-3 required significant modification to engage a different kind of target (a satellite rather than a ballistic missile) (Anonymous 'Pentagon official' in McIntyre et al. 2008). It was a political exception because the SM-3 was a part of the Aegis Ballistic Missile Defense system, and so the shoot-down was not framed as a policy shift: the Aegis system officially remained a BMD system, and no more. The MDA agency claimed the shoot-down as a great success for their organisation but made sure to play down the parallels with "space weapons." On the MDA website, the incident is referred to as a "One-Time Mission" (MDA N.D.). Similarly, the manufacturer of the missile, Raytheon, does not "sell" the SM-3 as an ASAT weapon, rather a 'defensive weapon the U.S. Navy uses to destroy short- to intermediate-range ballistic missiles' (Raytheon N.D.). The US Navy quickly returned to praising the BMD role of the SM-3 using MDA press releases, a position they repeated until after the end of the Obama administration (see USN/MDA 2009, 2017). At the end of the Obama administration it appeared that the MDA also praised the MOKV not as a space weapon, but rather as a highly effective ballistic missile interceptor (MDA 2016). Additionally, if we are to take the USN and MDA at their word, the SM-3 requires technical changes to be an ASAT weapon, indicating there may be even further technical barriers for the "call to arms." Either way, this would have to be a technopolitical change because a technical or contextual change would amount to a *de facto* change in US space policy. As a result, the manufacturing of the SM-3 and MOKV cannot be seen as a public success for the "call to arms" discourse – the two systems were publicly mobilised solely as symbols of the on-going success of the MDA and BMD technological development – not as evidence of the pursuit of a public policy of weaponisation.

In the case of the highly classified X-37B program, what little information was publicly released was mobilised by AFSPC to bolster its own credentials. In 2012, General Shelton (in

Koebler 2014), then head of the command, publicly described the vehicle as 'spectacular' and 'game-changing' but provided no information on the intended function. Similarly, his successor, General Hyten (in Martin 2015), enthusiastically told journalists that the X-37B was 'really for cool things' but when asked what the intent was said 'The intent is—I cannot answer that question … I'm not going to say what it's gonna become—'cause we're experimenting.' Secrecy meant that comments from Congressional supporters of deploying space weapons would likely have been difficult, if not ultimately counterproductive if the X-37b really was secretly considered to be a weapon. The proximity of the Air Force to the system lent their leaders a great deal of authority in defining its significance. By the end of the Obama administration, this had developed into releasing more information on the purpose of the X-37B which highlighted the scientific and engineering research – such as into Xenon thrusters – which the program was exploring and the institutional links with the civilian NASA (NASA 2015b, Zhang 2015). In terms of instrumentalisation, its function was implicitly defined as a symbol of Air Force (particularly Space Command) prestige – not as a weapon.

The claims of "ownership" of systems like the SM-3, MOKV and X-37B went unchallenged by those who had previously called for American deployment of space weapons. On this basis, it is clear see that the "call to arms" discourse ultimately failed to implement its logic of building symbolically symmetrical artefacts to "counter" China's rise in space. Instead, the discourses justifying the funding of these programs were much more fragmented, claimed by smaller institutions which, although some of them were endowed with the ability to speak authoritatively and officially on *matters* of state, collectively they were not the final arbiters of what American foreign or space policy ultimately was at that time. The most explicit calls for space weapons, such as they were, remained in unofficial discourse, with official sources seemingly taking pains specifically to avoid technologies like the SM-3 and X-37b being instrumentalised as "space weapons."

7.2 "Resilience" as a changing response to the "Chinese space threat"

"Most US military space systems were not designed with threats in mind … This is no longer an adequate methodology to equip space forces"

- General Hyten, then Commander of AFSPC (in AFSPC Public Affairs 2016a).

Although the concept of "resilience" remained ambiguous in high-level policy debates during the Obama administration, lower-level policy discourse provided fairly specific definitions. What this chapter labels the "resiliency" discourse also constitutes a technopolitical response to the problem of the "Chinese space threat." Unlike those calling for American space weapons, the "resilience" discourse broadly advanced the idea that existing American space capabilities needed to be made more survivable. By the end of the Obama administration, advocates of the "Chinese space threat" seemed to agree that building resilient space assets was the most suitable response to China's "rise" in space. However, few successful technical interventions were mobilised by these advocates to demonstrate the successful implementation of their policies.

From "Operationally Responsive Space" to "Resilience"

"We're not here to build neat toys"

– Col. Jon Anttonen, Director of USAF Operationally Responsive Space Office (in Gruss 2015a)

Much like the attempts to deploy American space weapons, the call for "resilience" had roots established before the concept of China's "rise" in space had much weight in US space policy circles. Prior to the events of 2007, the DoD and Congress had already begun to argue for a reappraisal on how the procurement of space technology was pursued, yet this was articulated in a fairly distinct manner – as Operationally Responsive Space (ORS) – and did not specify a geographical source of threats against space systems. By the end of the Obama administration, not only had the discourse of "resilience" gained a pre-eminent position in American space policy, but the rationale for pursuing this course of action was increasingly closely tied to the "Chinese space threat."

In the early years of the Bush administration, calls for improvements in American space capabilities were framed in terms of preserving space superiority. Exactly what was required to do this was often left in vague terms. The Joint Vision 2020 called for 'full-spectrum dominance,' which included space but provides no specifics on how to "dominate" it (JCS 2000). The accompanying DoD press release did not mention outer space at all (Garamone/DoD 2000). According to the critical scholar, David Grondin (2012 [2009]), the most prominent aspect of US space policy discourse in the early 2000s was a "re-territorialisation" to redefine outer space as American. Grondin (2012: 123) highlights how

vague the technological aspect of the discourse was – it provided some foundation for possible space weaponisation, but as was argued in the preceding section, these efforts failed to gain a hegemonic position in public policy discourse.[61] The seemingly imminent prospect of space weaponisation garnered the most academic attention at the time. Meanwhile, the discourse which would gain prominence over the "call to arms" was already gathering momentum in the mid-2000s.

In the run-up to the release of the Bush administration's National Space Policy, legislators debated how to maintain American dominance in space. In 2005, the debate in Congress was still portrayed as on-going – the executive and legislature (supposedly) agreeing that American satellites were vulnerable but had not yet agreed on how to address those concerns (see Everett in House 2005: H6124). In 2006, the new approach of Operationally Responsive Space was written into law. The 'John Warner National Defense Authorization Act for Fiscal Year 2007' (hereafter NDA 2007) declared that 'It is the policy of the United States to demonstrate, acquire, and deploy and effective capability for operationally responsive space' (Public Law 109-364 Sec. 905). The ORS concept had not originated in Congress, however. It had been drawn from ideas mooted by military leaders in the early-2000s (see Frick et al. 2004). This included discussion by a retired USN Vice-Admiral and the future head of AFSPC, John Raymond (see Cebrowski and Raymond 2005). The 2007 NDA directed the Air Force to set up an ORS Office to research both 'material' and 'non-material solutions' (Kirtland AF Base N.D.: 1). The aim was to provide 'assured space power focused on timely satisfaction of Joint Force Commanders' needs' and eventually 'the ability to address emerging, persistent, and/or unanticipated needs through timely augmentation, reconstitution, and exploitation of space force enhancement, space control, and space support capabilities' (ORS Office N.D.: 1). This included the development and launch of test-bed satellites (Kirtland AF Base N.D.: 2). The focus of ORS was on increasing the speed of design, procurement and launch. As we will see later, this was a much narrower, although complementary remit, compared with the Obama-era discourse of "resilient" space technology. ORS seems to have had sufficient influence at this stage to have resulted in the manufacture of some appropriate technopolitical artefacts (in the form of demonstrator satellites) but not in sufficient numbers to practice ORS in the form that was originally envisioned (ORS N.D.: 2). In 2015, the Director of the office, Colonel John Anttonen (in Gruss 2015a), claimed that 'People say it's [ORS] a lot of talk – I think there's

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[61] Grondin, writing at the end of the Bush administration, understandably did not anticipate the shift in emphasis on how to "solve" the problems of US space security.

been good evidence it isn't,' but portrayed the project as on-going. The defensive tone of his statement implies a lack of consensus that ORS was achieving its goals.

Even after the now iconic moment (at least in space policy circles) of the Chinese hit-to-kill demonstration, ORS was still not publicly pitched as a solution to the "new" threat but rather as a general "fix" to the perceived shortcomings of American space policy, particularly in procurement. As discussed earlier in the thesis, the Bush Administration's public response to China's technology test was muted. Bruce Macdonald (2008: 14-15), a scholar at the Council on Foreign Relations, claims that President Bush secretly directed the relevant agencies to improve space situational awareness and 'address defensive and offensive measures,' ideas which could easily be considered part of ORS. Macdonald (2008: 17) goes so far as to suggest that the US pursued ORS because of the Chinese ASAT test. For the purposes of this chapter, whether Macdonald is correct or not is beside the point. Either way, this was not the publicly formulated position during the George W. Bush presidency. The call for ORS in official policy documents predates the 2007 test by two years, and no White House, DoD or State Department claims seemed to directly link the need for ORS to the "Chinese space threat" during the Bush years[62] (White House 2005). This is to be expected given the low profile of a "Chinese space threat" in DoD and White House discourse of the time (see for example DoD 2001, 2006, Bush 2003, White House 2006 – discussed in Chapter 5). In Congress, the rationale for ORS was framed in part as a response to (as members of Congress saw it) unsatisfactory acquisition processes in the military (see for example Rep. Tauscher in House 2009b: H7238). The Air Force declined to request funds for its continuation until 2015, however, in the interim relying on "Congressional adds" to fund its operation (see Department of the Air Force 2014: 217, 2015: x). This was interpreted by some as an attempt by the Air Force to 'shutter' the office (Gruss 2015a), yet continued funding from Congress ensured its survival until after the end of the Obama administration (see 10 USC § 2273a).

Under the Obama administration, ORS became subsumed under the wider-ranging discourse of "resilience," although this change in rhetoric would only be closely linked to the "Chinese space threat" in the last year of Barack Obama's presidency (Kendall 2016). The years 2010-2011 saw the release of both the *National Space Policy* (NSP) and the *National Security Space Strategy*[63] (NSSS). This period saw the public confirmation of the new policy of pursuing

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[62] Some "fringe," semi-official voices did link ORS to a potential Chinese space threat. See Doggrell (2006) and Rouge (2007).
[63] The NSSS is an unusual example of public discourse in that it originated as a classified document. Some of its contents were then released through an unclassified summary.

"resilience." The need for the increased "resilience" of space systems is a thread which runs throughout both documents (White House 2010, DoD 2011c: 11). However, statements made from the White House and leadership of the DoD included only a rough approximation of what might be deemed a definition of "resilience." Both documents call for "resilience" and provide a limited sense of how it might be achieved, giving some sense of what it might be without providing an explicit definition. The NSP calls for 'assurance and resilience of mission-essential functions' such as creating 'back-up systems' for GPS (White House 2010: 5). Similarly, the NSSS states that 'Resilience can be achieved in a variety of ways' and includes a few examples, such as 'hosting payloads on a mix of platforms' but provides little detail (DoD 2011c: 11). A more precise definition was found in an accompanying fact sheet, setting out a list of ways to achieve resiliency (avoidance, robustness, reconstitution and recovery) and five 'evaluation criteria' (DoD 2011b: 1-2). "Resilience" was also defined by officials identifying what it was *not*. In this format, resiliency was portrayed as something which required urgent implementation. Most notably, General Hyten, then commander of AFSPC, stated that

> Most US military space systems were not designed with threats in … Without the
> need to factor in threats, longevity and cost were the critical factors to design. … This
> is no longer an adequate methodology to equip space forces (Hyten in AFSPC Public
> Affairs 2016a).

On this basis, resilience is defined as something which existing systems do not have,[64] making them inadequate. Hyten (in AFSPC Public Affairs 2016a) was instead calling for technology which *was* designed with threats in mind. Assumedly technology developed this way would logically be more "resilient."

More specific explanations of what "resilience" would look like in practice can be found in documents more directly tied into the procurement process.[65] It is these standards which this chapter uses to assess the extent to which "resilience" was inscribed into technics. In 2015, the Defense Budget explicitly used the language of "resilience" to explain procurement decisions (DoD 2015: **1**-1). The budget positions itself as 'designed to protect capabilities that are most closely aligned to the three pillars of the defense strategy – (1) protect the homeland, (2) build security globally, and (3) project power and win decisively' with space described as a 'key capability area' (DoD 2015: **1**-1, **1**-4). Specifically for space, the

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[64] A white paper from the Office of the Assistant Secretary of Defense for Homeland Defense and Global Security (2015: 1) similarly states 'overcoming this *lack* [emphasis mine] of robustness has been summed up in a single term, *resilience* [emphasis original].'
[65] See also two junior officers' specific suggestions (Bell and Rogers 2014)..

budget indicates that 'the DoD will move toward less complex, more affordable, more resilient systems …. And pursue a multi-layered approach to deter attacks on space systems' (DoD 2015: **2**-4). The specifics of how these goals might be enacted are not always clearly developed, yet where they are given it is clear what "resilience" would look like if inscribed into the materiality of American space technology. For example, whether the commitments to 'procure more vehicles than those currently on contract' for GPS III were adopted would be discernible from publicly available information if actually implemented (DoD 2015: **5**-3). Rather than direct procurement to achieve these aims, however, the largest spending commitments were for continuing existing programs in their current form, which were themselves replacements for long-standing American space capabilities, $800m on SBIRS being an indicative example (DoD 2015: **5**-4). For GPS, this meant continuing to procure at the previously planned (back to at least 2012) rate of two satellites per year, a trend which continued until the end of the Obama administration (GPS.gov 2017b). The apparent incongruence between DoD rhetoric and what was eventually procured raises the question of whether the discourse of "resilience" was ever inscribed into the materiality of space technology, addressed later in this chapter. The analysis so far of ORS and "resilience" has hardly touched upon the topic of China, however, and so a more pressing question as to the role of the "Chinese space threat" narrative in relation to the call for "resilience" must be addressed first.

In official discourse, the "Chinese space threat" only came to be closely linked to the need for pursuing "resilience" as a matter of policy in 2016. Yet some unofficial voices had already made this link, laying the discursive groundwork for Obama-era officials to build upon. Most notably, soon after China's hit-to-kill test, Ashley Tellis (2007: 7) had called for the US to adapt in order to better recover from an attack in space, albeit without using the word "resilient." The language of a '*congested, contested, and competitive*' space environment was used in the 2011 NSSS alongside the example of the debris caused by China's 2007 test (DoD 2011c: **1**-2, original emphasis). China was clearly meant to be associated with the newly competitive environment, given that they are invoked in such close proximity. Yet it is ultimately left for the reader to make that connection, rather than an explicit statement that the "Chinese space threat" demands a change in American space policy. The first official articulation of the need for "resilience" to specifically address the Chinese "threat" seems to have been by Representative Michelle Grisham (D-NM) (in House 2013a: H4921-H4922). When defending funding for the ORS Office, she argued that

resiliency and responsiveness are key objectives ... Increased speed for the delivery of space assets not only helps to close gaps in the United States' space systems capacity; it can also improve resiliency and reconstitute satellites lost to countermeasures. In 2007, China used a ground-based missile to destroy one of its own satellites, demonstrating their capacity to target our satellites ... ORS is integral to maintain our advantage in space (House 2013a: H4921-H4922).

Notably, Grisham's amendment to increase ORS funding was withdrawn after a critic, Representative Pete Visclosky (D-IN) (in House 2013a: H4922), pointed out that the Air Force had not requested funding for ORS. This example, then, is a potential glimpse at the deeper technocratic political dynamics which took place outside of the realm of public discourse. While Grisham's critics did not, and given the dominance of the "Chinese space threat" discourse likely could not, challenge the content of her claims, a presumably internal decision by the Air Force stymied her amendment to support ORS.

Grisham's explicit connection of "resilience" and the "Chinese space threat" was an isolated example in official discourse, however, until comments from Deputy Director of Defence Frank Kendall (2016), made a very clear link when stating that 'some of our more peer-competitors, potentially or possible adversaries were modernising in ways that challenge our technological superiority. Particularly China and Russia.' He then added that 'resiliency as we call it has become much, much more important to us, and we are looking at a variety of ways to build that into our architectures' (Kendall 2016). Connecting China and the need for "resilience" in this way reproduced both the "Chinese space threat" and "resilience" discourses simultaneously, and established them in a mutually supportive relationship at a high level of official discourse. Furthermore, while the advocacy of "resilience" was still a recurring trend in official space policy discourse, it is necessary to point out that this advocacy was not always justified with reference to the "Chinese space threat." For example, Representative Jim Bridenstine (R-OK) and Douglas Lamborn's (R-CO) 'American Space Renaissance' bill was introduced the same year, advocated "resilience," but mentioned neither China nor any other specific 'state and nonstate actors' whose threatening behaviour would warrant its implementation (see US Congress 2016: 3). In this light, Kendall's remarks should be understood as one possible official justification of "resilience," with other rationales co-existing and mutually supporting the wider call for these measures. As was previously hinted at earlier in this chapter, however, it is questionable to what extent "resilience" was inscribed in American space technology.

The inscription of "resilience" into the materiality of American space technology

Whether coupled with the notion of a "Chinese space threat" or not, it is clear from the analysis above that "resilience" became the dominant concept (or value) which US space technology would supposedly most benefit from. We now turn to assess how successfully the discourse of resilience was inscribed (or coded) into the materialities of American space technology. It is argued that despite the success of the "resilience" discourse in dominating what language was used, the public record shows that resilience was inscribed into space technology in only a limited way. By extension this means that the "Chinese space threat" was not fully constructed into American space technology either. That is not to say that American space technology procured at the end of the Obama administration, to transpose General Hyten's (in AFSPC Public Affairs 2016a) phrase, was still not "designed with threats in mind." Instead, the qualities which the discourse of "resilience" called for American space technology to possess were largely already present in the space systems deemed essential in space policy discourses to national security – GPS, SBIRS and AEHF. The failure of "resiliency" advocates, then, was to shape these key systems to reflect these values even further and crucially to frame these changes as successful interventions in favour of "resilience." This state of affairs shows that the dominance of "resilience" in public discourse was not necessarily sufficient to shape technics. Logically, this also points to important politics taking place beyond the sphere of public policy discourse, out of the reach of the analysis by this thesis due to secrecy.

To make the case that "resilience" was inscribed in only a limited way requires a framework by which we can roughly measure to what extent the values that the corresponding discourse espoused were manifested in specific technics. First, this requires being specific about what the discourse of "resiliency" set as its own requirements. The preceding analysis in this chapter has already given some idea of what these values were, but it is worth being even more specific. The most official and complete explanation of these characteristics is to be found in the DoD's fact sheet on resilience, which accompanied the release of the NSSS (DoD 2011b). The focus is on how long a given device continues to function under adverse circumstances such as '***hostile actions***' (DoD 2011b: 1, emphasis original). The four areas in which resilience can be found are the characteristics of '***avoidance, robustness, reconstitution, and recovery***' (DoD 2011b: 2, emphasis original). Although it is not explicit in its language, the clear implication is that the more manoeuvrable or physically robust a device is, the more "resilient" it is (DoD 2011b: 2). Additionally, the easier it is to replace a device, or restore the capacity of the system in some other way, the more "resilient" a system is (DoD 2011b: 2). A notable absence from this list is 'disaggregation,' a prominent theme in the DoD

budget requests which followed the NSSS (see DoD 2015: **1**-3, **5**-3). This was fairly explicitly explained as procuring 'less complex, more affordable, more resilient systems' (DoD 2015: **1**-3). It is these technical qualities, then, which this discussion uses to guide the analysis which follows. For each key system, the analysis asks whether its manoeuvrability, replaceability, redundancy, or number of satellites in the constellation, were increased.

GPS: Already resilient

Changes to the GPS constellation in 2015 and 2016 show little evidence of the implementation of "resilience." This seems to be due to the material qualities of the GPS system specified by long-standing design decisions. Indeed, the ex-Commander of AFSPC, General William Shelton (in Freedberg 2014), told a journalist that 'Nothing short of a nuclear missile' could disable GPS. In short, by the standards outlined above, GPS was already a fairly "resilient" system at the start of the Obama administration, pre-dating calls for more "resilient" technology. Shelton's remark is very unusual, however. It would appear no government official has publicly praised the resiliency of GPS since then. The Global Positioning System (GPS) is one of the largest and most important satellite constellations operated by the US military. The program began in the 1970s, with the first NAVSTAR satellite launched in 1978, becoming fully operational in 1993 (NASA 2015a). At the beginning of the Bush administration, the GPS constellation already possessed a number of on-orbit spares (in the form of older satellites retired from the prime constellation). During the period, GPS satellites continued to be launched, with improvements rolled out over time (such as increased on-orbit lifespan and stronger signal (GPS.gov 2017b). At the end of the Obama administration, for example, GPS satellites launched in the 1990s were still functioning alongside satellites launched in 2015 and 2016 (GPS World 2016). The durability of the system served as a barrier to the implementation of "resilience" because the older satellites were products of the American technopolitics of the 1990s and could not be reconfigured on orbit. Primary re-instrumentalisation was out of the question, then, but changes to the social understanding of the satellites was far more feasible.

Physically changing older GPS satellites may have been unfeasible, but advocates of "resilience" did little to frame the changes which were made to the constellation as evidence of the increasing "resilience" of American space technology. One possible change which made the system even more "resilient" – the 'Expandable 24' concept - was not publicly portrayed as an implementation of "resilience." In 2011, the USAF completed a program to move satellites

to double the number of active GPS satellites in three discrete orbits, putting older artefacts to work for a new and slightly modified function (InsideGNSS 2011). Rather than frame this in terms of "resilience," however, official discourse touted the benefits for users in terms of increased reliability in certain geographical areas and in certain kinds of terrain (50th SW Public Affairs 2011). This activity was seemingly ripe to be considered by American policymakers to have increased the "resilience" of the GPS network – after all, the orbits in question are now served by two distributed satellites. However, there is no evidence in the public discourse to show why the opportunity to point to a successful increase in "resilience" was not made. One clue may be found in the interesting tension in the Air Force press release on 'Expandable 24,' which praises how the change helped "modernize our weapon system," invoking a military utility (50th SW Public Affairs 2011). This can be compared with the claim elsewhere that the change was 'maximizing GPS coverage for all users worldwide," which is more neutral and could include civilian users (50th SW Public Affairs 2011). In contrast, the civilian GPS government website simply stressed the 'improved coverage' after the change (GPS.gov 2017b). The 'Expandable 24' concept for GPS is therefore a good example of the ambivalence of technical artefacts: the technopolitical changes which were made were compatible with the discourse of "resilience," but also other notions such as the benefits to civilian users. Without officials explicitly instrumentalising that the former was the case, the amount of "resilience" which GPS supposedly possessed was effectively unchanged in terms of public policy discourse.

A similar example can be found in the Next-Generation GPS Control Segment (OCX) for GPS, which was announced in February 2010. The program was aimed at upgrading both the software and hardware of control stations both in and outside the United States. Publicly, this was portrayed as working to support the planned introduction of the third generation GPS satellites and to generally improve cybersecurity (GPS World 2010, GPS.gov 2017b). It must be pointed out that this predates the official public endorsement of "resilience" by the Obama administration. However, what is pertinent about this example is that "resilience" was not publicly used to justify the continuation of the program after it controversially ran over budget. Due to the Nunn-McCurdy law, the cost overruns of OCX meant that it was at risk of cancellation (Parrish 2016, GPS.gov 2017). Given the prevalence, and widespread endorsement of the need for greater "resilience," one might assume that OCX's propensity to increase the "resilience" of GPS would have been a powerful and useful justification for its continuation. There is no evidence in the public record to suggest that this reasoning was utilised, however. Ultimately, the program survived until after the end of the Obama

administration. "Resilience" may well have played a role in the secret technopolitics relating to the continuation of OCX, but regardless it is striking that this justification was not used publicly.

"Resilience," nuclear-warfighting satellites and the ground segment

The Space-Based Infrared System (SBIRS) and the Milstar/AEHF communications systems have been described by US officials as critical to US nuclear security (see Chapter 6, Tucker 2014). US officials had strongly hinted at a Chinese ASAT capability to hit satellites in geo-stationary orbit (see Hyten and others in Martin 2015). Assumedly this meant that SBIRS and AEHF should have been adapted with this "threat in mind." Yet by the end of the Obama administration, these systems had no publicly announced changes which could be considered to have made them more "resilient." Both systems are modern replacements of Cold War systems. SBIRS was pitched in the middle of the Clinton administration as a replacement to the much older Defense Support Program (Richelson 2012: 219). Due to costs, the planned five geo-stationary satellites were reduced to three, although the DoD never totally ruled out the possibility of buying the final two if needed (Gruss 2016b). Similarly, additional satellites for the hardened communications system, AEHF (the replacement for Milstar, launched 1994-2003), were not procured due to cost (USAF 2015, Gruss 2016b). Almost global coverage was likely achieved with only three satellites with DSP (see Forden 2008d for a visual representation), so SBIRS could likely have afforded the "global coverage" demanded by policymakers with only three satellites too. The additional satellites would have been one way to demonstrate additional resilience, however. As of 2017, the fourth and fifth GEO SBIRS satellites were under construction, yet not scheduled for launch until 2021-2022 (Swarts 2017a), which would seem to indicate they are intended to replace aging satellites rather than increase coverage or resilience. This is because GEO SBIRS satellites are only expected to operate for around 10 years, making the fourth and fifth satellites replacements for the older devices (Lockheed Martin 2017). It is fairly definitive, then, that the numbers of satellites in these systems were not increased, and therefore also that "resilience" played no decisive role in deciding the shape of these technologies.

During the period in which "resilience" was called for by Obama administration officials, very few changes seem to have been made to the ground segment of key military satellite systems. Almost all American military satellites are controlled via the Air Force Satellite Control Network (AFSCN) (USAF N.D.b). Another important function is the primary role the AFSCN plays in verifying satellite "health" (USAF N.D.b), helping to determine if the US

is under attack in space. The success or failure of this system is therefore also almost synonymous with the success of failure of American military satellites at a technical level. According to an Air Force news report, no upgrades to antennas occurred between 1987 and 2012 (Prater 2014). When the upgrades were made to the Air Force Satellite Control Network (AFSCN) in New Hampshire, Britain, Guam and Hawaii, it was done with the aim of increasing automation and increasing 'redundancy' (Prater 2014). The sense of 'redundancy' in the report does not strongly mesh with the official DoD definitions of "resilience," however. One of the key indicators of "resilience" in the discourse (outlined earlier) are the notions of "robustness" and "recovery." Throughout the period in question, however, the AFSCN retained the same number of ground stations (with the exception of the retirement of the Colorado Station in 2014) (see Saunders/50th SW History Office 2015). Given the warnings from the DoD about China's ability to strike US bases in Guam (see DoD 2016: 60), it is noteworthy that no public attempt was made to disaggregate the Guam AFSCN station. Ground-based transmitters have physical limitations, such as the curvature of the Earth, although the specifications are classified (USAF N.D.b). Without the Guam base, there would inevitably be a gap in coverage between the Diego Garcia and Hawaii installations (see GPS.gov 2017a), an area presumably of great interest to advocates of the "China threat" theory (and specifically of the "China space threat"). There is no evidence in the public discourse as to why this issue was not pursued by those attempting to argue that American space technology was vulnerable to Chinese attack. An assessment of the SBIRS and AEHF systems therefore shows that "resilience" was not inscribed into the two constellations under the Obama administration. Much as in the case of the GPS constellation, none of the qualities which the "resilience" discourse called for were intensified at either level of the instrumentalisation of technology.

Conclusion

During the Bush and Obama years, the attempts to enact a technological and policy response to address the "Chinese space threat" (made by groups both inside and outside the government) seem to have failed. Instead, the technopolitical status quo was maintained, with no new technological projects and the continued pursuit of older procurement timetables. The public policy debate on the need for space weapons intended to somehow constrain China's actions in space ultimately led to a policy of non-deployment lasting for at least three presidential terms (a trend that has continued until the time of writing). Without the discursive conditions to justify the pursuit of such weapons, advocates of this course of action were left

with little hope of influencing procurement policy.[66] Some technical artefacts were produced during this period with qualities that would have seemed to be the early signs of a policy of weaponisation. However, these were mostly small projects, the most successful of which had strong links to American BMD. The systems which most closely resembled space weapons – the SM-3 missile, the MOKV and the X-37B – were ultimately claimed by rival groups for their own distinct purposes. The shootdown of USA-193 using the SM-3 was framed as a demonstration how successful research into BMD had been, rather than being touted as a capable US space weapon. Indeed, the significant steps taken to distance the shootdown from any space weapon applications indicates just how controversial the idea of American space weapons remained, how weak the discourse which supported it had remained, and the wider (and seemingly more powerful) technopolitical forces beyond space policy at work in US security politics.

In contrast, the Obama administration seemed to have easily established the solution of "resilience" as the dominant, accepted solution to an array of issues in American space security, including the "Chinese space threat." Yet achieving dominance in the realm of language has not translated to a re-shaping of American space technology to reflect the new desirable quality of "resilience." When analysing the space technology produced after 2011 (when the policy was introduced), no significant changes to the artefacts of American space technology can be detected. The three key systems analysed – GPS, AEHF and SBIRS – all had roots which long-predated the Obama administration. Incremental improvements had already been planned, and were implemented. This only adds to a picture of a major disparity between what was said in general, and what was said specifically about these changes. The discourse of "resilience" presumably could have been used to frame these "improvements," such as the expansion of the GPS network, but seemingly no public attempts were made to claim these as the accomplishment or implementation of national security space policy. This state of affairs correspondingly tells us something significant about the power of the "Chinese space threat" discourse. If "resilience" was one response to the "Chinese space threat," and it seems to have been framed this way, then the limited inscription of "resilience" into space technology was also accordingly only a limited inscription of the "Chinese space threat" as well.

The content of the public policy discourse leaves no answers as to how this occurred. It is worth noting that space policy does not feature much in American elections, meaning there

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[66] See also Moltz (2008: 294-296) who also argues that the advocates of space weapons failed to gain wider congressional support.

was little reason for politicians like Obama to demonstrate the success of what, in national political terms, is a fairly niche area. More importantly, public policy discourse does not constitute the entirety of the American technopolitics of space. Previous STS scholarship which has investigated less classified technologies has shown how important technologists and technocrats with no public profile can be in shaping technics (see Chapter 2). The analysis of the public policy discourse in this chapter leaves no other possible explanation for the limited implementation of the "call to arms" and "resilience" discourses apart from these more covert technopolitical dynamics. As the technologies in question become less sensitive in the future, it will become more feasible to study these dynamics. In the meantime, it is still possible to demonstrate the limits of the power of public discourse in the technopolitics of American space policy. Where these more covert, bureaucratic, interventions were detectable in the public record, they were clearly decisive. The not-so public politics around the funding of the ORS office, for example, showed how the Air Force's internal funding decisions could heavily influence public policy debates in quite specific ways, such as the defeat of Representative Grisham's ORS-supporting amendment (House 2013a: H4922). The interactions between internal, bureaucratic politics on the one hand, and the public sphere on the other, warrant further analysis. To this end, Chapter 8 explores these relationships in relation to futuristic American visions of space warfare with China.

Chapter 8

Imagining Future US-China Space Wars: the Technopolitics of Paper Time Machines

"War games are played in the future. They are not exercises which are played in the here and now … We look into the future so we have the opportunity to guide it slightly different in a better fashion"

– Jason Altchek, Executive Wargame Director (in David 2016)

Introduction

China's "rise" in space, and by extension the "Chinese space threat" is a narrative that implies historical momentum: it is going somewhere. But where? With no overt (at least in US space policy discourse) historical precedent of combat above the atmosphere to use as evidence, through the 2000s and 2010s, wargames played an important role in cementing both the contemporary and future technopolitics of US space security. The purpose of this chapter is to explore the complex and specific technopolitics of the "paper time machines" of American wargames and exercises. In so doing, this chapter makes an original contribution to knowledge by providing the first in-depth political analysis of contemporary space wargames, which have been referred to in the literature in only a cursory manner despite the recognition of their importance (see for example Johnson-Freese 2017: 57-58). These simulational practices provide an opportunity to study the final aspect of technopolitics raised by this thesis – the political contest to establish the future technological trajectory of the nation.

This chapter elides the differences between wargames and exercises, a distinction usually made by practitioners, and terms them collectively as "simulational practices." This is because, despite the identifiable differences, their technopolitical role is similar. Peter Perla (2011: 240), a grandee of modern wargaming, defines the phenomenon as

> A warfare model or simulation, not involving actual military forces, and in which the flow of events is affected by and in turn affects decisions made … by players representing the opposing sides.

Wargames are then distinguishable from military exercises which are 'any activity involving the operation of actual military forces in a simulated hostile environment' (Perla 2011: 241). Both are simulational practices in which the technopolitics of both the present and the future are produced simultaneously. In so doing, we will see that these standard definitions fail to account for the wider political impact of these simulational practices.

This chapter organises the analysis of the technopolitics of the simulational practices of "paper time machines" used to predict the future of (US-China) space warfare into three interrelated areas. The first question to be addressed is how imaginary visions of US-China space war related to simulational practices more widely in US security politics. The role and status of wargames in American security politics provided the discursive conditions under which the space war simulations could be considered to be legitimate locations for the production of knowledge about the future. Although wargames have varied in importance in American security politics, across time and institutional lines, space wargamers in the 21st century had a long-standing and well-respected canon to draw on to lend their own exercises a degree of credibility. In the second section, this chapter moves on to highlight the theatrical aspects of space wargames in the 2000s and 2010s, these being the elements most directly related to the games themselves. The *Schriever* wargame series was an opportunity for space policy elites to produce theatrical visions of future space war which could then be taken up by journalists, academics, and other policymakers, to advance a specific national vision. Careful management of the boundaries between public and secret knowledge were particularly useful for inviting speculation about the nature of the "Chinese space threat" without revealing national secrets. The final section then focuses more on the aspects of other wargames and exercises, including *Red Flag*, which had wider resonance for the technopolitics surrounding the military, but also the nation as a whole. Similar to the arguments made in Chapters 6 and 7, simulational practices should be understood as venues for the contestation of rival national and sub-national Selves. These games and exercises remain unique, however, in that they invite those endowed with the authority to speak on behalf of these national security Selves, and produce a kind of authoritative account of how the Self needed space technology today, and how it needs to adapt to the future to maintain its survival.

8.1 The long-standing significance of wargames in American security politics

James Dunnigan (in Sabin 2015: 3) wrote that 'a wargame is… a paper time machine.' These "paper time machines" saw extensive use in the United States during the Cold War (alongside military exercises), as a tool for finessing military and policymaking practices. As indicated earlier, mainstream conceptualisations fail to capture the full political significance of the phenomena. Sharon Ghamari-Tabrizi (2016) provides a much deeper, critical conceptualisation. She argues that 'wargames are gestalt inscriptions' – things which purport to be 'wholes' or a 'totality' – and thus they 'mean more than they say' (Ghamari-Tabrizi 2016: 349, 351). In the cases of their use in the Cold War, she writes that they are 'specimen[s] of the routinized labor of the soldier, airmen, astronaut, ICBM missileer in a given time and place; it can be summoned as evidence for the blurring between the *echt*-real and its simulacra' (Ghamari-Tabrizi 2016: 332). According to Ghamari-Tabrizi (2016: 331), these powerful characteristics have been used in American security circles for 'indoctrinating newly promoted military personnel into fresh roles and responsibilities' and as 'training mechanisms for inducing specific modes of embodied attention.' As she is quick to point out, however, all of this is 'historically inflected,' so the question we must answer first is how to site space warfare games in the US in some kind of historical context (Ghamari-Tabrizi 2016: 332).

The centrality of the Cold War in establishing the significance and prominence of wargames in American security politics can be seen in the mythologising embedded in a more recent American treatment of the subject. Micah Zenko (2015: 25-26) wrote that 'it is no accident that red teaming as we know it was refined and codified in the US military … the very term "red team" originated within the US military during the Cold War … The "red" referred to the color that characterizes the Soviet Union.' Zenko helps to highlight the prevailing Cold War-centric understanding of American wargaming, because this narrative has so totally obscured prior formulations and representations. For example, before the Second World War, the "red team" in US wargames for strategic planning was the British Empire (Morton 1960: 16). We will see later that the colour red was still conveniently apposite for alluding indirectly to the identity of one's future opponents. This Cold War heritage, however, is what lent the practices of wargaming weight and a sense of continuity in the early 21st century.

American nuclear war planners faced a similar problem to the space warfare planners of the early 21st century: a full-blown war existed only in the imagination. Consequently, the difficulty of answering the question of "how much is enough?" for nuclear weapons was

heightened compared to the same question regarding tanks or ships (see extensive archival sources in Burr 2009). Political wargames and seminar-room simulations seem to have been one way of exploring the "how much is enough?" question from very early on (Allen 1987: 5). The RAND Corporation was instrumental in the early applications of wargaming to all-things nuclear. Building on earlier, less 'realistic' games in the 1950s, RAND had developed a "Strategy and Force Evaluation" (SAFE) game, which was intended to be 'used to explore US and Soviet alternative budgetary options for planning and programming force postures' (Krepinevich and Watts 2015: 35, 260). The predictive and evaluative strengths of wargames were considered to be very useful for providing information about what was yet to pass, and therefore by extension a powerful way to influence the technopolitics of the future. China featured prominently in games in the mid-1960s, not so long after China became a nuclear power in its own right. According to Thomas Allen (1987: 43-44) the *Nu* series of games helped bring together McNamara's 'whiz kids' with senior generals in the US military, bonding over a scenario in which American, Russian and Chinese nuclear weapons were opposed in a crisis scenario (JWGA 1966). As early as 1960, a space variant of SAFE called Space Planning Against Ranged Contingencies (SPARC) was developed (Allen 1987: 163). Wargaming crisis scenarios involving either China or space definitively have a long-standing pedigree in policy planning. The combination of a crisis scenario involving *both* China *and* space, however, seems to have only been a relatively recent (circa. 2000) development, coinciding with the beginning of the supposed "rise" of China in space.

The most senior of American officials and politicians, including the President, were involved in wargames during the Cold War, lending them gravitas. A Red versus Blue nuclear wargame was run by Thomas Schelling for, among others, McGeorge Bundy (then National Security Advisor) and Henry Kissinger (then an academic at Harvard) at Camp David in September 1961 (Field 2014: 69). Over twenty years later, President Ronald Reagan 'sat in' on elements of nuclear exercises (Burr 2016). The stated intention by the organisers of including Reagan in the exercises was to aid in the 'educat[ion]' of the National Command Authority (i.e. the President) on nuclear matters (Burr 2016). In these cases, the details of the practices remain secret but clearly involved a mixture of elements with varying degrees of realism, such as physically moving participants to nuclear war command posts like Mount Weather (Burr 2016). Secretary of Defense Caspar Weinberger was secretly 'playing the role of the US president' in a later game, with the Chairman of the Joint Chiefs also participating (Krepinevich and Watts 2015: 164). The game concluded with a simulated, cataclysmic nuclear exchange, supposedly prompting Weinberger to turn to the Chairman and say 'Our strategy is bankrupt,'

which in turn supposedly led to 'banishing' launch on warning strategies (Krepinevich and Watts 2015: 164). These historical examples help demonstrate how Cold War narratives of wargames and exercises positioned the practices as respected, highly influential, and consequential. Most importantly for the analysis which follows in this chapter, during the Cold War, wargames had come to be a legitimate means to contribute to security politics.

Wargaming has played a role in constructing broader narratives of the "rise" of China and its corresponding threat to the US. Adding further weight to the importance of wargames in US security policy during the Obama administration, the DoD announced an intention to 'Revitaliz[e] Wargaming' because it was 'Necessary to be Prepared for Future Wars' (Work and Selva 2015). Undersecretary Robert Work (and Selva 2015) stressed the ability for wargames to help deal with 'technological and operational uncertainty,' to be used to 'explore a range of possible warfighting futures, generate innovative ideas, and consider how to integrate new technologies into doctrine, operations, and force structure.' The specific policy problems which would benefit from a "revitalisation" of wargames included 'managing the rise of China' (Work and Selva 2015). Work's policy announcements dovetailed well with the prominent role of wargaming in major security practices in the preceding years – not just in space but in conventional operations as well. Wargaming had remained well-regarded as a tool for officer training (Route 2016) and was likely used as part of Net Assessment projects like *The Chinese Penchant for Surprise* and *Chinese And Russian Asymmetrical Strategies For Space Dominance (2010-2030)* due to the long-standing centrality of wargames for speculation in Net Assessments (Elliott 2009, Skypek 2010: 8).

More fruitfully for the purposes of this chapter, the DoD and the United States Navy confirmed that the development and implementation of the "Air-Sea Battle" (ASB) doctrine[67] was done in part with wargaming and exercises (Air-Sea Battle Office 2013: 12), a narrative much more in keeping with the representations of nuclear wargames in the Cold War. Wargames were used in part for 'conceptual design' but also as concrete evidence that the doctrine was more than an idea on paper (Air-Sea Battle Office 2013: 9-10). This was very specifically and explicitly claimed to have the aim of making the military more flexible in developing 'new tactics, techniques, and procedures' (Air-Sea Battle Office 2013: 9). According to one analysis, the ASB was successful in 'an unprecedented degrees of integration between the Air Force and Navy and represents a new era in the USAF-USN relationship' (Marsh and

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[67] Air-Sea Battle's focus on defeating A2AD technologies at sea strongly indicates its intended use against China in a future war in the Pacific. See for example Kevin Marsh and Christopher Jones (2015: 247) who forefront China's A2AD capabilities in their analysis of ASB.

Jones 2015: 247). More widely, these findings were made publicly available for academics and journalists to draw upon as evidence of the realities of Sino-US security politics both in the present and the future (see for example Forden 2008e, Peck 2012, Johnson-Freese 2017: 57-58). Thus, Johnson-Freese (2017: 58) is not atypical in her use of wargames as evidence that 'it must be assumed events could and would likely escalate rapidly and dreadfully in space warfare.' The use of wargames as evidence outside of military circles lent the games a public profile, even as the details remained secret. Crucially, however, these games were not apolitical, objective productions of knowledge. Just as in these historical and contemporary examples, this chapter indicates that the ultimate goal of space wargames similarly seems to have been a re-shaping of military technopolitical practices and identities to better reflect and embody a "new" threat.

The historical and contemporary context outlined above shows how the definitions of wargames that practitioners use are insufficient because they cast the phenomenon as a problem-solving tool, while the historical records shows that they clearly had a political role which outstrips this narrow conception. Adopting a more critical perspective, particularly by using the analytical lens of technopolitics, this chapter re-conceptualises wargames as a place where knowledge, and specifically technopolitics, are produced. When game designers can figuratively design a whole imaginary world (a 'gestalt,' as Ghamari-Tabrizi (2016: 349) would put it) which positions even the most powerful politicians as players in their game, the practices of designing and implementing wargames cannot be seen as a neutral process. This recognition becomes even more important when the game designers clearly intend these scenarios to 'educate' their participants. How and why, then, were participants and audiences educated by US-China space warfare games?

8.2 The theatre of the Schriever wargames

The semi-public[68] wargames analysed in this chapter are the most in-depth articulations[69] of the future of Sino-US relations in space. Wargames on space warfare in the 2000s and 2010s had two main political aspects which were complementary, identified by this

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[68] I term them semi-public because much of their content was, and remains, classified..
[69] Outside of science fiction, at least. Peter Singer's (2015b) Clancy-esque science fiction novel *Ghost Fleet: A Novel of the Next World War* includes space weapons in a future Sino-US war. The novel has been warmly received by the US military (Prine 2017).

chapter as *theatrical* and *reflective*. The identification of "theatrical" aspects draws on Joseph

Masco's (2014) book, *The Theater of Operations* in which he defines theatricality as a process

of framing the 'theater of operations,' and with it the boundaries of violence in the 'new kind

of conflict' of the War on Terror (Masco 2014: 35, see also Ghamari-Tabrizi 2005: 161).

Furthermore, he points to simulations of nuclear strikes and terrorism, among other events, as

historical examples of this kind of theatrical boundary-making (Masco 2014: 56, 164). The main

difference between this and the subject of this chapter is that in Masco's studies, the audience

is the wider population, whereas for space wargames and exercises, the audience is a

technopolitical elite. The space wargames were perhaps theatrical in a more obvious way than

the practices studied by Masco. They allowed advocates of the "Chinese space threat" to play

the roles they would "really" play in a space war while simultaneously casting members of the

foreign policy elite as future American leaders faced with a showdown in outer space. The

public reflections on these experiences are testament to how powerful the format was in

"teaching" members of the foreign policy elite previously unfamiliar with space policy that the

threat in space was "really real," and of increasing consequence for national security at large.

The Schriever series of wargames took place through the 2000s and 2010s. The

boundaries between what was public, and what was secret, played an interesting role in

contributing to their broader technopolitical significance. By giving the games any kind of

public profile at all, what might otherwise be secret and left unarticulated in public could be

represented indirectly. Mere allusions to the identity of the "Red Team" in the official rhetoric,

for example, could be speculated upon more explicitly by less official voices. While the precise

details of the scenarios and conclusions of the games remain secret, the games in 2009 and

2010 had an unusually high public profile compared with other games and exercises run by the

American military, which facilitates a more in-depth political analysis than otherwise possible.

The Commander of the Space Innovation and Development Center (SIDC) at Schriever Air

Force Base, the "home" of the wargames, provides one official definition of the series as:

> A series of executive-level grand-strategy games sponsored by Headquarters, Air
> Force Space Command (AFSPC) ... Over the course of five wargames, the Schriever
> Wargame has helped identify areas of improvement in our national space community
> to significantly bolster America's national security. (Wright 2009: 25).

The official intent and result of the games, then, is that they have transformed technopolitical

practices in American space security. The Schriever wargames are not small affairs. The cost to

run the first of the multi-day wargames was $2.2 million,[70] and hundreds of military and civilian participants attended from both the US and allied states (David 2016). What made the 2009 and 2010 games unusual was the public publication of essays of participants reflecting on their experiences (analysed later). This is why, coupled with a clearer link to the "Chinese space threat," that the focus of this section is on the games in these two years, but the existence of the games generally was public knowledge at the time, and thus generally can be thought to be contributing publicly to American space policy discourses.

The presence of an explicit connection between Schriever and the "Chinese space threat" varies across sources. This ambiguity seems to have been carefully situated to allow unofficial sources to credibly extrapolate that the scenarios are "really" about China. For example, the journalist Taylor Dinerman (2009) argues that 'based on what has been previously reported, this series of wargames has mostly involved the question of how do we defend Taiwan against a Chinese attack supported by anti-satellite weapons.' He reported that 2009's Schriever V was set in 2019 and

> involved an attack using small, undetectable satellites on allied communications
> satellites in geosynchronous orbit combined with a commercial blocking maneuver
> aimed at preventing that nation from buying satcom capability on the open market
> (Dinerman 2009).

Similarly, Johnson-Freese (2017: 57) argues that 'It would not be difficult for anyone … to imagine that Blue represented the United States, Red represented China.' However, analysts should be mindful of the subtleties of these distinctions. The official details on the identity of the adversary are much more vague. The following year, official accounts of Schriever 2010 did not identify the simulated adversary. The semi-official Air Force Magazine, described the scenario as follows, however:

> The global space and cyber war of 2022 started out small, in a corner of the Pacific.
> One of America's allies in the region engaged in some sort of local action. A US "peer"
> adversary—and China would certainly seem to fit the description—viewed that action
> as a severe provocation.

> The peer responded violently. It swiftly knocked out the US ally's cyber and space
> systems, crippling it. Tensions escalated, and the next move was Washington's.

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[70] This remains the only public information on the cost of any of the games since.

> … The scenario did not include specific nations. However, US military personnel simulated what they thought could happen in the space and cyber realms a decade hence (Dudney 2011).

Considering these official and unofficial accounts of Schriever as a discursive whole, combined with the analysis conducted in the preceding chapters of this thesis, a credible case can be made that the practice of space wargames was primarily related to the construction of a "Chinese space threat." Yet at the same time, national secrets were protected, such as the finer details of present and future capabilities and plans, which are absent from the official public discourse. The tantalising allusions to restricted information can therefore be thought of as a key part of the theatricality of the wargames.

Playwrighting and set-building

Wargame scenarios must be written, with rules, objectives and the "facts" of the imagined world in which the crisis takes place. As the Air Force historian at the SIDC James Mesco (2009: 38) writes, this process requires 'the finest experts on space power available.' In other words, these are the people deemed to have the authority to speak, and thereby define, the reality of not only space security today but also in the future. This position of epistemic privilege is institutionalised in the USAF in explicit terms: any exercise or wargame which involves space should in theory have Space Command as the 'lead' (Wright 2009: 26). Mesco (2009: 38) gives an impression of where these experts come from in practice: serving and retired USAF generals (not all from AFSPC), members of the National Reconnaissance Office and researchers from the RAND corporation. Once in the scenario, the players can do little, if anything, to change the parameters laid down by the creators. The extent to which events are scripted in American wargames varies. It is considered poor practice to script too heavily but some constraints are inevitable in order for the game to function. It is also worth noting that participants "fighting" against the scenario is also seen as poor practice (see Booz Allen Hamilton 2008: 20). The power relations embedded in wargaming as a practice in these cases therefore has a clear tendency to place the playwrights in a more powerful position than the players, while seemingly lending the players agency. This arrangement continues through the actual playing of the game where designers may be a part of the 'white cell' (differentiated from the opposing red and blue teams) which is an arbiter of 'fair play' but also deciding what the effects of the player's actions will be (such as whether a missile hits its target) (see Zenko 2015: 55 for an example). Mishandling this position of power can result in seriously damaging the "credibility" of the output of the game or exercise in question. In the case of Millennium

Challenge in 2002 (a joint forces event), the white cell intervened to force the red team to make specific choices, and also arbitrarily limited the damage the American blue team had received. This led the red team leader to recall 'War-gaming is not normally corrupted, but this whole thing was prostituted; it was a sham intended to prove what they wanted to prove' (in Zenko 2015: 58). The playwrights must therefore tread carefully to avoid giving their players this impression. To do otherwise risks invalidating the process.

The details of the Schriever scenarios are secret, but reflections from organisers and participants show that space warfare games are subject to these constraints. The secrecy counterintuitively allowed significant leeway in how participants related their experiences to a non-player audience because there was no official account to adhere to. Colonel Roger Vincent, SIDC commander, indicated to a journalist that one participant's impression that Red had a 'significant offensive advantage against US space capabilities' and attacked with limited warning was 'more or less baked into the scenario' (Dudney 2011). There is a clear technopolitical dimension to these scenario building aspects of the Schriever games. The playwrights not only imagine future technical capabilities, but also endow these capabilities quantitative and qualitative values in relationship to the Blue and Red forces. By extension, then, the participants are free (and invited) to relate these technostrategic constructions back onto their own daily security practices and expectations of the future Sino-US relationship in space. We, as the non-player audience, are presumably supposed to draw the conclusion that the Red force *is* a stand-in for the People's Republic of China. In which case, Colonel Vincent's (in Dudney 2011) admission that Red was not only supposed to have superior counterspace capabilities but also a faster decision-making process is a clear articulation of a vision of how a China-like adversary *will* relate to its space technology and subsequently how that relationship will (negatively) affect the United States. At the same time, however, the ambiguity means that other interpretations are possible (such as substituting China for another specific, or perhaps a range of, hostile actors) which still serve the same technopolitical goal: the recognition of the "essential" role of space technology in protecting national security. It also provides political cover in regards to wider official American space policy toward China, especially from the White House, which as has been argued several times in this thesis, seemed to be reticent in identifying an explicit "Chinese space threat."

If these future technopolitical relationships are to have significance in the present, the scenario builders face constraints themselves. The creators of the scenarios must create a believable, realistic world. This is both in terms of the imagined world "out there," which the players experience through interactions with the other team and the control cell, but also in

rooms in which the game is physically played. In the case of Schriever, participants seem to have taken part in rooms which closely resembled the rooms in which space security is practiced on a daily basis. This is best demonstrated visually by comparing the public representations of space command centres with the public representations of the Schriever wargame rooms.

Visual representations of actual space command centres have a mix of chairs and tables for discussion, and plenty of technology to presumably implement those decisions. These images also include unit insignia, helping to convey a sense that these places belong to the military, in addition to a slightly science-fiction visual aesthetic with blue lighting, big screens, and brushed steel.

Figure 5: Officials inspect the new "JICSpOC"

Figure 4: The "JICSpOC" (Pellerin 2015).

Figure 4 shows officials being shown a new 'Joint Interagency Combined Space Operations Center' – the JICSpOC – at Schriever Air Force Base (Swarts 2017b). Figure 5 shows another view of the JICSpOC (a "real-life" command centre), released by the DoD (Pellerin 2015). These representations are then very close to publicly available images representing what a Schriever game looks like in progress. Figures 6, 7, and 8 are publicly released images which represent the internal workings of the games.

Figure 6: Players at Schriever 2010 (Helms 2010: 13).

Figure 7: Brigadier Weinstein presents an "outbrief" at Schriever V
(Wright 2009: 26).

Figure 8: Play proceeds at Schriever V (Wright 2009: 27).

Figure 8 shows players in the Schriever V wargame (Wright 2009: 27). Although the screens are less impressive than those in the JICSpOC, the players are still interacting with the "real world" through a screen much like the representations of the everyday practices of space security. From the comparison of these images, we can surmise that the participants in the Schriever games are supposed to feel an increased sense of realism through the choice of venue.

Simply writing an appropriate scenario and hosting the players in a believable setting is insufficient to achieve realism because the games themselves take place under wider discursive conditions. Judging by the similarity between the representations both in and of the games, and wider space policy discourse, the Schriever organisers achieved "realism" in part by reflecting dominant discursive representations of the "reality" of space security. What we know about the content of the wargames – the world it imagines – corresponds very closely with the dominant representations of Chinese and American space technology and policy found in the discourse analysed in the preceding chapters. The imagined space environment was fast-paced and dangerous, with powerful adversaries equipped with anti-satellite technologies (AFSPC 2009, 2010). The focus on capabilities (both of friend and foe) is the same explored in Chapter 5 of this thesis. Similarly, AFSPC (2009, 2010) positioned the Red Team/China as threatening some of the same elements of American national security identity as explored in Chapter 6. Overall, then, it would seem the organisers were successful in writing a believable, realistic scenario with the potential to blur the line between simulation and reality, the same *modus operandi* of the successful games of the Cold War (Ghamari-Tabrizi 2016: 332).

The players and the audience

'A most unusual experience'

– Representative Terry Everett (2009: 3) (R-AL) reflecting on "playing" the President in

Schriever V

The players and the audience of the Schriever wargames are closely entwined. In a sense, the players are a sub-set of the audience because they most closely observe the game, yet they are also endowed with agency in the game, as indicated earlier. The players of the Schriever wargames came from a wide range of institutions across the US foreign policy establishment, from members of Congress and the DoD to representatives of aerospace businesses and think tanks. Of course some of the players are already space security practitioners of some kind, and are "playing themselves" – this phenomenon is explored in the next section of this chapter. The rest of the audience of the games is difficult to pinpoint exactly, but asking the question is still fruitful (see Chapter 2). It is here that the Chapter follows Peoples' (2011: 92) direction to ask 'the extent to which these discourses … conceive of multiple relevant audiences.' As such, asking these questions is relevant for understanding the intended technopolitical role of the games.

The intended audience of the wargames, beyond the participants, are fairly clearly identified by the organisers. Reflections and press releases on the games were published in the Air Force journal *High Frontier*, and in technology and industry media like *Aviation Week*, *SpaceNews*, and *Vice* (Scott 2003, Gruss 2015b, Walters 2016). The games gained their highest mainstream exposure in *The New York Times* in 2001 (already linking them to China), and the JICSpOC and its games were mentioned in a Washington Post piece in 2016 (Hitt 2001, Lamothe 2016). In the case of *High Frontier,* the journal identifies its own audience: some combination of 'Space & Missile Professionals' or 'Space and Cyberspace Professionals' (AFSPC 2009, 2010). More specifically, the organisers cite STRATCOM, AFSPC, the 'National Security Space community' and 'commercial space partners' (Kehler 2010: 2). The selection of those chosen to publicly reflect on their experiences seems to reflect this. By explicitly identifying the authors of these reflections, the authoritative position which these individuals held on matters of national security could be brought to bear in its entirety. It included Congressmen Terry Everett (R-AL) and Thomas Davis (R-VA) (Everett 2009, Davis 2010); USN, USAF and RAF officers (see for example VADM Mauney (2009), LTG James (2009), AVM Anderson (2009)); former US

ambassador Lincoln Bloomfield (2009), an aerospace executive (Berkowitz 2009, 2010) and a former Homeland Security Under Secretary (Foresman 2010). The range of participants flag which other groups outside the narrow world of space policy are supposed to pay attention. The Air Force openly published reflections from these authoritative players, allowing an audience outside of the gaming rooms to learn the same "lessons." General Robert Kehler (2009: 2), writing in the introduction to *High Frontier*, said that he hopes that readers would 'find the analysis of the Schriever V Wargame within this edition … exposes the complexities facing our nation and allies in dealing with space policy and conflict involving the space domain,' and that 'over the past 10 years, the Schriever Wargame series has influenced space operations not only within the Air Force, but in joint and coalition space operations as well.' Readers of the reflections are thus reassured that they will be encountering insights which are both accurate and influential while Kehler simultaneously editorialises to guide the reader's interpretations.

8.3 Wargames and exercises as Self-reflection

"So here I am, the JFCC Space commander, playing the JFCC Space Commander and I'm in the game..." – Lt. General Jay Raymond (in Gruss 2016), then JFCC Space commander

What after all is the intended purpose of there being an audience at all? The point of having a wider audience is to invite a specific type of self-reflection in order to shape the technopolitics of American space policy. It is these forms of self-reflection which this chapter now moves on to analyse. The theatrical aspects of the games are primarily related to the initial instance of the simulational practices themselves – the assemblage of players, the scenario, and the immediate representation of the simulated events. The games and exercises which imagined future US-China (and other) space wars were significant, however, primarily because of how they were deployed in contests over the technopolitical identity of the state and its constituent parts, especially the military. From this perspective, the primary role of space wargames was to be a site for Self-reflection, in that the knowledge produced from these simulations was intended (and represented as such) to be self-knowledge used to "improve" the technopolitical practices of space security of the present. Put another way, wargames as a practice helped define what America really *is* in outer space and what it should

become. This is both in the sense of helping to cement a particular vision of American identity in matters of space policy, but perhaps more importantly attempting to have policymakers outside of space policy to profess that vision of identity too.

The primary political purpose of space wargames in the 2000s and 2010s was self-reflection, but exactly which "Self" in question varied depending on context, from the individual at the lowest level, up to a formulation of national identity at the highest. The Schriever games are thus not only theatrical in order to be sites for the Self-reflection of players but crucially also a wider community of space security practitioners and politicians who can "observe" the same lessons. Yet, Schriever is only one of a variety of wargames and exercises which provide places for this kind of individual, institutional and even national Self-reflection. Long-standing exercises like Red Flag were adapted in the 2000s and 2010s to include elements of space technology, and with it an invitation for military personnel from a variety of backgrounds, space and non-space, to reflect on how they can perform their jobs "better" in some way. Self-reflection here, crucially, heavily involves teaching personnel outside AFSPC that their own notions of their Selves – the roles they play in national security – are threatened by space threats from near-peer adversaries like China.

Players of the games have used their experiences to publicly justify changes to practices (for example General Raymond, whose reflections are analysed below). In this way, the outcomes of wargames are useful for shaping the technopolitics of American space security in the present, even as they make claims about a future. The knowledge produced by wargames is particularly effective for this purpose because it purports to be knowledge of the problems one's future Self might face. As we saw in Chapter 7, advocates of the "Chinese space threat" struggled to firmly establish a given policy change or procurement program as a response to the "Chinese space threat." The changes to technopolitical practices after wargames and exercises seem to have been made at a much lower level than a large satellite procurement. They are important nonetheless as examples of how, despite these setbacks, advocates of the "Chinese space threat" continued to attempt to simultaneously shape the technopolitics of the present and the future.

The clearest public example of individual self-reflection is from Lt. Gen. Raymond, who claimed that insights gained from a Schriever Wargame inspired the establishment of a Joint Functional Component Command for Space (JFCC for Space) after he had similar capabilities in the game (Henry 2015). He provided a fairly detailed narrative of his experiences talking to

SpaceNews the following year. His comments from the interview (in a slightly edited form) are as follows:

> its kind of a, a neat experience when you go to a wargame and you get to play
> yourself. … and we start and we had this commercial integration cell. And at the end
> of the week, the thing that I wrote down in my mental notebook was, probably the
> most important thing that we had in that game was that commercial integration cell
> … and then I go back to Vandenberg … *playing myself for real* and, and something
> happens in the space domain, a week or so later, that it would have been really good
> to have had a commercial space entity … and that void was loud and clear … I reached
> out to the commercial uh companies and said "hey, let's see if we can develop a way
> to stand this up" … what its going to become is a lot bigger than what it is today … I'm
> a huge fan (Raymond in Gruss 2016a, emphasis added).

In addition, Raymond (in Gruss 2016a) explicitly stated that these changes had to made to keep up with 'this maturing threat.' Bearing this in mind, along with the wider discursive context established so far in this thesis, the most obvious (to us, as public observers) scenario under which Raymond first "realised" the need for this innovation was during a simulated crisis with a China-like adversary.

General Raymond's proposed organisational changes were indeed put into effect, and despite the secrecy surrounding the policy area, information was released publicly that the everyday technopolitical practices of American security were indeed changed as a result. Commercial space "entities" were brought into the JFCC (and later the Joint Space Operations Center (JSpoC, pronounced "Jayspock"). This took the form of a Commercial Integration Cell (CIC) consisting of the space technology corporations Intelsat, SES, Inmarsat, Eutelsat, DigitalGlobe and Iridium sharing data with the JSpoC (Henry 2015). Although the finer technical details are classified, this required altering and adapting technology. To use a Feenbergian term, some aspects of space technology were re-instrumentalised, and thus a transformation in technopolitics took place. Raymond's narrative explains not only why this change did happen but also why it *should* have happened. In short, Raymond's narrative (and by extension the prevailing notions of the efficacy of wargaming he is reproducing) can be seen to be an example of a "successful" intervention on the social battlefield of technology by an advocate of the "Chinese space threat" (Raymond had previously cautiously expressed concern about China's ASAT program, and became more explicit after his promotion to become commander of AFSPC (see Raymond in Ferster 2015, Bao 2016, Capaccio 2017)). Again, however, no explicit reference to the "Chinese space threat" was made in the justification of

the creation of the CIC. Instead, a variety of "threats" can take China's place in the narrative, such as Russia, or inanimate space debris – both of which Raymond (in Ferster 2015, CBS 2015) had previously drawn public attention to.

Space wargames and exercises are also a site of self-reflection for institutional "Selves." The clearest examples of this are when AFSPC has taken its role as the institutionalised leader for all exercises dealing with space security. In this position, the USAF as an institution is invited to reflect on its own shortcomings *vis-à-vis* China and space. The most important aspect of this dynamic is AFSPC teaching its own vision of space-centric American security technopolitics to the Air Force as a whole, specifically the recognition that the whole Air Force *needs* space to be "itself." After one Schriever game, several USAF officers from Pacific Air Forces (PACAF) stated afterwards that 'At one point, ... it became clear that we had better intelligence and understanding of the state of Red's C2 than we had of our own systems' (Dudney 2011). This lack of self-understanding was also framed as leading to the poor performance of the Blue team's command and control (Dudney 2011). However, the impression of institutional shortcomings seems to have been carefully pitched to avoid Air Force personnel resigning themselves to hopelessness.[71] On the contrary, participants made it clear that if changes to practices were made now, then the cataclysmic visions in the games would not come to pass (Dudney 2011). Reflecting on institutional weaknesses is then a positive and productive experience which ultimately helps the Air Force to be a better version of itself – albeit by adopting newly prescribed practices.

The inclusion of a space component to the long-running Red Flag exercises is the most visible technopolitical victory for uniformed advocates of the "Chinese space threat" outside of their own narrow circles. Red Flag has a prominent position in the training of Air Force personnel, and since 1975 it has been run multiple times a year (Axe 2013). In total, 440,000 personnel have been trained in Red Flag exercises (Red Flag 16-3 Public Affairs 2016). A space component was first included in 2011 (50th SW 2013). It has historically been a large and costly exercise (Red Flag 13-3 in 2013 had 125 jets and cost $19m 'in fuel alone') (Axe 2013). Including a strong space component in the exercises means that large numbers of Air Force officers from outside AFSPC were exposed to the "realities" of future space warfare. It also provides a forum for AFSPC personnel to meet their prospective comrades from 'other communities' (as they term it) in the event of a real war (50th SW 2013). Much like the Schriever games, journalists were quick to identify the similarities between Red Flag's Red

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[71] This is once again reminiscent of Masco's (2014) analysis of theatrical American Cold War practices.

force and the real-life People's Republic of China (see Axe 2013). By simulating a 'degraded' space environment, AFSPC satellite controllers made sure that pilots and commanders alike were forced to experience what operations would be like without GPS and SATCOM (Axe 2013). By including elements of the 527th Space Aggressor Squadron, not only did the Red Team possess counterspace capabilities (50th SW 2013, see also AFSPC Public Affairs 2016b), but also by extension every future adversary the Red team was supposed to represent. Once again, this kind of move not only helps to cement a single, coherent vision of the future, but also a reappraisal of the technopolitics of the present. As we have seen in this thesis, advocates of the "Chinese space threat" often portray space capabilities as taken for granted foundational elements of national security, and the Chinese "threat" posed to them as unnoticed. Red Flag's inclusion of a degraded space environment does not allow participants to take satellite technologies for granted because it is taken from them in the realistic, simulated environment. Although we cannot definitively know how this shaped specific practices in the aftermath of Red Flag, it seems fairly incontrovertible that new institutional links were made. As Air Force press releases pointed out, 'satellite operators wouldn't normally be mission planning hand in hand with B-2 and Rivet Joint pilots … being at Red Flag will allow the operators to find solutions to tough problems' (50th SW 2013). Towards the end of the Obama administration, official discourse explicitly claimed that improvements in cooperation between space and non-space elements of the Air Force had been enacted as a result of lessons from Red Flag (Red Flag 16-3 Public Affairs 2016).

The inclusion of space in Red Flag was itself technopolitical, but with an explicit goal of shaping the future. The public affairs office of the space participants began their press release by stating 'Forget the fighter folklore. Let's talk about the next generation of Red Flag: space' (50th SW 2013). More formally, it was also stated that the objective of Red Flag 16-3 was 'establishing habits of achieving multi-domain combat success today to enable the rapid defeat of America's adversaries tomorrow' (Reyes 2016). The ramifications for intra-service identities are manifest. As Captain Neil Fournie (in Red Flag 16-3 Public Affairs 2016), one of the organisers of Red Flag, put it 'It's about building fifth-generation Airmen who understand how to combine air, space and cyber together' and ultimately that this means 'Understanding that it's not just a support function that we [space and cyber personnel] are warfighters and how the effects we have can be brought to bear to help us defeat our potential adversaries is an important cultural shift.' The claim then, is not just that space personnel are worthy of the same respect as the rest of the Air Force. More than that, the claim is that if the rest of the Air Force does not engage in self-reflection and draw this conclusion, it will be weaker in the

future. In this light, the intra-service reflection is by extension also a call to reconfigure technopolitics.

The final invitation for self-reflection is more ephemeral. Engaged as they are in practices of national security, the organisers, participants, and disseminators of wargames cannot help but also make claims about some kind of national Self. Although most of these claims are merely implied, there are a few instances where those involved in simulations of space warfare have called for the nation to recognise (and adopt) a certain strain of space technopolitics. After Schriever V, Vice Admiral Carl Mauney, then the Deputy Commander (2009: 9) of STRATCOM, stated that 'today, space capabilities are more than conveniences, they are fundamental to many aspects of modern life.' This sentiment was repeated by many other participants and observers, claiming that losing access to space 'would have severe and unthinkable consequences' for Americans (Felderman 2009: 24) and that 'Space capabilities are like oxygen … we cannot survive without them' (Roche in Wright 2009: 26). These kind of statements take the "findings" of the wargames and reflect not only on the relationship between the US military and space technology, but also between the nation and space technology. Although the audience might be relatively narrow, as explored earlier, it is an elite audience which is endowed with agency over national policy. It is perhaps unsurprising that these games and exercises are not meant simply as opportunities for the USAF, or the military as a whole, to learn about its "true Self," but rather for an elite audience to learn about a specific conception of the national Self. One participant went even further, claiming that the game showed participants that 'space is not only critical to US interests, it is critical to the operation of an entire interconnected world economy' (Blaisdell 2009: 37).

While the results of these attempts to make the national reflect on its space technological underpinnings are more ephemeral than those within the military, the organisers of these games and exercises seem keen to point to instances of the successful incorporation of insights from simulations successfully being incorporated into national policy. The example they highlight themselves is influencing the QDR, a recurring forum for assessing the "Chinese space threat" already analysed in Chapter 5. The explicit claim that Schriever V would influence the QDR was made by the Commander of the SIDC, Colonel Robert Wright (2009: 26), and the Vice President of Situational Awareness at Lockheed Martin, Marc Berkowitz (2009). As discussed in Chapter 5, the QDRs were not forthcoming in providing sources for the claims they make. It is unsurprising, then, that the QDR which followed the Schriever wargames in 2009 and 2010 did not mention the games as a source of insight or proof (DoD 2014). That being said, the language of the 2014 QDR and that of the participants of the Schriever games

are remarkably similar. As Roxanne Lynn Doty (1993: 310) might say, they "hang together" – there is 'a coherence among them.' This allowed the Schriever wargames organisers and participants to use the QDR as evidence of their success if they wished since it does seem to correspond with their conclusions and use of language. The review states, for example, that the US military should be prepared to fight 'sophisticated adversaries who could employ advanced warfighting capabilities while simultaneously attempting to deny U.S. forces the advantages they currently face in space and cyberspace' (DoD 2014: vii). It likewise echoed the conclusions of the wargames that improvements must be made to the command and control systems for space technology (DoD 2014: 36-37). Indeed, the most significant rupture between the discourse surrounding the games and the text of the QDR is that the QDR explicitly identifies China as an adversary in space, unlike the reports on Schriever and Red Flag (DoD 2014: 6). We should be cautious about claiming whether the Schriever games transformed technopolitics at a national level, but it does seem that due to the similarities of language, it was possible to tout the 2014 QDR as a victory by the Schriever organisers and more generally for advocates of the "Chinese space threat."

Conclusion

Wargames are a unique area for the analysis of the construction of the "Chinese space threat" because, as this chapter shows, the use of simulational practices accentuates the claims which the discourse of threat about the future. As has been frequently shown in this thesis, the narrative of threat has a strong historical (even teleological) component, claiming that certain things will, or must, happen. This chapter raised the final aspect of technopolitics analysed within this thesis: the political wrangling over the future technological trajectory of the nation. Making use of wargames to underpin these claims allowed the organisers to draw on decades of wargaming canon in American national security policy, burnished with the participation and endorsement of some of the most famous figures of the Cold War. The tradition of using wargames and exercises to understand a new and mostly untested technology under "realistic" conditions was well-suited to being extended to exploring the nature of the "Chinese space threat," and convincing outsiders of its reality and seriousness.

In opposition to the uncritical American journalistic and academic analyses (Forden 2008e, Peck 2012, Johnson-Freese 2017: 57-58), an important finding of this chapter is that wargames are carefully designed to produce particular kinds of knowledge. The organisers of space warfare games and exercises made use of a variety of techniques to ensure that both

the players and the audiences were convinced by the "realism" of the simulations. There is evidence to suggest that the Red team was carefully constructed as sufficiently China-like to be readily understood as the intended subject, yet sufficiently distinct to skirt potential controversy (and perhaps classification). The lack of certainty around the identity of the nefarious "red teams" of the scenarios contributed to the relative lack of traction which the "Chinese space threat" had in wider US security policy. Ultimately it was left to journalists and other unofficial observers to draw the conclusion that *Schriever* and *Red Flag* were definitively preparations for a coming space war with China.

Although there seem to have been constraints on the scenario builders, such as needing to reflect wider discourses of what space security is "really like," the playwrights of these games built a world which reflected a specific (in some ways, but not others) vision of a China-like enemy, the US, and their space technologies which the players were unable to change or challenge. By hosting the games in rooms which closely resembled the real-life locations of the everyday military practices of space security, the line between simulated and real practices was rendered indistinct. The players and the audience – closely intertwined – seem to have been members of American foreign policy and technological elites. This included members of the American and allied armed forces; politicians, bureaucrats, intelligence officers, and aerospace executives – those best placed to intervene in the technopolitics of American space security policy. The theatricality of these games was then put to a specific use: a call for the players and audience to engage in public Self-reflection, with a view to shaping American technopolitics.

The nature of both the self-identities and the reflection demanded by the games varied depending on the Selves in question. Senior practitioners of space security – most notably General Raymond – could "play themselves for real" and in so doing, learn how to be themselves "better." What distinguished these players from the others was their ability to most directly intervene in the everyday technopolitics of American space security. In Raymond's case, he set up a commercial entity under his command which he had previously utilised in a wargame. The public narrative was thus that good knowledge produced in the games had directly led to an improvement in the reality of American space security and, by extension, helped to shape a better future technopolitics too. A second "self" which the organisers seemed to be addressing was the Air Force and wider military community. The representations both of and within the space warfare simulations served as a warning that space technology was an underappreciated foundation of American military identity. By highlighting this "reality," the advocates of the "Chinese space threat" involved in *Schriever*

and *Red Flag* offered up the possibility that changing technopolitical practices within the military could avert a disaster in the future. Finally, the organisers used the games to call for the nation, or rather the foreign policy elite charged with its protection, to recognise the importance of (and threat to) American space technology and take steps to rectify the situation. The most concrete public expression of this sentiment was the publicly articulated goal of shaping of the QDR and the technological procurement which theoretically followed from it. Although it is difficult to be sure of their success, the advocates of the "Chinese space threat" seem to have been successful in aligning their discourse with the language in the QDR, thus providing a potential example of successfully influencing security policy at a national level. Ultimately, the space warfare games and exercises seem to have been the closest any official discourse came to establishing an authoritative vision of future Sino-US relations in outer space, during the same period in which advocates of the "Chinese space threat" had struggled to gain even limited change in the technopolitics of the present. Yet, it is noteworthy that even within these most explicit articulations of imaginary future US-China space warfare, there were limits on the extent to which these imaginations were definitively about China.

Chapter 6, 7, and 8 have collectively argued that the dominance of the "Chinese space threat" discourse only went so far. That is, despite the successful institution of a coherent representation of China as a "threat" in rhetoric and the sense of concern that was collectively produced, advocates of the thesis did not manage to re-instrumentalise much of American space technology at either the primary or secondary levels. Even in Chapter 8, where the simulations of the future of the "Chinese space threat" were analysed, the narrative was inconsistently present in official representations of the future of space security. Overall, then, the most profound aspect of unevenness in the construction of the "Chinese space threat" was in this persistent disjuncture between the content of rhetoric and the shape of technics and the national Self. This finding contributes further evidence for the overarching argument of the thesis that arguments of technological determinism found in policy discourse and academic literature have rather shaky foundations.

Chapter 9

Conclusion: The Uneven Construction of China's "Rise" in Space

Almost every American source that cares to mention China's space program agrees that its recent surge to prominence constitutes a grave threat to the national security of the United States of America. A streak of technological determinism was a recurring feature of within these debates, particularly after 2000 (see Parts 2 and 3). Chinese space technologies were instrumentalised as tools for the destruction of the US, contextualised with wider representations of China as a reckless and aggressive space power (see Chapter 6). Coupled with the instrumentalisation of American space technology as essential, in an ontological sense, to the nation, the "Chinese space threat" narrative became existential in scope. According to many of the proponents of this discourse, China's rising space power would inevitably entail a mix of fear, conflict and space (arms) racing. Yet the irrefutability of the "Chinese space threat" in US public policy discourse conceals a multitude of tensions and inconsistencies.

Asking "how" the threat came to be has revealed its uneven construction, and thus by extension demonstrated how misguided technologically determinist arguments about the "rise" have been. Part 1 showed both how the "threat" has varied over time, in some instances becoming side-lined in favour of cooperation in space. It also demonstrated how space has inconsistently appeared in broader American debates about China's "rise" more generally, sometimes cited as evidence of the "rise," elsewhere obscured by other foreign policy concerns. Part 2 showed how advocates of the "Chinese space threat" differed in which aspects of American identity, and which corresponding technologies, they valued and portrated as imperilled by China's "rise" in space. Finally, Part 3 underlined the appearance of unevenness by inquiring after the policies and procurements which were undertaken in the name of the "Chinese space threat." Beyond the maintenance of the ITAR restrictions already in place at the start of the century and the limitations on NASA-China interaction imposed in 2011, no new policies were sanctioned in line with what by any other measure was an incredibly dominant discourse. This disjuncture is the most pressing evidence for the uneven construction of China's "rise" in space, and sets up a puzzle for future research to address. Despite this puzzle, the lack of a technological response is itself is best understood as a part of technopolitical contestation within American public policy discourse. Viewed in this light, the

determinism of the "Chinese space threat" remained unmanifested. In other words, the "Chinese space threat" was a kind of "dog that didn't bark" where the omission of response is itself evidence worthy of consideration.

Contributions of the thesis

Two main claims, corresponding to the two main contributions of this thesis, have been made by this thesis. The first is that the dominant discourse of the "Chinese space threat," was unevenly socially constructed and historically contingent, and thus did not inevitably result in specific American responses such as arms races (Tellis 2007a: 7), spiralling security dilemmas (Handberg and Li 2012: 4) or Thucydides' traps (Johnson-Freese 2017: 54). Ultimately, American elites constructed US-China interaction in space differently to the rest of the relationship, focusing almost entirely on competition and threat. In doing so, this discourse even concealed historical cooperation between the two countries. It was this dominant discourse that actively made outer space an outlier in US-China relations. The second main claim is that threat construction analysis requires a technopolitical lens in order to understand the role that technology plays in underpinning and imperilling identities. In this way, this thesis seeks to make a contribution to threat construction literature. Existing literature in this area has recognised the social construction of technology, but not the technological construction of technology. As the analysis throughout the thesis, but particularly in Part 3 demonstrates, occluding the *co-* of co-construction obscures political contests over technology and identity that are worthy of study. This section re-iterates how the various elements of the thesis supported these two main claims and contributions.

The first Part of this thesis explored the context of the "rise" of China in space. A major component of this was researching the now mostly forgotten past of US-China relations. By establishing the precedents of both American alarm over China's space program, and the subsequent instrumentalisation of American and Chinese space technology which helped curtail the first "Chinese space threat," this thesis demonstrated how threat and technology have historically been co-constructed in the relationship. Importantly, however, this area of the project also highlighted how little of the historical precedents of the relationship figure into the 21st century policy debates. Instead, the rest of the thesis indicated that the contemporary American public discourse on China's "rise" in space is almost totally ahistorical in nature, both in terms of recognising prior tensions but perhaps most crucially omitting the previous mutually cooperative character of the relationship only a few decades before.

The main theoretical contribution of this thesis was to engage insights from threat construction with those from STS. As the thesis progressed into Parts 2 and 3, the social force of existing technology was increasingly identified as a contributing factor to both the interpretation of Chinese space technology as a threat, but also as a contributing factor to why changing rhetoric did not automatically entail technological overhaul. On the first point, by engaging closely with what relationships were created between formulations of identity, threat, and technology, a picture emerged of an important role for technology in representational practices more generally. Specifically, some representational practices are predicated on the availability of certain technologies. Even though the function of these technologies, and the meaning and importance of the practices, are all socially relative, the social reality which is constituted in these relations creates a complex and durable basis for the construction of threat. Thus, American policymakers instrumentalised Chinese space technologies as functioning as destroyers of American satellites, or replicators of unique American lunar achievements. In doing so, they could then draw on powerful and widely recognised discourses of national identity and very specifically locate the threat that China posed to key elements of those identities. The technological character of these threats then further girded these characterisations by appearing to be material, objective, and therefore all the more irrefutable. Future threat construction research could benefit from exploiting this theoretical insight by exploring how key identity-producing practices are technologically enabled in other cases.

The second element of the theoretical contribution of this thesis to threat construction literature was to identify how technology could "feedback" in a socially contingent manner to shape security politics. By under-theorising technology, prior threat construction literature may have over-stated the political significance of rhetoric and non-technological practices. In Chapter 6, this thesis identified the key technological systems that were supposedly under threat from China, and analysed which elements of American identity were invoked in these processes of threat construction. In becoming instrumentalised into American security practices, such as precision weapons guidance and global navigation, the technologies had become closely woven into the identity politics of sub-national identities but also formulations of national identity writ large. This is one form of technological "feedback," because the empirical evidence indicates how identity and technology are constantly being co-constructed in American space policy debates.

Further examples of technological feedback were explored in Chapter 7, but rather than in a productive capacity as in Chapter 6, the durability of existing technopolitical systems

helped to undermine calls for technical change. The formulation of a "Chinese space threat" was both explicitly and implicitly a call to action, be it to acquire new space weapons, Moon rockets, or defensive measures. In the case of the call for space weapons, one can point to the success of rhetorical opposition, which seems to have created sufficient controversy to defeat the proposals. Yet, for the calls to increase the number of satellites in existing constellations, or to split up capabilities across new systems, all official contributions to the discourse agreed that such technical changes were necessary. A key barrier which remained to technical change was the shape and qualities of the existing technologies, themselves products of an older arrangement of technopolitics. Orbiting hundreds of miles above the Earth, these systems were costly to modify or replace. The result was non-innovation and the continuation of the existing technopolitical status quo, even as the assumption of the "Chinese space threat" remained largely unquestioned within American public policy discourse.

The limited success of the "threat" interpretation

The most significant manifestation of the limitations of the "Chinese space threat" was the inability of its advocates to spread their narrative beyond a fairly narrow set of public forums. The threat of a rising China in space was publicly articulated by members of both parties, especially in Congress. However, the small number of elected representatives who took up the cause ultimately limited what was possible on Capitol Hill. Representative Wolf's anti-cooperation clause was repeatedly implemented in committees, where space policy was only one issue among many (the House Subcommittee on Commerce, Justice, and Science, and Related Agencies), and tacked onto larger pieces of legislation. At the subcommittee stage, a recurring set of elected officials who strongly endorsed the reality of the "Chinese space threat" repeatedly gained the votes to make this outcome fairly certain. The measure itself cost nothing financially, and did not interfere with large technological programs (either military or civilian), which were already in progress, features which may by consequence have made the clause a relatively uncontroversial inclusion for Congress at large. In contrast, denying the importance of the space program and of China's threat to the US in space was a much more difficult position to articulate, and when it was tried by elective representatives it was overwhelmed by "Chinese space threat" advocates (see Chapter 5 and Weiner in House 2006: 4748). Beyond these small interventions, however, in Congress the "Chinese space threat" never gained much traction outside of the committee room.

One important trend identifiable from the analysis taken as a whole is the relative absence of the Presidency in public policy debates on the significance of China's "rise" in space. Observers of American foreign and security policy might assume that the President's wide-ranging constitutional and customary powers in these fields would mean that the official position on the meaning of China's space program would be found in White House documents and Presidential rhetoric. The "bully pulpit" of the Oval Office undoubtedly constitutes the most powerful subject-position in American foreign policy, but it is startling that it was not used to publicly intervene in the policy processes examined within this thesis. Carter was the last President to exert significant public effort to pursue a specific space policy towards China. While his successors continued to approve cooperation by waiving Cold War-era trade restrictions, increasing rhetorical and eventually legislative pressure from Congress lent cooperation an increasingly public profile that Presidents eventually ceased to publicly intervene in. We should be careful in speculating on why this was the case, but it is worth recalling that during the 2000s and 2010s, the US was embroiled in two wars and a host of further conflicts under the rubric of the "Global War on Terror." As was also argued in Chapters 1 and 3, wider US-China relations were themselves deeply complex, and characterised by a mix of competition and cooperation, threat *and* opportunity (Pan 2012). It must be remembered that space policy was only one part of this relationship. Regardless of the conditions which underpinned the situation, with Presidential attention occupied elsewhere, a handful of legislators, military officers, and bureaucrats to publicly constructed and contested the official position of the United States on the significance of China's "rise" in space. The public appearance at least is one of Presidential retreat from Congressional and military controversy. Simultaneously, however, the lack of Presidential involvement in defining the official national position on the threatening "rise" of China in space can also be seen as a failure of its advocates to coerce the White House into endorsing its veracity.

The advocates of the "Chinese space threat" clearly fell short of their stated goals. The analysis in Chapters 6, 7 and 8 collectively show how the narrative of threat explicitly included specific calls for action, such as making systems more "resilient" for example (White House 2010, DoD 2011c: 11, 2011b: 1-2). There was no public indication that these goals had been achieved however, and as Chapter 7 particularly argued, potential changes to space systems were not contextualised as successful implementations of "resilience," for instance. Compared to the radical reorganisation of American security after the atomic bomb, the "rise" of China in space cannot be said to have constituted a "technopolitical rupture." A self-contained example of this is Representative Bridenstine's 'American Space Renaissance Act,' which called for a

rebirth of American space power. The bill, however, remains unimplemented. Indeed, it has not even been discussed by the Committees and Subcommittees to which it was referred (US Congress 2018). Calls to adopt space weapons were too controversial to Congress at large, and only the most modest of programs were funded (see Chapter 6, Hitchens et al. 2006, Masters 2014, Wasserbly 2017). Calls to "disaggregate" military space capabilities like early warning and communications saw widespread rhetorical support both from elected representatives, Defense and State Department officials, and senior military personnel, but instead the same Cold War-era follow-on programs were pursued. Likewise, no plans to replace the independent crew launch capability of the Space Shuttle have been successful, and the US continues to rely on Russian launches to send crew to the International Space Station. Even the capabilities sought in the Commercial Crew contracts have been delayed. One might have expected a predominant discourse of threat to provide the sense of urgency cultivated around *Sputnik*, the Cuban Missile Crisis, or the Bush Administration's justification of the 2003 Iraq War. No similar crash programs or justification of violence resulted from "Chinese space threat" arguments.

In the executive bureaucracy, the "rise" of China in space was increasingly a recurring concern for some departments and offices, but again the threat was expounded by very few individuals endowed with the authority to speak on behalf of the state, especially during the Bush years and through the early years of the Obama administration. Potential "counters" to the Chinese space threat were not mobilised by executive officials, even as they increasingly publicly expounded the reality of the "Chinese space threat." While it might be expected that the US shootdown of its own satellite after China's 2007 test was a "response," there is no evidence that the SM-3 missile was re-contextualised as an anti-satellite weapon, let alone a tool to deter or fight China in space. Indeed, it would seem that the relevant body, the Missile Defense Agency, took pains specifically *not* to re-instrumentalise the missile as an ASAT weapon. Even if the use of the SM-3 was *intended* as a "response" to China, it was not publicly justified in those terms. Similarly, by the time a Secretary of Defense, along with his Under Secretaries, were publicly supporting the "Chinese space threat" narrative, no new anti-Chinese technological procurements had been publicly identified, and developments like GPS upgrades and the creation of the JICSpOC were only implied to relate to the emergence of Chinese space power, if at all. Within American technopolitics, there is not a clear interrelationship between the discourse of the "Chinese space threat" and the design of US space technology.

Finally, portions of the military were consistent and early advocates of the "Chinese space threat" interpretation of the "rise." Politically, indeed technopolitically, the military has little direct control over the shape of the technology with which it operates. General Hyten (in AFSPC Public Affairs 2016a) claimed that American space technology was "not designed with threats in mind," and told the media (and the public at large) that a war in space would reduce American military capabilities to World War II levels. Yet Hyten's alarmist comments, which seemingly called for a total overhaul of American space technology to prevent his nightmare vision coming to pass, has so far resulted in no public identification of new American space capabilities, defensive or offensive. Indeed, as has consistently been argued in this thesis, few major changes to American space technology were made during the 2000s and 2010s at all.

Limitations of the project and opportunities for future research

The most significant limitation of this research is its exclusion of non-public data. This choice was made primarily for practical reasons because the "rise" of China in space is an on-going narrative in American security politics, and the technologies in question are highly sensitive and subject to strict secrecy. Adopting a technopolitical lens helped ensure that this thesis remained sensitive to the social construction of technology *and* the technological construction of society, yet previous literature indicates that a great portion of these dynamics are not public. It is this disconnect between public discourse and secret technopolitics which this thesis argues explains the lack of technological change in light of the "Chinese space threat." Studying the secret portion of American space technopolitics would therefore be of major significance to understand this case further. It would also open up the possibility of posing questions about the political economy of the "rise" of China in space – which groups benefit financially from constructing the threat? However, to undertake such a project would take years of Freedom of Information requests, exceptional research contacts, or simply waiting for the 25-year automatic declassification process. It may therefore be some time before research can be undertaken on the non-public and secret resistance to re-ordering American space technology to reflect the existence of a "Chinese space threat." Once this research is executed (to the level of detail provided in major works of STS), however, it will become much clearer how specific "technopolitical regimes" (as Hecht (1998) dubs them) struggled "behind the scenes" over the shape of American space technology.

A further limitation of this project was due to the conscious decision not to engage in comparison between other potential "space threats" (such as Russia and India) or other

national security threats more widely. A comparative survey would greatly add to knowledge and provide another avenue to understanding what issues may have trumped American alarmism about China's space program during the Bush and Obama years. Attempting to analyse how individual articulations of threat "compete" with one another for limited funds and attention could shed light on how some discourses can be relatively unchallenged, yet not powerful enough to pursue major foreign policy change. Likewise, trying to understand why the recent developments of the Indian space program were not constructed as a "rise," let alone a widely understood "threat" would be a potentially interesting case of why some foreign technologies do *not* become constructed as security issues.

Finally, this thesis aims to understand solely *American* understandings of China's "rise" in space. American space policy towards China is extremely unilateral in character, meaning that Chinese official viewpoints have not been analysed even in passing, since they are totally absent from American public policy discourse. Collectively, this meant that a further gap in the literature remains: has China adapted its space policies in response to recent American space policy, and to what extent is American alarm recognised in Chinese policy? Although some literature attempts to understand the bilateral dynamic, notably Baohui Zhang (2011), the tendency to assume threats are self-evident has obscured the kind of complex technopolitics explored in this thesis. Additionally, while researchers have provided excellent work on the domestic rationale of China's space program, a gap remains to understand if international political rationales play(ed) a role too, and to address that question with the nuance that this stream of literature has previously exhibited, particularly in the use of Chinese language sources. American journalists and members of Congress continue to repeatedly claim that the US and China are in a "space race" or even a "space arms race." That would presumably require an intersubjective recognition by both states of the existence and terms of that competition. A question remains as to whether the Chinese government will ever adopt the "space race" metaphor as a framing device for its space program too.

Future prospects: China's "rise" in space in the Trump-era and beyond

While this research project was drawing to a close, the Obama administration ended and Donald Trump won the Presidential election. At the time of writing, it is now only one year into the new administration, so it is too soon to draw firm conclusions about how President Trump's presence in the Oval Office will shape American space policy towards China, if at all. This is the main reason why the thesis analyses public policy discourses until the end of the

Obama years, coupled with my expectation that Trump, if he began to pursue space policy at all, would be "disruptive," with insufficient material to contextualise the significance of any changes. As it stands, Trump's space policy has, true to form, seen an escalation of rhetoric and a heightened sense that American "decline" must be reversed. The two centre pieces of Trump's space policy, such as it is, are the re-establishment of the National Space Council and the re-orientation of crewed space priorities from a distant Mars mission to a much sooner return to the Moon. Observers were quick to link the Moon policy to competition with China (Gao 2017, Yuhas 2017), and as this thesis demonstrated this is to be expected given the particular American sensitivity to lunar achievements, both Chinese and American. Yet, Trump's lunar focus supports another key argument of this thesis: rhetorical dominance in US space policy does not necessarily correspond with the (re-)shaping of American space technology. President Trump and Vice-President Pence both regaled audiences with lofty rhetoric, but beyond the re-establishment of the Space Council there were no concrete provisions for new technological programs or much of an increase in funding. It may be early in the process, but the Trump administration seems set-up to continue the trend of a coherent official discourse which conceives of a "Chinese space threat" but does not mobilise the discourse to sanction the corresponding practices, especially technological practices. Continuing to study US reactions to China's "rise" in space under Trump will provide further opportunities to analyse how dominance in language alone does not lead to technological change. One cannot simply "talk" a country to the Moon. The Trump administration will face technopolitical barriers just as his predecessors have done over the artefacts and systems which ultimately make the practice of "Moon landing" possible – his proposed $200m budget is unlikely to make much headway in this regard (Pasztor 2018).

Even at this early stage, it is possible to point to some of the discursive constraints which, if unchallenged, will continue to shape US space policy toward China during the Trump years. As is argued in Chapter 5, an underlying logic of American space policy discourse is that capabilities are synonymous with intentions. This logic prevents serious discussion of Chinese intentions in their own right, allowing Chinese capabilities to be figured – unchallenged – into hypothetical nightmare scenarios that seem mostly to be products of American imaginations. There is no evidence so far that US policymakers have publicly reflected on how American space dominance might figure into Chinese space policy decisions, for example, because the question seems settled with only a cursory analysis of Chinese capabilities. Modifying this logic would require a powerful intervention. As it stands, nearly every Chinese space capability is an

indicator of Chinese intentions to supplant America's position as the most powerful state in space, and for some observers even on the surface of the Earth too.

According to current procurement plans, the major space systems which American policymakers feared were under threat in the 2000s and 2010 will continue to be launched with no major overhauls to reflect the new "threat." As argued in Chapter 6, key American security practices which help constitute the "new American way of war" and "American exceptionalism" are enabled by systems first envisaged in the Cold War and 1990s. These systems, as if further argued in Chapter 7, have seen only marginal, not revolutionary changes. Unless there were to be a great rupture in American military identities (which, being socially contingent is of course possible), these same technical affordances would be understood as "essential" to the pursuit of national security. Correspondingly, these systems will then be objects to be secured themselves, or at least replaced with like-for-like capabilities which afford similar practices. Currently these discursive parameters determine the circumstances under which China would no longer be considered a "space threat." Collectively they seem to demand China abandoning the majority of its military and crewed space programs, however, which is an incredibly high set of requirements.

The technopolitical construction of the "rise" of China in space is by no means finished. During the period in question, the narrative appears to have been useful for justifying the pursuit of very few new policies or technologies. Yet despite its limitations, the sturdy construction of a (threatening) Chinese "rise" in space has a continuing role to play in wider US-China relations. While "Chinese space threat" advocates may have fallen short in their technological ambitions, establishing a heightened sense of threat (compared to say, the 1970s and 1980s when US-China space relations were cooperative) played well into wider notions of a "China threat/China rising," taking its place among fears of Chinese aircraft carriers, anti-ship missiles, "maritime militias," new nuclear capabilities, and cyberwarfare. The widely understood status of space technology as "advanced" remains commonly connected to cyber capabilities (Kharpal 2017, Pham 2017, Erwin 2018), positioning China as a "near peer" rival and endowing China with the necessary qualities to fulfil the role of a worthy adversary for American might and prestige.

The implications for the future course of US-China relations in outer space seem fairly grim. With no powerful counter-narrative, it would be a mistake to consider the "Chinese space threat" narrative to have "failed" merely because it fell short of its expressed goals to respond with the development of new hardware. This thesis found no evidence of public

voices willing to stand against the alarmist discourse of the China "hawks." Over the past ten to fifteen years, then, the advocates of a "Chinese space threat" have successfully established a sort of beach-head in US space policy that is only (publicly) "opposed" by ambivalence. As China pursues more and more space spectaculars, those sounding the alarm over China's space program will be handed new dramatic images to bolster their narratives of threat. It remains to be seen whether a Chinese flag on the Moon would in some way "popularise" the notion of a "Chinese space threat," but given the endurance of historical discourses of identity that combine techno-optimism, frontier myths and American exceptionalism, it is certainly possible. At that point, the "Chinese space threat" discourse would be in a prime position to justify the technological procurement that its proponents have sought since the beginning.

The understanding of the construction of China's "rise" in space provided by this thesis sheds significant light on how space relations have come to be an outlier in the most impactful relationship of the 21st century. By showing that this "threat" was not inevitable, this thesis indicates that there is room for both hope and anxiety for the coming years. The historical record gives a glimpse of how space technology could be a tool for cooperation, if American leaders are so inclined. Given its dominance, however, it seems more likely that the "Chinese space threat" will be used to maintain, or deepen, American suspicions of China in space, and consequently also on Earth.

Bibliography

Archives Consulted

Central Intelligence Agency Electronic Reading Room, Available at:
https://www.cia.gov/library/readingroom/ Accessed 29/01/2018

Congressional Record, Congress.gov/GPO: Washington DC

Declassified Documents Reference System, Library of Congress/National Archives and Records
Administration, Washington DC – both the microform and digital collections were consulted

The American Presidency Project, University of California Santa Barbara, Available at:
http://www.presidency.ucsb.edu/ Accessed 29/01/2018

The Digital National Security Archive, The George Washington University/Proquest, Accessed
at the Library of Congress, Washington DC

U.S. Declassified Documents Online, Gale/Cengage Learning: Detroit, Accessed at the Library of
Congress, Washington DC

Primary Sources

10 United States Code § 2273a (2017) Available at:
http://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title10-
section2273a&num=0&edition=prelim Accessed 29/01/2018

50th Space Wing Public Affairs (2011) '50 SW completes GPS constellation expansion,' Available
at: http://www.schriever.af.mil/News/Article-Display/Article/277054/50-sw-completes-gps-
constellation-expansion/ Accessed 29/01/2018

50th Space Wing Public Affairs (2013) 'Schriever to bring space capabilities to Red Flag,'
Schriever Sentinel, Available at: http://csmng.com/2013/02/14/schriever-to-bring-space-
capabilities-to-red-flag/ Accessed 29/01/2018

Air Force Space Command Public Affairs (2016a) 'AFSPC Commander Announces Space
Enterprise Vision,' Available at: http://www.afspc.af.mil/News/Article-
Display/Article/730817/afspc-commander-announces-space-enterprise-vision/ Accessed
29/01/2018

Air Force Space Command Public Affairs (2016b) 'Professional bad guys: Space aggressors
prepare Airmen for the enemy,' Available at:
http://www.nellis.af.mil/News/Article/873240/professional-bad-guys-space-aggressors-
prepare-airmen-for-the-enemy/ Accessed 29/01/2018

Arms Control and Disarmament Agency (1963) 'Summary and Appraisal of Latest Evidence on
Chinese Communist Advanced Weapon Capabilities,' Declassified Documents Reference
System, Library of Congress: Washington D.C.

Air-Sea Battle Office (2013) 'Air-Sea Battle: Service Collaboration to Address Anti-Access &
Area Denial Challenges,' Available at: http://archive.defense.gov/pubs/ASB-
ConceptImplementation-Summary-May-2013.pdf Accessed 20/12/2017

Bolden, C. (2014) 'Bringing Space Launches Back to America,' Available at:
https://blogs.nasa.gov/bolden/2014/03/25/bringing-space-launches-back-to-america/
Accessed 20/12/2017

Booz Allen Hamilton (2008) 'Briefing Book: Cyber Strategic Inquiry: Enabling Change Through a
Megacommunity Strategic Simulation,' *Business Executives for National Security*, Available at:
http://www.neweraassociates.com/downloads/CSI08_BriefingBook.pdf Accessed 20/12/2017

Buckley Air Force Base (2015) 'Space Airmen – Defending the Nation 24/7,' Available at:
https://www.youtube.com/watch?v=-N_OykgD15I Accessed 20/12/2017

Bush, G. (1991) 'Approving Exports for the Aussat and Freja Projects,' House Document 102-75,
GPO: Washington D.C.

Bush, G. (1992) 'Waiving Legislative Prohibitions on Approval of United States-Origin Exports to
China,' House Document 102-385, GPO: Washington D.C.

Bush, G. (2001) 'Executive Order 13222 – Continuation of Export Control Regulations,'
Available at: http://www.presidency.ucsb.edu/ws/?pid=61503 Accessed 20/12/2017

Bush, G. (2003) 'Letter to President Ju Jintao on China's First Human Space Mission,' Available
at: http://www.presidency.ucsb.edu/ws/index.php?pid=63579&st=china&st1=space Accessed
20/12/2017

Bush, G. (2007) 'Message to the Congress Certifying Exports to the People's Republic of China,'
Available at: http://www.presidency.ucsb.edu/ws/index.php?pid=24519&st=china&st1=space
Accessed 20/12/2017

Carter, A. (2015) Excerpt from Gruss, M. '17 Space Questions Posed to Ash Carter by Senate
Panel', Available at: http://spacenews.com/senate-panel-poses-17-space-questions-to-ash-
carter/ Accessed 20/12/2017

Carter, A. (2016) 'Remarks on Sustaining Nuclear Deterrence,' Available at:
https://www.defense.gov/News/Speeches/Speech-View/Article/956630/remarks-on-
sustaining-nuclear-deterrence Accessed 20/12/2017

CBS (2015) 'The Battle Above', Transcript available at: http://www.cbsnews.com/news/rare-
look-at-space-command-satellite-defense-60-minutes/ Accessed 20/12/2017

Cebrowski, A. and Raymond, J. (2005) 'Operationally Responsive Space: A New Defense
Business Model,' *Parameters*, No. 2, pp. 67-77

Chinese Aeronautical Establishment and National Aeronautics and Space Administration (1983)
'Protocol on Cooperation in Aeronautical Science and Technology,' Digital National Security
Archive: Washington D.C.

Chinese Aeronautical Establishment and National Aeronautics and Space Administration (1985)
'Annex I to the Protocol on Cooperation in Aeronautical Science and Technology,' Digital
National Security Archive: Washington D.C.

Central Intelligence Agency (1965a) 'Special Report: The Race for Third in Space,' Office of
Current Intelligence, Office of Scientific Intelligence, Available at:
https://www.cia.gov/library/readingroom/docs/CIA-RDP79-00927A004900120003-5.pdf
Accessed 20/12/2017

Central Intelligence Agency (1965b) 'National Intelligence Estimate Number 13-2-65: Communist China's Advanced Weapons Program,' Declassified Documents Reference System, Library of Congress: Washington D.C.

Central Intelligence Agency (1966) 'Intelligence Handbook: Communist China,' Office of Current Intelligence, U.S. Declassified Documents Online, Gale: Detroit

Central Intelligence Agency (1967) 'National Intelligence Estimate Number 13-8-67: Communist China's Strategic Weapons Program,' CIA Freedom of Information Act (FOIA) Electronic Reading Room, Available at: https://www.cia.gov/library/readingroom/docs/DOC_0001086601.pdf Accessed 20/12/2017

Central Intelligence Agency (1968a) 'Special National Intelligence Estimate Number 13-10-68: Communist China's ICBM and Submarine Launched Ballistic Missile Programs,' Declassified Documents Reference System, Library of Congress: Washington D.C.

Central Intelligence Agency (1968b) Communist Aid to North Vietnam (S-2659,' CIA Freedom of Information Act (FOIA) Electronic Reading Room, Available at: https://www.cia.gov/library/readingroom/document/0000483828 Accessed 4/1/2018

Central Intelligence Agency (1969) 'Response to NSSM No. 80: A Review of Major International Developments During 1969,' U.S. Declassified Documents Online, Gale: Detroit

Central Intelligence Agency (1971) 'Missile and Space Related Facilities China,' CIA Freedom of Information Act (FOIA) Electronic Reading Room, Available at: https://www.cia.gov/library/readingroom/docs/CIA-RDP78T05929A004500090001-2.pdf Accessed 20/12/2017

Central Intelligence Agency (1973) 'Probable Chinese Collection of U.S. Satellite Imagery,' Declassified Documents Reference System, NARA: Washington DC

Central Intelligence Agency (1974) 'Soviet and Chinese Aid to North Vietnam,' CIA Freedom of Information Act (FOIA) Electronic Reading Room, Available at: https://www.cia.gov/library/readingroom/document/cia-rdp85t00875r001900020062-8 Accessed 4/1/2018

Central Intelligence Agency (1975) 'Weapons Intelligence Summary,' Office of Weapons Intelligence, Digital National Security Archive: Washington D.C.

Central Intelligence Agency (2015) 'CORONA: Declassified,' Available at: https://www.cia.gov/news-information/featured-story-archive/2015-featured-story-archive/corona-declassified.html Accessed 210/12/2017

Central Intelligence Agency (2017) 'United States,' *The World Factbook*, Available at: https://www.cia.gov/library/publications/the-world-factbook/geos/us.html Accessed 21/12/2017

Central Intelligence Agency/Defense Intelligence Agency (1971) 'Intelligence Memorandum: Military Aid to North Vietnam During 1970,' CIA Freedom of Information Act (FOIA) Electronic Reading Room, Available at: https://www.cia.gov/library/readingroom/document/cia-rdp85t00875r001700010064-9 Accessed 4/1/2018

Clinton, W. (1991) 'Remarks Announcing Candidacy for the Democratic Presidential Nomination, October 3, 1991,' *The American Presidency Project UCSB,* Available at: http://www.presidency.ucsb.edu/ws/index.php?pid=77817 Accessed 10/09/14

Clinton, W. (1992) 'Address Accepting the Presidential Nomination at the Democratic National Convention in New York,' *The American Presidency Project UCSB,* Available at: http://www.presidency.ucsb.edu/ws/index.php?pid=25958 Accessed 10/09/14

Clinton, W. (1993a) 'Statement on MFN status for China,' *The American Presidency Project UCSB,* Available at: http://www.presidency.ucsb.edu/ws/index.php?pid=46632 Accessed 10/09/14

Clinton, W. (1993b) 'Letter to Congressional Leaders Transmitting a Report on Most-Favored-Nation Trade Status for China,' *The American Presidency Project UCSB,* Available at: http://www.presidency.ucsb.edu/ws/index.php?pid=46634 Accessed 10/09/14

Clinton, W. (1993c) 'Report to Congress Concerning Extension of Waiver Authority for the People's Republic of China,' *The American Presidency Project UCSB,* Available at: http://www.presidency.ucsb.edu/ws/index.php?pid=46635 Accessed 10/09/14

Clinton, W. (1993d) 'Executive Order 12850 - Conditions for Renewal of Most-Favored-Nation Status for the Peoples Republic of China in 1994,' *The American Presidency Project UCSB,* Available at: http://www.presidency.ucsb.edu/ws/index.php?pid=61546 Accessed 10/09/14

Clinton, W. (1994a) 'Memorandum on Most-Favored-Nation Trade Status for China,' *The American Presidency Project UCSB,* Available at: http://www.presidency.ucsb.edu/ws/index.php?pid=50270 Accessed 10/09/14

Clinton, W. (1994b) 'Letter to Congressional Leaders on Most-Favored-Nation Trade Status for China,' *The American Presidency Project UCSB,* Available at: http://www.presidency.ucsb.edu/ws/index.php?pid=50271 Accessed 10/09/14

Clinton, W. (1994c) 'Statement on Most-Favored-Nation Trade Status for China,' *The American Presidency Project UCSB,* Available at: http://www.presidency.ucsb.edu/ws/index.php?pid=48961 Accessed 10/09/14

Clinton, W. (1994d) 'Waiving Export Restrictions to the People's Republic of China on United States-Origin Satellites insofar as such Restrictions Pertain to the Echostar Project,' House Document 103-279, GPO: Washington D.C.

Clinton, W. (1994e) 'Terminating a Suspension of export to the People's Republic of China,' House Document 103-305, GPO: Washington D.C.

Committee on Appropriations (2015a) Jurisdiction of Commerce, Justice and Science Subcommittee, Available at: http://appropriations.house.gov/about/jurisdiction/commercejusticescience.htm Accessed 29/01/18

Committee on Appropriations (2015b) Member List of Commerce, Justice and Science Subcommittee, Available at: http://appropriations.house.gov/about/members/commercejusticescience.htm Accessed 29/01/18

Department of Defense (1950) 'Memorandum for the Acting Director, MDAP, Department of State – Subject: Military Assistance to the General Area of China,' Office of the Secretary of Defense: Washington D.C./U.S. Declassified Documents Online, Gale: Detroit

Department of Defense (1956) 'Memorandum for Chairman, Joint Chiefs of Staff – Subject: Trade with Communist China,' U.S. Declassified Documents Online, Gale: Detroit

Department of Defense (1965) 'Communist China Study Tentative Outline,' U.S. Declassified Documents Online, Gale: Detroit

Department of Defense (1986) Letter from the Assistant Secretary of Defense to Ambassador Holmes regarding the DoD position on WESTAR, Digital National Security Archive: Washington D.C.

Department of Defense (2000) 'Report to Congress Pursuant to Public Law 106-113 [Implementation of the Taiwan Relations Act]' Available at: http://www.dod.gov/pubs/twstrait_12182000.pdf Accessed 29/01/18

Department of Defense (2001) 'Quadrennial Defense Review Report,' Available at: http://archive.defense.gov/pubs/qdr2001.pdf Accessed 29/01/18

Department of Defense (2002) 'Annual Report on the Military Power of the People's Republic of China,' Available at: http://www.andrewerickson.com/wp-content/uploads/2015/11/DoD_China-Report_2002.pdf Accessed 29/01/18

Department of Defense (2003) 'Annual Report on the Military Power of the People's Republic of China,' Available at: http://www.andrewerickson.com/wp-content/uploads/2015/11/DoD_China-Report_2003.pdf Accessed 29/01/18

Department of Defense (2004) 'Annual Report on the Military Power of the People's Republic of China,' Available at: http://www.andrewerickson.com/wp-content/uploads/2015/11/DoD_China-Report_2004.pdf Accessed 29/01/18

Department of Defense (2005) 'Annual Report to Congress: The Military Power of the People's Republic of China,' Available at: http://www.andrewerickson.com/wp-content/uploads/2015/11/DoD_China-Report_2005.pdf Accessed 29/01/18

Department of Defense (2006a) 'Quadrennial Defense Review Report,' Available at: http://archive.defense.gov/pubs/pdfs/QDR20060203.pdf Accessed 29/01/18

Department of Defense (2006b) 'Annual Report to Congress: The Military Power of the People's Republic of China,' Available at: http://www.andrewerickson.com/wp-content/uploads/2015/11/DoD_China-Report_2006.pdf Accessed 29/01/18

Department of Defense (2007) 'Annual Report to Congress: The Military Power of the People's Republic of China,' Available at: http://www.andrewerickson.com/wp-content/uploads/2015/11/DoD_China-Report_2007.pdf Accessed 29/01/18

Department of Defense (2008) 'Annual Report to Congress: The Military Power of the People's Republic of China,' Available at: http://www.andrewerickson.com/wp-content/uploads/2015/11/DoD_China-Report_2008.pdf Accessed 29/01/18

Department of Defense (2009) 'Annual Report to Congress: The Military Power of the People's Republic of China,' Available at: http://www.andrewerickson.com/wp-content/uploads/2015/11/DoD_China-Report_2009.pdf Accessed 29/01/18

Department of Defense (2010a) 'Quadrennial Defense Review Report,' Available at: https://www.defense.gov/Portals/1/features/defenseReviews/QDR/QDR_as_of_29JAN10_160 0.pdf Accessed 29/01/18

Department of Defense (2010b) 'Annual Report to Congress: Military and Security Developments Involving the People's Republic of China,' Available at: http://www.andrewerickson.com/wp-content/uploads/2015/11/DoD_China-Report_2010.pdf Accessed 29/01/18

Department of Defense (2010c) 'Nuclear Posture Review Report,' Available at: https://www.defense.gov/Portals/1/features/defenseReviews/NPR/2010_Nuclear_Posture_Re view_Report.pdf Accessed 29/01/18

Department of Defense (2011a) 'Annual Report to Congress: Military and Security Developments Involving the People's Republic of China,' Available at: http://www.andrewerickson.com/wp-content/uploads/2015/11/DoD_China-Report_2011.pdf Accessed 29/01/18

Department of Defense (2011b) 'FACT SHEET: Resilience of Space Capabilities,' Available at: http://archive.defense.gov/home/features/2011/0111_nsss/docs/DoD%20Fact%20Sheet%20- %20Resilience.pdf Accessed 29/01/18

Department of Defense (2011c) 'National Security Space Strategy: Unclassified Summary,' Available at: http://archive.defense.gov/home/features/2011/0111_nsss/docs/NationalSecuritySpaceStrate gyUnclassifiedSummary_Jan2011.pdf Accessed 23/02/2018

Department of Defense (2012) 'Annual Report to Congress: Military and Security Developments Involving the People's Republic of China,' Available at: http://www.andrewerickson.com/wp-content/uploads/2015/11/DoD_China-Report_2012.pdf Accessed 29/01/18

Department of Defense (2013) 'Annual Report to Congress: Military and Security Developments Involving the People's Republic of China,' Available at: http://www.andrewerickson.com/wp-content/uploads/2015/11/DoD_China-Report_2013.pdf Accessed 29/01/18

Department of Defense (2014a) 'United States Department of Defense Fiscal Year 2015 Budget Request: Overview, March 2014,' Office of the Under Secretary of Defense (Comptroller)/Chief Financial Officer

Department of Defense (2014b) 'Annual Report to Congress: Military and Security Developments Involving the People's Republic of China,' Available at: http://www.andrewerickson.com/wp-content/uploads/2015/11/DoD_China-Report_2014.pdf Accessed 29/01/18

Department of Defense (2014c) 'Quadrennial Defense Review 2014,' Available at: http://archive.defense.gov/pubs/2014_Quadrennial_Defense_Review.pdf Accessed 29/01/18

Department of Defense (2015a) 'Annual Report to Congress: Military and Security Developments involving the People's Republic of China 2015', Office of the Secretary of Defense, Available at: http://www.defense.gov/pubs/2015_China_Military_Power_Report.pdf Accessed 29/01/18

Department of Defense (2015b) 'United States Department of Defense Fiscal Year 2016 Budget Request: Overview, February 2015,' Office of the Under Secretary of Defense (Comptroller), Chief Financial Officer

Department of Defense (2016) 'Annual Report to Congress: Military and Security Developments Involving the People's Republic of China,' Available at: https://www.defense.gov/Portals/1/Documents/pubs/2016%20China%20Military%20Power%20Report.pdf Accessed 29/01/18

Department of Defense (2017) 'DoD Dictionary of Military and Associated Terms,' Available at: http://www.dtic.mil/doctrine/new_pubs/dictionary.pdf Accessed 29/01/18

Department of State (1956) 'Briefing Paper for Council on Foreign Economic Policy,' U.S. Declassified Documents Online, Gale: Detroit

Department of State (1958a) 'U.S. Objectives in the Event of War with the Soviet Bloc,' National Archives copy, Digital National Security Archive, Washington D.C.

Department of State (1958b) 'Memorandum for the Secretary – Subject: Oral Presentation of the Annual Report of the Net Evaluation Subcommittee,' National Archives copy, Digital National Security Archive, Washington D.C.

Department of State (1958c) 'The Communist Threat in the Taiwan Area,' Far Eastern Series 76, GPO: Washington D.C.

Department of State (1958d) 'Oral Presentation of the Annual Report of the Net Evaluation Subcommittee,' Digital National Security Archive: Washington D.C.

Department of State (1959) 'U.S. Policy in the Event of War,' Policy Planning Staff, Digital National Security Archive: Washington D.C.

Department of State (1964c) 'An Exploration of the Possible Bases for Action Against the Chinese Communist Nuclear Facilities,' Declassified Documents Reference System, Document 0783, NARA: Washington D.C.

Department of State (1965) 'Memorandum for McGeorge Bundy, the White House [on the China confrontation study],' Declassified Documents Reference System, Library of Congress: Washington D.C.

Department of State (1971) 'Bargaining with China [Telegram to Assistant Secretary Green],' Declassified Documents Reference System, Library of Congress: Washington D.C.

Department of State (1978) 'Diplomatic Relations with the People's Republic of China and Future Relations with Taiwan,' Carter Library Copy, U.S. Declassified Documents Online, Gale: Detroit

Department of State (2006) 'Amendments to the International Traffic in Arms Regulations: Office Names, Corrected Cross-Referencing, Reference to Wassenaar Arrangement, and Other Corrections/Administrative Changes,' *Federal Register,* Vol. 71, No. 77 pp. 20534-20535, Available at: https://fas.org/asmp/resources/govern/109th/ITARamendment06-3500.pdf Accessed 29/01/18

Department of State (2007) 'Report on U.S. Space Policy,' Available at: https://2001-2009.state.gov/documents/organization/85263.pdf Accessed 29/01/18

Department of State (2013) 'The Arms Export Control Act', Available at:
https://www.pmddtc.state.gov/regulations_laws/aeca.html Accessed 29/01/18

Department of State (2014a) 'The International Traffic in Arms Regulations (ITAR)' Available at:
https://www.pmddtc.state.gov/regulations_laws/itar.html Accessed 29/01/18

Department of State (2014b) 'ITAR: Part 121 – The United States Munitions List', Available at:
https://www.pmddtc.state.gov/regulations_laws/documents/official_itar/2014/ITAR_Part_12
1.pdf Accessed 29/01/18

Department of State (2014c) 'Amendment to the International traffic in Arms Regulations:
Revision of U.S. Munitions List Category XV,' Federal Register, Vol. 79, No. 92, Available at:
https://www.pmddtc.state.gov/FR/2014/79FR27180.pdf Accessed 29/01/18

Department of State (2017) 'ITAR: Part 120 – The United States Munitions List', Available at:
https://www.pmddtc.state.gov/regulations_laws/documents/official_itar/2014/ITAR_Part_12
0.pdf Accessed 29/01/18

Department of the Air Force (2014) 'Department of Defense Fiscal Year (FY) 2015 Budget
Estimates: Air Force Justification Book Volume 2 Research, Development, Test & Evaluation,
Air Force,' Vol. 2, Available at: http://www.saffm.hq.af.mil/Portals/84/documents/FY15/AFD-
140310-047.pdf?ver=2016-08-24-094601-527 Accessed 29/01/18

Department of the Air Force (2015) 'Department of Defense Fiscal Year (FY) 2016 President's
Budget Submission: Air Force Justification Book Volume 1 of 3 Research, Development, Test &
Evaluation, Air Force,' Vol. 1, Available at:
http://www.saffm.hq.af.mil/Portals/84/documents/FY16/AFD-150309-009.pdf?ver=2016-08-
24-100234-910 Accessed 29/01/18

Department of the Army, Army Missile Command (1965) *Sino-Soviet Bloc Missile and Space
Technology*, CIA Freedom of Information Act (FOIA) Electronic Reading Room, Available at:
https://www.cia.gov/library/readingroom/docs/CIA-RDP78T05439A000500300075-5.pdf
Accessed 29/01/18

DeSutter, P. (2008) 'Is an Outer Space Arms Treaty Verifiable?' Available at: https://2001-
2009.state.gov/t/vci/rls/rm/101711.htm Accessed 29/01/18

Electronic Code of Federal Regulations (ECFR) (2015a) ''Title 22: Foreign Relations, Part 126 –
General Policies and Provisions', §120.7, Available at: http://www.ecfr.gov/cgi-bin/text-
idx?SID=86008bdffd1fb2e79cc5df41a180750a&node=22:1.0.1.13.57&rgn=div5#se22.1.120_17
Accessed 29/01/18

Electronic Code of Federal Regulation (ECFR) (2015b) 'Title 22: Foreign Relations, Part 126 –
General Policies and Provisions', §126.1, Available at: http://www.ecfr.gov/cgi-bin/text-
idx?SID=86008bdffd1fb2e79cc5df41a180750a&node=22:1.0.1.13.63&rgn=div5 Accessed
29/01/18

Ford, G. (1977) 'Executive Order 11958 – Administration of Arms Export Controls,' Available at:
http://www.archives.gov/federal-register/codification/executive-order/11958.html Accessed
29/01/18

Garamone, J./Department of Defense (2000) 'Joint Vision 2020 Emphasizes Full-spectrum Dominance,' Available at: http://archive.defense.gov/news/newsarticle.aspx?id=45289 Accessed 29/01/18

Gates, R. (2010) 'Defense Budget Recommendation Statement,' Available at: http://archive.defense.gov/Speeches/Speech.aspx?SpeechID=1341 Accessed 29/01/18

GPS.gov (2017a) 'Control Segment,' Available at: http://www.gps.gov/systems/gps/control/ Accessed 29/01/18

GPS.gov (2017b) 'Space Segment,' Available at: http://www.gps.gov/systems/gps/space/ Accessed 29/01/18

Greenert, J. (2013) 'Kill Chain Approach,' *The Official Blog of Chief of Naval Operations*, Available at: https://web.archive.org/web/20130613233413/http://cno.navylive.dodlive.mil/2013/04/23/kill-chain-approach-4/ Accessed 29/01/18

Haney, C. (2015) 'Department of Defense Press Briefinf by Adm. Haney' in DoD 'News Transcript', Available at: http://www.defense.gov/Transcripts/Transcript.aspx?TranscriptID=5605 Accessed 29/01/18

Haney, C. (2016a) '32nd Space Symposium,' Available at: https://www.stratcom.mil/speeches/2016/169/32nd_Space_Symposium/ Accessed 29/01/18

Haney, C. (2016b) 'Space and Missile Defense Symposium,' Available at: https://www.stratcom.mil/speeches/2016/181/Space_and_Missile_Defense_Symposium/ Accessed 29/01/18

Hewlett Packard Enterprises (2017) 'HPE Moonshot Servers,' Available at: https://www.hpe.com/uk/en/servers/moonshot.html Accessed 29/01/18

House of Representatives (1969) 'SAFEGUARD Antiballistic Missile System: Hearings before Subcommittees of the Committee on Appropriations,' GPO: Washington D.C.

House of Representatives (1970) 'Department of Defense Appropriations for 1971: Hearings before a Subcommittee of the Committee on Appropriations,' Part 6, GPO: Washington D.C.

House of Representatives (1971) '1972 NASA Authorization: Hearings before the Committee on Science and Astronautics,' No. 2, Part 1, GPO: Washington D.C.

House of Representatives (1988 [1989]) 'The Administration's Decision to License the Chinese Long March Launch Vehicle: Hearings before the Committee on Science, Space, and technology,' No. 145, GPO: Washington D.C.

House of Representatives (1991) 'Omnibus Export Amendments Act of 1991,' Report 102-267, GPO: Washington D.C.

House of Representatives (2001) 'Wake Up America: Engagement With China Has Failed,' *Congressional Record 107th Congress, 1st Session*, Vol. 147, No. 52, pp. H1546-H1551

House of Representatives (2003) 'Ruling Class Has Completely Pacified Swindled Class,' *Congressional Record 108th Congress 1st Session*, pp. H10330-H10336

House of Representatives (2004) 'The Case For A Special Relationship With China,' *108th Congress 2nd Session,* Vol. 150, No. 76, pp. H3773-H3777

House of Representatives (2005a) '[Proceedings on the] Science, State, Justice, Commerce, and Related Agencies Appropriations Act, 2006,' *Congressional Record 109th Congress, 1st Session*, Vol. 151, No. 78, pp. H4439-H4440

House of Representatives (2005b) '[Proceedings on the] Foreign Relations Authorization Act, Fiscal Years 2006 and 2007,' *Congressional Record 109th Congress, 1st Session*, Vol. 151, No. 99, pp. H6123-6130

House of Representatives (2006) '[Proceedings on the] Science, State, Justice, Commerce, and Related Agencies Appropriations Act, 2007, June 28th 2006' *Congressional Record 109th Congress, 2nd Session,* Vol. 152, No. 86, pp. H4748-4752

House of Representatives (2007a) '[Proceedings on the] National Defense Authorization Act for Fiscal Year 2008,' *Congressional Record 110th Congress, 2nd Session*, Vol. 153, No. 81, pp. H5267-5268

House of Representatives (2007b) '[Proceedings on the] National Defense Authorization Act for Fiscal Year 2008,' *Congressional Record 110th Congress, 2nd Session*, Vol. 154, No. 6, pp. H75-H195

House of Representatives (2008) '[Proceedings on the] National Aeronautics and Space Administration Authorization Act of 2008,' *Congressional Record 110th Congress, 2nd Session*, Vol. 154, No. 155, pp. H10192-10195

House of Representatives (2009a) 'Making Human Space Flight a Priority,' *Congressional Record 111th Congress, 1st Session*, Vol. 155, No. 73, pp. H5553-5554

House of Representatives (2009b) '[Proceedings on the] National Defense Authorization Act for Fiscal Year 2010,' *Congressional Record 111th Congress, 1st Session*, Vol. 155, No. 96, pp. H7238

House of Representatives (2009c) 'America's Long-term Strategic Positioning,' *Congressional Record 111th, 1st Session*, Vol. 155, No. 144, pp. H11101-H11106

House of Representatives (2009d) 'NASA Space Moment and Perils of Chinese Drywall,' *Congressional Record 111th Congress, 1st Session*, Vol. 155, No. 153, p. H11560

House of Representatives (2010a) 'Technology and Freedom,' *Congressional Record 111th, 2nd Session*, Vol. 156, No. 30, pp. H1155-1161

House of Representatives (2010b) 'The Space Program,' *Congressional Record 111th, 2nd Session*, Vol. 156, No. 94, pp. H4657-4663

House of Representatives (2010c) 'NASA's Constellation Program (Extension of Remarks),' *Congressional Record 111th Congress, 2nd Session*, Vol. 156, No. 48, p. E483

House of Representatives (2011a) 'National Defense Authorization Act For Fiscal Year 2012 – Continued,' *Congressional Record 112th Congress, 1st Session*, Vol. 157, No. 73, pp. H3649-H3680

House of Representatives (2011b) 'The Final Flight of the Space Shuttle Program On July 8, 2011,' *Congressional Record 112th Congress, 1st Session*, Vol. 157, No. 101, pp. E1274-1275

House of Representatives (2012a) Commerce, Justice, Science, And Related Agencies Appropriations Act, 2013,' *Congressional Record 112th Congress, 2nd Session*, pp. H2360-2361

House of Representatives (2012b) 'Space Launch Liability Provisions Extension,' *Congressional Record 112th Congress*, *2nd Session*, Vol. 158, No. 144, pp. H6335-H6337

House of Representatives (2013a) '[Proceedings on the] Department of Defense Appropriations Act, 2014,' *Congressional Record 113th Congress, 1st Session*, Vol. 159, No. 106, pp. H4877-4936

House of Representatives (2013b) 'Letter to NASA Clarifying Congressional Restrictions On Bilateral Relations With China,' *Congressional Record 113th Congress, 1st Session*, Vol. 159, No. 141, pp. E1478-E1480

House of Representatives (2014) 'Commerce, Justice, Science, And Related Agencies Appropriations Act, 2015,' *Congressional Record 113th Congress, 2nd Session*, pp. H4868-H4908

House of Representatives (2015a) '[Proceedings on the] National Aeronautics and Space Administration Authorization Act of 2015,' *Congressional Record 114th Congress, 1st Session*, Vol. 161, No. 22, pp. H891-H892

House of Representatives (2015b) '[Proceedings on the] National Defense Authorization Act for Fiscal Year 2016,' *Congressional Record 114th Congress, 1st Session*, Vol. 161, No. 74, p. H3005

House of Representatives (2015c) '[Proceedings on the] Science, State, Justice, Commerce, and Related Agencies Appropriations Act, 2016,' *Congressional Record 114th Congress, 1st Session*, Vol. 161, No. 87, p. H3721

House of Representatives (2015d) '[Proceedings on the] National Defense Authorization Act for Fiscal Year 2016,' *Congressional Record 114th Congress, 1st Session*, Vol. 161, No. 165, p. H7864

House of Representatives (2015e) '[Proceedings on the] Intelligence Authorization Act for Fiscal Year 2016,' *Congressional Record 114th Congress, 1st Session,* Vol. 161, No. 173, pp. H8663-8676

House of Representatives (2016) '[Proceedings on the] National Defense Authorization Act for Fiscal Year 2017,' *Congressional Record 114th Congress, 2nd Session*, Vol. 162, No. 78, pp. H2463-2471

Huntsman, J. (2009) President Obama's Nominee To Be United States Ambassador to the People's Republic of China, Testimony, Jon M. Huntsman, Jr.; Ambassador-Designate to the People's Republic of China, Statement Before the Senate Foreign Relations Committee,' Available at: https://2009-2017.state.gov/p/eap/rls/rm/2009/07/126382.htm Accessed 29/01/18

Information Office of the State Council of the PRC (1991) 'Human Rights in China White Paper,' Available at: http://www.china.org.cn/e-white/7/index.htm Accessed 10/09/14

Information Office of the State Council of the PRC (1995) 'The Progress of Human Rights in China,' Available at: http://www.china.org.cn/e-white/phumanrights19/index.htm Accessed 10/09/14 Accessed 29/01/18

John, E. (2006) 'Ask the State Department,' Available at: https://2001-2009.state.gov/r/pa/ei/ask/69772.htm Accessed 29/01/18

Joint Chiefs of Staff (2000) *Joint Vision 2020: America's Military – Preparing for Tomorrow*, Available at: http://www.dtic.mil/dtic/tr/fulltext/u2/a526044.pdf Accessed 29/01/18

Joint Chiefs of Staff (2013) 'Joint Publication 3-14: Space Operations,' Available at: http://www.dtic.mil/doctrine/new_pubs/jp3_14.pdf Accessed 29/01/18

Joint War Games Agency (1966) *Nu 66: Final Report*, Joint Chiefs of Staff, Washington D.C., from Declassified Documents Reference System/National Archives and Records Administration [Copy from Lyndon B. Johnson Library]

Kendall, F. (2016) 'Kendall lays out Pentagon thinking on future space programs,' Talk at Washington Space Business Roundtable, Video available at: http://spacenews.com/frank-kendall-at-wsbr/ Accessed 27/11/2017

Kennedy, B. (2015) '5 facts about Americans' views on space exploration,' *Pew Research Center,* Available at: http://www.pewresearch.org/fact-tank/2015/07/14/5-facts-about-americans-views-on-space-exploration/ Accessed 29/01/18

Kennedy, J. (1962) 'Text of President John Kennedy's Rice Stadium Moon Speech,' Available at: https://er.jsc.nasa.gov/seh/ricetalk.htm Accessed 17/01/18

Kirtland Air Force Base (N.D.) 'ORS Overview,' Available at: http://www.kirtland.af.mil/Portals/52/documents/AFD-150626-024.pdf?ver=2016-06-28-112910-020 Accessed 29/01/18

Kissinger, H./National Security Council (1969) 'National Security Study Memorandum 14,' *Office of the Historian, Department of State*, Available at: https://history.state.gov/historicaldocuments/frus1969-76v17/d4 Accessed 29/01/18

Knoedler, A. (2005) 'Lowering the High Ground: Using Near-Space Vehicles for Persistent ISR,' Available at: http://www.au.af.mil/au/awc/awcgate/cst/bugs_ch04.pdf Accessed 29/01/18

Larson, A. (2003) 'China's Role in the World Economic System,' Available at: https://2001-2009.state.gov/e/rm/2003/27026.htm Accessed 29/01/18

Leveson, I. (2015) 'GPS Civilian Economic Value to the U.S. Interim Report,' Available at: http://www.performance.noaa.gov/wp-content/uploads/2015-08-31-Phase-1-Report-on-GPS-Economic-Value.pdf Accessed 29/01/18

Lockheed Martin (2017) 'SBIRS Fact Sheet,' Available at: http://www.lockheedmartin.co.uk/content/dam/lockheed/data/space/documents/sbirs/SBIRS_Fact_Sheet_(Final).pdf Accessed 29/01/18

Lundberg, O. (1986) Letter to Dr William Schneider, Under Secretary of Defense regarding foreign launch options, Digital National Security Archive, Washington D.C.

Mahley, D. (2008) 'The State of Space Security,' Available at: https://2001-2009.state.gov/t/isn/rm/2008/99746.htm Accessed 29/01/18

McCormack, S. (2005) 'China: Successful Conclusion to Shenzhou VI Mission,' Available at: https://2001-2009.state.gov/r/pa/prs/ps/2005/55213.htm Accessed 29/01/18

Missile Defense Agency (N.D.) 'AEGIS BALLISTIC MISSILE DEFENSE One-Time Mission: Operation Burnt Frost,' Available at: https://www.mda.mil/system/aegis_one_time_mission.html Accessed 29/01/18

Missile Defense Agency (2005) 'Advanced Systems: Multiple Kill Vehicle,' Available at: https://web.archive.org/web/20051029191534/http://www.mda.mil/mdaLink/html/asptmkv.html Accessed 29/01/18

Missile Defense Agency (2016) 'Unclassified Statement of Vice Admiral J.D. Syring, USN Director, Missile Defense Agency Before the Senate Armed Services Committee Subcommittee on Strategic Forces Wednesday, April 13, 2016,' Available at: https://www.mda.mil/global/documents/pdf/FY17_Written_Statement_SASC_SFS_MDA_VADM_Syring_13042016.pdf Accessed 29/01/18

National Aeronautics and Space Administration (N.D.) 'NASA Technologies Benefit Our Lives,' Available at: https://spinoff.nasa.gov/Spinoff2008/tech_benefits.html Accessed 29/01/18

National Aeronautics and Space Administration (2010) 'Remarks by the President on Space Exploration in the 21st century,' Available at: https://www.nasa.gov/news/media/trans/obama_ksc_trans.html Accessed 29/01/18

National Aeronautics and Space Administration (2013) 'Remembering the Challenger Crew,' Available at: https://web.archive.org/web/20130128234159/https://www.nasa.gov/multimedia/imagegallery/image_gallery_2437.html Accessed 21/11/2017

National Aeronautics and Space Administration (2015a [2012] 'Global Positioning System History,' Available at: https://www.nasa.gov/directorates/heo/scan/communications/policy/GPS_History.html Accessed 29/01/18

National Aeronautics and Space Administration (2015b) 'NASA Test Materials to Fly on Air Force Space Plane,' Available at: https://www.nasa.gov/press-release/nasa-test-materials-to-fly-on-air-force-space-plane Accessed 29/01/18

National Cancer institute (N.D.) 'Cancer Moonshot,' Available at: https://www.cancer.gov/research/key-initiatives/moonshot-cancer-initiative Accessed 29/01/18

National Reconnaissance Office (N.D.a) 'CORONA Imagery,' Available at: http://nro.gov/history/csnr/corona/imagery.html Accessed 29/01/18

National Reconnaissance Office (N.D.b) *Hexagon: Sentinel of Liberty*, Available at: http://www.nro.gov/foia/declass/GAMBHEX%20Videos.html Accessed 29/01/18

National Security Council (1959) 'Memorandum for the National Security Council – Subject: NSC 5904,' Executive Office of the President, National Archives copy, National Security Archive, Washington D.C.

National Security Council (1966) 'Limited Objective Strategies Against China,' U.S. Declassified Documents Online, Gale: Detroit

National Security Council (1970) 'National Security Interests and Commitments Study for the Defense Program Review Committee,' U.S. Declassified Documents Online, Gale: Detroit

National Security Council (1971) 'Memorandum for General Haig, Subject: Administration Positions on Defense Issues,' Declassified Documents Reference System, Library of Congress: Washington D.C.

National Security Council (1978a) 'Memorandum of Conversation – Subject: Summary of Mr Huberman's Meeting with Chiang Nan-hsiang,' U.S. Declassified Documents Online, Gale: Detroit

National Security Council (1978b) 'Memorandum for Zbigniew Brzezinski – Subject: Your meeting with the Frank Press Delegation,' U.S. Declassified Documents Online, Gale: Detroit

National Security Council (1978c) 'Memorandum for Zbigniew Brzezinski – Subject: Weekly Report,' U.S. Declassified Documents Online, Gale: Detroit

National Security Council (1970a) 'National Security Interests and Commitments Study for the Defense Program Review Committee,' U.S. Declassified Documents Online, Gale: Detroit

National Security Council (1970b) 'National Security Decision Memorandum 72 – Subject: Exchange of Technical Data between the United States and the International Space Community,' U.S. Declassified Documents Online, Gale: Detroit

National Security Council (1970c) 'Memorandum for Dr. Kissinger – Subject: Technical Data Exchange in the Post-Apollo Space Program,' U.S. Declassified Documents Online, Gale: Detroit

New Hampshire State Library (N.D.) 'Unifying A Nation: World War II Posters from the New Hampshire State Library, Our Allies,' Available at: https://www.nh.gov/nhsl/ww2/allies.html Accessed 29/01/18

Nixon, R. (1970) 'The President's News Conference,' Available at: http://www.presidency.ucsb.edu/ws/index.php?pid=2496&st=china&st1= Accessed 29/01/18

Nixon, R. (1971) 'Conversation Between President Nixon and the Ambassador to the Republic of China (McConaughy),' *Office of the Historian, Department of State,* Available at: https://history.state.gov/historicaldocuments/frus1969-76v17/d136 Accessed 29/01/18

Obama, B. (2013) 'Executive Order 13637 – Administration of Reformed Export Controls', Available at: http://www.gpo.gov/fdsys/pkg/DCPD-201300143/pdf/DCPD-201300143.pdf Accessed 29/01/18

Office of Facts and Figures (1942) 'This man is your FRIEND. Chinese. He fights for FREEDOM,' GPO: Washington D.C., Accessed from New Hampshire Stat Library, Available at: https://www.nh.gov/nhsl/ww2/ww44.html Accessed 15/11/2017

Office of Technology Assessment, United States Congress (1979) *Technology and East-West trade* [prepared by the International Security and Commerce Program staff of the Office of Technology Assessment], OTA Publishing Office/GPO: Washington DC

Office of Technology Assessment, United States Congress (1985) 'OTA Report Brief: International Cooperation and Competition in Civilian Space Activities,' OTA Publishing Office/GPO: Washington DC

Office of the Assistant Secretary of Defense for Homeland Defense & Global Security (2015) 'Space Domain Mission Assurance: A Resilience Taxonomy,' Available at: https://fas.org/man/eprint/resilience.pdf Accessed 29/01/18

Office of the Historian, Department of State (N.D.) 'Rapprochement with China, 1972,' Available at: https://history.state.gov/milestones/1969-1976/rapprochement-china accessed 4/1/2018

Office of the Press Secretary (2015a) 'Fact Sheet: US-China Economic Relations,' Available at: https://www.whitehouse.gov/the-press-office/2015/09/25/fact-sheet-us-china-economic-relations Accessed 29/01/18

Office of the Press Secretary (2015b) 'Fact Sheet: President Xi Jinping's State Visit to the United States,' Available at: https://www.whitehouse.gov/the-press-office/2015/09/25/fact-sheet-president-xi-jinpings-state-visit-united-states Accessed 29/01/18

Office of the Press Secretary (2015c) 'Remarks by President Obama and President Xi of the People's Republic of China in Joint Press Conference,' Available at: https://www.whitehouse.gov/the-press-office/2015/09/25/remarks-president-obama-and-president-xi-peoples-republic-china-joint Accessed 29/01/18

Office of the Spokesperson, Department of State (2016) 'The Second Meeting of the U.S.-China Space Dialogue,' Available at: https://2009-2017.state.gov/r/pa/prs/ps/2016/10/263499.htm Accessed: 31/01/2018

Office of the United States Trade Representative (1995) 'U.S. and China Conclude New Commercial Space Launch Agreement,' Executive Office of the President: Washington D.C.

Organisation for Economic Cooperation and Development (2014) 'The Space Economy at a Glance 2014,' Available at: http://www.keepeek.com/Digital-Asset-Management/oecd/economics/the-space-economy-at-a-glance-2014_9789264217294-en#.WPi2V2nyuUk#page1 Accessed 29/01/18

Prater, S. (2014) 'AF Space Command adds new antennas,' http://www.af.mil/News/Article-Display/Article/473264/af-space-command-adds-new-antennas/ Accessed 29/01/18

Public Law 109-364 'John Warner National Defense Authorization Act for Fiscal Year 2007' Available at: https://www.gpo.gov/fdsys/pkg/PLAW-109publ364/pdf/PLAW-109publ364.pdf Accessed 29/01/18

Raytheon (N.D.) 'SM-3 Interceptor,' Available at: http://www.raytheon.com/capabilities/products/sm-3/ Accessed 29/01/18

Reagan, R. (1980) 'Election Eve Address "A Vision for America,"' *The American Presidency Project*, Available at: http://www.presidency.ucsb.edu/ws/?pid=85199 Accessed 29/01/18

Red Flag 16-3 Air Expeditionary Wing Public Affairs (2016) 'Red Flag: Integrating air, space, cyber domains,' Available at: http://www.nellis.af.mil/News/Article/878916/red-flag-integrating-air-space-cyber-domains/ Accessed 29/01/18

Reyes, J. (2016) 'Red Flag 16-3: Fly, fight, win in air, space, cyber,' Available at: http://www.afspc.af.mil/News/Article-Display/Article/902358/red-flag-16-3-fly-fight-win-in-air-space-cyber/ Accessed 29/01/18

Rose, F. (2011) 'Leading with Diplomacy to Strengthen Stability in Space,' Available at: https://2009-2017.state.gov/t/avc/rls/177306.htm Accessed 29/01/18

Rose, F. (2012) 'Space Security – An American Perspective,' Available at: https://2009-2017.state.gov/t/avc/rls/182703.htm Accessed 29/01/18

Rose, F. (2014) 'Strategic Stability in East Asia,' Available at: https://2009-2017.state.gov/t/avc/rls/2014/235384.htm Accessed 29/01/18

Rose, F. (2015a) 'Ballistic Missile Defense and Strategic Stability in East Asia', Remarks to the Federation of American Scientists, Available at: http://www.state.gov/t/avc/rls/2015/237746.htm Accessed 29/01/18

Rose, F. (2015b) 'Strengthening International Cooperation in Space Situational Awareness,' Remarks at the Advanced Maui Optical and Space Surveillance Technologies Conference, Available at: https://2009-2017.state.gov/t/avc/rls/262502.htm Accessed 29/01/18

Rose, F. (2016a) 'The Role of Diplomacy in Keeping Outer Space Safe, Secure, and Sustainable,' Available at: https://2009-2017.state.gov/t/avc/rls/255834.htm Accessed 29/01/18

Rose, F. (2016b) 'Strengthening International Cooperation in Situation Awareness,' Available at: https://2009-2017.state.gov/t/avc/rls/262502.htm Accessed 29/01/18

Route, R. (2016) 'Wargaming is Alive and Well at Naval Postgraduate School,' *Navy Live: The Official Blog of the U.S. Navy*, Available at: http://navylive.dodlive.mil/2016/01/20/wargaming-is-alive-and-well-at-nps/ Accessed 29/01/18

Rumsfeld et al. (2001) 'Report of the Commission to Assess United States National Security Space Management and Organization,' Available at: http://space.au.af.mil/space_commission/executive_summary.pdf Accessed 29/01/18

Russel, D. (2014) 'The Future of U.S China Relations, Testimony Before the Senate Foreign Relations Committee,' Available at: http://www.state.gov/p/eap/rls/rm/2014/06/228415.htm Accessed 29/01/18

Schneider, B. (2004) 'Counterforce Targeting Capabilities and Challenges,' The Counterproliferation Papers, Future Warfare Series No. 22, USAF Counterproliferation Center, Available at: http://www.dtic.mil/dtic/tr/fulltext/u2/a446187.pdf Accessed 29/01/18

Senate (N.D.) Biography [Senator James M. Inhofe] http://www.inhofe.senate.gov/biography Accessed 29/01/18

Senate (1967) 'Conflicts Between United States Capabilities and Foreign Commitments: Hearing Before the Committee on Foreign Relations,' GPO: Washington D.C.

Senate (1970) 'Threat to U.S. Security Posed by Stepped-up Sino-Soviet Hostilities (Testimony of Dr. Stefan T. Possony): Hearing Before the Subcommittee to Investigate the administration of the Internal Security Act and Other Internal Security Laws,' GPO: Washington D.C.

Senate (1971) 'Fiscal Year 1972 Authorization for Military Procurement, Research and Development, Construction and Real Estate Acquisition for the Safeguard ABM and Reserve

Strengths: Hearings before the Committee on Armed Services,' Parts 1-5, GPO: Washington D.C.

Senate (1972) 'Statement of Secretary of Defense Melvin R. Laird Before the Senate Armed Services Committee on the FY 1973 Defense Budget and FY 1973-1977 Program,' U.S. Declassified Documents Online, Gale: Detroit

Senate (2001) 'China's Military Policy,' *Congressional Record 107th Congress, 1st Session*, Vol. 147, No. 45, pp. S3208-3211

Senate (2002) 'Remarks on China,' *Congress, 2nd Session*, Vol. 148, No. 29, pp. E360-361

Senate (2003) 'National Defense Authorization Act for Fiscal Year 2004,' *Congressional Record 108th Congress, 1st Session*, Vol. 149, No. 144, p. S12579

Senate (2005a) 'China's Spreading Global Influence, April 4th 2005,' *Congressional Record 109th Congress, 1st Session*, Vol. 151, No. 36, pp. S3115-3116

Senate (2005b) 'America's Place in the World, June 24th 2005,' *Congressional Record 109th Congress, 1st Session*, Vol. 151, No. 86, pp. S7391-7393

Senate (2005c) '[Proceedings on the] Department of State, Foreign Operations and Related Programs Appropriations Act, 2006,' *Congressional Record 109th Congress, 1st Session*, Vol. 151, No. 96, pp. S8333-8373

Senate (2005d) '[Proceedings on the] National Defense Authorization Act, July 21st 2005' *Congressional Record 109th Congress, 1st Session*, Vol. 151, No. 100, pp. 8638

Senate (2005e) '[Proceedings on the] National Defense Authorization Act, July 26th 2005' *Congressional Record 109th Congress, 1st Session*, Vol. 151, No. 103, pp. S8937-8940

Senate (2006) '[Proceedings on the] National Defense Authorization Act for Fiscal Year 2007, June 29th 2006' *Congressional Record 109th Congress, 2nd Session*, Vol. 152, No. 87, pp. S6919

Senate (2007a) '[Proceedings on the] Department of Defense Appropriations Act,' *Congressional Record 110th Congress, 1st Session*, Vol. 153, No. 149, pp. S12501-12510

Senate (2007b) '[Proceedings on the] Science, State, Justice, Commerce, and Related Agencies Appropriations Act, 2008,' *Congressional Record 110th Congress*, *2nd Session*, Vol. 153, No. 150, pp. S12724-12725

Senate (2008a) 'Space-based Interceptor Study,' *Congressional Record 110th Congress*, *2nd Session*, Vol. 154, No. 157, pp. S10052-10053

Senate (2008b) 'Space,' *Congressional Record 110th Congress*, *2nd Session*, Vol. 154, No. 176, pp. S10636-10637

Senate (2009a) '[Proceedings on the] National Defense Authorization Act for Fiscal Year 2009,' *Congressional Record 111th Congress*, *1st Session*, Vol. 155, No. 109, p. S7688-7682

Senate (2009b) '[Proceedings on the] Science, State, Justice, Commerce, and Related Agencies Appropriations Act, 2010,' *Congressional Record 111th Congress*, *1st Session*, Vol. 155, No. 142, pp. S10104

Senate (2010a) '[Proceedings on the] Department of State, Foreign Operations, And Related Programs Appropriations Act, 2010' *Congressional Record 111th Congress, 2nd Session*, Vol. 156, No. 133, pp. S7712

Senate (2010b) 'Defense Modernization,' *Congressional Record 111th Congress, 2nd Session*, Vol. 156, No. 133, pp. S7736-7737

Senate (2011a) '50th Anniversary Of President Kennedy's Call To Go To The Moon,' *Congressional Record 112th Congress, 1st Session*, Vol. 157, No. 74, p. S3419

Senate (2011b) 'National Defense Authorization Act For Fiscal Year 2012,' *Congressional Record 112th Congress*, Vol. 157, No. 183, pp. S8094-8138

Senate (2014) 'National Security,' *Congressional Record 113th Congress, 2nd Session*, Vol. 160, No. 96, pp. S3826-3827

Senate (2015a) '[Proceedings on the] National Defense Authorization Act for Fiscal Year 2016, June 22nd 2015,' *Congressional Record 114th Congress, 1st Session*, Vol. 161, No. 100, pp. S4435

Senate (2015b) 'United States-China Relations,' *Congressional Record, 114th Congress, 1st Session*, Vol. 161, No. 139, pp. S6952-S6954

Senate (2016) 'Mission to Mars and Space Shuttle Flight 30th Anniversary,' *Congressional Record, 114th Congress, 2nd Session*, Vol. 162, No. 7, pp. S45-46

Senate (2017) 'U.S.-China Relations,' *Congressional Record, 115th Congress, 1st Session*, Vol. 163, No. 79, pp. S2816-S2819

Space Foundation (2016) 'Space Foundation Report Reveals Global Space Economy of $323 billion,' Available at: https://www.spacefoundation.org/media/press-releases/space-foundation-report-reveals-global-space-economy-323-billion-2015 Accessed 29/01/18

Stenbit, J. (2016) 'Spectrum Repurposing and Interference with Space-Based Positioning, Navigation, and Timing (PNT) Services,' Available at: http://www.gps.gov/governance/advisory/recommendations/2016-06-letter-to-excom.pdf Accessed 29/01/18

Stewart, M. (2015) 'Formulation, Coordination, and Implementation of Promoting Space Security and Sustainability,' Available at: https://2009-2017.state.gov/t/avc/rls/2015/250567.htm Accessed 29/01/18

Stewart, M. (2016) 'Space weapons and the risk of nuclear exchange,' Available at: http://www.atlanticcouncil.org/events/webcasts/space-weapons-and-the-risk-of-nuclear Accessed 29/01/18

United Nations Institute for Disarmament Research (2005) 'Conference: Safeguarding Space Security: Prevention of an Arms Race in Outer Space,' Available at: http://www.unidir.org/programmes/emerging-security-threats/safeguarding-space-security-prevention-of-an-arms-race-in-outer-space Accessed 29/01/18

United States Air Force (N.D.a) 'Mission,' Available at: https://www.airforce.com/mission Accessed 29/01/18

United States Air Force (N.D.b) 'Force Support – Air Force Satellite Control Network,' Available at: http://www.au.af.mil/au/awc/awcgate/au-18/au18004a.htm Accessed 29/01/18

United States Air Force (2015) 'Milstar Satellite Communications System,' Available at: http://www.af.mil/About-Us/Fact-Sheets/Display/Article/104563/milstar-satellite-communications-system/ Accessed 29/01/18

United States Air Force Space Command (N.D.a) 'Air Force Space Command,' Available at: http://www.afspc.af.mil/ Accessed 29/01/18

United States Air Force Space Command (N.D.b) 'Welcome to Air Force Space Command,' Available at: http://www.afspc.af.mil/About-Us/ Accessed 29/01/18

United States Air Force Space Command (N.D.c) 'High Frontier Journal,' Available at: http://www.afspc.af.mil/About-Us/High-Frontier-Journal/ Accessed 29/01/18

United States Air Force Space Command (2009) *High Frontier: The Journal for Space & Missile Professionals*, Vol. 5, No. 4

United States Air Force Space Command (2010) *High Frontier: The Journal for Space and Cyberspace Professionals*, Vol. 7, No. 1

United States Air Force Space Command (2017) 'Fact Sheets,' Available at: http://www.afspc.af.mil/About-Us/Fact-Sheets/ Accessed 29/01/18

United States Congress (1976) 'Public Law 94-329: International Security Assistance and Arms Export Control Act of 1976', Available at: http://www.gpo.gov/fdsys/pkg/STATUTE-90/pdf/STATUTE-90-Pg729.pdf Accessed 29/01/18

United States Congress (1997) 'National Defense Authorization Act for Fiscal year 1998,' H.R. 1119, GPO: Washington D.C.

United States Congress (1998) 'Strom Thurmond National Defense Authorization Act for Fiscal year 1999,' Public Law 105-261, GPO: Washington D.C.

United States Congress (2012) 'Public Law 55: Consolidated and Further Continuing Appropriations Act, 2012,' Available at: http://www.gpo.gov/fdsys/pkg/PLAW-112publ55/html/PLAW-112publ55.htm Accessed 29/01/18

United States Congress (2016) 'H.R. 4945 To permanently secure the United States as the preeminent spacefaring nation, and for other purposes ["American Space Renaissance Act"],' Available at: https://www.congress.gov/114/bills/hr4945/BILLS-114hr4945ih.pdf Accessed 20/12/2017

United States Navy (2014) 'US, China Conduct Anti-Piracy Exercise,' Available at: http://www.navy.mil/submit/display.asp?story_id=84858 Accessed 29/01/18

United States Navy and Missile Defense Agency (2009a) 'Aegis Ballistic Missile Defense Test Successful,' Available at: http://www.navy.mil/submit/display.asp?story_id=47327 Accessed 29/01/18

United States Navy and Missile Defense Agency (2009b) 'US, Japan Successfully Conduct First SM-3 Block IIA Intercept Test,' Available at: http://www.navy.mil/submit/display.asp?story_id=98719 Accessed 29/01/18

Unknown (1980) 'Draft Memorandum for the Secretary of Defense – Subject: Instructions for the China Trip,' Digital National Security Archive, Washington D.C.

U.S.-China Economic and Security Review Commission (2007) '2007 Report to Congress of the U.S.-China Economic and Security Review Commission,' Available at: https://www.uscc.gov/sites/default/files/annual_reports/2007-Report-to-Congress.pdf Accessed 29/01/18

U.S.-China Economic and Security Review Commission (2015a) 'Comprehensive List of the Commission's Recommendations,' Available at: http://origin.www.uscc.gov/sites/default/files/annual_reports/Comprehensive%20List%20of%20Recommendations.pdf Accessed 29/01/18

U.S.-China Economic and Security Review Commission (2015b) '2015 Annual Report to Congress,' Available at: https://www.uscc.gov/Annual_Reports/2015-annual-report-congress Accessed: 22/02/2018

USGS (2016) 'LANDSAT Ground Stations,' Available at: http://landsat.usgs.gov/about_ground_stations.php Accessed 29/01/18

White House (1953) 'Executive Order 10483 – Establishing the Operations Coordinating Board,' Available at: http://www.presidency.ucsb.edu/ws/?pid=60573 Accessed 29/01/18

White House (1958) 'Report on a Proposed Cooperative Scientific Satellite Launching Project,' Operations Coordinating Board, U.S. Declassified Documents Online, Gale: Detroit

White House (1963) 'Memorandum of Conversation with Ambassador Dobrymin,' Declassified Documents Reference System, Library of Congress: Washington D.C.

White House (1969) 'Memorandum for Dr. Kissinger – Subject: Overview of World Situation,' U.S. Declassified Documents Online, Gale: Detroit

White House (1970a) 'Memorandum for the President – Subject: Action on Directives and Commitments,' U.S. Declassified Documents Online, Gale: Detroit

White House (1970b) 'The President's News Conference, May 8th 1970,' *The American Presidency Project*, Available at: http://www.presidency.ucsb.edu/ws/index.php?pid=2496&st=china&st1= Accessed 29/01/18

White House (1971) 'Memorandum for General Haig/HAK' and 'Memorandum for: Dr. Henry Kissinger,' Available at: https://www.cia.gov/library/readingroom/docs/LOC-HAK-450-5-11-4.pdf Accessed 29/01/18

White House (1978a) 'Memorandum for the President – Subject: US-PRC S&T Relationships,' U.S. Declassified Documents Online, Gale: Detroit

White House (1978b) 'Memorandum for the President – Subject: S&T Exchanges with the PRC,' U.S. Declassified Documents Online, Gale: Detroit

White House (1979) Letter to Fang Yi confirming Understanding on Cooperation in Education, Agriculture and Space, Digital National Security Archive: Washington D.C.

White House (2005) 'U.S. SPACE TRANSPORTATION POLICY, January 6, 2005: FACT SHEET,' Available at: https://www.nasa.gov/pdf/572630main_nspd-40.pdf Accessed 29/01/18

White House (2006) 'National Space Policy,' Available at:
https://fas.org/irp/offdocs/nspd/space.pdf Accessed 12/12/2017

White House (2010) 'National Space Policy of the United States of America', Available at:
https://www.whitehouse.gov/sites/default/files/national_space_policy_6-28-10.pdf Accessed
29/01/18

Wilson, J. (2008) 'Space Program Benefits: NASA's Positive Impact on Society,' *50th Magazine*,
Available at: https://www.nasa.gov/50th/50th_magazine/benefits.html Accessed 29/01/18

Yi, F. (1979) Letter to Frank Press confirming Understanding on Cooperation in Space, Digital
National Security Archive, Washington D.C.

Secondary Sources

Adler, E. (1997) 'Seizing the Middle Ground: Constructivism in World Politics,' *European
Journal of International Relations*, Vol. 3, No. 3, pp. 319-363

Adler, E. and Pouliot, V. (2011) 'International practices,' *International Theory*, Vol. 3, No. 1, pp.
1-36

Allen, T. (1987) *War Games: The Secret World of the Players, and Policy Makers Rehearsing
World War III Today*, McGraw-Hill: New York

Allison, G. (2017) *Destined For War: Can America and China Escape Thucydides's Trap?* Scribe:
London

American Institute in Taiwan (2000) 'Pentagon Report on Implementation of Taiwan Relations
Act [Reproduced text of unclassified summary]' Available at:
https://www.ait.org.tw/en/20001219-pentagon-report-on-implementation-of-taiwan-
relations-act.html Accessed 29/01/18

Anderson, T. (2009) 'Schriever V – A UK Perspective,' *High Frontier*, Vol. 5, No. 4, pp. 14-16

Avant, D. and Nevers, R. (2011) 'Military Contractors & the American Way of War,' *Daedalus*,
Vol. 140, No. 3, pp. 88-99

Axe, D. (2013) 'More Jets, Jamming Make Air Force's toughest War Game Even Tougher,'
Wired, Available at: https://www.wired.com/2013/03/red-flag/ Accessed 29/01/18

Babbin, J. and Timperlake, E. (2006) *Showdown: Why China Wants War with the United States*,
Regnery Publishing: Washington D.C.

Babiarz, R. (2015) 'The People's Nuclear Weapon: Strategic Culture and the Development of
China's Nuclear Weapons Program,' *Comparative Strategy*, Vol. 34, No. 5, pp. 422-446

Balzacq, T., Léonard, S., and Ruzicka, J. (2016) ''Securitization' revisited: theory and cases,'
International Relations, Vol. 30, No. 4, pp. 494-531

Bao, L. (2016) 'US Space Command Chief: China Eyeing Space War Dominance,' *Voice of
America*, Available at: https://www.voanews.com/a/us-space-command-chief-china-space-
war-dominance/3630328.html Accessed 19/12/2017

Belcher, O. and Martin, L. (2013) 'Ethnographies of closed doors: conceptualising openness and closure in US immigration and military institutions,' *Area*, Vol. 45, No. 4, pp. 403-410

Bell, B. and Rogers, E. (2014) 'Space Resilience and the Contested, Degraded, and Operationally Limited Environment: The Gaps in Tactical Space Operations,' *Air & Space Power Journal*, Vol. 28, No. 6, pp. 130-147

Berkowitz, M. (2009) 'The Strategic Value of Schriever V: Policy and Strategy Insights for the Quadrennial Defense Review,' *High Frontier*, Vol. 5, No. 4, pp. 32-36

Berkowitz, M. (2010) 'A Comprehensive Approach to Space and Cyberspace Operations,' *High Frontier*, Vol. 7, No. 1, pp. 44-47

Bialasiewicz, L., Campbell, D., Elden, S., Graham, S., Jeffrey, A., and Williams, A. (2007) 'Performing security: The imaginative geographies of current US strategy,' *Political Geography*, Vol. 26, pp. 405-422

Bickers, R. and Wasserstrom, J, (1995) 'Shanghai's "Dogs and Chinese Not Admitted" Sign: Legend, History and Contemporary Symbol,' *The China Quarterly*, No. 142, pp. 444-466

Bijker, W., Hughes, T. and Pinch, T. (1987) *The Social Construction of Technological Systems: New Directions in the Sociology and History of Technology*, MIT Press: Cambridge

Blaisdell, F. (2009) 'Schriever V: Managing and Understanding Consequences to Military Space,' *High Frontier*, Vol. 5, No. 4, p. 37

Bloomfield, L. (2009) 'A Space Doctrine for Soldier, Scientist, and Citizen: What It Will Take to Secure the Space Domain,' *High Frontier*, Vol. 5, No. 4, pp. 17-22

Boot, M. (2003) 'The New American Way of War,' *Foreign Affairs*, Vol. 82m No. 4, pp. 41-58

Bracken, P. (2006) 'Net Assessment: A Practical Guide,' *Parameters*, Vol. 36, No. 1, pp. 90-100

Breslin, S. (2010) 'China's emerging Global Role: Dissatisfied Responsible Great Power,' *Politics*, Vol. 30, pp. 52-62

British Broadcasting Company (2015) 'China defence: Work starts on second aircraft carrier,' *BBC News*, Available at: http://www.bbc.co.uk/news/world-asia-china-35207369 Accessed 20/12/2017

Browne, A. (2014) 'U.S. and China Are Locked in a Security Dilemma,' *Wall Street Journal*, Available at: http://www.wsj.com/video/us-and-china-are-locked-in-a-security-dilemma/54C7244A-485F-4404-B563-7C26FD904452.html Accessed 29/01/18

Burghardt, T. (2010) 'The Militarization of Outer Space: The Pentagon's Space Warriors,' *Space Daily*, Available at:
http://www.spacedaily.com/reports/The_Militarization_of_Outer_Space_The_Pentagon_Space_Warriors_999.html Accessed 29/01/18

Burr, W. (2002) 'The Beijing-Washington Back-Channel and Henry Kissinger's Secret Trip to China,' in Burr, W. (ed.) *National Security Archive Briefing Book No. 66*, Available at: https://nsarchive2.gwu.edu/NSAEBB/NSAEBB66/

Burr, W. (ed.) (2009) '"How much is enough": The U.S. Navy and "Finite Deterrence,"' *The National Security Archive at the George Washington University*, The Nuclear Vault, Available at: http://nsarchive2.gwu.edu//nukevault/ebb275/index.htm Accessed 29/01/18

Burr, W. (ed.) (2015) 'U.S. Cold War Nuclear Target Lists Declassified for First Time: National Security Archive Electronic Briefing Book No. 538,' Available at: https://nsarchive.gwu.edu/nukevault/ebb538-Cold-War-Nuclear-Target-List-Declassified-First-Ever/ Accessed 29/01/18

Burr, W. (ed.) (2016) 'Reagan's Nuclear War Briefing Declassified,' National Security Archive Electronic Briefing Book No. 575, *The National Security Archive at the George Washington University*, The Nuclear Vault, Available at: http://nsarchive2.gwu.edu/nukevault/ebb575-Reagan-Nuclear-War-Briefing/ Accessed 29/01/18

Cable News Network (2000) 'Larry King Live, South Carolina Republican Debate,' Transcript available at: http://edition.cnn.com/TRANSCRIPTS/0002/15/lkl.00.html Accessed 5/1/18

Campbell, D. (1992) *Writing Security: United States Foreign Policy and the Politics of Identity*: University of Minnesota Press: Minneapolis

Campbell, D. (1994) 'Foreign Policy and Identity: Japanese "Other"/American "Self," in *The Global Economy as Political Space*, Rosow, S. Inayatullah, N. and Rupert, M. (eds.), Lynne Rienner: Boulder

Capaccio, A. (2017) 'U.S. Air Force Space Chief Sees Final Frontier as Battleground,' *Bloomberg News*, Available at: https://www.bloomberg.com/news/articles/2017-10-17/u-s-air-force-space-chief-sees-final-frontier-as-battleground Accessed 19/12/2017

Carter, A. (1987) 'Assessing Command System Vulnerability,' in Carter, A., Steinbruner, J. and Zraket, C. (eds.) *Managing Nuclear Operations*, Brookings Institute: Washington DC, pp. 555-610

Cebrowski, A. and Raymond, J. (2005) 'Operationally Responsive Space: A New Defense Business Model,' *Parameters*, Vol. 35, No. 2, pp. 67-77

Chai, W. (2002) 'The Taiwan Factor in U.S.-China Relations: An Interpretation,' *Asian Affairs: An American Review*, Vol. 29, No. 3, pp. 131-147

Chang, J. (1986) 'United States-China Normalization: An Evaluation of Foreign Policy Decision Making,' *Occasional Papers/Reprints Series in Contemporary Asian Studies*, No. 4, Available at: http://digitalcommons.law.umaryland.edu/cgi/viewcontent.cgi?article=1074&context=mscas Accessed 29/01/18

Chen, Y. (1991) 'China's space policy – a historical review,' *Space Policy*, Vol. 7, No. 2, pp. 116-128

Cheng, D. (2011) 'Written Testimony Submitted to the US China Economic and Security Review Commission China's Space Program, May 11, 2011,' Available at: https://www.uscc.gov/sites/default/files/5.11.11Cheng.pdf Accessed 29/01/18

Cheng, D. (2012) 'The Complicated History of U.S. Relations with China,' *The Heritage Foundation*, Available at: http://www.heritage.org/asia/report/the-complicated-history-us-relations-china Accessed 29/01/18

Chomsky, N. (2012) '"Losing" the World: American decline in perspective, part 1,' *The Guardian*, Available at:
http://www.theguardian.com/commentisfree/cifamerica/2012/feb/14/losing-the-world-american-decline-noam-chomsky Accessed 29/01/18

Chow, G. (2014 [2012]) 'Rising China: its strength and problems,') in Wang, L. (eds.) *Rising China in the Changing World Economy*, Routledge: London, pp. 42-51

Christensen, T. (1999) 'China, the U.S.-Japan Alliance, and the Security Dilemma in East Asia,' *International Security*, Vol. 23, No. 4, pp. 49-80

Christensen, T. (2015) *The China Challenge: The Shaping Choices of a Rising Power*, W.W. Norton and Company: New York

Clancy, T. (1994) *Debt of Honor*, G.P. Putnam's Sons: New York

Clark, S. (2016) 'China: the new space superpower,' *The Guardian*, Available at:
https://www.theguardian.com/science/2016/aug/28/china-new-space-superpower-lunar-mars-missions Accessed: 22/02/18

Cohen, E. (1990) 'Net Assessment: An American Approach,' *JCSS Memorandum no. 29*, Tel Aviv University

Cohn, C. (1987) 'Sex and Death in the Rational World of Defense Intellectuals,' *Signs*, Vol. 12, pp687-718

Connolly, W. (1991) *Identity\Difference: Democratic Negotiations of Political Paradox*, Cornell University Press: Ithaca

Cox, R. (1976) 'On Thinking About Future World Order,' *World Politics*, Vol. 28, No. 2, pp. 175-196

Cox, R. (1981) 'Social Forces, States and World Orders: Beyond International Relations Theory,' *Millennium*, Vol. 10, No. 2, pp. 126-155

Cupitt, R. and Grillot, S. (1997) 'COCOM is Dead, Long Live COCOM: Persistence and Change in Multilateral Security Institutions,' *British Journal of Political Science*, Vol. 27, No. 3, pp. 361-389

David, L. (2015) 'US-China Space Freeze May Thaw with Historic New Experiment,' *Space News*, Available at: http://www.space.com/30337-chinese-experiment-international-space-station.html Accessed 29/01/18

David, L. (2016) ''Star Wars' for Real: US Military Wraps Up Space War Games,' *Space.com*, Available at: https://www.space.com/31504-us-military-space-star-wars-games.html Accessed 29/01/18

Davis, J. (2016) 'To Mars, with a monster rocket: How politicians and engineers created NASA's Space Launch System,' *Planetary Society*, Available at: http://www.planetary.org/blogs/jason-davis/2016/20161003-horizon-goal-part-4.html Accessed: 31/01/2018

Davis, M. (2016) 'Why Russia and China Should Fear the X-37B Space Plane,' *The National Interest*, Available at: http://nationalinterest.org/blog/the-buzz/why-russia-china-should-fear-the-x-37b-space-plane-18099?page=2 Accessed 29/01/18

Davis, T. (2010) 'Schriever 2010, A Political Perspective,' *High Frontier*, Vol. 7, No. 1, pp. 3-4

Day, D. (2000) 'Cover Stories and Hidden Agendas: Early American Space and National Security Policy,' in Launius, R., Logsdon, J. and Smith, R. (eds.) *Reconsidering Sputnik: Forty Years Since the Soviet Satellite*, Routledge: London, pp. 161-196

Der Derian, J. (2009) *Virtuous War*: *Mapping the Military-Industrial-Media-Entertainment-Network* (2nd Edition), Routledge: Abingdon

Dietrich, J (2004) 'Interest groups and foreign policy: Clinton and the China MFN debates,' *Presidential Studies Quarterly*, Vol. 29, No. 2, pp. 280-296

Dinerman, T. (2009) 'Schriever V: in dubious battle,' *The Space Review*, Available at: http://www.thespacereview.com/article/1486/1 Accessed 29/01/18

Dinerman, T. (2010) 'If Constellation dies,' *The Space Review*, Available at: http://www.thespacereview.com/article/1554/1 Accessed 29/01/18

Dockrill, S. (1996) *Eisenhower's New-Look National Security Policy, 1953-61*, Macmillan: Basingstoke

Doggrell, L. (2006) 'Operationally Responsive Space: A Vision for the Future of Military Space,' *Air & Space Power Journal*, No. 3, pp. 42-49

Dolman, E. (2002) *Astropolitik: Classical Geopolitics: in the Space Age*, Frank Cass: London

Dong, W. (2013) 'Addressing the U.S.-China Security Dilemma,' *Carnegie Endowment for International Peace*, Available at: http://carnegieendowment.org/2013/01/17/addressing-u.s.-china-security-dilemma-pub-50668 Accessed 30/01/18

Dotson, T. (2015) 'Technological Determinism and Permissionless Innovation as Technocratic Governing Mentalities: Psychocultural Barriers to the Democratization of Technology,' *Engaging Science, Technology, and Society*, Vol. 1, pp. 98-120

Doty, R. (1993) 'Foreign Policy as Social Construction: A Post-Positivist Analysis of U.S. Counterinsurgency Policy in the Philippines,' *International Studies Quarterly*, Vol. 37, No. 3, pp. 297-320

Drezner, D. (2012) 'Pssst…. China…. It's called "the security dilemma,"' *Foreign Policy*, Available at: http://foreignpolicy.com/2012/11/27/pssst-china-its-called-the-security-dilemma/ Accessed 29/01/18

Drum, K. (2010) 'Daniel Ellsberg on the Limits of Knowledge,' *Mother Jones*, Available at: http://www.motherjones.com/kevin-drum/2010/02/daniel-ellsberg-limitations-knowledge/ Accessed 8/1/18

Dudney, R. (2011) 'Hard Lessons at the Schriever Wargame,' *Air Force Magazine*, Available at: http://www.airforcemag.com/MagazineArchive/Pages/2011/February%202011/0211wargame.aspx Accessed 29/01/18

Duvall, R. and Havercroft, J. (2008) 'Taking sovereignty out of this world: space weapons and empire of the future,' *Review of International Studies,* Vol. 34, pp. 755-775

Duvall, R. and Havercroft, J. (2012 [2009]). 'Critical Astropolitics: The Geopolitics of Space Control and the Transformation of State Sovereignty' in Bormann, N. and Sheehan, M. (Eds.), *Securing Outer Space*, Routledge: Abingdon, pp. 42-58

Easton, I. (2009) 'The Great Game in Space,' Project 2049 Institute, Available at: https://www.project2049.net/documents/china_asat_weapons_the_great_game_in_space.pdf Accessed 29/01/18

Echevarria, A. (2014) *Reconsidering the American Way of War: US Military Practice from the Revolution to Afghanistan*, Georgetown University Press: Washington DC

Edgerton, D. (1999) 'From innovation to use: Ten eclectic theses on the historiography of technology,' *History and Technology*, Vol. 16, No. 2, pp. 111-136

Edgerton, D. (2010) 'Innovation, Technology, or History: What is the Historiography of Technology About?' *Technology and Culture*, Vol. 51, No. 3, pp. 680-697

Elbe, S. (2006) 'Should HIV/AIDS Be Securitized? The Ethical Dilemmas of Linking HIV/AIDS and Security,' *International Studies Quarterly*, Vol. 50, No. 1, pp. 119–144

Elliott, J. (2009) 'Exclusive: Inside The Pentagon's Idea Factory,' *Talking Points Memo Muckraker*, Available at: http://talkingpointsmemo.com/muckraker/exclusive-inside-the-pentagon-s-idea-factory Accessed 29/01/18

Emmers (2003) 'ASEAN and the securitization of transnational crime in Southeast Asia,' *The Pacific Review*, Vol. 16, No. 3, pp. 419-438

Epstein, C. (2008) *The Power of Words in International Relations: Birth of an Anti-Whaling Discourse*, MIT Press: Cambridge

Epstein, C. (2013) 'Constructivism or the eternal return of universals in International Relations. Why returning to language is vital to prolonging the owl's flight,' *European Journal of International Relations*, Vol. 19, No. 3, pp. 499-519

Erickson, A. (2014) 'China's space and development history: A comparison of the rocket and satellite sectors,' *Acta Astronautica*, Vol. 103, pp. 142-167

Erwin, S. (2018) 'In Space and Cyber, China Is Closing in on the United States,' *Real Clear Defense*, Available at: https://www.realcleardefense.com/2018/01/11/in_space_and_cyber_china_is_closing_in_on_the_united_states_299541.html Accessed 23/1/18

Everett, T. (2009) 'Building the Political Consensus to Deter Attacks on Our Nation's Space Systems,' *High Frontier*, Vol. 5, No. 4, pp. 3-8

Fairclough, N. (1993) *Discourse and Social Change*, Polity Press: Cambridge

Fairclough, N. (2007) 'Global capitalism and change in Higher Education,' *Proceedings of the BAAL Conference 2007*, pp. 132-140

Faison, S. (1999) 'Review of *Eye of the Tiger: What Jiang Zemin Tells Us about China* by Bruce Gilley,' *Foreign Affairs*, Vol. 78, No. 1, pp. 140-145

Feenberg, A. (2002) *Transforming Technology: A Critical Theory Revisited*, Oxford University Press: Oxford

Feenberg, A. (2010) *Between Reason and Experience: Essays in Technology and Modernity*, MIT Press: Cambridge

Felderman, B. (2009) 'Political-Military Implications of Space Warfare on Homeland Defense and Allied Relations,' *High Frontier*, Vol. 5, No. 4, pp. 23-25

Ferster, W. (2015) 'General: Russian, Chinese Launches Demonstrate Growing Space Threat,' *SpaceNews*, Available at: http://spacenews.com/u-s-general-says-russian-chinese-launches-demonstrate-growing-space-threat/ Accessed 19/12/2017

Felt, U. (2015) 'Keeping Technologies Out: Sociotechnical Imaginaries and the Formation of Austria's Technopolitical Identity,' in Jasanoff, S. and Kim, S. (eds.) *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power*, University of Chicago Press: Chicago, pp. 103-125

Field, A. (2014) 'Schelling, von Neumann, and the Event that Didn't Occur,' *Games*, Vol. 5, pp. 53-89

Finkelstein, D., Saunders, P. and Schriver, R. (2017) 'The Military and Defense Dimensions of United States Relations with China,' in *Joint US-China Think Tank Project on the Future of US-China Relations: An American Perspective*, Center for Strategic and International Studies: Washington D.C., pp. 26-44

Finnemore, M. and Sikkink, K. (2001) 'Taking Stock: The Constructivist Research Program in International Relations and Comparative Politics,' *Annual Review of Political Science*, Vol. 4, pp. 391-416

Fisher, K. (2011) 'Terrorist Threat Construction and the Transition to Permanent British Counterterrorism Law,' *Journal of Terrorism Research*, Vol. 2, No. 3, pp. 9-23

Forden, G. (2008a) 'How China Loses the Coming Space War (Pt. 1),' *Wired*, Available at: https://www.wired.com/2008/01/inside-the-chin Accessed 29/01/18

Forden, G. (2008b) 'How China Loses the Coming Space War (Pt. 2),' *Wired*, Available at: https://www.wired.com/2008/01/inside-the-ch-1/ Accessed 29/01/18

Forden, G. (2008c) 'How China Loses the Coming Space War (Pt. 3),' *Wired*, Available at: https://www.wired.com/2008/01/inside-the-ch-2 Accessed 29/01/18

Forden, G. (2008d) 'SBIRS – Two Heads Are Better Than One,' Available at: http://www.armscontrolwonk.com/archive/302137/sbirstwo-heads-are-better-than-one/ Accessed 29/01/18

Forden, G. (2008e) 'Viewpoint: China and Space War,' *Astropolitics*, Vol. 6, No. 2, pp. 138-153

Foresman, G. (2010) 'The Complexities of America's National Security: Enabling A New generation of Leadership,' *High Frontier*, Vol. 7, No. 1, pp. 5-8

Foust, J. (2018) 'SpaceX Delays Commercial Crew Test Flights to Latter Half of 2018,' *SpaceNews*, Available at: http://spacenews.com/spacex-delays-commercial-crew-test-flights-to-latter-half-of-2018/ Accessed 31/01/2018

Freedberg, S. (2014) 'US Can't 'Stick Our Heads In The Sand On Space Threats: Gen. Shelton,' *Breaking Defense*, Available at: http://breakingdefense.com/2014/07/us-cant-stick-our-heads-in-the-sand-over-rising-threats-to-space-gen-shelton/ Accessed 29/01/18

Frick, W., Guerci, J. and Horais, B. (2004) 'Responsive Air Launch,' Paper presented at *AIAA 2nd Responsive Space Conference*, pp. 1-14

Friedberg, A. (2005) 'The Future of U.S.-China Relations: Is Conflict Inevitable?' *International Security*, Vol. 30, No. 2, pp. 7-45

Friedberg, A. (2011) *A Contest for Supremacy: China, America, And the Struggle For Mastery in Asia*, W.W. Norton: New York

Future of Life Institute (N.D.) '1100 Declassified U.S. Nuclear Targets,' Available at: https://futureoflife.org/background/us-nuclear-targets/ Accessed 29/01/18

Gaddis, J. (2007 [2005]) *The Cold War*, Penguin Books: London

Galison, P. (2004) 'Removing Knowledge,' *Critical Inquiry*, Vol. 31, No. 1, pp. 229-243

Gao, C. (2017) 'Did Trump Just Kick off the Space Race 2.0 With China?' *The Diplomat*, Available at: https://thediplomat.com/2017/12/does-trump-just-kick-off-the-space-race-2-0-with-china/ Accessed 22/01/2018

Gasser, A. (2017) 'The path to the infinite economy,' *The Space Review*, Available at: http://www.thespacereview.com/article/3135/1 Accessed 29/01/18

Gerstenzang, J. (1989) 'Bush Halts Arms Sales Over China Repression,' *LA Times*, Available at: http://articles.latimes.com/1989-06-06/news/mn-1699_1_chinese-students-chinese-army-chinese-military-leaders Accessed 29/01/18

Gertz, B. (2000) *The China Threat: How the People's Republic Targets America*, Regnery Publishing Inc.: Washington D.C.

Ghamari-Tabrizi, S. (2005) *The Worlds of Herman Kahn: The Intuitive Science of Thermonuclear War*, Harvard University Press: Cambridge

Ghamari-Tabrizi, S. (2016) 'Wargames as Writing Systems,' in Harrigan, P, and Kirschenbaum, M. (eds.) *Zones of Control: Perspectives on Wargaming*, MIT Press: Cambridge and London, pp. 331-354

Glaser, B. (2013) 'The Diplomatic Relationship: Substance and Process,' in Shambaugh, D. (ed.) *Tangled Titans: the United States and China,* Rowman and Littlefield: Plymouth, pp. 151-180

Glaser, C. (2011) 'Will China's Rise Lead to War? Why Realism Does Not Mean Pessimism,' *Foreign Affairs*, Vol. 90, No. 2, pp. 80-91

Glynos, J. and Howarth, D. (2007) *Logics of Critical Explanation in Social and Political Theory*, Routledge: Abingdon

Goh, E. (2005) *Constructing the U.S. Rapprochement with China, 1961-1974: From 'Red Menace' to 'Tacit Ally*,' Cambridge University Press: Cambridge

Goldman, C. (1995) 'Managing policy toward china under Clinton: the changing role of economics,' *RAND Centre for Asia-Pacific Policy*, pp. 1-35

Goldstein, A. (2013) 'China's Real and Present Danger: Now Is the Time for Washington to Worry,' *Foreign Affairs*, Vol. 92, No. 5, pp. 136-144

Gompert, D. and Saunders, P. (2011) *The Paradox of Power: Sino-American Restraint in an Age of Vulnerability*, National Defense University Press: Washington D.C.

GPS World Staff (2010) 'Raytheon Awarded Next-Generation Control Segment Contract (OCX)' *GPS World*, Available at: http://gpsworld.com/gnss-systemgps-modernizationnewsraytheon-awarded-next-generation-control-segment-contract-ocx-960/ Accessed 29/01/18

GPS World Staff (2016) 'The Almanac: Orbit Data and resources on Active GNSS Satellites,' *GPS World*, Available at: http://gpsworld.com/wp-content/uploads/2016/08/GPS_AUG16_Almanac.pdf Accessed 29/01/18

Gracie, C. (2015) 'South China Sea: David v Goliath as Dispute goes to court,' *BBC News*, Available at: http://www.bbc.co.uk/news/world-asia-china-33406609 Accessed 29/01/18

Graff, G. (2016) 'We're the Only Plane in the Sky,' *Politico*, Available at: http://www.politico.com/magazine/story/2016/09/were-the-only-plane-in-the-sky-214230 Accessed 29/01/18

Green, M., Bush, R. and Rapp-Hooper, M. (2017) 'Asia-Pacific Security Issues in the U.S.-China Relationship,' in *Joint US-China Think Tank Project on the Future of US-China Relations: An American Perspective*, Center for Strategic and International Studies: Washington D.C., pp. 18-25

Gregory, D. (2011a) 'The everywhere war,' *The Geographical Journal*, Vol. 177, No. 3, pp. 238–250

Gregory, D. (2011b) 'From a View to a Kill Drones and Late Modern War,' *Theory, Culture and Society*, Vol. 28, No. 7-8, pp. 188-215

Gries, P. (2001) 'Tears of Rage: Chinese Nationalist Reactions to the Belgrade Embassy Bombing,' *The China Journal*, No. 46, pp. 25-43

Grint, K. and Woolgar, S. (1992) 'Computers, Guns, and Roses: What's Social about Being Shot?' *Science, Technology, & Human Values*, Vol. 17, No. 3, pp. 366-380

Grondin, D. (2012 [2009]) 'The (power) politics of Space: the US astropolitical discourse on global dominance in the War on Terror,' in *Securing Outer Space*, Bormann, N. and Sheehan, M. (eds.), Routledge: Abingdon, pp. 108-127

Grondin, D. (2013) 'The study of drones as objects of security: targeted killing as military strategy,' in Salter, M. and Mutlu, C. (eds.) *Research Methods in Critical Security Studies: An Introduction*, New York: Routledge, pp. 191-194

Gruss, M. (2015a) 'ORS Director: "We're Not Here to Build Neat Toys," *Space News*, Available at: http://spacenews.com/ors-director-were-not-here-to-build-neat-toys/ Accessed 29/01/18

Gruss, M. (2015b) 'U.S. Air Force Initiative To Put Commercial Seats in JSpOC,' *Space News*, http://spacenews.com/u-s-air-force-initiative-to-put-commercial-seats-in-jspoc/ Accessed 29/01/18

Gruss, M. (2015c) 'Lamborn, Schiff Re-establish Space Power Caucus in House', Available at: http://spacenews.com/lamborn-schiff-re-establish-space-power-caucus-in-house/ Accessed 29/01/18

Gruss, M. (2016a) 'How space is changing the U.S. Air Force's day-to-day operations,' *SpaceNews*, Available at: https://www.youtube.com/watch?v=Kws6BvPDUto Accessed 29/01/18

Gruss, M. (2016b) 'More SBIRS, AEHF satellites still a possibility, Lockheed Martin says,' *Space News*, Available at: http://spacenews.com/more-sbirs-aehf-satellites-still-a-possibility-lockheed-martin-says/ Accessed 29/01/18

Hammes, T. (2006) *The Sling and The Stone: On war in the 21st century*, Zenith Press: Minneapolis

Handberg, R. and Li, Z. (2012) *Chinese Space Policy: A Study in Domestic and International Politics*, Routledge: Abingdon

Hansen, L. (2006) *Security as Practice: Discourse Analysis and the Bosnian War*, Routledge: London

Harper, J. (2017) 'Cold War in East Asia?' *Survival*, Vol. 59, No. 6, pp. 197-204

Harrison, R. (2013) 'Unpacking the Three C's: Congested, Competitive, and Contested Space,' *Astropolitics*, Vol. 11, No. 3, pp. 123-131

Harvey, B. (2004) *China's Space Program: From Conception to Manned Spaceflight*, Springer/Praxos: Chichester

Hayes, J. (2012) 'Securitization, Social Identity, and Democratic Security: Nixon, India, and the Ties That Bind,' *International Organization*, Vol. 66, No. 1, pp. 63-93

Head, K., Ries, J., Sun, X., and Hong, J. (2015) 'The legacy of nineteenth century treaties on the current trade of Chinese cities,' *Asia-Pacific Journal of Accounting and Economics*, Vol. 22, No. 3, pp. 251-270

Hecht, G. (1998) *The Radiance of France: Nuclear Power and National Identity after World War II*, MIT Press: Cambridge

Hecht, G. (2003) 'Globalization meets frankenstein? Reflections on terrorism, nuclearity, and global technopolitical discourse,' *History and Technology*, Vo. 19, No. 1, pp. 1-8

Heginbotham, E., Nixon, M., Morgan, F., Heim, J., Hagen, J., Li, S., Engstrom, J., Libicki, M., DeLuca, P., Shlapak, D., Frelinger, D., Laird, B. Brady, K. and Morris, L. (2015) *The U.S.-China Military Scorecard: Forces, Geography, and the Evolving Balance of Power 1996-2017*, RAND Corporation: Santa Monica

Helms, S. (2010) 'Schriever Wargame 2010: Thoughts on Deterrence in the Non-Kinetic Domain,' *High Frontier*, Vol. 7, No. 1, pp. 12-15

Henry, C. (2015) 'JFCC Space Details Commercial Integration Cell Goals,' *Via Satellite*, Available at: http://www.satellitetoday.com/regional/2015/07/20/jfcc-space-details-commercial-integration-cell-goals/ Accessed 29/01/18

Hernandez, J. (2015) 'China Blames US military actions for Tensions in the South China Sea,' *New York Times*, Available at: http://www.nytimes.com/2015/07/31/world/asia/china-blames-us-military-actions-for-tensions-in-the-south-china-sea.html?ref=topics Accessed 29/01/18

Hilborne, M. (2013) 'China's rise in space and US policy responses: A collision course?' *Space Policy*, Vol. 29, No. 2, pp. 121-127

Hilborne, M. (2015 [2012/2013]) 'The Impact of China's Rise in Space,' in Al-Ekabi, C., Baranes, B., Hulsroj, P., Lahcen, A. (eds.) *Yearbook on Space Policy 2012/2013*, Springer: Vienna, pp. 233-240

Hitchens, T., Katz-Hyman, M. and Lewis, J. (2006) 'U.S. Space Weapons: Big Intentions, Little Focus,' *Nonproliferation Review*, Vol. 13, No 1, pp. 35-56

Hitt, J. (2001) 'Battlefield: Space,' *The New York Times*, Available at: http://www.nytimes.com/2001/08/05/magazine/battlefield-space.html Accessed 29/01/18

Hoffman, C. (2009) 'China's Space Threat: How Missiles Could Target U.S. Satellites,' *Popular Mechanics*, Available at: http://www.popularmechanics.com/space/satellites/a1782/4218443/ Accessed: 29/01/18

Horkheimer, M. and Adorno, T, (1972 [1947]) *Dialectic of Enlightenment* (Tr. Cumming, J.), Seabury Press: New York

Horn, E. (2012) 'Logics of Political Secrecy,' *Theory, Culture, & Society,* Vol. 28, No. 7-8, pp. 103-122

Hughes, B. (2007) 'Securitizing Iraq: The Bush Administration's Social Construction of Security, Global Change,' *Global Change, Peace & Security*, Vol. 19, No. 2, pp. 83-102

Hunt, M. (1987) *Ideology and U.S. Foreign Policy*, Yale University Press: New Haven

Hutchby, I. (2001) 'Technologies, Texts and Affordances,' *Sociology*, Vol. 35, No. 2, pp. 441-456

Jackson, R. (2005) *Writing the War on Terrorism: Language, Politics and Counter-terrorism*, Manchester University Press: Manchester

James, L. (2009) 'Schriever V Wargames: The Boundaries of Space and Cyberspace,' *High Frontier*, Vol. 5, No. 4, pp. 12-13

Jasanoff, S. and Kim, S. (2009) 'Containing the Atom: Sociotechnical Imaginaries and Nuclear Power in the United States and South Korea,' *Minerva*, Vol. 47, pp. 119-146

Joerges, B. (1999) 'Do Politics have Artefacts?' *Social Studies of Science*, Vol. 29, No. 3, pp. 411-431

Jørgensen, M. and Phillips, L. (2002) *Discourse Analysis as Theory and Method*, Sage: London

Johnson-Freese, J. (2003) 'China's Manned Space Program: Sun Tzu or Apollo Redux?' *Naval War College Review*, Vol. 56, No. 3, pp. 51-71

Johnson-Freese, J. (2007) *Space as a Strategic Asset*, Columbia University Press: New York

Johnson-Freese, J. (2015) 'Ceding American Leadership in Space,' *Fletcher Forum of World Affairs*, Vol. 39, No. 1, pp. 91-98

Johnson-Freese, J. (2017) *Space Warfare in the 21st Century: Arming the Heavens*, Routledge: New York

Kan, S. (2007) 'China's Anti-Satellite Weapon Test,' *CRS Report for Congress*, Available at: https://fas.org/sgp/crs/row/RS22652.pdf Accessed 29/01/18

Kanwisher, N. (1989) 'Cognitive Heuristics and American Security Policy,' *The Journal of Conflict Resolution,* Vol. 33, No. 4, pp. 652-675

Karber, P. (2014) 'Net Assessment for Secretary of Defense: Future Implications from Early Formulations,' *The Potomac Foundation*, Available at: http://www.thepotomacfoundation.org/net-assessment-for-secdef/ Accessed 29/01/18

Kastner, S. (2015/2016) 'Is the Taiwan Strait Still a Flash Point?: Rethinking the Prospects for Armed Conflict between China and Taiwan,' *International Security*, Vol. 40, No. 3, pp. 54-92

Kaufman, A. (2010) 'The "Century of Humiliation," Then and Now: Chinese Perceptions of the International Order,' *Pacific Focus*, Vol. 25, No. 1, pp. 1-33

Kaufman, M. and Linzer, D. (2007) 'China Criticized for Anti-Satellite Missile Test,' *Washington Post,* Available at: http://www.washingtonpost.com/wp-dyn/content/article/2007/01/18/AR2007011801029.html Accessed 29/01/18

Kehler, R. (2010) 'Introduction,' *High Frontier*, Vol. 7, No. 1, p. 2

Kennedy, S. and Economy, E. (2017) 'US-China Economic Relations: Toward a Genuine Wi-Win Outcome,' in *Joint US-China Think Tank Project on the Future of US-China Relations: An American Perspective*, Center for Strategic and International Studies: Washington D.C., pp. 10-17

Kharpal, A. (2017) 'China uses a quantum satellite to transmit potentially unhackable data,' *CNBC*, Available at: https://www.cnbc.com/2017/08/10/china-uses-quantum-satellite-to-transmit-potentially-unhackable-data.html Accessed 23/1/18

Killian, J. (1977) 'Sputnik Fever,' *The Sciences*, Vol. 17, No. 6, pp. 6-9

Kissinger, H. (1979) *The White House Years*, Weidenfeld and Nicolson: London

Kling, R. (1992a) 'Audiences, Narratives, and Human Values in Social Studies of Technology,' *Science, Technology, & Human Values*, Vol. 17, No. 3, pp. 349-365

Kling, R. (1992b) 'When Gunfire Shatters Bone: Reducing Sociotechnical Systems to Social Relationships,' *Science, Technology, & Human Values*, Vol. 17, No. 3, pp. 381-385

Klotz, I. (2015) 'NASA chief says ban on Chinese partnerships is temporary,' *Reuters News*, Available at: http://www.reuters.com/article/us-space-usa-china-idUSKCN0S61SU20151012 Accessed 29/01/18

Koebler, J. (2014) 'Everything We Know About X-37B, the Air Force's Mysterious Space Drone,' *Motherboard*, Available at: https://motherboard.vice.com/en_us/article/3dkppj/everything-we-know-about-x-37b-the-air-forces-top-secret-space-plane Accessed 29/01/18

Kratochwil, F. (1989) *Rules, norms and decisions : on the conditions of practical and legal reasoning in international relations and domestic affairs*, Cambridge University Press: Cambridge

Krepinevich, A. and Watts, B. (2015) *the Last Warrior: Andrew Marshall and the Shaping of Modern American Defense Strategy*, Basic Books: New York

Krepon, M., Hagt, E., Shen, D., Bao, S., Pillsbury, M. and Tellis, A. (2008) 'China's Military Space Strategy: An Exchange,' *Survival*, Vol. 50, No. 1, pp. 157-198

Kristof, N. (2003) 'Bringing China In From the Cold,' *The New York Times*, Available at: http://www.nytimes.com/2003/06/03/opinion/bringing-china-in-from-the-cold.html Accessed 29/01/18

Ku, A. (1998) 'Boundary Politics in the Public Sphere:Openness, Secrecy, and Leak,' *Sociological Theory*, Vol. 16, No. 2, pp. 172-192

Kulacki, G. (2004) 'A Military Intelligence Failure? The Case of the Parasite Satellite,' *Union of Concerned Scientists*, Available at: http://www.ucsusa.org/sites/default/files/legacy/assets/documents/nwgs/parasite_satellite_8-17-04.pdf Accessed 29/01/18

Kulacki, G. and Lewis, J. (2009) *A Place for One's Mat: China's Space Program, 1956-2003,* American Academy of Arts and Sciences: Cambridge, MA

Lamothe, D. (2016) 'Pentagon chief wants secretive space unit involved in fight against Islamic State,' *The Washington Post*, Available at: https://www.washingtonpost.com/news/checkpoint/wp/2016/05/13/pentagon-chief-wants-secretive-space-unit-involved-in-fight-against-islamic-state/?utm_term=.21092b418753 Accessed 29/01/18

Lampton, D. (1994) 'America's China Policy in the Age of the Finance Minister: Clinton Ends Linkage,' *The China Quarterly*, Vol. 139, pp. 597-621

Lang, B. (2015) ''The Martian' Soars to $50.1 Million Opening in China,' *Variety,* Available at: http://variety.com/2015/film/box-office/the-martian-china-opening-1201649698/ Accessed 29/01/18

Launius, R. (2003) 'Public opinion polls and perceptions of US human spaceflight,' *Space Policy*, Vol. 19, pp. 163–175

Launius, R. (2005) 'Perceptions of Apollo: Myth, nostalgia, memory or all of the above?' *Space Policy*, Vol. 21, pp. 129–139

Launius, R. (2015) 'Thoughts on an Historical Essay Currently Underway: The Space Program and the Ideal of American Exceptionalism,' Available at: https://launiusr.wordpress.com/2015/01/02/thoughts-on-an-historical-essay-currently-underway-the-space-program-and-the-ideal-of-american-exceptionalism/ Accessed 29/01/18

Layne, C. (1993) 'The Unipolar Illusion: Why New Great Powers Will Rise,' *International Security*, Vol. 17, No. 4, pp. 5-51

Lee, E. (2007) 'The "Yellow Peril" and Asian Exclusion in the Americas,' *Pacific Historical Review*, Vol. 76, No. 4, pp. 537-562

Lee, J. (2012) 'The 'Tragedy' of China's Energy Policy,' *The Diplomat*, Available at: http://thediplomat.com/2012/10/the-tragedy-of-chinas-energy-policy/ Accessed 29/01/18

Leng, S. (1967) 'Pre-1949 Development of the Communist Chinese System of Justice,' *The China Quarterly*, pp. 93-114

Leone, D. (2015) 'NASA Spending Panel Chairman Keeps Focus on China,' *SpaceNews*, Available at: http://spacenews.com/nasa-spending-panel-chairman-keeps-focus-on-china/ Accessed 29/01/18

Lewis, J. (2015) 'Say It Ain't So, Phil,' *Foreign Policy*, Available at:
http://foreignpolicy.com/2015/02/19/say-it-aint-so-phil-ukraine-russia-open-source-analysis/
Accessed 29/01/18

Lewis, J. (2017) 'Let's Face It: North Korean Nuclear Weapons Can Hit the U.S.' *The New York Times*, Available at: https://www.nytimes.com/2017/08/03/opinion/north-korea-nukes.html
Accessed 29/01/18

Li, M. (2009a) 'Introduction: Soft Power: Nurture not Nature' in Li, M. (ed.) *Soft Power: China's Emerging Strategy in International Politics*, Lexington Books: Plymouth, pp. 1-18

Li, M. (2009b) 'Soft Power in Chinese Discourse' in Li, M. (ed.) *Soft Power: China's Emerging Strategy in International Politics*, Lexington Books: Plymouth, pp. 21-44

Lieber, K. (2005) *War and the Engineers: The Primacy of Politics over Technology*, Cornell University Press: Ithaca

Liffm A. and Ikenberry, G. (2014) 'Racing toward Tragedy?: China's Rise, Military Competition in the Asia Pacific, and the Security Dilemma,' *International Security*, Vol. 39, No. 2, pp. 52-91

Lin, J. (2013) 'Demystifying the Chinese Economy,' *The Australian Economic Review*, Vol. 46, No. 3, pp. 259-268

Linn, B. (2008) 'The American Way of War,' *OAH Magazine of History*, Vol. 22, No. 4, pp. 19-23

Linn, B. (2010) 'The American Way of War Debate: An Overview,' *Historically Speaking*, Vol. 11, No. 5, pp. 22-23

Lipset, S. (1996) *American Exceptionalism: A Double Edged Sword*, W.W. Norton: New York

Löfflmann, G. (2015) 'Leading from Behind – American Exceptionalism and President Obama's Post-American Vision of Hegemony,' *Geopolitics*, Vol. 20, No. 2, pp. 308-332

Logan, J. (2007) 'China's Space Program: Options for U.S.-China Cooperation', Report for Congress, Congressional Research Service: Washington DC

Lohan, M. (2001) 'Men, masculinities and 'mundane' technologies: The domestic telephone,' in Adam, A. and Green, E. (eds.) *Virtual Gender: Technology, Consumption and Identity Matters,* Routledge: London

López, D. (2012) 'Predicting an Arms Race in Space: Problematic Assumptions for Space Arms Control,' *Astropolitics*, Vol. 10, No. 1, pp. 49-67

Lubin, G. (2016) '18 Hollywood movies that pandered to China's giant box office,' *Business Insider UK*, Available at: http://uk.businessinsider.com/hollywood-movies-in-china-2016-10?r=US&IR=T/#cloud-atlas-removed-nearly-30-minutes-from-its-chinese-cut-largely-plotlines-and-scenes-with-controversial-sexual-relations-3 Accessed 29/01/18

Maass, R. (2015) 'U.S., Chinese naval forces conduct group passage exercise,' *United Press International*, Available at: http://www.upi.com/Business_News/Security-Industry/2015/11/11/US-Chinese-naval-forces-conduct-group-passage-exercise/1901447253771/ Accessed 29/01/18

Mack, P. (1990) *Viewing the Earth: The Social Construction of the Landsat Satellite System*, MIT Press: Cambridge

Mackenzie, D. (1993 [1990]) *Inventing Accuracy: A Historical Sociology of Nuclear Missile Guidance*, MIT Press: Cambridge

Mackey, J. (2009) 'Recent US and Chinese Antisatellite Activities,' *Air and Space Power Journal*, Vol. 23, No. 3, pp. 82-93

Madsen, D. (1998) *American Exceptionalism*, Edinburgh University Press: Edinburgh

Marcuse, H. (1998 [1941]) 'Some Social Implications of Modern Technology,' in Kellner, D. (ed.) *Technology, War and Fascism: Collected Papers of Herbert Marcuse Volume One*, Routledge: London, pp. 39-66

Marcuse, H. (2001 [1961]) 'The Problem of Social Change in the Technological Society,' in Kellner, D. (ed.) *Towards a Critical Theory of Society: Collected Papers of Herbert Marcuse Volume Two*, Routledge: London, pp. 35-58

Marcuse, H. (2002 [1964]) *One Dimensional Man: Studies in the Ideology of Advanced Industrial Society*, Routledge: Abingdon

Marinelli, M. (2009) 'Making concessions in Tianjin: heterotopia and Italian colonialism in mainland China,' *Urban History*, Vol. 36, No. 3, pp. 399-425

Marsh, D. (2009) 'Keeping Ideas in their Place: In Praise of Thin Constructivism,' *Australian Journal of Political Science*, Vol. 44, No. 4, pp. 679-696

Marsh, K. and Jones, C. (2015) 'From rivals to partners: AirSea Battle and the US air force–navy relationship,' *Defense & Security Analysis*, Vol. 31, No. 3, pp. 246-259

Martin, D. (2015) 'The Battle Above,' *CBS*, Transcript available at: http://www.cbsnews.com/news/rare-look-at-space-command-satellite-defense-60-minutes/ Accessed 29/01/18

Masco, J. (2014) *The Theater of Operations: National Security Affect from the Cold War to the War on Terror*, Duke University Press: Durham and London

Masco, J. (2017) '101 - Joe Masco,' *Cultures of Energy: The Energy Humanities Podcast*, Available at: http://culturesofenergy.com/101-joe-masco/ Accessed 8/1/18

Masters, J. (2014) 'Ballistic Missile Defense,' *Council on Foreign Relations*, Available at: https://www.cfr.org/backgrounder/ballistic-missile-defense Accessed 29/01/18

Matson, J. (2011) 'NASA's New Rocket: Will Congress's Pet Project Fly?' *Scientific American*, Available at: https://blogs.scientificamerican.com/observations/nasas-new-rocket-will-congresss-pet-project-fly/ Accessed: 31/01/2018

Mauney, C. (2009) 'Employing Elements of National Power in Schriever V,' *High Frontier*, Vol. 5, No. 4, pp. 9-11

Mayer, M., Carpes, M., and Knoblich, R. (2014) 'A Toolbox for Studying the Global Politics of Science and Technology,' in Mayer, M., Carpes, M. and Knoblich, R. (eds.) *The Global Politics of Science and Technology Vol. 2: Perspectives, Cases and Methods*, Springer: Heidelberg, pp. 1-17

McCarthy, D. (2013) 'Technology and 'the International' or: How I Learned to Stop Worrying and Love Determinism,' *Millenium*, Vol. 41, No. 3, pp. 470-490

McCarthy, D. (2015) *Power, information Technology, and International Relations Theory: The Power and Politics of US Foreign Policy and the Internet*, Palgrave Macmillan: Basingstoke

McCarthy, D. (2018) 'Introduction: Technology in World Politics,' in McCarthy, D. (ed.) *Technology and World Politics: An Introduction*, Routledge: Abingdon, pp. 1-22

McDonald, M. (2008) 'Securitization and the Construction of Security,' *European Journal of International Relations*, Vol. 14, No.4, pp. 563-587

McIntyre, J., Malveaux, S. and O'Brien, M. (2008) 'Navy Missile hits dying spy satellite, says Pentagon,' *CNN*, Available at: http://edition.cnn.com/2008/TECH/space/02/20/satellite.shootdown/?eref=rss_us Accessed 29/01/18

McSweeney, B. (1996) 'Identity and security: Buzan and the Copenhagen school,' *Review of International Studies*, Vol. 22, pp. 81-93

Mearsheimer, J. (2006) 'China's Unpeaceful Rise,' *Current History*, Vol. 105, pp. 160-162

Medeiros, E., Crane, K., Heginbotham, E., Levin, N., Lowell, J., Rabasa, A., Seong, S. (2008) *pacific Currents: The Responses of U.S. Allies and Security Partners in East Asia to China's Rise*, RAND Corporation: Santa Monica

Mesco, J. (2009) 'Schriever Wargames: The Battle for the Ultimate High Ground,' *High Frontier, Vol. 5, No. 4, pp. 38-41*

Mills, S. (2004) *Discourse*, Routledge: London

Milner, M. (2007) 'In Search of the American Way of War: The Need for a Wider National and International Context,' *The Journal of American History*, Vol. 93, No. 4, pp. 1151-1153

Mitzen, J. (2008) 'Ontological Security in World Politics: State Identity and the Security Dilemma,' *European Journal of International Relations*, Vol. 12, pp. 341-370

Moltz, J. (2008) *The Politics of Space Security: Strategic Restraint and the Pursuit of National Interests*, Stanford University Press: Stanford

Moltz, J. (2012) *Asia's Space Race: National Motivations, Regional Rivalries, and International* Risks, Columbia University Press: New York

Morring, F. (2015) 'Bolden: Ban On Cooperation with China 'Temporary',' *Aviation Week and Space Technology*, Available at: http://aviationweek.com/space/bolden-ban-cooperation-china-temporary Accessed 29/01/18

Nathan, A. (1994) 'Human Rights in Chinese Foreign Policy,' *The China Quarterly*, No. 139, pp. 622-643

Nathanson, C. (1988) 'The Social Construction of the Soviet Threat: A Study in the Politics of Representation,' *Alternatives*, Vol. 13, pp. 443-483

Morton, L. (1960) 'Germany First: The Basic Concept of Allied Strategy in World War II,' in Greenfield, K. (ed.) *Command Decisions*, Center for Military History, Department of the Army: Washington DC, Available at: https://history.army.mil/books/70-7_0.htm Accessed 29/01/18

Munsil, L. (2014) 'Crisis may end Russia space reliance,' Available at: http://www.politico.com/story/2014/03/ukraine-crisis-russia-space-104361 Accessed 29/01/18

Mutlu, C. and Salter, M. (2013) 'The Discursive Turn,' in Salter, M. and Mutlu, C. (eds.) *Research Methods in Critical Security Studies: An Introduction*, New York: Routledge, pp. 113-119

Nabers, D. (2009) 'Filling the Void of Meaning: Identity Construction in U.S. Foreign Policy After September 11, 2001,' *Foreign Policy Analysis*, Vol. 5, pp. 191–214

Nathan, A. (2001) 'The Tiananmen Papers: An Editor's Reflections,' *The China Quarterly*, No. 167, pp. 724-737

Nathanson, C. (1988) 'The Social Construction of the Soviet Threat: A Study in the Politics of Representation,' *Alternatives*, Vol. 13, pp. 443-483

Neufeld, M. (2013) '*Eisenhower's Sputnik Moment: The Race for Space and International Prestige* by Yanek Mieczkowski (review),' *Technology and Culture*, Vol. 54, No. 4, pp. 998-999

Newman, R. (1992) *Owen Lattimore and the "Loss" of China*, University of California Press: Berkeley

New York Times Editorial Board (2015) 'Preventing a Space War,' *The New York Times*, Available at: https://www.nytimes.com/2015/06/29/opinion/preventing-a-space-war.html Accessed 22/02/18

Noland, M. (1996) 'US-China Economic Relations,' *Petersen Institute for International Economics Working Paper 96-6*, Available at: https://piie.com/publications/working-papers/us-china-economic-relations Accessed 04/01/2017

Nuclear Threat Initiative (2016) 'Is Launch Under Attack Feasible?' Available at: http://www.nti.org/analysis/articles/launch-under-attack-feasible/ Accessed 29/01/18

Nye, J. (2010) 'The Futures of American Power – Dominance and Decline in Perspective,' *Foreign Affairs*, Vol. 89, No. 6, pp. 2-12

Nye, J. (2016 [2015]) *Is the American Century Over?* Polity: Cambridge

O'Hanlon, M. (2004) *Neither Star Wars nor Sanctuary: Constraining the Military Uses of Space*, Brookings Institution Press: Washington D.C.

Oksenberg, M. (2002) 'U.S. Politics and Asian Policy,' in Vogel, E., Ming, Y. and Akihiko, T. (eds.) *The Golden Age of the U.S.-China-Japan Triangle 1972-1989*, Harvard University Press: Cambridge, pp. 17-37

Onuf, N. (2013 [1989]) *World of Our Making: Rules and rule in social theory and international relations*, Routledge: London

Opall-Rome, B. (2017) 'Experts tout space-based sensors, lasers for missile defense,' *Defense News*, Available at: https://www.defensenews.com/smr/defense-news-conference/2017/09/06/us-experts-tout-space-based-sensors-lasers-for-active-defense/ Accessed 23/02/2018

Osgood, K. (2000) 'Before Sputnik: National Security and the Formation of U.S. Outer Space Policy,' in Launius, R., Logsdon, J. and Smith, R. (eds.) *Reconsidering Sputnik: Forty Years Since the Soviet Satellite*, Routledge: London, pp. 197-230

Ó Tuathail, G. and Agnew, J. (1992) 'Geopolitics and discourse: Practical geopolitical reasoning in American foreign policy,' *Political Geography*, Vol. 11, No. 2, pp. 190-204

Oldenziel, R. (2011) 'Islands: The United States as a Networked Empire,' in *Entangled Geographies: Empire and Technopolitics in the Global Cod War*, Hecht, G. (ed.), pp. 13-42

Overholt, W. (1996) 'China After Deng,' *Foreign Affairs*, Vol. 75, No. 3, pp. 63-78

Pan, C. (2004) 'The "China Threat" in American Self-Imagination: The Discursive Construction of Other as Power Politics,' *Alternatives*, Vol. 29, pp. 305-331

Pan, C. (2012) *Knowledge, desire, and power in global politics: Western representations of China's rise*, Edward Elgar: Cheltenham

Parker, C. (1978) 'The Tactical Revolution in Soviet Military Doctrine: A Critique,' via Lewis, J. at *Scribd*, Available at: https://www.scribd.com/document/256197726/Tactical-Revolution-in-Soviet-Military-Doctrine-A-Critique Accessed 29/1/18

Parrish, K. (2016) 'DoD Decision Breathes New Life into Critical OCX Satellite Program,' *DoD News, Defense Media Activity*, Available at: https://www.defense.gov/News/Article/Article/974228/dod-decision-breathes-new-life-into-critical-ocx-satellite-program/ Accessed 5/1/18

Parsons, P. and Xu, X. (2001) 'News framing of the Chinese embassy bombing by the people's daily and the New York Times,' *Asian Journal of Communication*, Vol. 11, No. 1, pp. 51-67

Pasztor, A. (2018) 'Trump's NASA Budget: More Moon, Less Space Station,' *The Wall Street Journal*, Available at: https://www.wsj.com/articles/trumps-nasa-budget-more-moon-less-space-station-1516873423?utm_content=buffer70510&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer Accessed: 31/01/18

Pease, D. (2009) *The New American Exceptionalism*, University of Minnesota Press: Minneapolis

Peck, M. (2012) 'Wargaming A U.S.-China War,' *Kotaku*, Available at: https://kotaku.com/5939729/wargaming-a-us-china-war Accessed 5/1/18

Pei, M. (1998) 'Is China Democratizing?' *Foreign Affairs*, Vol. 77, No. 1, pp. 68-82

Peoples, C. (2008) 'Sputnik and 'skill thinking' revisited: technological determinism in American responses to the Soviet missile threat,' *Cold War History*, Vol. 8, No. 1, pp. 55-75

Peoples, C. (2010) *Justifying Ballistic Missile Defence: technology, Security and Culture*, Cambridge University Press, Cambridge

Peoples, C. (2011) 'The Securitization of Outer Space: Challenges for Arms Control,' *Contemporary Security Policy*, Vol. 32, No. 1, pp. 76-98

Peoples, C. (2018) 'Extra-terrestrial Technopolitics: The politics of technology in space,' *Technology and World Politics: An Introduction*, Routledge: London, pp. 182-203

Perla, P. (2011) *Peter Perla's The Art of Wargaming: A Guide for Professionals and Hobbyists*, Curry, J. (ed.), United States Naval Institute: Annapolis/History of Wargaming Project: Wroclaw

Pham, S. (2017) 'China hits milestone in race to create hack-proof communications,' *CNN* , Available at: http://money.cnn.com/2017/06/16/technology/china-quantum-satellite-success/index.html Accessed 23/1/18

Pollack, J. (2002) 'American Perceptions of Chinese Military Power,' in Yee, H. and Storey, I. (eds.) *The China Threat: Perceptions, Myths and* Reality, Routledge: Abingdon, pp. 43-64

Porter, G. (2015) 'Israel's Construction of Iran as an Existential Threat,' *Journal of Palestine Studies*, Vol. 45 No. 1, pp. 43-62

Prestowitz, C. (1988) *Trading Places: How We Allowed Japan to Take the Lead*, Basic Books: New York

Prine, C. (2017) 'Why novelist Peter Singer is so popular with both military leaders and 'grunts,'' *The San Diego Union-Tribune*, Available at: http://www.sandiegouniontribune.com/military/sd-me-singer-warfare-20170501-story.html Accessed 5/1/18

Pursell, C. (1995) 'Seeing the Invisible: New Perceptions in the History of Technology,' *Icon*, Vol. 1, pp. 9-15

Ralston, D., Gustafson, D., Terpstra, R. and Holt, D. (1995) 'Pre-post Tiananmen square: Changing values of Chinese managers,' *Asia Pacific Journal of Management*, Vol. 12, No. 1, pp. 1-20

Rauch, J. (2005) 'Europe Is the Next Rival Superpower. But Then, So Was Japan,' *The Atlantic*, Available at: https://www.theatlantic.com/magazine/archive/2005/02/europe-is-the-next-rival-superpower-but-then-so-was-japan/303774/ Accessed 5/1/18

Reiss, E. (1992) *The Strategic Defense Initiative*, Cambridge University Press: Cambridge

Rendleman, J. (2010) 'A Strategy for Space Assurance,' *Astropolitics*, Vol. 8, No. 2-3, pp. 220-255

Richelson, J. (2006) *Spying on the Bomb: American Nuclear Intelligence from Nazi Germany to Iran and North Korea*, W.W. Norton and Company: New York

Richelson, J. (2012) *America's Space Sentinels: The History of the DSP and SBIRS Satellite Systems*, University Press of Kansas: Lawrence

Rigger, S. (2013) 'Taiwan in U.S.-China Relations,' in Shambaugh, D. (ed.) *Tangled Titans: the United States and China,* Rowman and Littlefield: Plymouth, pp. 293-314

Roop, L. (2017) 'Lawmakers say China building 'unfriendly navy in space,' *The Birmingham News*, Available at: http://www.al.com/news/huntsville/index.ssf/2017/10/american_leaders_say_china_bui.html Accessed 19/3/18

Ross, R. (1986) 'International Bargaining and Domestic Politics: U.S.-China Relations since 1972,' *World Politics*, Vol. 38, No. 2, pp. 255-287

Ross, R. (1995) *Negotiating Cooperation: The United States and China, 1969-1989*, Stanford University Press: Stanford

Ross, R. (2002) 'U.S. Relations with China,' in Vogel, E., Ming, Y. and Akihiko, T. (eds.) *The Golden Age of the U.S.-China-Japan Triangle 1972-1989*, Harvard University Press: Cambridge, pp. 79-108

Rouge, J. (2007) 'Operationally Responsive Space: Now Is The Time to Step-Out Smartly,' Available at: http://www.dtic.mil/ndia/2007/space/rouge.pdf Accessed 5/1/18

Rucker, P. (2012) 'Mitt Romney on Space Coast promises 'commitment to American exceptionalism' – not moon colonies,' *Washington Post*, Available at: https://www.washingtonpost.com/blogs/election-2012/post/mitt-romney-on-space-coast-promises-commitment-to-american-exceptionalism--not-moon-colonies/2012/01/27/gIQAjCzIWQ_blog.html?utm_term=.7297e1953f69 Accessed 5/1/18

Ruggie, J. (1997) 'The Past as Prologue?: Interests, Identity, and American Foreign Policy,' *International Security*, Vol. 21, No. 4, pp. 89-125

Rychnovská, D. (2014) 'Securitization and the Power of Threat Framing,' *Perspectives*, Vol. 22, No. 2, pp. 9-31

Sachdev, A. (2000) 'Chinese Missiles: Winning the Limited War,' *Strategic Analysis*, Vol. 24, No. 3 pp. 525-538

Sage, D. (2008) 'Framing Space: A Popular Geopolitics of American Manifest Destiny in Outer Space,' *Geopolitics*, Vol. 13, No. 1, pp. 27-53

Sage, D. (2016) *How Outer Space Made America: Geography, Organization and the Cosmic Sublime*, Routledge: Abingdon

Said, E. (2003 [1978]) *Orientalism*, Penguin Books: London

Saito, N. (1997) 'Model Minority, Yellow Peril: Functions of "Foreignness" in the Construction of Asian American Legal Identity,' *Asian Law Journal*, Vol. 4, No. 71, pp. 71-95

Sankaran, J. (2014) 'Limits of the Chinese Antisatellite Threat to the United States,' *Strategic Studies Quarterly*, Vol. 19, pp. 19-46

Sathyamurthy, T. (1990) 'China: A Year after Tiananmen Uprising,' *Economic and Political Weekly*, Vol. 25, No. 32, pp. 1757-1765

Saunders, P. and Lutes, C. (2007) 'China's ASAT Test: Motivations and Implications,' *Joint Force Quarterly*, No. 46, pp. 39-45

Saunders, R. (2015) 'History office highlights AFSCN history,' *Schriever Sentinel*, Available at: http://csmng.com/2015/03/19/history-office-highlights-afscn-history/ Accessed 5/1/18

Schueler, J. (2008) *Materialising Identity: The Co-construction of the Gotthard Railway and Swiss National Identity*, Aksant: Amsterdam

Scott, W. (2003) 'Space Wargame: 2017,' *Aviation Week & Space Technology*, Available at: http://aviationweek.com/awin/space-wargame-2017 Accessed 5/1/18

Shambaugh, D. (2012) *China goes global: the partial power*, Oxford University Press: Oxford

Shambaugh, D. (2013) 'Tangled Titans: Conceptualizing the US-China Relationship' in *Tangled Titans: The United States and China*, Shambaugh (ed.), Rowman and Littlefield: Plymouth, pp. 3-28

Sheehan, M. (2007) *The International Politics of Space*, Routledge: Abingdon

Sheehan, M. (2013) ''Did you see that, grandpa Mao?' The prestige and propaganda rationales of the Chinese space program,' *Space Policy*, Vol. 29, No. 2, pp. 107-112

Shen, S. (2004) 'Nationalism or Nationalist Foreign Policy? Contemporary Chinese Nationalism and its Role in Shaping Chinese Foreign Policy in Response to the Belgrade Embassy Bombing,' *Politics*, Vol. 24, No. 2, pp. 122-130

Shepherd, L. (2008) *Gender, Violence and Security: Discourse as Practice*, Zed Books: London

Shirk, M. (2017) 'How Does Violence Threaten the State? Four Narratives on Piracy,' *Terrorism and Political Violence*, Vol. 29, No. 4, pp. 656-673

Shlapak, D., Orletsky, D., Reid, T., Tanner, M. and Wilson, B. (2009) *A Question of Balance: Political Context and Military Aspects of the China-Taiwan Dispute*, RAND Corporation, Santa Monica

Singer, J. and Clark, C. (2007) 'White House Confirms Chinese Anti-Satellite Weapon Test,' *Space.com*, Available at: http://www.space.com/3367-white-house-confirms-chinese-anti-satellite-weapon-test.html Accessed 5/1/18

Singer, P. and Cole, A. (2015a) 'Space could be the battlefield for World War III,' Available at: http://edition.cnn.com/2015/07/01/opinions/singer-space-war/ Accessed 5/1/18

Singer, P. and Cole, A. (2015b) *Ghost Fleet – A Novel of the Next World War*, Houghton Mifflin Harcourt Publishing Company: New York

Sjöstedt, R. (2013) 'Ideas, identities and internalization: Explaining securitizing moves,' *Cooperation and Conflict,* Vol. 48, No. 1, pp. 143-164

Skonieczny, A. (2001) 'Constructing NAFTA: Myth, Representation, and the Discursive Construction of U.S. Foreign Policy,' *International Studies Quarterly*, Vol. 45, No. 3, pp. 433-454

Skypek, T. (2010) 'Evaluating Military Balances Through the Lens of Net Assessment: History and Application,' *Journal of Military and Strategic Studies*, Vo. 12, No. 2, pp. 1-25

Smith, C. (2011) 'Peacekeepers and Human trafficking: The New Security Dilemma,' in Brysk and Choi-Fitzpatrick (eds.) *From Human trafficking to Human Rights: Reframing Contemporary Slavery*, Ch. 7, Penn State Press: Philadelphia

Smith, M. (1990) 'Space Launch Options,' Congressional Research Service: Washington D.C.

Smith, M. (2003) *CRS Report for Congress: China's Space Program: An Overview,* Available at: http://www.dtic.mil/dtic/tr/fulltext/u2/a611159.pdf Accessed 19/01/17

Solomone, S. (2006) 'China's Space Program: the great leap upward,' *Journal of Contemporary China*, Vol. 15, No. 47, pp. 311-327

Song, W. (2015) 'Securitization of the "China Threat" Discourse: A Poststructuralist Account,' *China Review*, Vol. 15, No. 1, pp. 145-169

Sorensen, J. (2014) 'RIMPAC Concludes with Enhanced Cooperation among 22 Nations,' *Commander of the USN Pacific Fleet Website*, Available at: http://www.cpf.navy.mil/news.aspx/030454 Accessed 5/1/18

Spacy, W. (1999) 'Does the United States Need Space-Based Weapons?' CADRE Paper, College of Aerospace Doctrine, Research, and Education, Air University Press: Maxwell Air Force Base

Stefan-Gady, F. (2015) 'Is the Pentagon's Andrew Marshall the Leo Strauss of Military Analysis?' *The Diplomat*, Available at: http://thediplomat.com/2015/01/is-the-pentagons-andrew-marshall-the-leo-strauss-of-military-analysis/ Accessed 5/1/18

Steinberg, A. (2012) 'Weapons in Space: The Need to Protect Space Assets,' *Astropolitics*, Vol. 10, No. 3, pp. 248-267

Swaine, M., Mochizuki, M., Brown, B., Giarra, P., Paal, D., Odell, R., Lu, R., Ren, X. (2013) *China's Military and the U.S.-Japan Alliance in 2030: a strategic net assessment*, Carnegie Endowment for International Peace: Washington DC

Swarts, P. (2016) 'Space Wars: The Air Force Awakens,' *Air Force Times*, Available at: https://www.airforcetimes.com/news/your-air-force/2016/02/15/space-wars-the-air-force-awakens/ Accessed 23/02/2018

Swarts, P. (2017a) 'Newest SBIRS satellite operational and transmitting,' *Space News*, Available at: http://spacenews.com/newest-sbirs-satellite-operational-and-transmitting/

Swarts, P. (2017b) 'The JICSpOC is dead; Long live the National Space Defense Center,' *SpaceNews*, Available: http://spacenews.com/the-jicspoc-is-dead-long-live-the-national-space-defense-center/

Tatarewicz, J. (2009) 'The ''Vision for Space Exploration'' of President George W. Bush, space science, and U.S. space policy,' *Futures*, Vol. 41, pp. 531-540

Taureck, R. (2006) 'Securitization theory and securitization studies,' *Journal of International Relations and Development*, Vol. 9, pp. 53–61

Taussig, M. (1999) *Defacement: Public Secrecy and the Labor of the Negative*, Stanford University Press: Stanford

Tellis, A. (2007a) 'Punching the US Military's "Soft Ribs": China's Antisatellite Weapon Test in Strategic Perspective', *Carnegie Endowment for International Peace*, Policy Brief 51, pp. 1-8

Tellis, Ashley J. (2007b) 'China's Military Space Strategy', *Survival*, Vol. 49, No. 3, pp. 41-72

Tian, D. (2015) 'U.S. "3 Halts" proposals stirs tensions in South China Sea,' *Xinhua*, Available at: http://news.xinhuanet.com/english/2015-08/05/c_134483897.htm Accessed 5/1/18

Tiezzi, S. (2014) 'Report: To Reach Mars, NASA Must Work With China,' *The Diplomat*, Available at: http://thediplomat.com/2014/06/report-to-reach-mars-nasa-must-work-with-china/ Accessed 5/1/18

Tiezzi, S. (2015) 'When the US and China Were Allies,' *The Diplomat*, Available at: https://thediplomat.com/2015/08/when-the-us-and-china-were-allies/ Accessed 5/1/18

Toal, G. (2009) ''In No Other Country on Earth': The Presidential Campaign of Barack Obama,' *Geopolitics*, Vol. 14, No. 2, pp. 376-401

Tsoukala, A. (2008) 'Boundary-creating Processes and the Social Construction of Threat,' *Alternatives*, Vol. 33, No. 2, pp. 137-152

Tucker, N. (2005) 'Taiwan Expendable? Nixon and Kissinger Go to China,' *The Journal of American History*, Vol. 92, No. 1, pp. 109-135

Tucker, N. (2012) *The China Threat: Memories, Myths, and Realities in the 1950s,* Columbia Press: New York

Tucker, N. (2013) 'The Evolution of U.S.-China Relations,' in *Tangled Titans: The United States and China*, Shambaugh (ed.), Rowman and Littlefield: Plymouth, pp. 29-52

Tucker, P. (2014) 'America's Top Threats in Space are Lasers and Nukes,' *Defense One*, Available at: http://www.defenseone.com/threats/2014/07/americas-top-threats-space-are-lasers-and-nukes/89519/ Accessed 5/1/18

Turner, O. (2013) 'Threatening' China and US security: the international politics of identity,' *Review of International Studies*, Vol. 39, pp. 903–924

Turner, O. (2014) *American Images of China: Identity, Power, Policy*, Routledge: Abingdon

Turner, O. (2016) 'China, India and the US Rebalance to the Asia Pacific: The Geopolitics of Rising Identities,' *Geopolitics*, Vo. 21, No. 4, pp. 922-944

Tyler, P. (1999) 'The (Ab)normalization of U.S.-Chinese Relations,' *Foreign Affairs*, Vol. 78, No. 5, pp. 93-122

US-China Institute, University of Southern California (2011) 'Getting To Beijing: Henry Kissinger's Secret 1971 Trip,' Available at: http://china.usc.edu/getting-beijing-henry-kissingers-secret-1971-trip Accessed 5/1/18

Vincent, R. (1982) 'Race in International Relations,' *International Affairs*, Vol. 58, No. 4, pp. 658-670

Vogel, E. (2002) 'Introduction,' in Vogel, E., Ming, Y. and Akihiko, T. (eds.) *The Golden Age of the U.S.-China-Japan Triangle 1972-1989*, Harvard University Press: Cambridge, pp. 1-16

Wachman, A. (2001) 'Does the Diplomacy of Shame Promote Human Rights in China?' *Third World Quarterly*, Vol. 22, No. 2, pp. 257-281

Waever, O. (1995) 'Securitization and Desecuritization,' in Lipschutz, R. (ed.), *On Security*, Columbia University Press: New York, pp. 46-87.

Walters, G. (2016) 'The Pentagon Is Betting Big on Space Warfare – Against China and Russia,' *Vice News*, Available at: https://news.vice.com/article/the-pentagon-is-betting-big-on-space-warfare-against-china-and-russia Accessed 5/1/18

Walters, R. (2016) 'Shot Pakistani girl': The limitations of girls education discourses in UK newspaper coverage of Malala Yousafzai,' *The British Journal of Politics and International Relations*, Vol. 18, No. 3, pp. 650-670

Waltrop, D. (2014) 'Recovery of the Last GAMBIT and HEXAGON Film Buckets from Space, August-October 1984,' *Studies in Intelligence*, Vol. 58, No. 2, pp. 19-34

Wang, D. (2013) 'Addressing the U.S.-China Security Dilemma,' *Carnegie Endowment for International Peace*, Available at: http://carnegieendowment.org/2013/01/17/addressing-u.s.-china-security-dilemma-pub-50668 Accessed 5/1/18

Wang, Z. (2008) *In Sputnik's shadow: the President's Science Advisory Committee and Cold War America*, Rutgers University Press: New Brunswick NJ

Wasserbly, D. (2017) 'Next MOKV interceptor development phase advances with three contractors,' *IHS Jane's Defence Weekly*, Available at: http://www.janes.com/article/70421/next-mokv-interceptor-development-phase-advances-with-three-contractors Accessed 5/1/18

Watson, S. (2012) ''Framing' the Copenhagen School: Integrating the Literature on Threat Construction,' *Millennium*, Vol. 40, No. 2, pp. 279-301

Weeden, B. (2008) 'How China "Wins" a Space War,' *China Security,* Vol. 4, No. 1, pp. 137-150

Weeden, B. (2010) '2007 Chinese Anti-Satellite Test Fact Sheet,' https://swfound.org/media/9550/chinese_asat_fact_sheet_updated_2012.pdf Accessed 5/1/18

Weeden, B. (2014) 'Through a glass, darkly: Chinese, American, and Russian anti-satellite testing in space,' Available at: http://www.thespacereview.com/article/2473/2 Accessed 5/1/18

Weeden, B. (2015) 'Anti-satellite Tests in Space – The Case of China,' *Secure World Foundation*, Available at: https://swfound.org/media/115643/china_asat_fact_sheet_may2015.pdf Accessed 27/11/2017

Weigley, R. (1973) *The American Way of War: A history of United States Military Strategy and Policy*, Indiana University Press: Bloomington

Weldes, J. (1996) 'Constructing National Interests,' *European Journal of International Relations*, Vol. 2, No. 3, pp. 275-318

Weldes, J., Laffey, M., Gusterson, H., and Duvall, R. (1999) 'Introduction: Constructing Insecurity,' in Weldes, J., Laffey, M., Gusterson, H., and Duvall, R. (eds.) *Cultures of Insecurity: States, Communities, and the Production of Danger*, University of Minnesota Press: London, pp. 1-34

Wellerstein, A. (2016) 'Mapping the US nuclear war plan for 1956,' *Restricted Data: The Nuclear Secrecy Blog*, Available at: http://blog.nuclearsecrecy.com/2016/05/09/mapping-us-nuclear-war-plan-1956/ Accessed 5/1/18

Wendt, A. (1992) 'Anarchy is what States Make of it: The Social Construction of Power Politics,' *International Organization*, Vol. 46, No. 2, pp. 391-425

Winner, L. (1980) 'Do Artifacts Have Politics?' *Daedalus*, Vol. 109, No. 1, pp. 121-136

Winner, L. (1993) 'Upon Opening the Black Box and Finding It Empty: Social Constructivism and the Philosophy of Technology,' *Science, Technology, & Human Values*, Vol. 18, No. 3, pp. 362-378

Wong, C. (2015) 'China To Expand Naval Operations Amid Growing Tensions With U.S.,' *Wall Street Journal*, Available at: http://www.wsj.com/articles/china-shifts-maritime-military-focus-to-open-seas-1432648980 Accessed 5/1/18

Work, R. and Selva, P. (2015) 'Revitalizing Wargames is Necessary to be Prepared for Future Wars,' *War on the Rocks*, Available at: https://warontherocks.com/2015/12/revitalizing-wargaming-is-necessary-to-be-prepared-for-future-wars/ Accessed 5/1/18

Wortzel, L. (2013) *The Dragon Extends Its Reach: Chinese Military Power Goes Global*: Potomac Books: Washington D.C.

Wortzel, L. and Cheng, D. (2006) *China's Military Ambitions in Space*, George C. Marshall Institute: Washington D.C.

Wright, M. (N.D.) 'Three Saturn Vs on Display Teach Lessons in Space History,' *Marshall Space Flight Center History Office*, Available at: https://history.msfc.nasa.gov/saturn_apollo/display.html Accessed 20/2/2018

Wright, R. (2009) 'The Value of the Domain,' *High Frontier*, Vol. 5, No. 4, pp. 26-27

Wrobel, D. (1993) *The End of American Exceptionalism: Frontier Anxiety from the Old West to the New Deal*, University of Kansas Press: Lawrence

Wyn Jones, R. (1999) *Security, Strategy, and Critical Theory*, Lynne Rienner: Boulder

Xia, W. and Wang, L. (2014 [2012]) 'Rising China and its integration with changing world economy,' in Wang, L. (eds.) *Rising China in the Changing World Economy*, Routledge: London, pp. 1-41

Xinhua News Agency (2015) 'Outcome list of Xi's state visit to US,' Available at: http://www.china.org.cn/xivisitus2015/2015-09/26/content_36687002.htm Accessed 5/1/18

Yan, X. (2001) 'The Rise of China in Chinese Eyes,' *Journal of Contemporary China*, Vol. 10, No. 26, pp. 33-39

Yan, X. (2010) 'The Instability of China-US Relations,' *The Chinese Journal of International Politics*, Vol. 3, pp. 263-292

Yang, K. and Mao, S. (2016) 'Unafraid of the Ghost: The Victim Mentality of Mao Zedong and the Two Taiwan Strait Crises in the 1950s,' *China Review*, Vol. 16, No. 1, pp. 1-34

Yee, H. and Storey, I. (2002) 'Introduction,' in Yee, H. and Storey, I. (eds.) *The China Threat: Perceptions, Myths and* Reality, Routledge: Abingdon, pp. 1-20

Yitan, L. (2014) 'Constructing Peace in the Taiwan Strait: a constructivist analysis of the changing dynamics of identities and nationalisms,' *Journal of Contemporary China*, Vol. 23, No. 85, pp. 119-142

Yoshihara, T. and Holmes, J. (2010) *Red Star Over the Pacific: China's Rise and the Challenge to US. Martitime Strategy*, Naval Institute Press: Annapolis

Yuhas, A. (2017) 'To infinity and beyond: Trump has big plans for Nasa – but is it just a fantasy?' *The Guardian*, Available at: https://www.theguardian.com/science/2017/dec/26/trump-nasa-moon-space-travel Accessed 22/01/2018

Zenko, M. (2015) *Red Team: How to Succeed by Thinking Like the Enemy*, Basic Books: New York

Zhang, B. (2011) 'The Security Dilemma in the US-China Military Space Relationship,' *Asian Survey*, Vol. 51, No. 2, pp. 311-332

Zhang, S. (2015) 'The Air Force's Secretive Space Plane Just Launched Again,' *Gizmodo*, Available at: http://gizmodo.com/the-air-forces-mysterious-space-plane-is-going-into-orb-1704817585/1705800464 Accessed 5/1/18

Zhang, Y. (2009) 'The Discourse of China's Soft Power and its Discontents' in Li, M. (ed.) *Soft Power: China's Emerging Strategy in International Politics*, Lexington Books: Plymouth, pp. 45-60

Zhang, Y. (2013a) ''China Anxiety': Discourse and Intellectual Challenges,' *Development and Change*, Vo. 44, No. 6, pp. 1407-1425

Zhang, Y. (2013b) 'China's security problematique: critical reflections,' in Zhang, Y. and Austin, G. (eds.) *Power and Responsibility in Chinese Foreign Policy,* ANU Press: Canberra

Zhang, Y. (2013c) 'the eagle eyes the dragon in space: A critique,' *Space Policy*, Vol. 29, pp. 113-120

Zhang, Y. (2016) 'China and liberal hierarchies in global international society: power and negotiation for normative change,' *International Affairs*, Vol. 92, No. 4, pp. 795–816

Zheng, B. (2005) 'China's Peaceful Rise: Speeches of Zheng Bijian 1997-2004,' Available at: https://www.brookings.edu/wp-content/uploads/2012/04/20050616bijianlunch.pdf Accessed 5/1/18