

Research Thesis – International Relations in Historical Perspective

The development of India and Pakistan's nuclear strategy

What are the security implications of India and Pakistan's development of their nuclear strategy?



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*“There lies the port; the vessel puffs her sail:
There gloom the dark, broad seas. Come, my friends,
’Tis not too late to seek a newer world.
It may be that the gulfs will wash us down:
It may be we shall touch the Happy Isles,
And see the great Achilles, whom we knew.”*

Alfred Lord Tennyson, *Ulysses*

Keith ‘Steve’ Skelding, 1930–2020

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Abstract

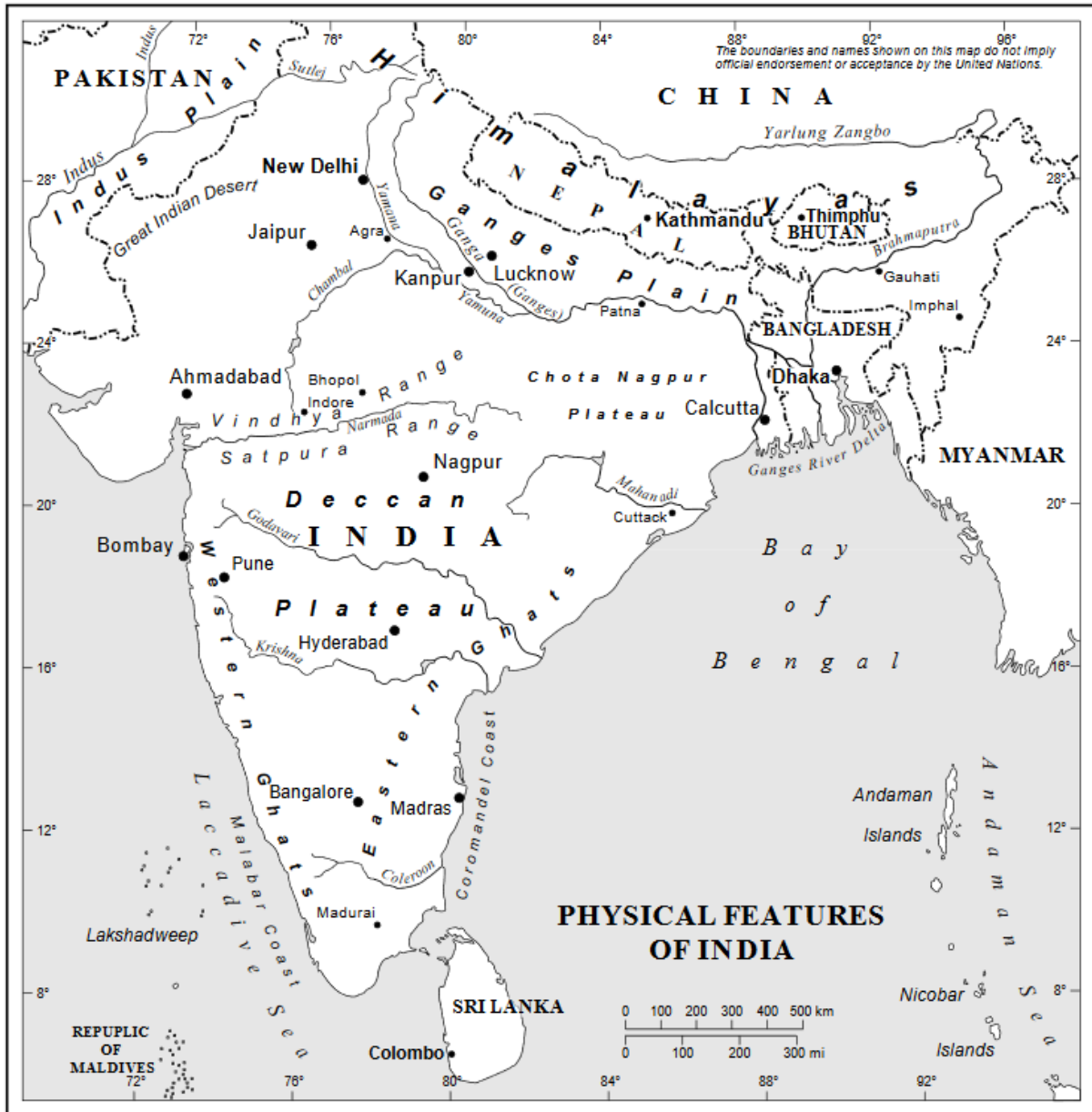
This thesis seeks to answer the question: How has India and Pakistan's nuclear strategy development changed the security environment in South Asia? By applying a constructivist approach to this problem, this thesis challenges the dominant neorealist discourse on nuclear deterrence. By researching the nuclear command-and-control structure of India and Pakistan, instead of nuclear doctrine, this thesis has produced the following conclusions. Pakistan's nuclear posture continues to inhibit India's ability to compel Pakistan, raising the risk of nuclear escalation. India and Pakistan are horizontally developing their nuclear forces, raising the cost of nuclear escalation. India and Pakistan's nuclear command-and control measures are respectively trending more towards positive control, or are already positive control-oriented, increasing the risk of unwanted nuclear use. India and Pakistan are vertically developing their nuclear forces as well, expanding their capabilities to include tactical nuclear weapons and sea-based missiles, thus lowering the threshold for nuclear use. This thesis finds that the development of India and Pakistan's nuclear posture has opened up new avenues for a crisis to escalate to the nuclear level, and increased the number of nuclear missiles that would be involved.

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Image 1 - United Nations cartographic map of South Asia



MAP NO. 3885 UNITED NATIONS
JANUARY 1992

Image 2 - United Nations cartographic map of India



Image 3 - United Nations cartographic map of Pakistan

Glossary

Term	Definition
Assertive command-and-control	A nuclear C2 system that prioritises negative control
Assured retaliation posture	Nuclear strategy which aims to deter nuclear attack by using its nuclear capability
Asymmetric escalation posture	Nuclear strategy which aims to deter conventional attack using its nuclear capability
Asymmetric warfare	Warfare in which low-intensity tactics and strategies are used against a conventionally superior adversary
Bharatiya Janata Party	Political party in India, currently in government. Right-wing, Hindu nationalist party.
Canisterised missiles	Missiles which are pre-mated to their delivery vehicle
Catalytic posture	Nuclear strategy which aims to catalyse a third-party to intervene on its behalf, using its nuclear capability
Chain of command	The way (military) orders travel from the commanding authority to the executing unit
Cold Start	Indian strike plan, developed to strike Pakistan if necessary
Command-and-control structure	How a state chooses to operationalise its nuclear strategy through its nuclear force deployment, its command structure, and its command-and-control measures
Compellence	Forcing another to carry out a desired action. Antonym of deterrence
Constructivism	IR theory which places an emphasis on the social structures that govern the interests of all actors.
Conventional weapons	Non-nuclear weapons
Decapitation	When a nuclear strike eliminates all commanding authorities of a state, so that said state's capacity for retaliation is destroyed
Delegative command-and-control	A nuclear C2 system that prioritises positive control
Delivery vehicle	The way a nuclear device gets to its destination when launched. Could be a missile or an airplane.
Deterrence	Forcing another to refrain from an undesired action. Antonym of compellence
Dual-use missile	A missile which can be loaded with a nuclear or conventional payload
Fissile material	Material capable of sustaining a nuclear fission chain reaction. Nuclear weapons need fissile material to work
Highly enriched Uranium (HEU)	Uranium with a high concentration of ²³⁵ U, which makes it suitable for use in nuclear weapons
Indian National Congress	Indian political party, currently in opposition. Centre-left, secular party.
Inter-Services Intelligence	Pakistani intelligence service.
Jaish-e-Mohammed (JeM)	Pakistani-based Jihadist terror group. Aims to secede Kashmir from India and is responsible for several terrorist attacks in India, including the 2001 Parliament attack.
Jammu and Kashmir	Indian union territory which is disputed by Pakistan. Centre of Kashmir insurgency

Kashmir	Geographical region in South Asia which is divided in Indian, Pakistani and Chinese parts. All three claim another's territory
Lashkar-e-Taiba (LeT)	Pakistani-based Jihadist terror group. Aims to secede Kashmir from India and is responsible for several terrorist attacks in India, including the 2008 Mumbai attacks.
Minimum credible deterrence	Key principle of Indian nuclear doctrine which states that India will develop a limited amount of nuclear weapons to credibly deter its adversaries
Negative control	Command-and-control measures designed to prevent unwanted use of a state's nuclear weapons
Neorealism	IR theory which emphasises the role of the state as a rational actor in an anarchic world system
No-first-use (NFU)	Key principle of Indian nuclear doctrine which states that India shall not use its nuclear weapons first in a conflict
Nuclear doctrine	What states say about the way they use their nuclear capability to achieve their goals
Nuclear posture	How a state's command-and-control choices are described in terms of their deterrent value
Nuclear proliferation	The spread of nuclear weapons through the world
Nuclear strategy	How states seek to use their nuclear capability to achieve their goals
Partition	The independence of India and Pakistan from the British Empire
Permissive Action Link (PAL)	Device attached to a nuclear weapon which intends to prevent unwanted use by requiring a launch code prior to arming or launching said nuclear weapon
Plutonium	Radioactive element used as fissile material in nuclear weapons
Positive control	Command-and-control measures designed to ensure the readiness of a state's nuclear weapons
Pakistan Tehreek-e-Insaf	Populist political party in Pakistan, currently in government
Rational deterrence	Neorealist theory on nuclear deterrence which states that all nuclear capabilities deter equally
Security environment	The collection of external and internal threats that work together and against each other to form the way states interact with each other.
Stability-instability paradox	The effect of nuclear weapons on the conflict dynamics between nuclear states, producing higher-level barriers to conflict, but encouraging it on a lower level.
Tactical nuclear weapon	Short-range, low-yield nuclear weapon, intended for battlefield use against (conventional) military forces
Unitary	To have sole power of decision-making and execution
Use-of-force threshold	The red line which a state has agreed it will use nuclear weapons if crossed.
Warhead	The explosive part of a missile
Yield	The amount of energy released when a (nuclear) weapon is detonated, usually measured in TNT

Abbreviations

Term	Definition
AEC	Atomic Energy Commission (India)
BARC	Bhabha Atomic Research Centre
BJP	Bharatiya Janata Party
BRI	Belt and Road Initiative
C2	Command-and-control
CCS	Cabinet Committee on Security (India)
DRDO	Defence Research and Development Organisation (India)
ICBM	Intercontinental ballistic missile
IGCAR	Indira Gandhi Centre for Atomic Research
IR	International relations
ISI	Inter-Services Intelligence
JeM	Jaish-e-Mohammed
JIC	Joint Intelligence committee
LeT	Lashkar-e-Taiba
LoaC	Line of Actual Control
LoC	Line of Control
MIRV	Multiple Independent Re-entry Vehicle
NATO	North Atlantic Treaty Organisation
NCA	National Command Authority
NESCOM	National Engineering and Scientific Commission
NFU	No-first-use
NSAB	National Security Advisory Board (India)
NSC	National Security Council (India)
NSFC	Naval Strategic Forces Command (Pakistan)
PAEC	Pakistan Atomic Energy Commission
PAL	Permissive Action Link
PFBR	Prototype Fast Breeder Reactor
PMO	Prime Minister's Office (India)
PTI	Pakistan Tehreek-e-Insaf
SFC	Strategic Force Command
SLBM	Submarine-launched ballistic missile
SPD	Strategic Plans Division (Pakistan)
SSBN	Ballistic missile submarine
SUPARCO	Space and Upper Atmosphere Research Commission (Pakistan)

Introduction

In the early evening of 11 May 1998, Indian Prime Minister Atal Bihari Vajpayee called a press conference at his residence in New Delhi, India. Before the hastily gathered Indian and international press, the Prime Minister announced that “[t]oday, at 15:45 hours, India conducted three underground nuclear tests in the Pokhran range.” (...) “I warmly congratulate the scientists and engineers who have carried out these successful tests.” India had successfully exploded three nuclear weapons: a fission device, a low yield device and a thermonuclear weapon. Just over two weeks later, on the 28th of May, neighbouring Pakistan carried out a series of underground nuclear tests of its own. Codenamed Chagai-I, five boosted-fission uranium weapons tests were followed up by a further boosted-fission plutonium test on 30 May. Within a month, the relationship between India and Pakistan that had been so fraught with conflict since 1947 turned nuclear. Since the dissolution of the Soviet Union, the world had not known two nuclear-armed nations sharing such an adversarial relationship. Furthermore, the fact that two nuclear states shared a border while having so recently waged war with one another was unprecedented.

Historical context

Since the Partition of India in 1948, India and Pakistan have had a history of mutual tension which frequently degenerated in open conflict. Partition left its mark on both the Indian and Pakistani populations, with a large proportion of both populations exposed to the massive population exchanges and the violence that accompanied them. The Indo-Pakistani wars of 1947 and 1965 over Kashmir, and the 1971 war over East Pakistan demonstrate the brittleness of Indo-Pakistani relations and the propensity for both states to resort to war in their mutual disputes. On 18 May 1974, India exploded ‘Smiling Buddha’, a plutonium fission bomb with a yield of eight kilotons TNT, marking the start of the nuclear age for Southeast Asia. Subsequently, Pakistan sought and gained a (limited) nuclear capability in the 1980s. In 1998, both states carried out nuclear weapons tests, marking the start of a new atomic age in South Asia. From 1998 on, Indian-Pakistani relations would have a nuclear component.

Nuclear component

This nuclear component became apparent after a terrorist group with ties to Pakistan attacked the Indian Parliament on 13 December 2001. The ensuing standoff between the two states lasted until October 2002, bringing South Asia to the brink of nuclear war twice. The threat of nuclear escalation was so acute that it caused the United States to evacuate nonessential personnel from its embassy in New Delhi, the first time in history that American diplomats had been evacuated for fear of a nuclear war. In the end, the crisis was only defused after extensive diplomacy efforts by the global community led by the United States. In November 2003, almost two years after the attack on the Indian Parliament, a cease-fire between the two states was finally signed.

With India and Pakistan having come to the brink of nuclear war in 2001, when both states had only just developed nuclear weapons, this begs the question: how would both states deal with such a crisis today? Would another terrorist attack on Indian soil, surreptitiously supported by Pakistan, be a realistic scenario, or are there other situations in which the risk of nuclear escalation is apparent? And how would India react to such an attack? Would it still refrain from retaliating with its superior conventional military forces, or would it respond with force? If so, how would Pakistan respond, given its threat to use nuclear weapons if India were to attack Pakistan?

Explaining the research question

In this thesis, I seek to find the answers to these questions, and more. To do so, I shall answer the following research question: How has India and Pakistan's nuclear strategy development changed the security environment in South Asia?

In order to contextualise my main research question, I shall explain its different components. The main concept of the research question, and thus of this thesis is 'nuclear strategy'. Although I will break this concept up into several constituent parts later in my thesis, for now it is important to know that I define 'nuclear strategy' as: the way states seek to use their nuclear capability (what a state can do with its nuclear weapons) to achieve their goals. This thesis seeks to identify developments in the nuclear strategies of India and Pakistan, by analysing these nuclear strategies, and comparing them to official doctrine. Doctrine is defined as: What states say about the way they use their nuclear capability to achieve their goals. In short, doctrine is what states say their strategy is. Indian official nuclear doctrine was published in 2003, while Pakistan's was in 2001. There appears to be enough time to evaluate developments since then. 'Security environment' is the collection of external and internal threats that work together and against each other to form the way states interact with each other. South Asia can be defined as: India, Pakistan, Bangladesh, Afghanistan, Bhutan, the Maldives, Nepal, and Sri Lanka. Given that India and Pakistan are the only nuclear powers in this region, I have limited my analysis to these two states.

Academic debate

Having thus defined the different components of my research question, I will now introduce the academic debate in I seek to place myself by answering this research question. This thesis deals with the question whether nuclear weapons can prevent war from breaking out; in other words: nuclear deterrence. Do nuclear weapons deter conflict, and if so, how? The academic debate on this question has been divided in those who claim that the possession of nuclear weapons always deters adversaries, and those who claim that the deterrence of conflict depends on how a state uses its nuclear capability (in other words, nuclear strategy).

The dominant IR theory in the first category is the neorealist theory of rational deterrence, which states that states are rational, unitary actors who will always act to serve their national interest. It is evident that any nuclear exchange would risk casualties in the hundreds of thousands or even millions, trillions of economic damage, and the destruction of a state's governing apparatus. As the costs of nuclear war are extremely high, the risk of nuclear retaliation will prevent states using nuclear weapons against a fellow nuclear-armed state.¹ Waltz argues that, as states are deterred from attacking another nuclear-armed states due to the potential costs, the probability of any major war between these states "approaches zero".²

On the other hand, constructivists posit that one cannot assume that states are rational, unitary actors, because they are influenced by social practices, identities and the interests of other actors. It states that states are expected to have a far wider array of potential choices of action than is assumed by neorealism, and that these choices are constrained by the social structures mutually created by states and structures via social practices.³ Constructivism therefore rejects the focus on the state as the single, essentialised unit of analysis and instead proposes to analyse the choices of

¹ Kenneth N. Waltz, "Nuclear Myths and Political Realities" *American Political Science Review* 84 (1990) 3, 731.

² Kenneth N. Waltz "The Origins of War in Neorealist Theory" in Robert I. Rotberg and Theodore K. Rabb, eds., *The Origin and Prevention of Major Wars* (Cambridge, UK 1988) 50-51.

³ Ted Hopf, "The promise of constructivism" *International Security* 23 (1998) 1, 172-173.

states within the webs of understanding of the practices, identities, and interests of other actors that prevail in particular historical contexts".⁴

Relevance of the thesis

The question is, what do scholars and policymakers actually know about the development of nuclear strategy in India and Pakistan, and about their security implications? Based on existing scholarship, the answer is: not enough. The academic relevance in this thesis is that I will challenge the neorealist consensus on nuclear deterrence in three ways. I seek to critique the dominant IR theory of neorealism in existing scholarship on nuclear deterrence and establish its insufficiency to the task of providing an answer to the research question of this thesis.

Firstly, with the main body of academic scholarship focused on the question of nuclear proliferation, I have shifted my research question to the question of nuclear strategy. Rational deterrence assumes that nuclear states with different nuclear capabilities are equivalent, building on Waltz's argument that even a small nuclear deterrent is credible enough to provide Schelling's "threat that leaves something to chance". Therefore, neorealist theory seeks to answer the question *whether* nuclear weapons deter conflict without stopping to ask the question *how* nuclear weapons deter conflict. In my thesis, I attempt to fill this lacuna by focusing on the question of *how*: through a state's strategy.

Secondly, in order to find an answer to the research question of this thesis, I will apply the constructivist approach to examine actors and structures within their social context. Taking a traditional approach to nuclear deterrence, I will first examine the interests of India and Pakistan, before analysing how the development of India and Pakistan's nuclear doctrines has been subjected to these interests. However, I will then depart from the neorealist approach by researching the command-and-control structures of India and Pakistan, in order to understand the way the practices, identities and interests of other actors have influenced the choices that have been made within these structures.

Thirdly, the experience of regional powers is underrepresented in the academic scholarship on nuclear strategy. Because the experience of the United States and the Soviet Union/Russia with nuclear strategy has been the most extensive, the superpower experience has been overrepresented in the literature. The experience of the US and the USSR is not representative for regional nuclear powers such as India and Pakistan, however, as regional powers are forced to make choices in operationalising their nuclear arsenal that the superpowers never had to make with their enormous defence budgets. I shall therefore use Narang's postures theory which describes three ways in which a regional nuclear power can operationalise its nuclear capability.

In addition to the academic relevance of the thesis, the subject of the thesis is still very much of immediate relevance. While the last serious crisis involving nuclear threats between India and Pakistan dates from 2002, India and Pakistan's border conflict continues to fester, with cross-border shelling belonging to the order of the day. India and Pakistan's nuclear capability has been predicted to develop further in numbers, placing an additional cost on the threat of nuclear escalation. The outcome of my research on the development of India and Pakistan's nuclear strategy is undoubtedly of importance for the security situation in South Asia.

⁴ Ted Hopf, "The promise of constructivism" *International Security* 23 (1998) 1, 173.

Hypothesis

Having introduced the academic debate on nuclear deterrence, I will now offer a hypothesis to the research question of: “How has India and Pakistan’s nuclear strategy development changed the security environment in South Asia?” I will offer three predictions which I will test in my research.

Firstly, I expect that Pakistan’s nuclear strategy will continue to inhibit India’s ability to compel Pakistan, effectively functioning as an umbrella under which Pakistan can carry out lower-level conflict against India without fearing retaliation from India’s superior conventional forces.

Secondly, I hypothesise that India and Pakistan will both have developed their nuclear capability horizontally (meaning that they produce more of the nuclear missiles they already have). As predicted by the US Defense Intelligence Agency in a 1999 report, India and Pakistan can both be expected to modernise their nuclear arsenals.⁵ I therefore predict that both states will expand the number of warheads in their possession.

Thirdly, I predict that India will undertake measures within its command-and-control structure that protect the safety and security of its nuclear weapons, ensuring that no unwanted use of its nuclear weapons can occur, accidental or unauthorised. In contrast, Pakistan would take measures that would be more focused on the readiness of its nuclear capability, thus increasing the risk of an accidental launch by field commanders, or terrorists gaining control of nuclear weapons.

Thesis structure

In order to test these hypotheses and find an answer to the research question, I will address the a total of seven sub-questions in my thesis. Firstly, why does neorealist international relations (IR) theory on nuclear deterrence not suffice to offer an answer to the research question? Secondly, how can a constructivist approach offer a theoretical framework for addressing the research question? Thirdly, what is the historical context of the India-Pakistan relationship? Fourthly, how has the Pakistani state expressed itself about the goals of its nuclear capability? Fifthly, how has Pakistan developed its nuclear command-and-control structure? Sixthly, how has the Indian state expressed itself about the goals of its nuclear capability? And finally, how has India developed its nuclear command-and-control structure? I have devoted a chapter to answer each of these sub-questions, in that same order. In the conclusion of the thesis I will bring show how the answers to these questions will have led me to solve the research question.

Literature

In this thesis, I shall make use of neorealist and constructivist essays on nuclear proliferation, deterrence and strategy to make sense of the academic debate and shape my academic framework. I will allow authors such as Waltz, Mearsheimer and Schelling to explain the neorealist approach, before critiquing their assumptions with constructivist arguments. In the chapter on my theoretical framework I will explore constructivist concepts by way of authors such as Jervis, Sagan and Narang. I will use the work my fellow historians Yasmin Khan and Percival Spear in telling the story of India and Pakistan’s historical relationship. In analysing India and Pakistan’s nuclear doctrine, I will make use of the official statements by the respective governments on official doctrine, before offering my own interpretation. Numerous arms control organisations have been focused on the danger of nuclear escalation, in addition to the US government. I will therefore review their research on the command-

⁵ US Defense Intelligence Agency, “The Decades Ahead:1999-2020, A Primer on the Future Threat” in: Rowan Scarborough, *Rumsfeld’s War: the Untold Story of America’s Anti-Terrorist Commander* (Washington, DC 2004) 194-223.

and-control structures of India and Pakistan, before conducting my own research based on primary sources. Of course, it is hard to find many primary sources where India or Pakistan deliberately reveals information about its nuclear command-and-control structure. However, a number of retired (military) officials on both sides of the border have offered their views on the command-and-control structures of their country. I will critically apply these sources to my research, as well.

Personal note

Before the thesis moves on to the academic context (academic discussion and theoretical framework) of the thesis, I would like to caution the reader. Academic scholarship on nuclear weapons is very heavy on subject-specific terms and jargon. As the author, I have made a conscious effort to ensure this thesis is readable even for those who are not initiated into the jargon of nuclear weapons scholarship by deliberately introducing academic concepts one-at-a-time, explaining how the next point relates to the previous one, and following a logical path towards my research question. However, if you, the reader might feel disoriented by the large number of terms and acronyms used, especially in the research section, I would urge to check the glossary and/or the list of abbreviations, both situated before the introduction. I wish the reader wisdom in reading this work, and I hope reading it gives you as much pleasure as I had in writing this work.

Thomas Hardeman, 22 August 2020

Chapter 1 – Academic Discussion

Introduction

This thesis deals with the question whether nuclear weapons can prevent war from breaking out; in other words: nuclear deterrence. Do nuclear weapons deter conflict, and if so, how? The academic debate on this question has been divided in two camps: the neorealists and the constructivists. In short, their respective answers to the question whether nuclear weapons deter conflict are “yes!” and “it depends on how they are used”. As mentioned in the introduction, this thesis seeks to place itself in the academic discussion on nuclear deterrence by making a contribution to the academic discussion between neorealism and constructivism. This chapter seeks to critique the dominant IR theory in existing scholarship on nuclear deterrence and establish its insufficiency to the task of providing an answer to the research question of this thesis. The main question posed in this chapter is: why does neorealist IR theory on nuclear deterrence not suffice to offer an answer to the question how India and Pakistan's nuclear weapons affect the security environment? In order to answer this question, this chapter will first introduce neorealism, the IR theory of which ‘rational deterrence’ is but a part, before explaining the thinking behind rational deterrence. I will then introduce constructivism, the IR theory which critiques neorealist thinking. Finally, this chapter will examine three problems that constructivists identify within rational deterrence theory. The solutions to these three problems will form a part of the theoretical framework of the thesis, and are discussed in the next chapter.

Rational deterrence

The international relations (IR) theory which has dominated academic scholarship on nuclear weapons since the 1980s is neorealism, or ‘structural realism’.⁶ Neorealist IR theory posits that the inherent anarchy of the world system compels states to maximise their own security in order to be able to increase its relative power. States are assumed to be similar in their need for security and power, and their relative success in attaining these lies within the differing capabilities of states, not within their differing interests. States are seen as rational, unitary actors who will always act to improve their own interests.⁷

In the 1995 book *the spread of nuclear weapons: a debate renewed*, Kenneth N. Waltz and Scott Sagan debate the issue of nuclear proliferation and the dangers of a nuclear-armed world. Waltz, the doyen of neorealists, argues that the spread of nuclear weapons is a good thing, because the historical evidence shows that nuclear-weapons states have never gone to war with each other.⁸ The neorealist argument is that states are rational, unitary actors who will always act to serve their national interest. It is evident that any nuclear exchange would risk casualties in the hundreds of thousands or even millions, trillions of economic damage, and the destruction of a state's governing apparatus. As the costs of nuclear war are extremely high, the risk of nuclear retaliation will prevent states using nuclear weapons against a fellow nuclear-armed state.⁹ Waltz argues that, as states are deterred from attacking another nuclear-armed states due to the potential costs, the probability of any major war between these states “approaches zero”.¹⁰ What's more, “[t]he likelihood of war

⁶ Scott D. Sagan and Kenneth Waltz, *The spread of nuclear weapons* (New York 2013); Thomas Schelling, *Arms and Influence* (New Haven 1966); Scott D. Sagan, “Why do States Build Nuclear Weapons? Three Models in Search of a Bomb.” *International Security* 21 (1997) 3, 54-86.

⁷ John J. Mearsheimer, *The Tragedy of Great Power Politics* (New York 2014) 3.

⁸ Scott Sagan and Kenneth Waltz, *The spread of nuclear weapons*, 15.

⁹ Kenneth N. Waltz, “Nuclear Myths and Political Realities” *American Political Science Review* 84 (1990) 3, 731.

¹⁰ Kenneth N. Waltz “The Origins of War in Neorealist Theory” in Robert I. Rotberg and Theodore K. Rabb [eds.] *The Origin and Prevention of Major Wars* (Cambridge 1988) 50-51.

decreases as deterrent and defensive capabilities increase. Nuclear weapons make wars hard to start."¹¹ The risk of nuclear war is not in the state's interest, so nuclear weapons deter states from starting wars with each other. For Waltz, this 'rational deterrence' holds true for both major and minor nuclear powers, and therefore he asserts that nuclear proliferation is in the interest of peace.

Constructivist critiques of 'rational deterrence'

Constructivist IR theory critiques this assumption of state rationality, as well as rational deterrence's focus on the state as the main (single) unit of analysis. Constructivism and neorealism share the assumption that states make choices based on furthering their interests, but constructivists see interests as the products of states' social practices, identities, and the interests of other actors within the particular context.¹² The result of this treatment of interests is that states are expected to have a far wider array of potential choices of action than is assumed by neorealism, and that these choices are constrained by the social structures mutually created by states and structures via social practices.¹³ In other words, constructivists assign more agency to states, but also assign constraints to agency. States' choices are constrained by "the webs of understanding of the practices, identities, and interests of other actors that prevail in particular historical contexts".¹⁴ In short, constructivist approaches offer a way to examine actors and structures, within their social context.

Constructivist approaches identify three problems that exist within the neorealist theory of rational deterrence: existential bias, actor bias and superpower bias. Respectively, these problems are in essence problems of academic concepts, unit of analysis, and choice of case study. These problems stand in the way of finding an answer to my research question. The solutions to these three problems will inform the theoretical framework I will establish in the next chapter. These solutions are not new, but are composed of constructivist approaches to the question of nuclear deterrence.

Existential bias

Firstly, constructivists charge that the neorealist argument for universal deterrence has led to a pervasive "existential bias" in the literature, with the main body of academic work focused on the question of nuclear proliferation, rather than nuclear strategy.¹⁵ This is predicated on the assumption that the mere possession of nuclear weapons suffices as a deterrent for attack. Rational deterrence assumes that nuclear states with different nuclear capabilities are equivalent, building on Waltz's argument that even a small nuclear deterrent is credible enough to provide Schelling's "threat that leaves something to chance".¹⁶ Whether a state possesses a single nuclear warhead or an entire nuclear triad with second-strike and first-use capabilities does not, according to Walz, Mearsheimer and others, make a material difference. Even a small nuclear arsenal could deter competitors from attacking, because just a few nuclear weapons would introduce enough uncertainty that a first strike could completely disable an adversary's retaliatory capacity.¹⁷ Mearsheimer concludes that "there is no question . . . the presence of nuclear weapons makes states more cautious about using military force of any kind against each other."¹⁸ The theory of rational

¹¹ Scott Sagan and Kenneth Waltz, *The spread of nuclear weapons: an enduring debate* (New York 2013) 40

¹² Ted Hopf, "The promise of constructivism" *International Security* 23 (1998) 1, 172-173.

¹³ Hopf, "The promise of constructivism", 188.

¹⁴ Ibidem, 177.

¹⁵ Thomas Schelling, *Arms and Influence* (New Haven 1966); John Lewis Gaddis, *The long peace: Inquiries into the history of the cold war* (Oxford 1987); Robert Jervis, "Realism, game theory, and cooperation" *World Politics* 40 (1988) 3, 317-349; John Mearsheimer, "Nuclear weapons and deterrence in Europe" *International Security* 9 (1984-1985) 19-46.

¹⁶ Schelling, Thomas, *The Strategy of Conflict* (New Haven 1960) 201-206.

¹⁷ Scott Sagan and Kenneth Waltz, *The spread of nuclear weapons: an enduring debate* (New York 2013) 20-22; Robert Jervis, "Realism, game theory, and cooperation" *World Politics* 40 (1988) 3, 317-349.

¹⁸ John J Mearsheimer, *The Tragedy of Great Power Politics* (New York, 2014), 129

deterrence seeks to answer the question *whether* nuclear weapons deter conflict without stopping to ask the question *how* nuclear weapons deter conflict. Qualitative literature treats states as equivalents, even when they operationalise their forces in very different ways. As a result of this, most post-Cold War research has focused on nuclear proliferation: the questions of how and why states acquire nuclear weapons. There is, according to neorealist deterrence theory, no compelling reason to analyse the choices nuclear-weapons states make in how they operationalise their nuclear capability, as the destructive power of nuclear weapons is so great, that conventional conflict should be inhibited due to any risk of nuclear escalation. As Narang observes, "In the established logic, the mere acquisition of nuclear weapons is the crucial leap to achieving security, not only against nuclear but also conventional attack."¹⁹

Actor bias

Most academic discourse on the question of nuclear weapons is predicated on neorealist assumptions that the state is the central actor in the international system, that it is a rational actor which always acts to preserve or further its own security, and that it is unitary with regard to the operationalisation of the nuclear capability of said state.²⁰ A state must have centralised decision-making authority by way of a clear chain of command, with the state's political leadership at the top of the chain. Neorealists do not deny the fact that a state, like any collective, "may act inconsistently although every person in it is fully consistent".²¹ However, as Jervis states in his examination of rational deterrence theory, "it is generally assumed that the compelling nature of the external environment and the importance of the national interest submerge divergent domestic interests and coalition dynamics that could produce inconsistent policies."²² The result of these assumptions is that that scholarly analysis of nuclear deterrence focuses on the study of actors in the international system, rather than of the structures that influence these actors. However, without established norms and practices, any action by a state would be devoid of meaning. It is only possible to assume the rationality and unitarity of the state if one denies that interests "are the products of the social practices that mutually constitute actors and structures." It is very well that neorealist theory presumes state leaders to *intend* to take rational decisions which maximise the state's interests. However, their beliefs, options available to them and the implementation of their decisions are all influenced by the structures that shape their beliefs, offer them options, and implement their decisions (or not). For instance, states possess nuclear command and control structures in order to provide safe and secure guardianship of their nuclear capability. These are complex organisations which have their own routines, internal conflicts and organisational interests.

Superpower bias

The third argument for why a constructivist approach would offer a new view on the nuclear deterrence is that current scholarship on the deterrence of nuclear weapons displays a "superpower bias". In two ways, the literature does not adequately address the deterrence challenges of nuclear powers that are not the United States or Russia/the Soviet Union. Firstly, the superpower experience is overweighted in quantitative research, given that the bulk of it is based on bilateral conflicts between nuclear powers.²³ Since the United States and the USSR have possessed nuclear weapons the longest, were involved in the most international crises (with each other and by proxy), and their

¹⁹ Vipin Narang, "What does it take to deter? Regional Power Nuclear Postures and International Conflict" *Journal of Conflict Resolution* 57 (2012) 3, 483.

²⁰ Mearsheimer, John J, *The Tragedy of Great Power Politics* (New York, 2014) 3.

²¹ Robert Jervis, "Rational Deterrence: Theory and Evidence", *World Politics* 41 (1989) 2, 203.

²² Robert Jervis, "Rational Deterrence: Theory and Evidence", *World Politics* 41 (1989) 2, 204.

²³ Vipin Narang, *Nuclear Strategy in the Modern Era* (Princeton 2014) 3.

relationship was the most politically relevant, the deductions from quantitative research are mostly based on the superpower experience. Secondly, the preponderance of superpowers in qualitative research does not bode well for the analysis of regional nuclear powers, as superpower nuclear arms racing is a poor guide to analysing the relationship between nuclear weapons and deterrence. Both superpowers “developed massive nuclear arsenals to deter each other, without first answering how much was actually necessary to deter conventional conflict”.²⁴ Unlike the superpowers, who could invest billions of dollars into a nuclear force that could deter the full spectrum of conventional and nuclear conflict, regional powers operate on thin margins. They are forced to adopt mutually exclusive nuclear force postures which constrain the deterrent value of a state's nuclear capability. For example, some states have developed a second-strike capability in order to prevent a decapitating nuclear first strike, but other states have tactical nuclear weapons in their arsenal, in order to deter conventional forces.

Conclusion

In this chapter, I have explained how neorealist IR theory views nuclear deterrence and proliferation as one and the same. The terrible cost of nuclear war deters rational state actors from risking any nuclear escalation, whatever the deterrent value of the adversary's nuclear capability. Constructivist theory shares neorealism's assumption that states act according to their interests, but see interests as influenced and constrained by social practices, identities and other actors. Therefore, constructivists find that the dominant IR theory on nuclear deterrence ('rational deterrence') is insufficient to answer the research question for three reasons. Firstly, the theory of rational deterrence does not recognise the differential value of a nuclear capability's deterrent, instead treating all nuclear states as equal. Secondly, rational deterrence sees states as rational actors unitary with regard to the operationalisation of its nuclear capability. However, it is clear that states are composed of diverse (organisational) structures which impose their own routines, internal conflicts and organisational interests on a state's decision-making. Thirdly, current scholarship with regard to nuclear deterrence is focused on the experience of the United States and the Soviet Union during the Cold War in both quantitative and qualitative research. The critiques I have developed of neorealist IR theory will be applied in the following chapter to develop a constructivist framework on which to base my research.

²⁴ Vipin Narang, “What does it take to deter?” *Journal of Conflict Resolution* 57 (2012) 3, 479.

Chapter 2 – Theoretical Framework

As stated in the introduction, the main aim of this thesis is to assess the security implications of India and Pakistan's respective nuclear strategies. In order to do so, one must first examine India and Pakistan's development of their nuclear strategies. This chapter establishes a general deductive framework for the analysis of India and Pakistan's nuclear strategy by drawing from organisational theory. The previous chapter has demonstrated three main reasons why the neorealist consensus on nuclear deterrence is not a good fit for the analysis of the deterrent power of India and Pakistan's nuclear capability. In this chapter, I will offer the three solutions I apply to these problems in my research, which form the theoretical framework in order to answer my research question. I will seek a different way of approaching the question of nuclear deterrence, firstly by analysing nuclear strategy instead of nuclear proliferation, secondly by shifting the unit of analysis from 'the state' to the nuclear command-and-control organisation, and thirdly applying regional power experiences to the question of nuclear deterrence. To this end, I will explore the concept of nuclear command and control through the 'always/never' dilemma and seek to define a way in which to describe the deterrent value of choices made in the nuclear organisation.

Nuclear strategy

Firstly, neorealist theory of rational deterrence assumes that nuclear deterrence is a binary variable and all nuclear capabilities have an equal deterrent value. Therefore, rational deterrence only addresses the question *whether* a state possesses nuclear weapons (nuclear proliferation), not *how* it will use it (nuclear strategy). Nuclear strategies and capabilities are therefore not usually analysed in research on nuclear deterrence. Contrary to structural realists' interpretation of nuclear deterrence, there is a variance in the deterrence value of a nuclear capability. As shown by Narang in *Nuclear Strategy in the Modern Era*, nuclear powers have achieved widely differing deterrence results with their nuclear arsenals.²⁵ During the Cold War, superpowers' nuclear strategies evolved to establish a degree of mutual stability with differing deterrent effects as their strategy evolved.²⁶ Likewise, Pakistan has been more successful in deterring Indian conventional attack than India has been in deterring Pakistan, as the 1999 Kargil War shows. Israel suffered deterrence failures in 1973 and 1991 at the hand of Arab adversaries.²⁷ The assumption that all nuclear deterrence is equal therefore leaves a major lacuna in academic thinking on nuclear weapons. The existential bias appears to have convinced academia that how a state tries to use its nuclear weapons has no impact on a state's ability to deter conflict – a belief that the evidence suggests is sorely mistaken.

How does a state operationalise its nuclear deterrent? Through its nuclear strategy. Nuclear strategy can be defined as the way a state chooses to operationalise its nuclear capability through nuclear doctrine and nuclear posture.²⁸ I will explain first how a state's doctrine is a limited unit of analysis, before explaining nuclear posture in the next section. Doctrine is limited to a state's official (and unofficial) statements: it is what a state wants its allies, adversaries and own populace to know about its nuclear capability. This can be very extensive in case of a state with a survivable second-strike capability, meaning that the state does not need to fear losing its nuclear weapons because it is sure that its nuclear capability will survive a first strike by an adversary.²⁹ A state's doctrine can also be

²⁵ Vipin Narang, *Nuclear Strategy in the Modern Era* (Princeton 2014) 7

²⁶ Lawrence Freedman, *Evolution of Nuclear Strategy* (London 2003).

²⁷ See: Ward Wilson, "The Myth of Nuclear Deterrence" *Nonproliferation Review* 15 (2008) 3, 421-439.

²⁸ Vipin Narang, *Nuclear Strategy in the Modern Era* (Princeton 2014) 5-7.

²⁹ The enormous three-legged US nuclear deterrent is so large that it cannot be destroyed in a first strike, nor can much of its capabilities be kept a secret.

very limited, for example if a state has an ambiguous nuclear capability and does not want adversaries (or allies) to know how it has developed its nuclear capability.³⁰ Most nuclear states have a declared doctrine in which they enunciate their nuclear force thresholds (conditions for nuclear use) at the very least. Of course, a state leader looking for diplomatic support or funding from the United States will look to downplay the capability for nuclear destruction he holds in his hands. Conversely, a state which is at risk of invasion by a conventionally superior adversary will seek to use the nuclear threat to full effect. Therefore, it is precisely because a state's nuclear doctrine is shaped by the way the nuclear-armed state leaders want its audience to see it, that the analysis of nuclear doctrine holds limited value for accurately describing a state's nuclear strategy.

Nuclear command and control

Secondly, neorealism focuses on the analysis of the state as the primary actor within the international system, assuming it to be rational, unitary, and to act to preserve or promote its own security. However, this denies the existence of structures and social context which influence actors in their behaviour, despite their intention to act according to the national interest.

The constructivist critique on the neorealist assertion that nuclear weapons always deter conflict is that the assumption on which this claim is based is incorrect. Firstly, the state is not unitary with regard to the administration of nuclear weapons, but rather possesses nuclear command and control structures in order to ensure safe and secure guardianship of their nuclear capability. These are complex organisations which have their own routines, internal conflicts and organisational interests. Although a state leader may intend to act according to state interests, he is influenced by the organisations that shape their beliefs, offer them options, and implement their decisions (or not).³¹ Thus, the question of state rationality becomes less important, as the state is no longer the appropriate unit of analysis. In order to understand whether nuclear weapons are indeed a force for peace, one must take into account the interests of all actors involved in the nuclear command and control organisation.

Command/control

This is where a state's nuclear posture becomes part of its nuclear strategy. Nuclear posture can be described as its nuclear force deployment (how many missiles and where are they located?), its command structure, and its command-and-control measures. All nuclear-armed states have developed complex organisations to operationalise their nuclear posture. States possess nuclear command-and-control structures in order to ensure safety in the command (launch authority) and control (deployment and administration) of nuclear weapons, while providing for enough flexibility that the state's nuclear capability is effective. This trade-off is also referred to as the 'always/never' dilemma, which lies at the heart of nuclear command-and-control (C2).³² In order for the deterrent function of the nuclear capability to function, commanders need an assurance that the weapon will always work when directed (positive control), but will be never available to use in the absence of authorised direction (negative control).

Although all states face the always/never dilemma, not all states' C2 systems possess the same characteristics. This has to do with the two main threats which complicate the always/never dilemma: the potential for unwanted use (threat to negative control) and the potential for

³⁰ For example, Israel has an ambiguous nuclear capability. Although it is an open secret that Israel developed a nuclear capability in the 1960s, it still has not confirmed that it even tested nuclear weapons.

³¹ Ted Hopf, "The promise of constructivism" *International Security* 23 (1998) 1, 172-173.

³² Peter D. Feaver, "Command and Control in Emerging Nuclear Nations" *International Security* 17 (1992) 3, 160-187.

decapitation (threat to positive control). These threats and their solutions are often mutually exclusive, so that to tackle one threat tends to exacerbate the other.

Negative control

The main threat to negative control is unwanted use: use of nuclear weapons which has not been ordered by the relevant command authority. There are two main variants of unwanted use: accidental use and unauthorised use.³³ Accidental use refers to use resulting from any mishap, such as a plane crash or a maintenance error. Unauthorised use is deliberate use by any actor with access to the weapon, but without the legitimate authority to order its use. Due to the destructive power of nuclear weapons, any unwanted use can cause significant damage and casualties. Potentially more destabilising still, unwanted use can potentially trigger an international nuclear conflict, especially if the circumstances of the unwanted use of a nuclear weapon are unclear or if the use occurs at a time of increased tension.³⁴

A nuclear C2 system that prioritises negative control is called 'assertive'. Such a system is characterised by a top-down organisational structure, where central command has asserted its control over operations. Overall policy goals are set by leadership, and compliance and coordination is enforced, leaving little room for autonomy of operators. Weapons may be stored in an unassembled state in peacetime, or at least not collocated with their delivery systems.³⁵ If weapons are assembled, other measures are introduced to prevent unwanted use, such as PALs or dual-key launch procedures. The USSR had another solution to ensure assertive control of its nuclear weapons: while the KGB had possession of the nuclear warheads, responsibility for the delivery systems was placed with the Red Army or Soviet Air Force, depending on the delivery system type.³⁶

Assertive C2 systems seek to minimise the risk of any unwanted use, be it accidental or without authorisation. By constraining nuclear operators in their autonomy of decision and action, assertive C2 systems ensure their reliability. Measures designed to constrain operators' latitude for action provide higher assurance that the nuclear weapons will not be used in an unintended way. However, assertive nuclear C2 systems tend to "fail-safe": aside from improving negative control, the aforementioned measures are at odds with an effective positive control, degrading the readiness of retaliatory systems in case of a surprise first strike and rendering the nuclear deterrent unresponsive to rapid change (such as in a crisis).³⁷

Positive control

The main threat to positive control is decapitation: a "successful first strike that renders the defender's arsenal unusable, either because the attack destroys the delivery systems (or the weapons themselves), or because the attack so disrupts command and control that retaliation becomes infeasible."³⁸ If a nuclear-armed state is faced with a (perceived) decapitation threat, it cannot be confident that its nuclear arsenal will always work when directed to use. The threat of decapitation is a destabilising one for a NUCLEAR-ARMED STATE, especially for an emerging nuclear-weapon state. As incipient nuclear capabilities are by definition limited in scope and numbers, emerging NUCLEAR-ARMED STATE are especially vulnerable to decapitation, and therefore have a strong incentive to posture for early use in a crisis, before enemy action has disabled its nuclear

³³ Feaver, "Command and Control in Emerging Nuclear Nations", 164-166.

³⁴ Ibidem, 168.

³⁵ Vipin Narang, *Nuclear Strategy in the Modern Era* (Princeton, 2014) 12-17.

³⁶ Scott D. Sagan, *The Limits of Safety* (Princeton 1993) 77-78.

³⁷ Feaver, "Command and Control in Emerging Nuclear Nations", 172-173.

³⁸ John D. Steinbruner, "Nuclear Decapitation," *Foreign Policy*, 45 (1981) 2, 16-28.

capability. The danger of such attack-on-warning postures, or 'nuclear hair-triggers' cannot be overestimated, especially in a febrile local environment with multiple nuclear-weapons states such as Southeast Asia.

A nuclear C2 system that focuses on positive control is called 'delegative'.³⁹ A distinguishing feature of delegative systems is that, although leadership might retain overall control over the direction of the delegative C2 system, military operators are granted a degree of autonomy in the handling of nuclear weapons.⁴⁰ The implementation of policy guidance by leadership, however detailed, would rest on the will and ability of operators to follow it, rather than on institutional and technical constraints limiting operators' leeway in carrying out their work. In addition, the deployment of nuclear weapons in delegative systems will favour the "always" side of the always/never dilemma, making sure that nuclear weapons are in a ready-to-go condition. Several measures would produce a nuclear capability in ready-to-go condition, such as keeping nuclear weapons deployed near or on their delivery systems, and delegating launch authority to local commanders in times of heightened tensions.

These measures, and others taken in a delegative nuclear C2 system are designed to minimise risks of decapitation. Due to its high responsiveness, delegative systems would have a higher chance to survive a first strike and keep its capability intact for a retaliatory strike, thus preserving its deterrent capability. However, delegative nuclear C2 systems would be liable to "fail-deadly": because of the relatively large autonomy granted to operators in handling the nuclear weapons, the absence of many organisational and technical measures to reduce the chance of unwanted use, and the fact that in delegative nuclear C2 systems, launch authority may be delegated to field commanders, the system's failure mode would fall at the negative control side of the dilemma ('never').⁴¹

Nuclear postures

The third problem identified with neorealist nuclear deterrence theory is that it is predicated on the superpower experiences of the United States and the USSR, whose massive spending and conventional dominance does not transfer well to regional powers such as India and Pakistan. Regional powers must adopt command-and-control measures that are mutually exclusive, and therefore must make choices about which form of deterrence to prioritise. The trade-offs involved in nuclear command and control must be confronted by those who shape the system, be they political or military leaders, or the actors within the nuclear C2 system. Although the nature of the always/never dilemma is universal across nuclear C2 systems, its resolution is not, as evidenced by the wide difference in nuclear C2 systems around the world.⁴² Obviously, all nuclear C2 systems contain measures intended to prevent unwanted use, as well as others designed to ensure high responsiveness at times of crisis. Still, because many measures are inherently contradictory, actors are forced to make choices to prioritise positive control over negative control or vice versa.⁴³ These choices are what make a nuclear C2 system unique to a nuclear-armed state and are influenced by a number of factors, such as (geo)- strategic environment, nuclear weapons norms, leadership, civil-military relations and management of nuclear operations. These choices have profound effects for the nuclear-armed state's nuclear capability's ability to function effectively as a deterrent.

³⁹ Samuel Huntington, *The Soldier and the State* (Cambridge, M.A., 1957) 80-97.

⁴⁰ Feaver, "Command and Control in Emerging Nuclear Nations", 170.

⁴¹ Peter Feaver, *Guarding the Guardians* (New York 1992) Chapter One.

⁴² Vipin Narang, *Nuclear Strategy in the Modern Era* (Princeton, 2014) 55-221.

⁴³ Narang, *Nuclear Strategy in the Modern Era*, 22.

In *Nuclear Strategy in the Modern Era*, Vipin Narang formulates the concept of *nuclear posture* to describe the ways a state can choose to operationalise its nuclear capability. Nuclear posture is defined as: "the incorporation of some number and type of nuclear warheads and delivery vehicles into a state's overall military structure, the rules and procedures governing how those weapons are deployed, when and under what conditions they might be used, against what targets, and who has the authority to make those decisions".⁴⁴ The three nuclear postures a regional power can choose to operationalise its nuclear capability are: a catalytic posture that seeks to catalyse superpower intervention on the nuclear-armed state's behalf; an assured retaliation posture that threatens nuclear retaliation against any nuclear attack on the nuclear-armed state; and an asymmetric escalation posture that threatens first use of nuclear weapons in response to any conventional attack on the nuclear-armed state. Narang's three regional power nuclear postures are differentiated by their 'primary envisioned employment', their capabilities, their C2 choices and their levels of transparency.⁴⁵

Catalytic posture

The first posture that Narang mentions is the catalytic posture. This posture is predicated on a state catalysing third-party action on its behalf if its interests are threatened, by threatening to break out previously ambiguous or non-operational nuclear weapons capabilities or even escalate conflict if the third party does not intervene.⁴⁶ This third party is itself a state or organisation with sufficient deterrent power to measure up to the catalytic state's adversary. In practice, this means a nuclear superpower with an interest in regional stability, usually the United States, is called upon to exert political and economic pressure on the adversary. States with a catalytic posture do not possess a survivable second-strike capability or tactical nuclear weapons. To execute this posture, nuclear-weapons states need not have even a functional nuclear capability, as long as the third party sees a risk of nuclear use. This posture relies on a high level of ambiguity with regard to nuclear capabilities and conditions of use, and therefore C2 is centralised and not integrated into a state's military doctrine. The important feature of a catalytic posture is that the nuclear deterrent is not primarily positioned vis-à-vis its adversary, but rather the third party in an attempt to compel its intervention.⁴⁷ Deterrent signals are not sent to the opponent, but to the third party, as in the example of Israel during the 1973 Yom Kippur War, given by Narang. Several days into the war, when it felt its existence was being threatened by Syrian and Egyptian forces, Israel conducted operational checks on delivery vehicles in a way that was detectable only to the most advanced spying organisation in the world: the CIA.⁴⁸ Without Syria or Egypt any the wiser, Israel intentionally sent a deterrent signal to the United States in order to galvanise US intervention.

Assured retaliation

Unlike a catalytic posture, assured retaliation seeks to directly deter nuclear attack by using its own nuclear capability.⁴⁹ It does so by threatening certain nuclear retaliation in case of nuclear attack, even in case of massive damage. Assured retaliation can only be credible if a state has a survivable second-strike force. Nuclear-weapons states can achieve survivability by taking C2 measures (e.g. dispersal, de-mating, or a sea-based capability) that make it impossible for opponents to be confident of a disarming first strike. A nuclear capability in an assured retaliation posture will target

⁴⁴ Vipin Narang, "What Does It Take to Deter? Regional Power, Nuclear Postures and International Conflict" *Journal of Conflict Resolution* 57 (2012) 3, 483.

⁴⁵ Narang, "What Does It Take to Deter?", 483-484.

⁴⁶ Ibidem, 484-486.

⁴⁷ Ibidem, 489-490.

⁴⁸ Louis René Beres, "Security or Armageddon: Israel's Nuclear Strategy" *Shofar* 4 (1986) 4, 25-31.

⁴⁹ Narang, "What Does It Take to Deter?", 485.

key strategic points, political nerve centres and civilian targets in order to confront the adversary with the unacceptable costs of a first strike.⁵⁰ The measures a nuclear-armed state can take to enhance its nuclear capability's survivability, such as dispersal and de-mating, simultaneously inhibit the immediate use of nuclear weapons. Additionally, deployment patterns for tactical nuclear weapons can impair survivability. Therefore, an assured retaliation posture leaves no room for tactical nuclear use and nuclear weapons are primarily oriented towards deterrence by punishment. In order for an assured retaliation posture to work, an assured retaliation posture requires a larger measure of transparency than a catalytic posture. Nuclear-armed states can be ambiguous about deployment patterns, but adversaries must be aware of the nuclear-weapons state's second-strike capability. Nuclear-armed states with an assured retaliation posture, such as India and China, have a declaratory no-first-use policy, paired with C2 measures that inhibit the first use of nuclear weapons.⁵¹

Asymmetric escalation

While assured retaliation is designed to deter nuclear use by an adversary, the asymmetric escalation posture is designed to deter conventional use by an enemy.⁵² The posturing of an assured retaliation capability enables a nuclear-armed state to respond rapidly against conventional attacks with nuclear force against conventional and strategic targets. A nuclear capability with an asymmetric escalation posture must be flexible and usable at short notice and therefore prioritises positive control. Peacetime deployment can be centralised, but an asymmetric escalator must operationalise its nuclear capability to be able to disperse and deploy nuclear weapons quickly, delegating launch authority to field commanders who would be responsible for employing tactical or strategic nuclear weapons against an adversary's conventional force. Measures designed to enhance negative control such as de-mating, PALs and a centralised command structure are mutually exclusive with an effective asymmetric escalation posture.⁵³ In order to credibly threaten first use, a nuclear-armed state must operationalise its forces to be ready for use, and communicate this readiness by being transparent about its nuclear capability, deployment patterns and conditions of use. It must, like asymmetric escalator France, express its intention to use nuclear weapons on an adversary's conventional forces in case of an attack. During the Cold War, France was, as the only mainland European nuclear power, threatened by the conventionally vastly superior force of the Soviet Union and faced with the prospect that it would be left alone to fight Soviet forces. In order to deter the Soviet Union's superior conventional forces, France threatened first use of nuclear weapons against the Red Army and strategic targets, should the Soviet Union invade Western Europe.⁵⁴

Conclusion

In this chapter, I have established a theoretical framework for the analysis of my research question. By drawing from constructivist IR theory, I have critiqued the assumptions upon which neorealist deterrence theory is predicated. I have shown how analysis must, in addition to the question of nuclear proliferation, also focus on the question of nuclear deterrence. The deterrent value of a state's nuclear capability is determined by its nuclear strategy. Nuclear strategy is composed of nuclear doctrine and nuclear command-and-control. The analytical value of doctrine is limited, because doctrine is essentially a state signalling its nuclear capability to an audience, be that its allies, adversaries or domestic public. Analysing nuclear command-and-control, which is the total nuclear

⁵⁰ Ibidem, 490.

⁵¹ Ibidem, 485-486.

⁵² Ibidem, 486.

⁵³ Ibidem, 487.

⁵⁴ Ibidem, 486.

organisation tasked with operationalising a state's nuclear capability is much more useful for answering my research question, given that a state's nuclear force deployment, its command structure, and its command-and-control measures necessarily represent the operationalisation of its nuclear strategy. A state's nuclear command-and-control structure would betray said state's doctrine if the doctrine was inaccurate for the purposes of signalling. Thus, I have shifted the unit of analysis from actor to structure in order to be able to study the operationalisation of India and Pakistan's nuclear capability. A state's nuclear weapons must simultaneously be reliable and secure, although these two objectives often contradict each other. This inherent contradiction means that nuclear-armed states must make choices whether to emphasise its nuclear command-and-control systems' reliability or security against unauthorised use. Finally, this framework provides a model for describing the nuclear structure of states in terms of strategy. Introduced by Narang, the formulation of three nuclear postures that represent a collection of command-and control measures postured towards a deterrent goal offers a way of describing my research on the development of India and Pakistan's nuclear strategy in a way that I can analyse the effect of these developments on the security environment in South Asia.

Having thus established my theoretical framework, I will move on to introducing my case studies India and Pakistan in the next chapter, before applying the framework outlined in this chapter to the nuclear strategy of India and Pakistan, in order to reach a conclusion on the question of the deterrent value of their respective nuclear postures.

Chapter 3 – Historical context

This chapter analyses the way the India-Pakistan relationship has developed since Independence. The purpose of this chapter is to contextualise the role of nuclear weapons within the India-Pakistan relationship. The chapter seeks to do so by answering the following question: how has the geostrategic environment in South Asia influenced India and Pakistan's conventional strategy towards each other? I will do so by first examining the common history of India and Pakistan in achieving independence from the British Empire, the Partition of India in 1947, and the three wars in which India and Pakistan have fought each other during the second half of the twentieth century, showing how India has achieved a dominant position vis-à-vis Pakistan in the military, economic and social sphere. Then, I will explain how Pakistan has sought to counter the increasing conventional superiority of India by low-intensity, asymmetric warfare, described as "bleeding India by a thousand cuts". I will also show how this strategy has increased terrorist activity in India. Thirdly, I will analyse the Indian struggle to bring its conventional superiority to bear in its relationship with Pakistan, responding to Pakistani acts of aggression with compellence through limited war and developing a new attack plan called 'Cold Start'.

Common history

In this section, I will endeavour to draw the common historical context of the Indian-Pakistani relationship, in order to understand the way the geostrategic environment in South Asia has evolved. I will firstly describe the common history of India and Pakistan as a Dominion of the British Empire, traumatically birthed into independence during Partition. After independence, India and Pakistan found themselves in an adversarial relationship, at odds about Kashmir, East Pakistan (now Bangladesh) and regional hegemony. I will explain how this relationship degenerated into four wars between 1947 and 2001, and how these wars can illuminate the unequal strategic balance on the Indian subcontinent.

Partition

The trajectory taken by India and Pakistan towards independence from the British Empire has ensured that their history is a common one. After the dissolution of the East India Company after the Indian Rebellion of 1857, the British had imposed direct rule on India under the British Raj, encompassing all of current-day India, Pakistan and Myanmar.⁵⁵ Hindus and Muslims had organised themselves into the Indian National Congress and the Muslim League respectively, nationalist movements which strived for independence from the British Empire.⁵⁶ The respective fathers of the nation, Jinnah and Gandhi (and Nehru) were both British-educated lawyers who managed to harness the popular support of their peoples in favour of their goal: independence from Britain. Muslim leaders explicitly rejected the ability of the Indian National Congress to represent the Muslim community in India. The communal state desired by Gandhi became impossible due to the awakening of a Muslim national identity among Indian Muslim communities.⁵⁷ The deeply violent nature of Partition has left deep tensions between the two countries. The massive population exchanges involving almost fifteen million people were accompanied by communal violence, exacerbated by the newly established governments' utter inability to police the exchanges and process the millions of people moving across the border.⁵⁸ The partitions of Punjab and Bengal were

⁵⁵ Percival Spear, *A History of India* (London 1990) 35-68.

⁵⁶ Yasmin Khan, *The Great Partition: The Making of India and Pakistan* (New Haven 2007) 11-23.

⁵⁷ Khan, *The Great Partition*, 63-80.

⁵⁸ *Ibidem*, 128-142.

of a particularly violent nature.⁵⁹ After Partition, hardly any Muslim remained on the western side of the Indian-Pakistani border in Punjab, with the reverse being so for the Hindu community in East Punjab.⁶⁰

Now, more than 70 years later, it is still not clear whether the Partition of India claimed 200,000 or one million dead, nor is it apparent how many of the dead can be attributed to communal violence and mutual genocide or to the incompetent administration of the population transfers, but the Partition remains a deep scar on relations within the Indian subcontinent.⁶¹ The Radcliffe Line demarcating the Indian-Pakistani border has decisively shaped the battleground between India and Pakistan. Four wars have been fought over the mountainous terrain of Jammu and Kashmir. Today, the situation in the disputed province remains unstable, with Pakistan directly and indirectly sponsoring Islamist terrorism in Kashmir and India's rule over the province having been described as "an occupation". The stronger influence, however, has been on India and Pakistan's collective memories. Having been literally born out of Partition, the images of horrific violence are embedded - branded, even - on the collective consciousness of the Indian and Pakistani populations.⁶²

Three wars between India and Pakistan

During Partition, the status of the numerous princely states was left unresolved. Lord Mountbatten advised the states to join either the state of Pakistan or India, and most states did so according to the faiths of their leader and the majority of his subjects. The princely state of Jammu and Kashmir, however, was particular in the way that its Maharaja was Hindu, though the majority of his subjects were Muslim.⁶³ While the status of Jammu and Kashmir hung in the balance, the Maharaja faced a Pakistani-supported Muslim uprising. Irregular militia rapidly pushed towards the capital of Srinagar. The Maharaja turned to India for assistance, who agreed to help on the condition that the Maharaja sign an Instrument of Accession to India. He duly relented and Indian troops spilled over the border to halt the advance of the militias. The next year generally showed a picture of stalemate, with the Muslim militias unable to push into Srinagar and depose the Maharaja, but Indian troops were unable to dislodge the militia either. At the time a ceasefire was agreed on New Year's Day 1949, the front had solidified along what is now known as the Line of Control. One-third of the former princely state was under Pakistani control, including Azad Kashmir and Gilgit-Baltistan, while two-thirds of Jammu and Kashmir remained under Indian control including Jammu, the Kashmir valley and Ladakh.⁶⁴

In 1965, Pakistan moved over 30,000 soldiers into Indian-controlled Kashmir, disguised as peasants. The soldiers infiltrated as a part of Pakistan's Operation Gibraltar, in which it aimed to precipitate an insurgency against Indian rule in Muslim-majority Kashmir. Although the Pakistani attack initially had success and advanced into Kashmir, the advances were reversed when the Indian Army and Air Force attacked further south, over the international border into Punjab. The widening of the theatre of war into Punjab proved a turning point of the war, as Pakistan needed to divert troops from its advance in Kashmir to defend the city of Lahore. Once again, an Indo-Pakistani war devolved into a stalemate, with both sides holding territory of the other, although India was in a more advantageous position.⁶⁵

⁵⁹ Ibidem, 132-138.

⁶⁰ Ibidem, 190.

⁶¹ Ibidem, 167-182.

⁶² Ibidem, 186-210.

⁶³ Percival Spear, *A History of India* (London 1990) 123-134.

⁶⁴ Spear, *A History of India*, 135-138.

⁶⁵ Ibidem, 144-151.

In December 1971, a Bengali nationalist rebellion in East Pakistan invited an especially strong backlash by the Pakistani authorities. A pacification of the country by the Pakistani army started with the taking of the cities in Bengali hands, and began the 1971 Bangladesh genocide, perpetrated by the Pakistani Army.⁶⁶ Between 300,000 and 3 million Bengalis were killed by members of the Pakistani military and supporting militias and between 200,000 and 400,000 women were systematically raped in acts of genocidal rape.⁶⁷ As a result of the intense violence, a further ten million, mostly Hindus, fled to India. In India, Prime Minister Indira Gandhi had concluded that, rather than taking in millions of refugees from East Pakistan, it would be better to take advantage of the rebellion.⁶⁸ Both nations geared up for war once again until Pakistan launched pre-emptive air strikes on Indian air fields, inspired by the Israelis in the Six-Days War in 1967. Pakistan's initial offensive was repulsed by strong Indian defensive positions and stalled, whereupon India counterattacked devastatingly and overran the Pakistani positions. The war was over within a fortnight in a devastating blow to Pakistan. It had lost not only the war, but also its eastern wing containing about half of its population, 93,000 soldiers and its pride.

Strategic balance

This overview of the three Indian-Pakistani wars between show how the military-strategic position of Pakistan vis-à-vis India changed in the second half of the twentieth century. Directly after Partition, Pakistan was in the position to prevent the accession of Jammu and Kashmir to India. Although Pakistan could not impose its will on India and take the entirety of Jammu and Kashmir, at the end of the war it controlled one-third of the territory of the former princely state and had extracted an Indian promise to hold a plebiscite on Kashmir's future. In the 1965 war, Pakistan carried out an offensive within Kashmir and made progress towards Srinagar before India counterattacked further south and forced a Pakistani retreat. This was the turning point in the military-strategic relationship between Pakistan and India. Although Pakistan was never able to impose its will on India, it was previously in the position to stand up to its rival. The 1971 war illustrated how the tables had turned. Pakistan was powerless to stop India amputating its eastern wing, collapsing within a fortnight to the combined Indian and Bangladeshi forces.

'Bleeding India by a thousand cuts'

After the Pakistani national humiliation in the 1971 Bangladeshi Liberation War, the country was confronted with a new, brutal reality. The Indian armed forces had displayed a shocking conventional superiority over the Pakistani Army. Pakistan had lost 150,000 square kms of territory as well as millions of people to the new state of Bangladesh. What is more, it had failed to achieve any form of assistance, material, financial or moral, from China and the United States. The support of (either one of) these two superpowers was the Pakistani insurance policy against the superior might of the Indian military. In that sense, the 1971 war was a harsh wake-up call: Pakistan was isolated internationally, and would have to deal with the Indian threat, which in the wake of their glorious victory in Bangladesh seemed stronger than ever, alone. The 1971 Indo-Pakistani War clarified that Pakistan could no longer aspire to achieve its goals of control over Kashmir, Bangladesh (East Pakistan), and regional dominance in a conventional military conflict. Instead, Pakistani prime minister Zulfikar Ali Bhutto declared that Pakistan's could only be successful by "delivering a thousand cuts on its body politic". Bhutto's successor as prime minister General Zia-ul-Haq gave form to the doctrine of "bleeding India by a thousand cuts" by using low-intensity, asymmetric warfare,

⁶⁶ Devin Hagerty [ed.], *South Asia in World Politics* (Oxford 2005) 72.

⁶⁷ Anthony Mascarenhas, *The Rape of Bangladesh* (New Delhi 1972) 14-22.

⁶⁸ Hagerty, *South Asia in World Politics*, 26-28.

supporting insurgencies, and training militants to destabilise India.⁶⁹ These tactics were employed in Punjab and Kashmir when respectively Sikh and Muslim insurgents rose up against Indian rule.

Punjab

When in the mid-1980s India was fighting a Sikh insurgency in the state of Punjab, Pakistan seized on the unrest in accordance with its stated doctrine vis-à-vis India of 'bleeding India with a thousand cuts'. Since the 1970s, Pakistan had been aiding the Sikh separatist movement, with the ISI supporting the Sikh militant leader Bhindranwale and his followers with weapons and ammunition. ISI created a special Punjab cell at its headquarters, and set up terrorist training camps outside Lahore and Karachi. Throughout the 1980s and early 1990s, Punjab was consumed by a terrorist campaign and a heavy-handed and often indiscriminate Indian army and police presence, leading to over 20,000 deaths in total.⁷⁰ A destabilised Punjab meant a threat to India's stability. Most of Punjab lies in an alluvial plain formed by the Indus River and its tributaries, a flat, fertile land stretching over 11 million acres. The state is known as the 'granary of India' for containing 40 per cent of the country's wheat production. Not only is Punjab India's wealthiest state, it also borders Pakistan in the west. The geology of the state means that it is "one of the vulnerable thrust points for any Pakistani incursion" into Indian territory.⁷¹ The flat, stretched-out plain is effectively a 300-mile wide welcome mat for the Pakistani Army. According to a former director of ISI, keeping Punjab destabilised was "equivalent to the Pakistan Army having an extra division at no cost to the tax payer".⁷²

Kashmir

As earlier described in this chapter, stewardship of the province of Jammu and Kashmir has been a source of contention between India and Pakistan since Partition, leading to three wars between the two countries, in 1947, 1965 and 1999. Since 1989, the province has been host to a popular and armed insurgency movement. Although the sources of popular discontent can be found in the incompetence and failure of Indian governance and democracy in the province, like in Punjab, Pakistan was not going to waste a good crisis. According to Kapur, "The Pakistanis actively capitalized on Kashmiri discontent (...) and played a crucial role in transforming spontaneous, decentralized opposition to Indian rule into a full-fledged insurgency dedicated to promoting an Islamist socio-political agenda and violently joining Kashmir to Pakistan".⁷³ Over the past thirty years, over 40,000 people have died in violence related to the Kashmir insurgency and Indian rule, with some human rights groups claiming casualties of more than 100,000.⁷⁴

Analysts at Western intelligence agencies such as MI6 and the CIA have confirmed their understanding that Inter-Services Intelligence, the Pakistani intelligence service provided systematic support to Kashmiri insurgent groups. Pakistan sees backing for insurgent groups as a relatively cheap and effective way to strike a blow to India without bringing India's massive conventional

⁶⁹ Owen Sirrs, *Pakistan's Inter-Services Intelligence Directorate: Covert Action and Internal Operations* (New York 2016) 166.

⁷⁰ Hamish Telford, "Counter-Insurgency in India: Observations from Punjab and Kashmir", *Journal of Conflict Studies*, 21 (2001) 1. Retrieved at: <https://journals.lib.unb.ca/index.php/JCS/article/view/4293> (retrieved 22 August 2020).

⁷¹ Vipin Narang, *Nuclear Strategy in the Modern Era* (Princeton, 2014) 63-65.

⁷² Owen Sirrs, *Pakistan's Inter-Services Intelligence Directorate: Covert Action and Internal Operations* (New York 2016) 167-168.

⁷³ S. Paul Kapur, *Jihad as Grand Strategy: Islamist Militancy, National Security, and the Pakistani State* (Oxford 2017), 84.

⁷⁴ "40,000 people killed in Kashmir: India", *The Express Tribune*, 10 August 2011.

Retrieved at: <https://web.archive.org/web/20170227232416/https://tribune.com.pk/story/228506/40000-people-killed-in-kashmir-india/> (retrieved 22 August 2020).

superiority upon itself. Through its Joint Intelligence North sub-division, ISI has been deeply involved in coordinating insurgent activity in Kashmir, including military training, planning and organisation, provision of equipment, weaponry and funds, and religious instruction at camps in Pakistan and Azad (Pakistani) Kashmir. In addition, ISI has aided insurgents in crossing the Line of Control, the border separating the Indian and Pakistani-controlled parts of Kashmir, into Indian territory. According to the former British High Commissioner to Pakistan Sir Hilary Synnott, "I had absolutely no doubt that ISI had been supporting infiltration and had been assisting with camps, and that this should stop."⁷⁵

Compellence

India's conventional superiority further improved in the 1990s, with a quantitative force ratio of 2:1 to 3.33:1 in India's favour.⁷⁶ However, the previous section has shown how India has struggled to bring that superiority to bear vis-à-vis Pakistan. Pakistan's strategy of 'bleeding India by a thousand cuts' has forced India to battle insurgencies in Punjab and Kashmir. Pakistan has supported terrorist groups operating in India with funding, materiel and training. After both states demonstrated their nuclear capability in 1998, Pakistan started its incursions into Indian-controlled Kashmir, triggering the Kargil War in early 1999. In this section I will address the Indian efforts to counter Pakistan's destabilisation strategy.

Limited war

Although the outcome of the Kargil War was positive for India, with Pakistani forces pushed back to the Line of Control and the status quo ante re-established, the conflict emphasised the importance of disabusing Pakistan of the notion that it could kick India in the shins and get away with it. India's strategy in countering the Pakistan would be to fight and win limited wars such as in Kargil in 1999, in order to compel Pakistan to bend to India's will. In a limited war, according to Indian Gen. V.P. Malik, "the escalatory ladder can be climbed in a carefully controlled ascent wherein politicodiplomatic [sic] factors would play an important role".⁷⁷ However, when the Indian strategy of compellence through limited war was tested during the 2001-2002 India-Pakistan standoff, it failed. Following the terrorist attack on the Indian Parliament on 13 December 2001, India aimed to coerce Pakistan into complying with its demands to extradite those responsible for the attacks, and more importantly, ending cross-border terrorist attacks in Indian-administered Kashmir, and other parts of India.

At a meeting of the Cabinet Committee on Security (CCS), Indian Prime Minister Atal Bihari Vajpayee and his cabinet colleagues agreed on a strike against terrorist camps in the Pakistani part of Kashmir. It would entail air strikes to destroy zones with a high concentration of camps, followed by a limited ground offensive by special forces to further neutralise the camps and occupy favourable positions along the Line of Control.⁷⁸ In addition, India mobilised its offensive strike corps to the border, a total of 500,000 troops. These steps were intended to signal that India was ready to go to war to compel Pakistan to end its support to Pakistani-based militant groups.

Cold Start

However, India's attack was ultimately called off after the Indian strike corps took nearly three weeks to reach the international border area. The three-week delay in India's response gave Pakistan ample

⁷⁵ Steve Coll, "The Stand-Off", *The New Yorker*, 6 February 2006. Retrieved at: <https://www.newyorker.com/magazine/2006/02/13/the-stand-off> (retrieved 22 August 2020).

⁷⁶ Vipin Narang, *Nuclear Strategy in the Modern Era* (Princeton, 2014) 90.

⁷⁷ VP Malik, "Indo-Pak Security Relations: Kargil and After," *Indian Express*, June 21, 2002.

⁷⁸ Coll, "The Stand-Off". Retrieved at: <https://www.newyorker.com/magazine/2006/02/13/the-stand-off>. (retrieved 22 August 2020).

time to escalate the stakes of the crisis in three ways, raising the cost of Indian escalation.⁷⁹ Firstly, Pakistan mobilised its own two strike corps, eliminating the element of strategic surprise. Secondly, Musharraf delivered a speech on 12 January 2002, two days before the planned strike into Pakistani Kashmir, in which he denounced religious extremism, promised to reform the *madrasas*, the Islamic schools that were used by militant groups as terrorist training grounds and condemned the 13 December attack as a "terrorist act".⁸⁰ Thirdly, most terrorist training camps had been moved out of Pakistani Kashmir, requiring Indian forces to cross the international border into Pakistan in order to strike a blow at the militant camps.⁸¹ The required escalation on India's part would paint it as an aggressor and might invite international intervention in Kashmir or even nuclear first use by Pakistan. These risks were too large to take for the Indian government and Indian PM Vajpayee called off the planned attack.

The failure of India's compellence through limited war strategy during the 2001-2002 India-Pakistan standoff spurred India to develop a new strategy to retaliate against Pakistan in a way that would inflict significant damage to the Pakistani Army before the international community could intervene, but with narrow enough aims to prevent escalation to the nuclear level.⁸² India developed Cold Start, an operational plan devised to make a rapid and limited penetration into Pakistani territory. Cold Start is aimed at providing India with the ability to punish Pakistan for any transgressions, such as a Pakistani-backed terrorist attack in India, without increasing the threat of nuclear escalation by threatening the survival of the Pakistani state. As such, it does not plan for the invasion of Pakistan. Emphasising speed and firepower, armoured divisions would perform a "rapid, time- and distance-limited penetration" into eastern Pakistan, without threatening the survival of the Pakistani state or provoking a nuclear response.⁸³

Conclusion

In this chapter, I have described the underlying historical context that explains the contentious relationship between Pakistan and India. Birthed from Partition and with territorial disputes over Kashmir and East Pakistan, India and Pakistan fought three wars in 1947, 1965 and 1971. Over the course of these wars, the conventional superiority of India became more apparent, at no time more so than during the 1971 war in which Indian armed forces inflicted a crushing military defeat on the Pakistani Army, amputating the eastern wing of the country in the process.

I have also explained how Pakistan has looked to counterbalance its growing conventional military and economic deficit compared to India. In the 1970s Pakistani President Zia developed a strategy of 'bleeding India by a thousand cuts'. Recognising that Pakistan would not be able to defeat India in any full-scale conventional war, this strategy called for low-intensity warfare, which mainly expressed itself as support for insurgencies in Punjab during the 1980s and Kashmir from 1989 onwards.

⁷⁹ Ibidem.

⁸⁰ Celia W. Dugger, "After Musharraf's Speech, Indian Officials Respond Cautiously and Only in Private", *New York Times*, 13 January 2001.

Retrieved at: <https://www.nytimes.com/2002/01/13/world/india-pakistan-tension-reaction-after-musharraf-s-speech-indian-officials.html> (retrieved 22 August 2020).

⁸¹ Coll, "The Stand-Off". Retrieved at: <https://www.newyorker.com/magazine/2006/02/13/the-stand-off>. (retrieved 22 August 2020).

⁸² Walter Ludwig, "A Cold Start for Hot Wars?: The Indian Army's New Limited War Doctrine" *International Security* 32 (2007) 3: 158-164.

⁸³ Tim Roemer, "COLD START – A MIXTURE OF MYTH AND REALITY", US Embassy in India, 16 February 2010. Retrieved at: <https://www.theguardian.com/world/us-embassy-cables-documents/248971> (retrieved 22 August 2020).

Although these insurgencies developed organically as a result of Indian repression of minorities, Pakistan offered support by way of weaponry, funds and training.

Beset by internal divisions in Punjab and Kashmir stoked by Pakistan and struggling to bring its conventional superiority to bear upon Pakistan, India sought to find a way to punish Pakistan for its transgressions. The 1999 Kargil War gave India the impression that it could contain Pakistan's 'bleeding by a thousand cuts' strategy by fighting and winning limited wars such as in Kargil. However, the lack of readiness of India's armed forces to carry out this 'compellence by limited war' strategy was exposed after the 13 December 2001 attack on the Indian Parliament, when India attempted to compel Pakistan to cease its support to terrorist groups operating in India by carrying out a strike across the border. The failure of India's 'compellence by limited war' strategy spurred India to develop a more responsive plan to punish Pakistan. 'Cold Start' aims to strike a rapid and debilitating blow to the Pakistani military, without threatening the survival of the Pakistani state.

This chapter has shown that the historic relationship between India and Pakistan has been one of conflict and tension, with India developing conventional and economic superiority in the second half of the twentieth century. Pakistan has developed an effective strategy to harm India's objectives, without exposing itself to India's conventional superiority. India has failed to devise a strategy that prevents the escalation of insurgent attacks in the 21st century without threatening uncontrollable escalation into the nuclear dimension. In the following chapters, I will examine the nuclear strategy of India and Pakistan to analyse the development of their respective nuclear postures and the consequences for nuclear escalation.

Chapter 4 – Pakistani nuclear doctrine

Introduction

In this chapter, I will examine the way the Pakistani state has expressed itself about the goals of its nuclear capability, and how Pakistani official statements say it will use its nuclear capability to achieve these goals. In the chapter outlining the theoretical framework of this thesis I have explained why examining a state's declared nuclear doctrine holds limited analytical value when seeking answers on the state's nuclear posture. However, it is important to start our analysis of Pakistan's nuclear capability by contextualising it through the way Pakistan claims to intend to use its nuclear deterrent.

In this chapter, I will first examine the political structures and external threats that influence Pakistan's nuclear strategy. Although I have already touched on these issues in the previous chapter on the historical relationship between India and Pakistan, it is nevertheless important to explain the political and geostrategic context in which Pakistan's nuclear capability exists. After that, I will explain how Pakistani nuclear doctrine has been developed, in order to explain how the core tenets of Pakistan's nuclear strategy have evolved. Finally, I will assess the current declared nuclear doctrine of Pakistan, by analysing the principle of 'first use'.

In the next chapter analysing Pakistan's nuclear command-and-control structure, I will of course test the conclusions reached in this chapter, in order to be able to discern whether Pakistan's declared doctrine accurately reflects its nuclear strategy, or whether it rather reflects state signalling. I will offer a hypothesis about what posture Pakistan is likely to assume, based on its nuclear doctrine.

Pakistani context

Political context

Political leadership

The Islamic Republic of Pakistan is a parliamentary democracy, in which the prime minister is head of government and the president is head of state. The bicameral Pakistani parliament is comprised of the National Assembly (lower house) and Senate (upper house), both with directly elected representatives from Pakistan's four provinces (Balochistan, Kheber Pakhtunkhwa, Punjab & Sindh), the Federally Administered Tribal Areas, and the Islamabad Capital Territory.⁸⁴

Historically, constitutionalism and democracy have not fared well in Pakistan, with the country under direct military rule for nearly half of its 72-year existence. Civilian governance has generally been weak, with military interference and influence high, even in times of formal civilian control of the government. The military has outright seized power from elected civilian leaders three times: in 1958, 1977 and 1999. However, not until 2013 did an incumbent government leave power through loss at the ballot box; all previous were removed by the army through explicit or implicit presidential orders.⁸⁵

In 2018, former cricketer Imran Khan was elected prime minister after his PTI party received a plurality during the parliamentary elections. Western analysts contend that Pakistan's security services interfered in the country's domestic politics both before and during the election in order to

⁸⁴ K. Alan Kronstadt, "Pakistan's Domestic Political Setting" *Congressional Research Service*, 5 March 2020. Retrieved at: <https://fas.org/sgp/crs/row/IF10359.pdf>

⁸⁵ Kronstadt, "Pakistan's Domestic Political Setting". Retrieved at: <https://fas.org/sgp/crs/row/IF10359.pdf> (retrieved 22 August 2020).

remove the incumbent prime minister Nawaz Sharif. The same analysts spoke of a 'military-judiciary nexus' that favoured Khan's PTI during the election. Prime Minister Khan, who has no previous governing experience, came to power emphasising an anti-corruption message and the creation of a welfare state, by investing more in education and health care. However, the latter effort has not yet borne fruit due to the country's dire financial state. Pakistan's military establishment is seen to retain a dominant influence over foreign and security policies.⁸⁶

Civil-military relations

In order to illustrate the dominance of the military in Pakistani decision-making on nuclear matters, I will show how the Pakistani army has complete control of Pakistan's nuclear capability. After Gen. Pervez Musharraf deposed Prime Minister Nawaz Sharif in 1999, he created the National Command Authority (NCA). This organisation has been responsible for Pakistani nuclear strategic policy ever since. Although the prime minister chairs the NCA, operational control of Pakistan's nuclear assets rests with the Strategic Plans Division (SPD), which is led by a military officer of Lt. Gen. rank.⁸⁷ This has resulted in the Pakistani Army retaining de facto control of Pakistan's nuclear assets, although the (usually civilian) prime minister is the de jure chair of the NCA. Even though Gen. Musharraf transferred power to a civilian government in 2008, there is no evidence that the SPD has relinquished this control since, leaving the military free of any civilian oversight on the positive or negative control side.⁸⁸ The National Command Authority Act of 2010 entrusted the "complete command and control over research, development, production and (...) all personnel, facilities, information, installations or organizations and other activities or matters connected therewith or ancillary thereto", enshrining the complete control of the NCA (and with it operational control of the SPD) of Pakistan's nuclear capability into law.⁸⁹

International context

India

As explained in the previous chapter, India and Pakistan have a contentious relationship which continues to express itself in border incidents and shootings. Since the 1990s, India's conventional military superiority has in fact improved, with a quantitative force ratio of 2:1 to 3.33:1 in India's favour.⁹⁰ Narang compares Pakistan's strategic predicament to that of NATO forces in Central Europe during the Cold War, "facing a nuclear-armed conventionally superior adversary that poses an existential land threat to the state".⁹¹ Pakistan has attempted to counter India's conventional superiority by relying on high-quality matériel and operating on interior lines of communication. In a war between the two states, these features will only prevent India from overrunning Pakistan in a short conflict. In a longer conventional conflict, India's overwhelming conventional superiority would be brought to bear and Pakistan would likely lose. From a security perspective then, it is crucial to Pakistan's survival that any conflict would be brought to an end as soon as possible, before Indian quantitative and qualitative superiority could be fully utilised.

⁸⁶ Ibidem. Retrieved at: <https://fas.org/sgp/crs/row/IF10359.pdf> (retrieved 22 August 2020).

⁸⁷ Peter Lavoy, "Pakistan's Nuclear Posture: Security and Survivability", *Calhoun Faculty and Researcher Publications* (2007), 12.

⁸⁸ Zeeshan Haider, "Pakistan's Nuclear Command Status Unchanged" *Reuters*, 8 April 2008. Retrieved at: <https://www.reuters.com/article/us-pakistan-nuclear/pakistans-nuclear-command-stays-unchanged-official-idUSISL28991220080408> (retrieved 22 August 2020).

⁸⁹ Government of India, "National Command Authority Act, 2010". Retrieved at: <http://nasirlawsite.com/laws/ncaa.htm> (retrieved 22 August 2020).

⁹⁰ Vipin Narang, *Nuclear Strategy in the Modern Era* (Princeton, 2014) 90.

⁹¹ Narang, *Nuclear Strategy in the Modern Era*, 90-91.

Pakistan possesses a significant geographical vulnerability to invasion from India, given that the centre of the country lies in an alluvial plain formed by the Indus River and its tributaries, a flat, fertile land stretching over 11 million acres. Bordering the Indian state of Rajasthan in the east, the geology of the Pakistani state of Punjab means that it is “one of the vulnerable thrust points for any Indian incursion” into Pakistani territory.⁹² The flat, stretched-out plain is effectively a 300-mile wide welcome mat for the Indian Army. In addition, Pakistan's strategic and population centres are located in the upper north (Islamabad, Lahore) of the country or in the lower south (Hyderabad, Karachi). An Indian thrust into Pakistani Punjab would sever supply lines and make communication between the capital and forces trapped in the south impossible, not to mention the military-strategic undesirability of having a bisected country to defend. Therefore, Pakistan feels existentially threatened by the threat of invasion by the conventionally superior Indian armed forces.

In the previous chapter, I have explained how India has developed its ‘Cold Start’ plan to counter destabilising efforts by India. Although Cold Start is designed to offer India a proportional response to Pakistani actions without escalating the conflict, the effectiveness of the plan is predicated upon the assumption that Pakistan will trust India, its primary adversary, to show proportionality and restraint. If India were to initiate Cold Start and Indian troops would swiftly advance into Sindh and Punjab, Pakistani leaders would likely feel threatened by the risk of bisection and subsequent vulnerability of Islamabad. Pakistani strategy would call for devolving tactical nuclear launch authority to field commanders, who could use the tactical nuclear weapons to stymie the Indian Army's advance. In addition, Pakistan's leaders would face a “use it or lose it” situation with regard to their strategic nuclear capability located in these provinces and might be pressed to release its nuclear weapons before capture or disabling by Indian forces. Strategic nuclear use by Pakistan would invite assured retaliation by India, ensuring the release of India's nuclear assets as well.

Development of Pakistani nuclear doctrine

While Pakistan is believed to have developed the ability to weaponise its nuclear capability in the mid-1980s, it refrained from doing so during this period. Instead, Pakistan possessed an ambiguous breakout nuclear capability.⁹³ This means that Pakistan was deliberately opaque about its nuclear options, in order to inflate the potential risk of its nuclear capability, and that it had the ability to assemble a handful of nuclear weapons. Pakistan adopted a catalytic posture, in which a nuclear-capable state leverages its importance to a third, nuclear-armed state in order to compel this state to intervene on its behalf in times of crisis. In Pakistan's case, it was a crucial conduit for the United States' support for the mujahideen in their war against the Soviet Union in neighbouring Afghanistan. Pakistan made optimum use of its importance to the United States in order to compel the superpower to intervene on its behalf during crises with India, without the need for developing an operational nuclear capability itself.

With the Soviet-Afghan War (and the Cold War) over, Pakistan lost its status as a key ally of the United States in the early 1990s. Narang compares Pakistan's strategic predicament to that of NATO forces in Central Europe during the Cold War, “facing a nuclear-armed conventionally superior adversary that poses an existential land threat to the state”.⁹⁴ Although its fragile economy could not weather the international backlash of a unilateral test to demonstrate the reliability and functionality of its capability, it started to seek delivery vehicles by missile and by air. In between 1991 and 1998, Pakistan sought to develop nuclear-capable attack aircraft, as well as dual-use ballistic missiles, such

⁹² Ibidem, 63-65.

⁹³ Ibidem, 22.

⁹⁴ Ibidem, 90-91.

as the Shaheen family of missiles (based on the Chinese M-class missile) and the Ghauri family of missiles (based on the North Korean No-Dong missile). When India tested its nuclear weapons in 1998, Pakistan was presented with an existential threat: its rival had acquired an overt nuclear capability, on top of its overwhelming conventional superiority.⁹⁵

After testing its nuclear weapons in May 1998, Pakistan moved to fully integrate its nuclear capability into its military forces and doctrine. It did so by credibly threatening the first use of nuclear weapons against Indian conventional forces, in the event of a breach of Pakistan's territorial integrity. Unlike Pakistan's previous catalytic nuclear posture in which its nuclear threat was meant to threaten escalation to a third-party state, Pakistan's new strategy directly deters conventional attack by an adversary by threatening the first use of nuclear weapons in either a tactical or strategic strike. The deterrent threat is communicated directly to the adversary instead of through a third party.

Principles of Pakistani nuclear doctrine

Nuclear first use

Pakistan has made it clear that the first use of nuclear weapons is its operational nuclear doctrine. Pakistani officials have also made statements on the conditions under which Pakistan would exercise the nuclear option. However, thresholds for Pakistani nuclear use in case of Indian aggression are left intentionally vague. Brig. Gen. Feroz Khan notes the reason for this ambiguity, "By declaring the red-line, what you are (...) indicating to them is that 'up to this point it is fair; you can come and beat me up'. (...) By declaring red lines, Pakistan erodes its deterrent value of the nuclear weapons". Filling the vacuum left by Pakistan's ambiguity are several ideas on the thresholds for Pakistani nuclear use.

In January 2002, during the 2001-2002 India-Pakistan crisis, Lt. Gen. Khalid Kidwai, the head of the Strategic Plans Division gave an interview in which he outlined the conditions for use: "Nuclear weapons are aimed solely at India. In case that deterrence fails, they will be used if: India attacks Pakistan and conquers a large part of its territory (space threshold); India destroys a large part of either its land or air forces (military threshold); India proceeds to the economic strangling of Pakistan (economic threshold); India pushes Pakistan into political destabilisation or creates a large-scale internal subversion in Pakistan (domestic destabilisation)".⁹⁶ While the last two conditions can be dismissed on account of the excessive escalation it would entail on Pakistan's part, it appears that the military threshold is the most important red line, as the space threshold can only be violated if the Pakistani armed forces are overrun. This is borne out by former Pakistani Foreign Secretary Aizaz Chaudhary, who stated in 2015 that Pakistan would use low-yield ('tactical') nuclear weapons on Indian forces in the case of an incursion into Pakistani territory, in order to stop the Indian forces in their tracks.⁹⁷

Lt. Gen. Sardar Lodi compares Pakistan's likely response to advancing Indian conventional forces to NATO doctrine during the Cold War, employing a graduated strategy, a "stage-by-stage approach in which the nuclear threat is increased at each step to deter India from attack". The first step would be

⁹⁵ Bhumitra Chakma, "Road to Chagai: Pakistan's Nuclear Programme, Its Sources and Motivations" *Modern Asian Studies* 36 (2002) 4, 909.

⁹⁶ Landau Network Centro Volto, *Nuclear Safety, Nuclear Stability, and Nuclear Strategy in Pakistan, A Concise Report of a Visit*, 15 January 2002. Retrieved at: <https://pugwash.org/september11/Pakistan-nuclear.htm> (retrieved 22 August 2020).

⁹⁷ Ankit Panda, "Pakistan Clarifies Conditions for Tactical Nuclear Weapon Use Against India" *The Diplomat*, 20 October 2015. Retrieved at: <https://thediplomat.com/2015/10/pakistan-clarifies-conditions-for-tactical-nuclear-weapon-use-against-india/> (retrieved 22 August 2020).

a public or private warning, before a demonstrative explosion of a small nuclear weapon on Pakistani soil. The third step would be nuclear use against advancing Indian forces on Pakistani soil. The fourth step would be to strike military targets in India. Others, such as Brig. Gen. Feroz Khan argue that Pakistan cannot rely on a graduated strategy, and instead must use its nuclear weapons capability massively and early in a conflict with India, striking both tactical and strategic targets. In the public sphere, the debate on Pakistan's thresholds for nuclear use has not been resolved, so in order to evaluate the direction of Pakistan's nuclear strategy, I will analyse Pakistan's nuclear command and control structure in the following chapter.

Stability-instability paradox

In the previous chapter, I have written about how Pakistan has tried to counterbalance India's conventional military superiority with its strategy of 'bleeding India by a thousand cuts'. Pakistan has used its nuclear capability as an umbrella under which it has been able to expand its strategy of 'bleeding India by a thousand cuts' without incurring a significant penalty from India in the form of an invasion. Pakistan's use of nuclear weapons as a shield to protect itself from the consequences of its actions is explained by the concept of the 'stability-instability paradox'. The stability-instability paradox essentially states that stability at the strategic level of conflict causes instability at lower levels of conflict. States are emboldened to carry out lower-level hostile actions, because they can be confident that these will not escalate into full-blown conflict.

On 26 November 2008, ten highly-trained operatives from Lashkar-e-Taiba arrived in Mumbai, India by sea from Karachi, Pakistan. In the following four days, the gunmen carried out 12 coordinated shooting and bombing attacks across the city of Mumbai, killing at least 174 people and leaving more than 300 wounded. The Indian Congress government did not want a repeat of the 2001/2 standoff by mobilising its troops and standing by, and did not see an serious option for conventional retaliation without risking nuclear escalation. Reporting on an Indian Cabinet crisis meeting led by prime minister Manmohan Singh debating retaliatory options after the Mumbai attack, the Indian Express reported: "But when the dust settled, all agreed that the unpredictability on the Pakistan side and the fear that its decision-makers could opt for a disproportionate response, including the nuclear option, stymied any possible chance of military action on India's behalf after 26/11."⁹⁸

Conclusion

It is clear that Prussian minister Friedrich von Schrötter's 18th century quip that Prussia "was not a country with an army, but an army with a country" may well be directed towards contemporary Pakistan.⁹⁹ The Pakistani military has rotated between exerting direct control via coups and indirect control, through its extensive influence over domestic and especially foreign affairs. Its influence has resulted in the army dominating decision-making on higher- and lower-level of (nuclear) policy. Pakistan's primary external threat is India, its deeply superior neighbour in terms of socio-economic, military and geo-strategic factors. Pakistan's nuclear strategy is therefore fully aimed at deterring an Indian attack. Pakistan first instituted a catalytic nuclear strategy, wherein it used its ambiguous nuclear capability to compel the US to prevent escalation by India.

The main principle which forms the basis of Pakistan's nuclear doctrine is first use of nuclear weapons. After India's nuclear tests in 1998, it instituted a first-use policy in an effort to stymie

⁹⁸ Pranab Dhal Samanta, "26/11: How India debated a war with Pakistan that November", *Indian Express*, 26 November 2010. Retrieved at: <http://archive.indianexpress.com/news/2611-how-india-debated-a-war-with-pakistan-that-november/716240/5> (retrieved 22 August 2020).

⁹⁹ See: Christophe Jaffrelot [ed.], *Pakistan at the Crossroads* (New York 2016).

India's conventional superiority. Pakistan's use of nuclear force thresholds are kept intentionally vague, so that its adversaries would not try and test the outer bounds of Pakistan's patience. However, it is clear that it would use nuclear force if conventional Indian forces would advance significantly into Pakistan. Pakistan deems itself to be inoculated against an Indian conventional attack by its first-use nuclear doctrine. It has thus utilised its doctrine to serve as an umbrella under which it can carry out its conventional strategy of destabilising India through support of terrorist groups active in India. The 2008 Mumbai terrorist attacks are an example of the way Pakistan is emboldened to support terrorist activities on Indian soil with funding, materiel and training.

The outline of Pakistan's nuclear doctrine I have drawn in this chapter would indicate that Pakistan's nuclear posture is that of asymmetric escalation. Pakistan's strategy is designed to deter conventional use by India, ensuring it to respond rapidly against conventional attacks with nuclear force. Pakistan has clearly expressed its intention to use its nuclear forces on its adversary's conventional forces in case of an attack, although it has kept its use of force thresholds vague. In the following chapter, I will test this hypothesis by analysing Pakistan's nuclear command-and-control structures through Pakistani nuclear weapons production, nuclear force development and nuclear command-and-control measures.

Chapter 5 – Pakistan's nuclear command-and-control system

Introduction

In this chapter, I will examine Pakistan's nuclear posture by evaluating Pakistan's nuclear weapons production, nuclear force development and nuclear command-and-control measures. In the previous chapter, I have analysed Pakistan's nuclear declared doctrine. I have offered the hypothesis that, consistent with the conclusions from that chapter, Pakistan will have adopted an asymmetric escalation posture. The adoption of an asymmetric escalation strategy would predict three developments within Pakistan's nuclear posture. Firstly, military control of production of nuclear materials, including warheads, non-fissile materials and delivery vehicles. Secondly, a delegative command structure which goes through the military chain of command, and which gives military commanders much leeway in nuclear use of force in times of crisis. Thirdly, a focus on development of short-range, ground-based nuclear missiles, to be used against invading Indian conventional forces. No horizontal development of Pakistan's nuclear development should be expected, given Pakistan's focus on deterring Indian conventional attack.

The chapter is composed of three main parts. Firstly, I will examine the socio-political context of Pakistan's nuclear weapons programme, explaining how the Pakistani Army retains a key influence in society, and the Pakistani nuclear programme in particular. Secondly, I will analyse Pakistan's nuclear forces, looking at it how it has developed its capabilities and how it is likely to develop in the future. Thirdly, I will analyse the measures that Pakistan has taken with regard to its nuclear command and control structure, in order to test the conclusion of the last chapter that Pakistan should have a delegative command and control system. The conclusions drawn from my research will inform my answer to part of the research question: what are the implications of Pakistan's development of its nuclear strategy for the security environment in South Asia?

I have based my research mainly on Pakistani public statements, on yearly reports by the Bulletin of the Atomic Scientists and US Congressional reports. Although it is unfortunate (but understandable) that little official information about the guardianship of Pakistan's nuclear weapons is in the public domain, the sources available have enabled me to offer an accurate and detailed examination of the development of Pakistan's nuclear capability.

Nuclear production and development

This section analyses the production and development of nuclear materials, including warheads, non-fissile materials and delivery vehicles. Military control of the production and development lines would imply a nuclear posture of asymmetric escalation, given the fact that this is the only one of the three postures to have a delegative nuclear command-and-control system. In a delegative command-and-control system, responsibility of a state's nuclear capability is increasingly devolved from the state's civilian leadership to the military. In addition, an asymmetric escalation posture would predict warhead production to remain limited and stable, given the posture's focus on deterring conventional attack. Given the deterrent's focus on tactical use, the development of longer-range nuclear missiles or air- or sea-based capabilities would not be logical for an asymmetric escalation posture. In this section, I will evaluate whether this is the case.

Military control

Although little has been publicly made available about the organisations which are responsible for developing and producing various missile systems and other crucial components of Pakistan's nuclear

capability, publicly available intelligence assessments have provided useful insights into the way these organisations are run and how they relate to one another.

Responsibility for the production of various nuclear components is spread among a number of organisations.¹⁰⁰ For instance, the National Development Complex (NDC) is responsible for Pakistan's missile development programme, overseeing development of the Shaheen missiles. It has also been involved in the development of the Ghauri missile. The Air Weapons Complex (AWC) develops guidance systems for Pakistan's missiles, and is involved in development of the Ra'ad missile. The Pakistan Atomic Energy Commission (PAEC) is partly responsible for the development of a sea-launched version of the Babur (Babur-3), together with the Naval Strategic Forces Command (NSFC), which is to become the "custodian of the nation's second strike capability".¹⁰¹ The Space and Upper Atmosphere Research Commission (SUPARCO) oversees Pakistan's space programme, but also assisted the NDC in the development of the Shaheen-1 and Shaheen-2 missiles.

The above collection of commissions and agencies appears indicative of a competitive culture of nuclear research in Pakistan. However, all of the aforementioned organisations are under the administrative control of the National Engineering and Scientific Commission (NESCOM). NESCOM functions as an umbrella organisation for Pakistani military research and development, responsible for carrying out research and development in many areas relating to information technology, fluid dynamics, aerodynamics, aerospace engineering, electrical engineering, mechanical engineering and chemical engineering, with specialties in the design and production of communication systems and aerodynamic vehicles for the Pakistan Armed Forces. NESCOM is under the administrative control of the Strategic Plans Division of Pakistan's National Command Authority, meaning that the Pakistani army (and air force) has not only centralised all military-adjacent research in the country, but it also has taken custody of all the necessary components of a functional nuclear weapon, from the delivery vehicles, to the explosives used, to the warhead itself.¹⁰²

Expansion

According to public estimates, Pakistan possesses 140 to 150 nuclear weapons, though it could have more.¹⁰³ This exceeds the projection made in 1999 by the US Defense Intelligence Agency that Pakistan would possess 60 to 80 warheads by 2020.¹⁰⁴

Pakistan produced fissile material for its nuclear weapons using gas-centrifuge uranium enrichment technology. The fissile materials used in Pakistan's nuclear weapons are highly-enriched uranium and plutonium. The main facility for enriching uranium is located at Kahuta, the technology used there has been gained through many different sources, from A.Q. Khan's proliferation network in the 1980s, and more recently from China. Pakistan's uranium warheads use an implosion design with a solid core of around 15-20 kgs of highly enriched uranium. It is reported that Pakistan continues to produce highly enriched uranium for five additional nuclear weapons a year (a rate of 100 kgs/year).

¹⁰⁰ Jonathan McLaughlin, "Pakistan Prioritizes Short-Range, Nuclear-Capable Missiles", *Wisconsin Project on Nuclear Arms Control*, 1 February 2016. Retrieved at: <https://www.wisconsinproject.org/pakistan-missile-update-february-2016/> (retrieved 22 August 2020).

¹⁰¹ Inter-Services Public Relations (ISPR), "No PR-122/2012-ISPR", 19 May 2012. Retrieved at: <https://www.ispr.gov.pk/press-release-detail.php?id=2067> (retrieved 22 August 2020).

¹⁰² Nuclear Threat Initiative, "National Engineering and Scientific Commission (NESCOM)", 26 September 2011. Retrieved at: <https://www.nti.org/learn/facilities/586/> (retrieved 22 August 2020).

¹⁰³ Hans M. Kristensen, Robert S. Norris & Julia Diamond, "Pakistani nuclear forces, 2018" *Bulletin of the Atomic Scientists*, 74 (2018) 5, 348.

¹⁰⁴ Nuclear Threat Initiative, "National Engineering and Scientific Commission (NESCOM)", 26 September 2011. Retrieved at: <https://www.nti.org/learn/facilities/586/> (retrieved 22 August 2020).

In 2016, the International Panel on Fissile Materials estimated that Pakistan had an inventory of 3,400 kgs of highly enriched uranium.¹⁰⁵

Pakistan also possesses plutonium-based warheads and continues to produce weapons-grade plutonium. Pakistan has had an operational heavy-water plutonium production reactor at Khushab since 1998. In addition, Pakistan appears to be constructing three additional reactors at Khushab, significantly increasing its plutonium production. According to an estimate, Pakistani plutonium warheads likely contain 4-6 kgs of plutonium.¹⁰⁶ In 2016, the International Panel on Fissile Materials estimated that Pakistan had an inventory of approximately 280 kgs of weapon-grade plutonium.¹⁰⁷

Nuclear-capable missiles and mobile launchers are developed and produced at the National Defence Complex in the Kala Chitta Dahr mountain range to the west of Islamabad. While the western section of the complex appears to be involved in development, production and testing of missiles and rocket engines, the eastern section is focused on the production and assembly of Transporter Erector Launchers (TEL), which are designed to transport and fire missiles. Satellite images show that this section has been expanded significantly over the last 10 years, with several large launcher assembly buildings having been built.¹⁰⁸

Conclusion

It can be confirmed that Pakistan's nuclear production and development lines are firmly under military control. A wide array of military organisations is responsible for different parts of Pakistan's nuclear research and development. All these organisations are under the aegis of NESCOM, a military umbrella organisation under the administrative control of the Strategic Plans Division of Pakistan's National Command Authority, meaning that the Pakistani armed forces have not only centralised all military-adjacent research in the country, but have also taken custody of all the necessary components of a functional nuclear weapon, from the delivery vehicles, to the explosives used, to the warhead itself.

Pakistani development on materials and production show that it is expanding its nuclear capability. In theory, Pakistan's stockpile of fissile materials (highly-enriched uranium and plutonium) could produce between 236 and 283 warheads, assuming that each warhead's solid core uses 15-18 kgs of highly-enriched uranium or 5-6 kgs of plutonium.¹⁰⁹ However, this would not be an accurate stockpile estimate, given that not all fissile material is used for warheads, but some is kept in reserve. In addition, Pakistan lacks the nuclear-capable launchers to accommodate 200-300 warheads, especially given the fact that Pakistan's launchers are dual-capable, meaning that some of the launchers are used for non-nuclear ends as well. However, the growth of the missile launcher

¹⁰⁵ David Albright, "Pakistan's Inventory of Weapon-Grade Uranium and Weapon-Grade Plutonium Dedicated to Nuclear Weapons," *Institute for Science and International Security*, 19 October 2015. Retrieved at: www.isis-online.org/uploads/isis-reports/documents/Pakistan_WGU_and_WGPu_inventory_Oct_16_2015_final_1.pdf (retrieved 22 August 2020).

¹⁰⁶ Hans M. Kristensen and Robert S. Norris, "Pakistan's nuclear forces, 2011", *Bulletin of the Atomic Scientists* 67 (2011) 4, 91-99.

¹⁰⁷ International Panel on Fissile Materials, "Global Fissile Materials Report 2015: Nuclear Weapon and Fissile Material Stockpiles and Production". Retrieved at: <http://fissilematerials.org/library/gfmr15.pdf> (retrieved 22 August 2020).

¹⁰⁸ Hans M. Kristensen, Robert S. Norris & Julia Diamond, "Pakistani nuclear forces, 2018" *Bulletin of the Atomic Scientists*, 74 (2018) 5, 351.

¹⁰⁹ These estimates are based on Table A.1 of: International Panel on Fissile Materials, *Global Fissile Materials Report 2015: Nuclear Weapon and Fissile Material Stockpiles and Production*, 44. Retrieved at: <http://fissilematerials.org/library/gfmr15.pdf> (retrieved 22 August 2020).

production facility at the National Defence Complex shows that Pakistan is growing its missile launcher capability, as well.¹¹⁰

Pakistan's nuclear forces

In this section I will evaluate whether Pakistan's nuclear force structure development fits the hypothesis of an asymmetric escalation posture. According to its predicted nuclear posture of asymmetric escalation, Pakistan should not have to expand its nuclear arsenal too far outside the minimum needed for deterrence.¹¹¹ Pakistan's predicted nuclear force structure is limited in size, and focused on readiness to deter Indian conventional forces. Pakistan can be expected to narrowly focus on short-range, ground-based tactical nuclear missiles, in order to stymie a conventional Indian advance.¹¹² No horizontal development of Pakistan's nuclear development should be expected, given Pakistan's focus on deterring Indian conventional attacks.

Land-based capability

Land-based ballistic missiles

Currently, Pakistan has six operational nuclear-capable land-based ballistic missiles. These can be divided into short-range and medium-range missiles. The short-range Abdali, Ghaznavi, Shaheen-1 and NASR have ranges of 70 km to 750 km, while the medium-range Ghauri and Shaheen-2 have ranges of 1,300 km and 2,000 km respectively. The Abdali, Ghaznavi and Shaheen-1 missiles are aimed at targets across the Indian border, while the Ghauri and Shaheen-2 are intended to target strategic targets further inland. Pakistan continues to develop its land-based missile capability, with the development of three missile types being particularly illuminating as to Pakistan's nuclear posture evolution.

Development of the new NASR short-range missile has caused consternation, because its range of 70 km is too short to attack strategic targets inside India. Thus, the NASR appears to be intended as a 'tactical' nuclear device, for battlefield use against invading Indian armed forces.¹¹³ The development of this missile shows that Pakistan is acting on its public statements to use low-yield nuclear devices to stall the advance of Indian troops.¹¹⁴ The belief of some Pakistani military and political leaders that the use of tactical nuclear weapons would stay below the threshold of nuclear war is an assumption not shared by most analysts.¹¹⁵ Instead, the development of the NASR missile offers an additional route for nuclear escalation between India and Pakistan, especially in the unstable environment of a crisis.

In 2015, Pakistan conducted two test launches of the medium-range Shaheen-3 with an estimated range of 2,750 km, making it the longest-range missile in Pakistan's armoury.¹¹⁶ The Shaheen-3's

¹¹⁰ Kristensen, Norris & Diamond, "Pakistani nuclear forces, 2018", 349.

¹¹¹ Vipin Narang, *Nuclear Strategy in the Modern Era* (Princeton 2014) 19.

¹¹² Vipin Narang, *Nuclear Strategy in the Modern Era* (Princeton 2014) 19.

¹¹³ AH Nayyar and Zia Mian, "The Limited Military Utility of Pakistan's Battlefield Use of Nuclear Weapons in Response to Large Scale Indian Conventional Attack", *Pakistan Security Research Unit*, 61 (2011). Retrieved at: <https://spaces.brad.ac.uk:8080/download/attachments/748/Brief61doc.pdf> (retrieved 22 August 2020).

¹¹⁴ ISPR, "No PR-344/2017-ISPR", 5 July 2017. Retrieved at: <https://www.ispr.gov.pk/press-release-detail.php?id=4097> (retrieved 22 August 2020).

¹¹⁵ See for example: Jeffrey D. McCausland, "Pakistan's Tactical Nuclear Weapons: Operational Myths and Realities," in: Michael Krepon, Joshua T. White, Julia Thompson, and Shane Mason [eds.], *Deterrence Instability and Nuclear Weapons in South Asia* (Washington, D.C 2015), 149-175. Retrieved at: <https://www.stimson.org/wp-content/files/file-attachments/McCausland.pdf> (retrieved 22 August 2020).

¹¹⁶ Defense Intelligence Ballistic Missile Analysis Committee, "Ballistic and Cruise Missile Threat" US Department of Defense (2017), 5. Retrieved at:

range is sufficient to target all of mainland India if launched from positions south of Islamabad. In addition, the Shaheen-3 could reach the Andaman and Nicobar Islands in the eastern part of the Indian Ocean. In recent years, the archipelago has been developed as a strategic base for the Indian Navy, and has even been speculated as a base for India's nuclear weapons.¹¹⁷ However, if deployed in the western part of Pakistan, in Balochistan province, the Shaheen-3 missile gives Pakistan the capability to reach many states in the Middle East, including Israel.¹¹⁸ Thus, the development of the Shaheen-3 missile widens the scope of Pakistan's nuclear deterrent.

The third notable land-based ballistic missile development is the Ababeel missile, tested in January 2017. This medium-range (2,200 km) missile is "capable of carrying multiple warheads, using Multiple Independent Re-entry Vehicle (MIRV) technology."¹¹⁹ According to the Pakistani government, the Ababeel missile is "aimed at ensuring the survivability of Pakistan's ballistic missiles in the growing regional Ballistic Missile Defence environment", referring to India's planned Prithvi and Ashwin missile defence systems.

Air-based capability

Pakistan's air-based nuclear capability is based on select squadrons of the F-16A/B and Mirage III/V fighter aircraft. Its F-16 fighter aircraft fleet, supplied by the United States between 1983 and 1987 is believed by the United States to have been modified to accommodate the delivery of nuclear weapons.¹²⁰ More modern F-16C/Ds have been supplied to Pakistan by the George W. Bush administration. The F-16A/Bs are based at the Mushaf Air Base, 160 km to the northwest of Lahore. These aircraft have a range of 1,600 km and are probably equipped to carry a single nuclear bomb each. The nuclear bombs are most likely not stored on base, but could be stored at the Sargodha Weapons Storage Complex, only 10 km to the south. In a crisis, the weapons could be quickly transferred to the base.

Mirage V fighter-bombers may also be used as delivery vehicles.¹²¹ With their added range, their use would enhance Pakistan's air-based nuclear capability. The Mirages are based at two locations, Masroor Air Base outside Karachi, with a potential nuclear storage facility only five km to its northwest, and the Rafiqui Air Base near Shorkot, which does not have an apparent storage site close by. In addition, secure underground facilities have been constructed at Masroor since 2004, which could potentially include weapons-handling capability.¹²²

https://www.nasic.af.mil/Portals/19/images/Fact%20Sheet%20Images/2017%20Ballistic%20and%20Cruise%20Missile%20Threat_Final_small.pdf?ver=2017-07-21-083234-343 (retrieved 22 August 2020).

¹¹⁷ Khalid Kidwai and Peter Lavoy, "A Conversation With Gen. Khalid Kidwai (transcript)" Carnegie International Nuclear Policy Conference 2015, 23 March 2015. Retrieved at: <https://carnegieendowment.org/files/03-230315carnegieKIDWAI.pdf> (retrieved 22 August 2020).

¹¹⁸ Kidwai and Lavoy, "A Conversation With Gen. Khalid Kidwai (transcript)". Retrieved at: <https://carnegieendowment.org/files/03-230315carnegieKIDWAI.pdf> (retrieved 22 August 2020).

¹¹⁹ ISPR, No PR-34/2017-ISPR, 24 January 2017. Retrieved at: <https://www.ispr.gov.pk/press-release-detail.php?id=3705> (retrieved 22 August 2020).

¹²⁰ National Security Council, "Report To Congress: Update on Progress toward Regional Nuclear Nonproliferation in South Asia", 3 April 2013. Retrieved at: https://www.armscontrol.org/files/ACA_2013_Nuclear_Report_Card.pdf (retrieved 22 August 2020).

¹²¹ Hans M. Kristensen, Robert S. Norris & Julia Diamond, "Pakistani nuclear forces, 2018" *Bulletin of the Atomic Scientists*, 74 (2018) 5, 351.

¹²² Paul K. Kerr and Mary Beth Nikitin, "Pakistan's Nuclear Weapons" *Congressional Research Service (CRS) Report* (2016) 7.

Sea-based capability

Pakistan does not currently possess a sea-based nuclear capability. The lack of submarine-launched ballistic missiles (SLBM) reduces the credibility of Pakistan's secure second-strike capability. However, it is developing a sea-launched version of the Babur, known as Babur-3. Once operational, it will be deployed on the diesel-electric Agosta-class submarines and have a range of 450 km, completing the triad of nuclear strike platforms from ground, air and sea.¹²³ A sea-based nuclear force could provide Pakistan with a more secure second-strike capability, although Pakistan's diesel submarines do not currently have stealth technology.¹²⁴

Conclusion

If one examines Pakistan's development of its nuclear forces, one can only conclude that Pakistan is expanding its nuclear arsenal, both in size and in depth. What's more, Pakistan's nuclear expansion is not reflected by its asymmetric escalation posture.

Pakistan continues to develop its nuclear capability, expanding its nuclear arsenal "with (...) more warheads, more delivery systems, and a growing fissile materials production industry".¹²⁵ With several delivery systems in development, and its plutonium and highly enriched uranium production expanding, scientists expect Pakistan's nuclear stockpile to expand to 220 to 250 warheads by 2025, if current trends continue.

Although the development of the NASR tactical missile is predicted by Pakistan's asymmetric escalation posture of threatening nuclear first use against advancing Indian forces, the development of the medium-range Shaheen-3 with its 2,750 km range is not. Neither are Pakistan's efforts to ensure a secure second-strike capability by way of gaining a sea-based nuclear capability. It is clear that Pakistan is expanding its nuclear capability beyond the requirements of its asymmetric escalation posture.

¹²³ ISPR, No PR-142/2018-ISPR, 14 April 2018. Retrieved at: <https://www.ispr.gov.pk/press-release-detail.php?id=4693> (retrieved 22 August 2020).

¹²⁴ Feroz Hassan Khan, "Going Tactical: Pakistan's Nuclear Posture and Implications for Stability" *IFRI Security Studies Center* 53 (2015). Retrieved at: https://www.ifri.org/sites/default/files/atoms/files/pp53khan_0.pdf (retrieved 22 August 2020).

¹²⁵ Hans M. Kristensen, Robert S. Norris & Julia Diamond, "Pakistani nuclear forces, 2018" *Bulletin of the Atomic Scientists*, 74 (2018) 5, 348.

Table 1. Pakistani nuclear forces, 2018.

Type	NATO designation	Number of launchers	Year deployed	Range (kilometers) ¹	Warhead x yield (kilotons) ³	Number of warheads ²
Aircraft						
F-16A/B		~24	1998	1,600	1 x bomb	~24
Mirage III/V		~12	1998	2,100	1 x bomb (or Ra-ad)	~12
Subtotal:		~36				~36
Land-based ballistic missiles						
Abdali (Hatf-2)		10	(2015)	200	1 x 5-12 kt	10
Ghaznavi (Hatf-3)		~16	2004	300	1 x 5-12 kt	~16
Shaheen-1(Hatf-4)		~16	2003	750	1 x 5-12 kt	~16
Shaheen-1A (Hatf-4)		-	(2018)	900	1 x 5-12 kt	-
Shaheen-2(Hatf-6)		~12	2014	1,500	1 x 10-40 kt	~12
Shaheen-3 (Hatf-6)		-	(2018)	2,750	1 x 10-40 kt	-
Ghauri (Hatf-5)		~24	2003	1,250	1 x 10-40 kt	~24
NASR (Hatf-9)		~24	(2013)	60-70	1 x 5-12 kt	~24 ⁴
Ababeel (Hatf-?)		-	-	2,200	MIRV or MRV	-
Subtotal:		~102				~102
Ground and air-launched cruise missiles						
Babur GLCM (Hatf-7)		~12	2014	350 ⁵	1 x 5-12 kt	~12
Babur-2/1(B) GLCM (Hatf-?)		-	- ⁶	700	1 x 5-12 kt	-
Ra'ad ALCM (Hatf-8)		-	(2017)	350	1 x 5-12 kt	-
Ra'ad-2 ALCM (Hatf-?)		-	(2018)	>350	1 x 5-12 kt	-
Subtotal:		~12				~12
Sea-based cruise missiles						
Babur-3 SLCM (Hatf-?)		-	- ⁷	450	1 x 5-12 kt	-
Total						~140-150

¹ Range listed is unrefueled combat range with drop tanks.

² There may be more missiles than launchers but since each missile is dual-capable, this table assigns an average of one warhead per launcher unless noted otherwise.

³ Yield estimate is based on the range of yields measured in the 1998 nuclear tests. It is possible that Pakistan since has developed warheads with lower and higher yields.

⁴ Each NASR launcher has up to four missile tubes. But since NASR is a dual-capable system and the primary mission probably is conventional, this table counts only one warhead per launcher.

⁵ The Pakistani government claims the Babur range is 700 kilometers, twice the 350-km range reported by the US intelligence community.

⁶ The Babur-2/1(B) seems to be an improved version of the original Babur GLCM. It was first tested on 14 December 2016.

⁷The Babur-3 SLCM was first test launched on 9 January 2012 from an underwater platform.

Image 2- Pakistani nuclear forces, 2018¹²⁶

¹²⁶ Ibidem, 349.

Pakistan's nuclear C2 measures

In this section, I will examine the command-and-control procedures that govern Pakistan's nuclear weapons. I will first make a hypothesis about the choices that Pakistan has made as part of its nuclear command and control structure. Then, I will look at the positive control and negative control measures that Pakistan has taken. After that, I will conclude by returning to my hypothesis, and analyse the meaning of the data I have found.

In order to credibly threaten a rapid, asymmetric escalation to first use of nuclear weapons, Pakistan must develop the ability to disperse and deploy nuclear assets quickly, pre-delegate launch authority to field commanders who would be charged with deploying tactical or strategic weapons to deter an adversary's advancing conventional forces or war-making capacity.¹²⁷ For an asymmetric escalator such as Pakistan, it is necessary to prioritise positive control measures in order to prevent decapitation, and deprioritise negative control measures in order to credibly threaten rapid nuclear escalation, especially in times of crisis.

In addition, the previous sections on control of nuclear policy and research and development have shown that in Pakistan, the military has operational control of the nuclear arsenal and the development of materials. Research by Sagan and Posen has shown that organisations, especially military organisations, tend to overestimate its own competence, favour offensive strategies and procedures that allow the retention of initiative and independence, and try to minimise civilian interference.¹²⁸ Given the role of the military in the command and control of Pakistani nuclear weapons, the research would suggest that the Pakistani Army would undertake measures that underestimate the possibility of accidental or unauthorised use, and measures that would support an offensive doctrine to make sure that Pakistan's nuclear weapons would not be destroyed ('use it or lose it'). Translating to C2 systems, the measures that the Pakistani Army would adopt would be of a delegative nature, placing nuclear launch authority in the hands of theatre commanders in times of crisis, with as little physical impediments to their release as possible.

Positive control

As part of its delegative command-and-control structure, the Pakistani Army has placed a premium on positive control measures to minimise the risk of decapitation: a successful first strike that renders Pakistan's arsenal unusable, either because the attack destroys the delivery systems, or because the attack so disrupts command-and-control that retaliation becomes impossible.¹²⁹ One of the positive control measures that Pakistan has taken is the pre-delegation of launch authority to field commanders in the event that communication was to break down in a crisis. This is also because of the short missile flight time between India and Pakistan, giving Pakistan precious little time to respond, upon receiving warning of attack.

Weapons storage

Pakistan claims to store its nuclear arsenal in component form, meaning that the pits, explosives packages and delivery vehicles are stored separately from each other, in order to enhance security. However, Pakistani officials have made several statements that qualify the claim that its nuclear components are stored separately. Pakistani military officials have been quoted to say that "in emergency conditions (...) equipment is repositioned to allow for rapid assembly."¹³⁰ Gen. Kidwai has

¹²⁷ Vipin Narang, *Nuclear Strategy in the Modern Era* (Princeton 2014) 19.

¹²⁸ Scott D. Sagan, *The Limits of Safety: Organisations, Accidents, and Nuclear Weapons* (Princeton 1993) 11-39.

¹²⁹ John D. Steinbruner, "Nuclear Decapitation," *Foreign Policy*, 45 (1981) 2, 16-28.

¹³⁰ Molly Moore and Kamran Khan, "Pakistan Moves Nuclear Weapons: Musharraf Says Arsenal is Now Secure", *Washington Post*, 11 November 2001. Retrieved at: (see next page)

suggested that all the components necessary to assemble and deliver a functional nuclear weapon are in close proximity to each other: "Whether separated by yards or miles, the weapons will be ready to go in no time."¹³¹ These statements, together with the evolving capabilities of some Pakistani military bases, imply that Pakistan stores all necessary components for rapid assembly and deployment either on base (such as at Masroor Air Base) or in close proximity (Sargodha Air Base). It is even possible that a small number of nuclear warheads is kept in reserve fully assembled for emergencies. Indeed, Gen. Kidwai in an interview denied that Pakistan ever claimed that the nuclear cores of the bombs are split from their detonators and that the warheads are kept separate from their delivery system. "Distance is not the issue," Kidwai stated, "the issue is timing. Separation is more linked to time rather than to space".¹³² There is the added complication of the development of new systems such as the NASR which are kept in a pre-mated state in sealed tubes before deployment.¹³³

Storage locations

Six to twelve secret military locations have been reported to store nuclear components, although some are likely to be dummy sites to enhance security and survivability.¹³⁴ These locations are likely to be in sectors where Indian conventional forces would be expected to advance, and thus where rapid assembly and deployment of nuclear weapons is necessary. To prevent a rapid Indian advance capturing or pre-empting Pakistan's nuclear deterrent, nuclear assets cannot be moved too close to the border (e.g. Lahore). Given the ranges of the Pakistani tactical missiles such as the NASR, the assets cannot be moved too far back from the international border either (e.g. Northwest Frontier Province). These conditions narrow the likely area to a strip of land 50-150 km from the international border, to the rear of Punjab and Sindh provinces south of Islamabad.

Negative control

Given Pakistan's delegative command-and-control system, negative control measures are expected to be weak in comparison to its positive control measures. The credibility of Pakistan's asymmetric escalation posture relies on theatre commanders' ability to quickly release nuclear weapons during crisis situations, when communication with the NCA might become impossible. Pakistan's lack of strategic depth means that the absence of robust negative controls may be necessary to enable a quick release of nuclear weapons in the event of a surprise Indian attack or NCA decapitation. The lack of negative controls are a feature of the tactical nuclear capabilities that Pakistan has been developing, as well. Although Pakistan has established negative control procedures limiting the release of nuclear weapons, these measures appear to share one key feature: they do not physically prevent lower-level officers from actually taking offensive steps without authorisation.

Chain of command

Although the chain of command is clearly demarcated under all military contingencies according to Brig. Gen. Khan, "in the event of a command breakdown, a theatre commander, seeing the

<https://www.washingtonpost.com/archive/politics/2001/11/11/pakistan-moves-nuclear-weapons/f1656801-497f-4ce0-94d9-9283de873584/> (retrieved 22 August 2020).

¹³¹ Ron Moreau, "Pakistan's Nukes", *Newsweek*, 26 January 2008.

¹³² Maurizio Martellini, "Security and Safety Issues about the Nuclear Complex: Pakistan's Standpoints" 2. Retrieved at: <https://pugwash.org/2002/01/14/report-on-nuclear-safety-nuclear-stability-and-nuclear-strategy-in-pakistan/> (retrieved 22 August 2020).

¹³³ Verghese Koithara, *Managing India's Nuclear Forces* (Washington, DC 2012), 127.

¹³⁴ Moore and Khan, "Pakistan Moves Nuclear Weapons". Retrieved at: <https://www.washingtonpost.com/archive/politics/2001/11/11/pakistan-moves-nuclear-weapons/f1656801-497f-4ce0-94d9-9283de873584/> (retrieved 22 August 2020).

opponent's forces marching into his area of responsibility, would be hard-pressed to stand by and take no action."¹³⁵ As stated previously, the NCA must authorise each step of the nuclear escalation ladder (assembly, mating, movement, release), but the absence of strong negative controls mean that these directives rely on the will and ability of the guardians of Pakistan's nuclear deterrent to follow them. Brig. Gen. Khan states that "[A] theatre commander would probably take matters into his own hands (...) should a trade-off be required, battle effectiveness of the nuclear force will trump centralised control."¹³⁶

Two-man rule

Pakistan has implemented the 'two- or three-man rule' in order to prevent any one individual to operate a weapons system or issue the command for nuclear weapons use. In order to achieve this, launch codes are split between two (in case of moving nuclear assets) or three (in case of launching them) individuals.¹³⁷ In theory, the two- or three-man rule is a measure strengthening negative control, by decreasing the risk of unwanted use. However, the launch codes are split at lower levels of military command and appear to be co-located with each other, as well as with the warheads themselves.¹³⁸ For example, at an air force base the code may be split between the base commander and the unit commander, or in the army, a code is divided between the group commander and the unit commander. The execution of the Pakistani two- or three-man rule means that negative control is not reinforced by the measure, to the contrary.

PAL

One key negative control measure is a Permissive Action Link (PAL) capability, designed to prevent unwanted use. The term is broadly used for any device included in or attached to a nuclear weapon system to preclude arming and/or launching until the insertion of a launch code.¹³⁹ According to Gen. Kidwai, Pakistan employs 'Pak PALs', which are a domestic version of the American system, comprised of a twelve-digit alphanumeric code.¹⁴⁰ Given Pakistan's asymmetric escalation posture and disassembled maintenance procedures, 'Pak-PALs' are likely a rudimentary system of combination locks on (some) nuclear components, circumventable by design for rapid assembly and use. The credibility of Pakistan's asymmetric escalation posture hinges on theatre commanders' ability to quickly release nuclear weapons, even when the appropriate channels for launch authorisation cannot be reached. A weak, by-passable PAL is therefore the negative control measure most consistent with Pakistan's chosen posture. This is also the belief of India, who "assume there is nothing preventing these chaps from releasing the weapons once they take custody of them."¹⁴¹

¹³⁵ Feroz Khan, "Challenges to nuclear stability in South Asia" *The Nonproliferation Review* 10 (2003) 1, 67-68.

¹³⁶ Feroz Khan, "Nuclear Command and Control in South Asia during Peace, Crisis, and War", *Contemporary South Asia*, 14 (2005) 2, 169.

¹³⁷ Vipin Narang, *Nuclear Strategy in the Modern Era* (Princeton 2014) 89.

¹³⁸ Narang, *Nuclear Strategy in the Modern Era*, 89.

¹³⁹ Ross Anderson, *Security Engineering: A Guide to Building Dependable Distributed Systems* (Cambridge 2010) 236-237.

¹⁴⁰ David E. Sanger, "Obama's Worst Pakistan Nightmare" *New York Times Magazine*, 11 January 2011.

¹⁴¹ Vijay Shankar, "A Covenant Sans Sword: Evolution of Nuclear Strategies & Doctrines" *IPCS NIAS Nuclear Workshop*, 5 May 2015, 5. Retrieved at: <http://issp.in/wp-content/uploads/2015/06/7-Evolution-of-Nuclear-Strategies-and-Doctrines-Vijay-Shankar.pdf> (retrieved 22 August 2020).

Conclusion

It is clear that the command-and control structure of Pakistan is delegative, rather than assertive. In order to support its asymmetric escalation posture, Pakistan has developed several positive control measures over its nuclear weapons, such as pre-delegation of launch authority, co-location of nuclear assets, and nuclear component storage at strategic points. These measures are designed to ensure the ability to rapidly assemble and use Pakistan's nuclear capability. In addition, Pakistan has only weakened negative control measures in place, so that officers have the ability to assemble and release nuclear weapons if they deem it necessary to do so, regardless of whether they are authorised to do so by the NCA. Existing negative control measures have been made circumventable by design, such as the two- or three-man rule or the 'Pak PALs'.

Conclusion

Although Pakistan's nuclear command-and-control structure fulfils the conditions of an asymmetric escalation posture, it is expanding its nuclear capability in such a way that exceeds the requirements of deterring conventional attack from India. Like its politics, Pakistan's nuclear production and development lines are the military's responsibility, under the aegis of NESCOM, which in turn is controlled by the NCA. Pakistani development of fissile material shows a rapidly expanding stockpile of plutonium and highly-enriched uranium, which is capable of producing around 250 warheads.

If one examines Pakistan's development of its nuclear forces, one can only conclude that Pakistan is expanding its nuclear arsenal, both in size and in depth. What's more, Pakistan's asymmetric escalation posture is not fully reflected in its nuclear expansion. The development of the tactical NASR missile is a further step towards an asymmetric escalation posture. However, Pakistan is also developing longer-range missiles which can reach the entire mainland of India. In addition, Pakistan is working on its secure second-strike capability by developing a sea-based deterrent.

The command-and-control measures in place in Pakistan reflect one of the most delegative nuclear command-and-control systems in the world. In order to rapidly and effectively use nuclear force if deemed necessary, Pakistan has developed several positive control measures over its nuclear weapons, such as pre-delegation of launch authority, co-location of nuclear assets, and nuclear component storage at strategic points. Pakistan's negative control measures are weakened by design, so that they can be circumvented without authorisation.

I end this chapter by concluding that my hypothesis based on the analysis of Pakistan's declared nuclear doctrine is true. Pakistan's nuclear posture is indeed that of asymmetric escalation. However, Pakistan is developing its nuclear forces in a way that increases both the cost and the risk of nuclear escalation in South Asia. The vertical development (more missiles) of a Pakistan's nuclear capability increases the cost of nuclear escalation, as it increases the amount of warheads deployed. The horizontal development (more capabilities) of a Pakistan's nuclear capability increases the risk of nuclear escalation, as it increases the chance of deterrence failure.

Chapter 6 – Indian nuclear doctrine

Introduction

After having established that Pakistan's nuclear command-and-control structure is consistent with the assertion that its nuclear doctrine reflects a nuclear posture of asymmetric escalation, I will now move on to India's nuclear strategy. In this chapter, I will examine the way the Indian state has expressed itself about the goals of its nuclear capability, and how Indian official statements say it will use its nuclear capability to achieve these goals. Of course, the previous warnings about the limited analytical value of a state's declared nuclear doctrine still apply. Yet, the previous case study has shown that doctrine is far from useless analytically.

In this chapter, I will first examine the political structures and external threats that influence India's nuclear strategy. Because Pakistan is not India's only external threat, it is important to explain the political and geostrategic context in which India's nuclear capability exists. After that, I will explain how India nuclear doctrine has been developed, in order to explain how the core tenets of India's nuclear strategy have evolved. Finally, I will assess the current declared nuclear doctrine of India, by analysing the principles of minimum deterrence and no-first-use (NFU).

The conclusions reached in this chapter on India's nuclear doctrine will be tested in the next chapter analysing India's nuclear command-and-control structure. In the conclusion of this chapter, I will offer a hypothesis on what posture India is likely to assume, based on my analysis of its nuclear doctrine. In the next chapter I will then test this hypothesis on India's nuclear command-and-control system.

Indian context

Political context

Political leadership

The Republic of India, the world's most populous democracy, is a parliamentary republic with a multi-party system. In India, executive power rests mainly with the prime minister and his Council of Ministers, while the president is a ceremonial head of state with limited executive powers. The Indian Parliament is composed of the Lok Sabha (People's House), whose 543 directly elected representatives from the country's 29 states and 7 union territories may introduce and pass legislation, and the Rajya Sabha (States' Council) whose (maximum) 250 members may review, but not veto, revenue legislation.¹⁴²

The two main political parties in India are the Indian National Congress and the Bharatiya Janata Party (BJP). Congress is seen as a centre-left party, historically espousing a brand of secular socialism. Congress dominated the country's politics from independence until the 1990s, after an instrumental role in the birth of the nation. Jawaharlal Nehru and Indira Gandhi led Congress to election victories during the first thirty years of India's existence. Since the 1990s, Congress has increasingly traded the balance of power with the BJP, a right-wing Hindu nationalist party. In the last election, Congress and the BJP together garnered around 60 percent of the vote. Most of the remaining votes went to regional and caste-based (often dynastic) parties. These smaller parties, 31 of whom are represented in the Lok Sabha, remain a crucial variable in Indian politics today.¹⁴³

¹⁴² K. Alan Kronstadt, "India's Domestic Political Setting", *Congressional Research Service*, 31 May 2019.

¹⁴³ Kronstadt, "India's Domestic Political Setting".

Narendra Modi became India's first-ever lower-caste prime minister when his BJP swept Congress out of office in the 2014 elections. Western analysts have expressed concerns about the Hindu nationalist themes during Modi's first term, with BJP policies exacerbating communal tensions in some BJP-governed states.¹⁴⁴ Modi's victory in the May 2019 general election consolidated the BJP's dominant position in contemporary Indian politics. In August 2019, the Modi government revoked Article 370 of the Indian Constitution which granted limited autonomy to Jammu and Kashmir.¹⁴⁵ In December 2019, the Lok Sabha passed the Citizenship Act 2019, which provided a path to Indian citizenship for undocumented immigrants of Hindu, Sikh, Buddhist, Jain, Parsi, and Christian faith, but excluding Muslims from this eligibility.¹⁴⁶

Civil-military relations

Differently to Pakistan, where the armed forces have always played a key role in making policy and have functioned as its government for more than half of Pakistan's existence, civil-military relations in India have historically placed an emphasis on civilian dominance of decision-making processes.

From the very point of India's independence in 1947, then-Prime Minister Jawaharlal Nehru abolished the separate position of military commander-in-chief to prevent it from becoming a challenge to civilian authority, while placing high-level and even low-level military decision-making authority in the hands of civilian authorities in the PMO, Ministry of Defence and Ministry of Finance.¹⁴⁷ According to Narang, this was an intentional strategy designed to keep India's military peripheral, and wholly subservient to civilian political authorities.¹⁴⁸ V.K. Krishna Menon, who was India's Defence Minister during the 1962 Sino-Indian War stated that "[i]t is wrong for the army to try to make policy (...) Military planning and arrangements and things of that kind must remain in the hands of the Government."¹⁴⁹

The initial 'defanging' of India's military has led to an assertive civil-military arrangement in which the civilian leadership exerts a tight bureaucratic control over the military, in order to negate the perceived threat of the military to the civilian leadership. Fears of coups mean that control of major troop movements or other military forces is in the hands of the Defence Minister. In effect, the Ministry of Defence acts as a higher headquarters that makes all military decisions, leaving the service chiefs without statutory powers to make decisions.¹⁵⁰ According to former Chief of Naval Staff Admiral Arun Pradash, the military is not taken seriously even in military affairs: "between a scientist and a soldier, the politicians (...) believe the scientist."¹⁵¹ More than seventy years after PM Nehru abolished the position of commander-in-chief of the Indian armed forces, its absence remains conspicuous in the Indian chain of command. "This situation (...) was assembled, piece by piece, over the years, and is now enshrined in various constitutional and bureaucratic structures".¹⁵² With it, the absence of military input into the policy-making process remains conspicuous also.

¹⁴⁴ Ibidem.

¹⁴⁵ Indian Ministry of Law and Justice, "The Constitution (Application to Jammu and Kashmir) Order, 2019" *The Gazette of India*. Retrieved at: <http://egazette.nic.in/WriteReadData/2019/210049.pdf> (retrieved 22 August 2020).

¹⁴⁶ Indian Ministry of Law and Justice, "The Citizenship (Amendment) Act, 2019" *The Gazette of India*. Retrieved at: <http://egazette.nic.in/WriteReadData/2019/214646.pdf> (retrieved 22 August 2020).

¹⁴⁷ Stephen Cohen, *The Indian Army: Its contribution to the Development of a Nation* (Delhi 1990) 171-172.

¹⁴⁸ Vipin Narang, *Nuclear Strategy in the Modern Era* (Princeton 2014) 113.

¹⁴⁹ Michael Brecher, *India and World Politics: Krishna Menon's View of the World* (New York 1968) 260.

¹⁵⁰ George K. Tanham, *Indian Strategic Thought: An Interpretative Essay* (Santa Monica 1992) 73.

¹⁵¹ Bharat Karnad, *India's Nuclear Policy* (Westport 2008) 69.

¹⁵² Cohen, *The Indian Army*, 114.

Aside from the military's lack of decision-making ability, India's civil-military relations have produced a layer of 'bureaucratic control' which subjects everything from budgeting to recruitment and training to political interference from the Ministry of Defence, Finance and DRDO. The civil servants in these ministries rotate frequently and routinely possess limited knowledge of military matters and the army as an organisation.¹⁵³

International context

There are two main external threats to the security of India and its people, Pakistan and China. I will briefly introduce them here. India's nuclear strategy must necessarily deal with both threats, but the way in which it prioritises one over the other changes the way its nuclear capability is postured.

Pakistan

As explained at greater length in chapter 3, Pakistan and India share a long and tempestuous relationship, sharing four wars since their traumatic Partition. However, the tensions between India and Pakistan are not limited to the past. Despite limited confidence-building measures in the past couple of years, such as both countries recommitting to the 2003 cease-fire along the Line of Control in Kashmir in May 2018, cross-border incidents have continued to proliferate on an almost daily basis. Although most incidents do not develop beyond cross-border shelling, the risk of escalation is always present along the Line of Control.

For example, ahead of the 2019 Indian elections, an Indian police convoy was attacked by a member of Jaish-e-Mohammed (JeM), killing over forty Indian security personnel. In response, the Indian Air Force conducted airstrikes at Balakot in Pakistan. Although the Indian government claimed that the airstrikes had struck multiple militant camps, killing around 350 militants, Pakistani officials refuted the figures, instead claiming that the Indian forces were intercepted and only struck unpopulated areas. In a retaliatory airstrike by Pakistan, Pakistani forces bombed unpopulated areas across the Line of Control, and an Indian aircraft was shot down and its pilot was captured. Two days later, the pilot was released, with Pakistan describing it as a "gesture of peace", while India claimed Pakistan was obligated to do so by the Geneva Convention. These attacks only serve to harden each state's position vis-à-vis each other and reduce the political will for reconciliation.

India's BJP-led government has pursued a path of oppositional nationalism, with policies such as the revocation of the special status of Jammu and Kashmir and the exclusion of Muslim refugees from a path to Indian citizenship. BJP policies have deepened communal tensions in some states, and analysts predict that Hindu nationalist state leaders might incite low-level communal violence in order to animate their own supporters. Increasing communal violence would alienate further Indian Muslims and allow Islamist terrorist groups to expand its foothold in India.

Jihadist terrorism

Pakistan's strategy of 'bleeding India by a thousand cuts', as explained in chapter 3, has caused it to extensively support jihadist and separatist militant movements such as Jaish-e-Mohammed (JeM) and Lashkar-e-Taiba (LeT) with the goal of destabilising India and provoking it into an armed response. These organisations, based in Pakistan, have engaged in a campaign of terror attacks in Indian-administered Jammu and Kashmir, with the expressed aim of promoting an Islamist socio-

¹⁵³ Ibidem, 114-121.

political agenda and violently joining Kashmir to Pakistan.¹⁵⁴ Over the past thirty years, more than 40,000 people have died in violence related to the Kashmir insurgency and the Indian response.¹⁵⁵

However, in the past twenty years, JeM and LeT have expanded operations to include the rest of India as its target, as well. The 13 December 2001 Indian Parliament attack in New Delhi, for example, was an (unsuccessful) attempt by JeM militants to decapitate India's legislative and executive branches. Conversely, the November 2008 Mumbai attacks by LeT members, killing over 150 and injuring another 300, were aimed at causing terror among Indians far removed from the Pakistani border, and among foreigners, specifically targeting this group.

China

Relations between India and People's Republic of China have historically been characterised by border disputes, culminating in three military conflicts: the Sino-Indian War of 1962, the Chola incident in 1967, and the 1987 Sino-Indian skirmish. Today, India and China are important trade partners and cooperate on climate change and reform of international institutions as well. In 2017 the volume of bilateral trade between India and China stood at 84.5 billion dollars, with a large trade deficit in China's favour. However, border disputes continue to proliferate, with a standoff occurring in 2017 on the Doklam plateau on China's border with Bhutan, India's ally.¹⁵⁶ In addition, Chinese and Indian troops have engaged in skirmishes along the Sino-Indian border since 5 May 2020, producing a troop build-up near the Line of Actual Control in Kashmir and in Sikkim to the east.

China's pursuit of regional dominance clashes with India's own efforts to assert itself in the region.¹⁵⁷ China's vision for Asia is hierarchical and does not consider India as an equal.¹⁵⁸ There exists a difference in threat perception between India and China. Whereas India views China as its primary threat, Chinese priorities unequivocally lie in the western Pacific.¹⁵⁹ Because India is not China's primary threat and expansion in South Asia is not its primary aim, China prefers to minimise the resources it has to expend on India. China's policy toward India can be summarised as balancing India in South Asia by supporting Pakistan and developing ties with smaller countries in the region. As part of its Belt and Road Initiative (BRI), China has already invested billions of dollars in Pakistan, as well as in Nepal, Sri Lanka and Bangladesh.¹⁶⁰ In addition, China has sought – unsuccessfully – to prevent India-US alignment in South Asia.¹⁶¹

¹⁵⁴ S. Paul Kapur, *Jihad as Grand Strategy: Islamist Militancy, National Security, and the Pakistani State* (Oxford 2017), 84.

¹⁵⁵ "40,000 people killed in Kashmir: India", *The Express Tribune*, 10 August 2011.

Retrieved at: <https://web.archive.org/web/20170227232416/https://tribune.com.pk/story/228506/40000-people-killed-in-kashmir-india/> (retrieved 22 August 2020).

¹⁵⁶ "What's behind the India-China border stand-off?" *British Broadcasting Corporation*, 5 July 2017.

Retrieved at: <https://www.bbc.com/news/world-asia-40478813> (retrieved 22 August 2020).

¹⁵⁷ Carla P. Freeman, "China's 'regionalism foreign policy' and China-India relations in South Asia" *Contemporary Politics* 24 (2018) 1, 82.

¹⁵⁸ Yun Sun, "China's Strategic Assessment of India" *War on the Rocks*, 25 March 2020. Retrieved at: <https://warontherocks.com/2020/03/chinas-strategic-assessment-of-india/> (retrieved 22 August 2020).

¹⁵⁹ Sun, "China's Strategic Assessment of India". Retrieved at: <https://warontherocks.com/2020/03/chinas-strategic-assessment-of-india/> (retrieved 22 August 2020).

¹⁶⁰ Peter Ferdinand, "Westward ho—the China dream and 'one belt, one road': Chinese foreign policy under Xi Jinping" *International Affairs* 92 (2016) 4, 941–95.

¹⁶¹ Sumit Ganguly, "India and the United States Need Each Other Mostly Because of China" *Foreign Policy*, 3 August 2020. Retrieved at: <https://foreignpolicy.com/2020/08/03/india-united-states-balancing-china-threat/>; Rajeswari Pillai Rajagopalan, "This Time the US is Taking India's Side Against China" *The Diplomat*, 23 July 2020. Retrieved at: <https://thediplomat.com/2020/07/this-time-the-us-is-taking-indias-side-against-china/> (retrieved 22 August 2020).

Although China's interests seem to benefit from rapprochement with India so it can focus on the United States and the Pacific, conflicting visions on Asia have resulted in an antagonistic relationship between China and India marked by border tensions and hostile policies toward each other.

Development of Indian nuclear doctrine

After India's May 1998 nuclear tests, India's government developed a nuclear doctrine to operationalise its nuclear capability. Immediately after the tests, the BJP-led government announced that India would adopt a "no-first-use" (NFU) policy and declared that it would never use nuclear weapons against a non-nuclear weapons state. In the statement, India also reiterated its commitment to working toward the goal of universal nuclear disarmament.¹⁶²

In order to assuage international concerns that the nascent nuclear state lacked an "institutional framework to evaluate security threats or evolve a nuclear doctrine", the Indian government instituted the National Security Council (NSC) in November 1998.¹⁶³ The NSC was tasked with undertaking India's first ever Strategic Defence Review "to study and analyse the security environment and make appropriate recommendations".¹⁶⁴ The NSC is a three-tiered structure with at its head the Strategic Policy Group, led by the National Security Adviser and including the ministers for home affairs, external affairs, defence and finance, as well as the armed forces chiefs of staff. The second tier of the NSC is the National Security Advisory Board (NSAB), which contains military and civilian national security experts who provide long-term solutions for national security issues and advise the Strategic Policy Group. The third tier is the Joint Intelligence Committee (JIC), which analyses intelligence data and supports the NSAB.

1999 draft doctrine

It was the NSAB that produced a draft nuclear doctrine in 1999 that shaped the direction of Indian nuclear strategy. In this draft, India expressed its "minimum deterrence" nuclear doctrine and established the parameters for use of India's nuclear capability.¹⁶⁵ The draft doctrine was effectively based on two pillars, namely a minimum deterrent and no first use of nuclear weapons. In its purest form, the concept of minimum deterrence is predicated on realist theory on nuclear deterrence. It does not matter the size of the nuclear arsenal, nor the readiness or sophistication of the nuclear capability. The possession of nuclear weapons alone ought to serve as a sufficient deterrent to any adversary. The absence of certainty on the part of the adversary that a first strike will disarm the state's nuclear deterrent means the adversary cannot risk such a first strike. "No first use" (NFU) is a pledge or policy not to use nuclear weapons as a means of warfare, unless first attacked by an adversary using nuclear weapons. India's declaration of no first use of nuclear weapons has been an important part of India's nuclear doctrine: nuclear weapons "will only be used in retaliation against a

¹⁶² "Suo Moto Statement by Prime Minister Atal Bihari Vajpayee in the Indian Parliament on May 27, 1998" *India News*, 15 June 1998.

¹⁶³ PR Chari, "India's Nuclear Doctrine: Confused Ambitions" *The Nonproliferation Review* 7 (2000) 3, 125.

¹⁶⁴ Bharatiya Janata Party, "BJP Election Manifesto: Our National Security". Retrieved from <http://www.bjp.org/manifes/chap8.htm> (retrieved 22 August 2020).

¹⁶⁵ Brajesh Mishra, "Draft Report of National Security Advisory Board on Indian Nuclear Doctrine" *Indian Ministry of External Affairs* (17 August 1999). Retrieved at: <https://mea.gov.in/in-focus-article.htm?18916/Draft+Report+of+National+Security+Advisory+Board+on+Indian+Nuclear+Doctrine> (retrieved 22 August 2020).

nuclear attack on Indian territory or on Indian forces anywhere".¹⁶⁶ Every Indian national security adviser since 1998 has reiterated the importance of the NFU.¹⁶⁷

Although "considerable stress" was put on the fact that it was a draft and the NSAB had an advisory capacity, the draft generated debate both in India and among India's allies such as the US.¹⁶⁸ While the BJP was attacked domestically by the opposition for issuing a nuclear doctrine seen as hewing closely to the party line and for publishing the document shortly before the election as a stunt to secure votes, Pakistan and China reacted with alarm to the draft's terminology. Even the United States expressed its disappointment with the draft's calling for a "triad of aircraft, mobile land-based missiles, and sea-based assets."¹⁶⁹

2003 official doctrine

After the 2001-2002 India-Pakistan standoff, international pressure increased on India to formalise its nuclear doctrine. In January 2003, it finally did so by publishing its official nuclear doctrine. In an announcement, the Indian government established the main elements of Indian nuclear doctrine:

- Building and maintaining a credible minimum deterrent;
- A no-first-use (NFU) posture;
- Massive retaliation to a first strike, designed to inflict unacceptable damage;
- Civilian authorisation for nuclear use through the Nuclear Command Authority (NCA) only;
- Non-use of nuclear weapons against non-nuclear-weapons states;
- Nuclear retaliation in the event of a major biological or chemical attack on India or Indian forces;
- Participation in international arms control agreements and working toward the goal of universal nuclear disarmament.¹⁷⁰

In addition, the statement announced a formal nuclear command structure under civilian control.¹⁷¹ The 2003 official nuclear doctrine was described as simply a continuation of the post-1998 policy of minimum deterrence and no first use. While the 2003 doctrine continues to lean on these two pillars, the wording of these ideas has changed subtly.

Principles of Indian nuclear doctrine

The development of Indian nuclear doctrine has shown that it is underpinned by two main principles: 'minimum credible deterrence' and 'no-first-use' (NFU). I will explain here how these principles act as pillars of Indian nuclear doctrine, and what that should mean for Indian nuclear strategy.

¹⁶⁶ Harsh V. Pant, "India's Nuclear Doctrine and Command Structure: Implications for India and the World," *Comparative Strategy* 24 (2005), 277–93.

¹⁶⁷ Vipin Narang, "Did India Change its Nuclear Doctrine? Much Ado about Nothing" *IDS Comment*, 1 March, 2011. Retrieved at: http://www.idsa.in/idsacomments/DidIndiaChangeitsNuclearDoctrine_vnarang_010311 (retrieved 22 August 2020).

¹⁶⁸ Rahul Roy-Chaudhury, "India's Nuclear Doctrine: A Critical Analysis" *Strategic Analysis* 33 (2009) 3, 406.

¹⁶⁹ Pakistan: "Pak Reacts Strongly to India's Assertion," *Times of India*, 19 August 1999; China: Chen Yali, "Nuclear Arms Race Looms" *China Daily*, 24 August 1999; United States: Howard Diamond, "India Releases N-Doctrine, Looks to Emulate P-5 Arsenal" *Arms Control Today*, 29 (1999) 5, 23.

¹⁷⁰ Prime Minister's Office of India, "Cabinet Committee on Security Reviews Progress in Operationalising India's Nuclear Doctrine", 4 January 2003. Retrieved at: <http://pib.nic.in/archieve/lreng/lyr2003/rjan2003/04012003/r040120033.html> (retrieved 22 August 2020).

¹⁷¹ Harsh V. Pant, "India's Nuclear Doctrine and Command Structure: Implications for India and the World," *Comparative Strategy* 24 (2005), 238.

Minimum credible deterrence

In its 2003 official nuclear doctrine, the Indian government's emphasis on a credible minimum deterrent enunciated a shift from a strict minimum deterrent as emphasised previously. The underlying thinking behind a strict minimum deterrent is that the possession of nuclear weapons alone ought to serve as a sufficient deterrent to any adversary. Therefore it calls for building a limited number of nuclear weapons, without a need to respond to an adversary's arms buildup. On the other hand, a credible minimum nuclear deterrent is predicated on the *credibility* of the deterrent threat, involving India's threat perception and the threat perception of its adversaries.

India's adoption of a credible minimum deterrence doctrine begs the question: which adversary is India aiming to deter with its credible minimum deterrence strategy? India's two main competitors, China and Pakistan, present a threat of a different nature towards India. China's force structure, (nuclear) modernisation efforts and geographical layout (its strategic centres lie far from India's border) require far greater deterrence requirements than Pakistan, in terms of numbers, deployment modes and reach. Narang states: "What is credible towards China will (...) not be minimum towards Pakistan, and what is minimum towards Pakistan cannot be credible towards China." This 'theoretical paradox', as Narang calls it, means that Indian decision-makers must choose which adversary it must posture its nuclear weapons toward: Pakistan or China.

No first use

"No first use" (NFU) is a pledge or policy not to use nuclear weapons as a means of warfare, unless first attacked by an adversary using nuclear weapons. India's 2003 official nuclear doctrine states that India strictly adheres to the policy of "no first use" (NFU): nuclear weapons "will only be used in retaliation against a nuclear attack on Indian territory or on Indian forces anywhere". India's declaration of no first use of nuclear weapons has been an important part of India's nuclear doctrine. Every Indian national security adviser since 1998 has reiterated the importance of the NFU.¹⁷² However, India's official nuclear doctrine caveats India's NFU policy in two ways.

Firstly, India's no-first-use pledge in its official doctrine document reads: "Nuclear weapons will only be used in retaliation against a nuclear attack on Indian territory or on Indian forces anywhere".¹⁷³ This is almost a carbon copy of the 1999 draft doctrine statement on NFU, except for the word "anywhere". This addition accounts for the possibility that Indian forces fighting a conventional war inside Pakistan could be threatened by Pakistani (tactical) nuclear weapons. Although technically still a no-first-use policy, this change does call into question the defensive focus of India's nuclear deterrent, given that it would, in this situation, effectively act as a shield for offensive actions by Indian conventional forces.

Secondly, India's no-first-use declaration is caveated by the threat of nuclear first use in case of a chemical or biological attack. This formulation was rejected in the 1999 draft doctrine, with NSAB member Jasjit Singh writing that "India's nuclear weapons are not meant to deter the use and threat of use of conventional weapons, chemical weapons, biological weapons or a generalised formulation of protecting national interests any time anywhere", a clear repudiation of nuclear first-use in case of chemical or biological attack.¹⁷⁴ However, in the 2003 doctrine document, India explicitly threatens

¹⁷² Vipin Narang, "Did India Change its Nuclear Doctrine? Much Ado about Nothing" *IDSA Comment*, 1 March, 2011. Retrieved at: http://www.idsa.in/idsacomments/DidIndiaChangeitsNuclearDoctrine_vnarang_010311 (retrieved 22 August 2020).

¹⁷³ Prime Minister's Office of India, "Operationalising India's Nuclear Doctrine", 4 January 2003. Retrieved at: <http://pib.nic.in/archieve/Ireleng/lyr2003/rjan2003/04012003/r040120033.html> (retrieved 22 August 2020).

¹⁷⁴ Rahul Roy-Chaudhury, "India's Nuclear Doctrine: A Critical Analysis" *Strategic Analysis* 33 (2009) 3, 406.

nuclear first use in case of a chemical or biological attack “on India or Indian forces”. This can be seen as a response to the increased terror threat emanating from Pakistani-backed militant groups in a post-9/11 and post-12/13 world.

Conclusion

In this chapter, I have first examined the domestic and international context of India's nuclear doctrine. Due to poor civil-military relations, the Indian military continues to play an undersized role in decision-making on military-strategic matters, such as dealing with these three threats. The emasculation of the Indian military within the decision-making process has led to a lack of influence unlike any military of equivalent size or importance in the world. The result of India's poor civil-military relationship is a military that is subject to the priorities of the political leadership, with little ability to pursue its own organisational preferences.

Relations with Pakistan remain fraught, with both states engaging in border skirmishes, shootings and cross-border shelling. Terrorist attacks by Pakistani-backed militant groups in Kashmir have claimed thousands of casualties over the past thirty years, but groups such as LeT and JeM also aim for targets in the rest of India, such as the Indian Parliament in 2001, or downtown Mumbai in 2008.

Border skirmishes continue to proliferate between Chinese and Indian soldiers, with the most recent stand-off occurring on the Line of Actual Control in the summer of 2020. China aims to be(come) an Asian hegemon, while India seeks to take up the mantle of regional leadership. These conflicting visions on Asia have resulted in an antagonistic relationship between China and India marked by border tensions and hostile policies toward each other.

The two main principles that have become the foundation of Indian nuclear doctrine are minimum credible deterrence and no-first-use (NFU). However, both principles do not seem as air-tight as is suggested. ‘Minimum credible deterrence’ implies credibility of the deterrent to India's adversaries, but it begs the question: which adversary is India deterring? China and Pakistan have wildly differing definitions of a credible deterrent. India has caveated its own no-first-use pledge by eliminating situations in which Indian troops are attacked with nuclear weapons outside Indian soil or with chemical or biological weapons from its no-first-use pledge, raising the question whether the NFU policy is a virtue-signalling device, rather than a cast-iron guarantee.

The outline of India's nuclear doctrine, based on minimum credible deterrence and no-first-use, drawn in this chapter would indicate that India's nuclear posture is that of assured retaliation. India's doctrine is designed to directly deter Pakistani nuclear attack. It does so by threatening certain nuclear retaliation in case of nuclear attack, even in case of massive damage. Nuclear-armed states with an assured retaliation posture have a declaratory no-first-use policy. In the following chapter, I will put the hypothesis to the test by analysing India's nuclear command-and-control structure through its nuclear weapons production, nuclear force development and nuclear command-and-control measures.

Chapter 7 – India's nuclear command-and-control system

Introduction

In this chapter, I will examine India's nuclear posture by evaluating India's nuclear weapons production, nuclear force development and nuclear command-and-control measures. In the previous chapter, I have analysed India's nuclear declared doctrine. I have offered the hypothesis that, consistent with the conclusions from that chapter, India will have adopted an assured retaliation posture. The adoption of an assured retaliation strategy would predict three developments within Pakistan's nuclear posture. Firstly, civilian control of nuclear weapons production, given India's persistently poor civil-military relations. Secondly, an assertive nuclear command structure, in which technological, procedural and chain-of-command barriers to unwanted use have been developed. And thirdly, limited nuclear force development commensurate with India's declaratory nuclear doctrine of credible minimum deterrence.

In order to test this hypothesis, this chapter shall first assess the civilian-military balance in the nuclear production sector, in order to examine the way in which India has developed the production of its nuclear weapons, including delivery vehicles and non-nuclear components. Then, I will analyse the development of India's nuclear forces, so that the hypothesis of a limited nuclear force development can be tested. Third, I will test the hypothesis that India would have an assertive nuclear command-and-control structure, in order to evaluate whether India has indeed prioritised civilian control over readiness. This chapter is aimed at finding developments in India's nuclear strategy which are not evident from an analysis of India's nuclear doctrine, as done in the previous chapter. As explained in the introduction of this thesis, the lack of scholarly analysis of a state's nuclear posture creates a lacuna in academic understanding of nuclear strategy. The conclusions of this chapter will inform my conclusion on the security implications of India nuclear strategy development, and are therefore relevant to the research question.

Control of nuclear materials and production

The fissile material used in India's nuclear weapons is plutonium. According to the International Panel on Fissile Materials, India is estimated to have produced at least 600 kg of weapon-grade plutonium, sufficient for 150-200 warheads. Based on its land-, air-, and sea-based capabilities (see next section), India is estimated to possess 130-140 nuclear warheads. In order to arm the new missiles it is currently developing, India will have to increase its warhead production. India's notorious civil-military relations have led to a marginalisation of the military in decision-making on the military-strategic level.¹⁷⁵ Differently from Pakistan, it can be predicted that the Indian military does not play an important role in the production of nuclear materials, non-fissile components and delivery vehicles, with these responsibilities instead placed with ministries and other civilian agencies.

The Dhruva Reactor at the Bhabha Atomic Research Centre (BARC) near Mumbai is India's primary generator of weapons-grade plutonium. This reactor can produce 20-25 kg of weapons-grade plutonium per year.¹⁷⁶ India has plans to build at least one more plutonium production reactor.¹⁷⁷ In addition, the Prototype Fast Breeder Reactor (PFBR) under construction at the Indira Gandhi Centre

¹⁷⁵ See chapter 6 of this thesis.

¹⁷⁶ Waheguru Pal Singh Sidhu, *Enhancing Indo-US Strategic Cooperation* (Abingdon 2013) 22.

¹⁷⁷ Hans Kristensen and Matt Korda, "Indian Nuclear Forces, 2018" *Bulletin of the Atomic Scientists* 74 (2018) 6, 361.

for Atomic Research in Kalpakkam could significantly increase India's plutonium production capacity, especially if six more fast breeder reactors will be constructed in the coming fifteen years, as stated by the director of IGCAR.¹⁷⁸

The Atomic Energy Commission is the governing body of the Department of Atomic Energy, and conducts research on nuclear matters. Although most of the AEC 15,000-plus scientists and engineers research the peaceful applications of nuclear energy, in particular with regard to the energy, medical and agricultural sectors, a significant part of AEC's workforce are focused on the research and development of India's nuclear capability.¹⁷⁹ Development of India's missile capability is the purview of the Defence Research and Development Organisation (DRDO), which is the research agency of the Department of Defence. The DRDO employs 30,000 people who are engaged in developing defence technologies covering various fields at a network of 52 laboratories spanning the whole of India.¹⁸⁰ DRDO's Integrated Guided Missile Development Programme (IGMDP) has produced India's Prithvi and Agni missile family. In addition, DRDO retains stewardship of non-fissile components as part of India's disassembled nuclear stockpile.¹⁸¹ Stewardship of different components lies with respective civilian agencies: nuclear pits with the Department of Atomic Energy, the non-fissile components with DRDO, the delivery vehicle with the SFC.¹⁸² To enhance survivability, each of these civilian agencies store reserves of their respective components in dispersed locations.¹⁸³

Contrary to Pakistan, India has put civilians in charge of India's nuclear materials and production. India's nuclear research is conducted by the civilians at the Atomic Energy Commission and DRDO. These organisations are also the guardians of the disassembled components of India's nuclear stockpile. It is clear that India's production of nuclear materials, non-fissile components and delivery vehicles is entirely under control of India's civilian leadership, leading to the conclusion that any increase in production shall be part of the strategy of that same civilian leadership.

Indian nuclear forces

In the previous chapter, I explained how the very nature of 'minimum credible deterrence' forces India to choose whether to aim its nuclear strategy toward China and Pakistan, as the different nature of their respective threats to India means that China requires far greater deterrence requirements than Pakistan, in terms of numbers, deployment modes and reach. What are the implications of that choice for India's posture? A strategy postured for the Chinese threat would include a triad of nuclear forces, with ground-, air- and sea-based capabilities, as well as long-range missiles capable of reaching Chinese strategic centres far from the Indian border. In addition, India would increase its warhead production to keep up with Chinese production. A strategy aimed at deterring Pakistan would necessarily include a limited nuclear posture, both vertically (number of warheads) and horizontally (delivery modes). In the previous chapter, I also found that declared doctrine and official statements strongly indicated the development of a 'credible minimum deterrent' vis-à-vis Pakistan, rather than China. In this section, I will examine the development of India's nuclear force structure to evaluate whether this conclusion can be backed up with facts.

¹⁷⁸ Pradeep Kumar, "Kalpakkam Fast Breeder Test Reactor Achieves 30 MW Power Production" *Times of India*, 27 March 2018. Retrieved at: <https://timesofindia.indiatimes.com/city/chennai/kalpakkam-fast-breeder-test-reactor-achieves-30-mw-power-production/articleshow/63480884.cms> (retrieved 22 August 2020).

¹⁷⁹ Sidhu, *Enhancing Indo-US Strategic Cooperation*, 23.

¹⁸⁰ Singh, *Enhancing Indo-US Strategic Cooperation*, 24.

¹⁸¹ Vipin Narang, *Nuclear Strategy in the Modern Era* (Princeton 2014), 101.

¹⁸² Narang, *Nuclear Strategy in the Modern Era*, 101.

¹⁸³ *Ibidem*, 103-104.

Capabilities

India currently has seven operational nuclear-capable systems: four land-based ballistic missiles, two aircraft, and one sea-based ballistic missile. India is estimated to possess a total of 130-140 nuclear warheads, with further warhead development expected to match India's new missile development.¹⁸⁴ In addition, India continues to develop its nuclear capability, with five more systems in development. Of particular note are the long-range land- and sea-based nuclear capabilities currently in development.

Air-based capability

Until 2003, fighter-bombers were India's only nuclear strike force. Still, despite the development of a diverse arsenal of land- and sea-based ballistic missiles, India's air-based nuclear capability continues to play an important role as a flexible delivery vehicle for India's nuclear weapons.

India has two types of nuclear capable aircraft, the Mirage 2000H 'Vajra' ('Divine Thunder') and the Jaguar IS/IB 'Shamsher' ('Sword of Justice'). The Mirages are stationed at Maharajpur Air Force Station, near Gwalior, where one or two squadrons are estimated to have a secondary nuclear mission.¹⁸⁵ The Indian Mirage aircraft, supplied by France in the late 1980s, are undergoing upgrades to extend its service life and enhance its capabilities. The Indian Air Force also operates five squadrons of Jaguar aircraft at three bases. Experts estimate that two of these squadrons, one at Ambala Air Force Station and one at Gorakhpur Air Force Station have a secondary nuclear strike mission.¹⁸⁶ The Jaguars are nuclear-capable, and have received an upgrade in 2016 that will enable the planes to operate for another 20 years.¹⁸⁷

Due to the advanced age of the Mirage and Jaguar aircraft, India has been looking for a modern fighter-bomber to take over its air-based nuclear capability in the future. In 2012, India announced a deal with Dassault Rafale, which would supply India with 126 Rafale aircraft, of which 108 were to be built.¹⁸⁸ In the French Air Force, the Rafale is used for its air-based nuclear capability. However, due to a lack of Indian political support, the deal was abandoned in favour of the acquisition of 36 fully-built Rafales from France for an estimated total cost of €7.8 billion.¹⁸⁹ Delivery started in 2019 and is scheduled to be completed by 2022. According to the Times of India, the Rafales will be deployed in two squadrons, one at Hasimara Air Base Station in West Bengal and another at Ambala Air Force station, just 220 km from the Pakistani border.¹⁹⁰

Land-based capability

At this time, India has four land-based, nuclear-capable ballistic missile types in operation: the short-range Prithvi-2 and Agni-1, the medium-range Agni-2, and the intermediate-range Agni-3.

¹⁸⁴ Kristensen and Korda, "Indian nuclear forces" (2018), 362.

¹⁸⁵ Ibidem, 362.

¹⁸⁶ Ibidem, 362.

¹⁸⁷ Ibidem, 362.

¹⁸⁸ Rajat Pandit, "French Jet Rafale bags \$20bn IAF fighter order; India 'briefs' losing European countries", *Times of India*, 1 February 2012. Retrieved at: <https://timesofindia.indiatimes.com/india/French-jet-Rafale-bags-20bn-IAF-fighter-order-India-briefs-losing-European-countries/articleshow/11706551.cms> (retrieved 22 August 2020).

¹⁸⁹ Indian Ministry of Defence, "Annual Report 2016-17", 38. Retrieved at: <https://mod.nic.in/writereaddata/AnnualReport1617.pdf> (retrieved 22 August 2020).

¹⁹⁰ Press Trust of India, "Ambala, Hasimara IAF bases being readied for Rafale fighter jets" *Times of India*, 1 October 2017. Retrieved at: <https://timesofindia.indiatimes.com/india/ambala-hasimara-iaf-bases-being-readied-for-rafale-jets/articleshow/60899664.cms> (retrieved 22 August 2020).

Prithvi-2 and Agni-1 are short-range missiles that can deliver a nuclear or conventional warhead to a distance of approximately 250 and 700 km respectively. The deployment locations of these missiles indicate that India's short-range ballistic missiles are focused on targeting the Pakistani border, with possible locations in Punjab and Rajasthan.¹⁹¹ The medium-range Agni-2, however appears not to be focused on Pakistan at all. Boasting the ability to deliver a nuclear or conventional warhead over 2,000 km, it is believed to be deployed in northern India, targeting western, central and southern China. Similarly, India has developed the intermediate-range Agni-3 in order to deter China, as well. Its added range of over 3,200 km allows India to either deploy its units further back from the Chinese border (e.g. on the Andaman and Nicobar islands in the Indian Ocean), or deploy the missiles in Northeast India, bringing most of China into range, even including Shanghai.¹⁹²¹⁹³

In addition to its four operational nuclear-capable ballistic missile types, India is also developing at least two other longer-range Agni missiles targeting China. The intermediate-range Agni-4 missile has a range of 3,500 km and is capable of striking targets in nearly all of China (including Beijing and Shanghai), if deployed from Northeast India.¹⁹⁴ Following the final development test in 2014, the Indian Ministry of Defence stated that "serial production will begin shortly".¹⁹⁵ The Agni-5 is a ballistic missile of near-intercontinental range (+5,000 km). The missile would allow the Indian military to target the entirety of China (and Pakistan) from central and southern India, and even the Andaman & Nicobar Islands. Unlike other Indian land-based ballistic missiles, the Agni-5 is carried in a sealed canister on the launcher, instead of in a component state. This design will "reduce the reaction time drastically (...) just a few minutes from 'stop-to-launch'".¹⁹⁶

Sea-based capability

As predicted, India's sea-based capability is more advanced than that of Pakistan. India operates a ship-launched nuclear capable missile and is developing two submarine-launched ballistic missiles for deployment on nuclear-powered ballistic missile submarines.

India's existing sea-based capability is provided by the Dhanush, a ship-based ballistic missile designed to launch from two specially configured ships, the 'Subhadra' and 'Suvarna'. The utility of the Dhanush as a weapon of strategic deterrence is severely limited by its range of 400 km. To target Pakistan or India, the 'Subhadra' or 'Suvarna' would have to sail dangerously close to the coast of South Pakistan or China, exposing itself to destruction or pre-emption.

India currently has two ballistic missile submarines (SSBNs) in operation. The 'Arihant' and the 'Arighat' have been launched, with the former primarily intended as a training vessel and technology

¹⁹¹ Kristensen and Korda, "Indian nuclear forces", 363.

¹⁹² Indian Ministry of Defence, "Annual Report 2013–14", 86. Retrieved at: <https://mod.nic.in/writereaddata/AnnualReport2013-14-ENG.pdf> (retrieved 22 August 2020).

¹⁹³ "Agni-III Not Targeted at any Particular Country: Army" *India Today*, 8 May 2008. <https://www.indiatoday.in/latest-headlines/story/agni-iii-not-targeted-at-any-particular-country-army-25083-2008-05-08> (retrieved 22 August 2020).

¹⁹⁴ Ankit Panda, "India Successfully Tests Intermediate-Range Nuclear-Capable Submarine-Launched Ballistic Missile." *The Diplomat*, 10 April 2016. Retrieved at: <https://thediplomat.com/2016/04/india-successfully-tests-intermediate-range-nuclear-capable-submarine-launched-ballistic-missile/> (retrieved 22 August 2020).

¹⁹⁵ Indian Ministry of Defence, "Annual Report 2013–14", 88. Retrieved at: <https://mod.nic.in/writereaddata/AnnualReport2013-14-ENG.pdf> (retrieved 22 August 2020).

¹⁹⁶ Rajat Pandit, "India Readies Hi-tech Naval Base to Keep Eye on China" *The Times of India*, 26 March 2013. Retrieved at: <https://economictimes.indiatimes.com/news/politics-and-nation/india-readies-hi-tech-naval-base-to-keep-eye-on-china/articleshow/19207495.cms> (retrieved 22 August 2020).

demonstrator¹⁹⁷, while the latter may be joined by up to four more SSBNs as a nuclear deterrent patrol vessel. In order to arm the SSBNs, India is developing two new submarine-launched ballistic missiles (SLBMs), the K-15 with a 700 km range, and the K-4 with a 3,500 km range. Once again, the short range of the K-15 SLBM renders the missile impractical to target either Pakistan or China, but experts estimate that the K-15 should be seen as an “intermediate programme intended to develop (...) technology for more capable missiles”.¹⁹⁸

Conclusion

The analysis of India's nuclear forces shows that India is expanding its nuclear force, both in numbers and in type. While India's expansion of its short-range nuclear use options can still be seen as oriented toward against Pakistan, these forces do not typically form part of a nuclear strategy of assured retaliation. India's longer-range options Agni-4 and Agni-5 are postured toward China both in their capabilities and their deployment locations. In addition, the development of SSBNs to complete India's nuclear triad with a sea-based capability serves to harden the survivability of India's nuclear deterrent. This is mainly to combat the threat of China, which requires a larger nuclear deterrent force, and requires different capabilities than the threat of Pakistan.

Table 1. Indian nuclear forces, 2018.

Type	NATO designation	Number of launchers	Year deployed	Range ^a (kilometers)	Warhead x yield (kilotons)	Number of warheads
Aircraft						
Vajra	Mirage 2000H	~16	1985	1,850	1 × bomb	~16
Shamsher	Jaguar IS/IB	~32	1981	1,600	1 × bomb	~32
Subtotal:		~48				~48
Land-based ballistic missiles						
Prithvi-II	n.a.	~24	2003	350 ^b	1 × 12	~24
Agni-I	n.a.	~20	2007 ^c	700+	1 × 40	~20
Agni-II	n.a.	~8	2011 ^d	2,000+	1 × 40	~8
Agni-III	n.a.	~8	2014?	3,200+	1 × 40	~8
Agni-IV	n.a.	n.a.	(2018)	3,500+	1 × 40	n.a.
Agni-V	n.a.	n.a.	(2020)	5,200+	1 × 40	n.a.
Subtotal:		~60				~60 ^e
Sea-based ballistic missiles						
Dhanush	n.a.	2	2013	400	1 × 12	4
K-15	(Sagarika)	(12)	(2018)	700	1 × 12	(12)
K-4	n.a.	(4)	?	3,500	1 × ?	0
Subtotal:		(18)				(16)
Total						130–140^f

^aRange listed is unrefueled combat range with drop tanks.

^bUS NASIC has estimated the range as 250 kilometers (155 miles) but we assume the range has probably been increased to about 350 kilometers (217 miles) as stated by the Indian government.

^cAgni I first began induction with the 334th Missile Group in 2004 but did not become operational until 2007.

^dAgni II first began induction with the 335th Missile Group in 2008 but did not become operational until 2011.

^eThe missile and warhead inventory may be larger than the number of launchers, some of which can be reused to fire additional missiles. This table assumes an average of one warhead for each launcher.

^fIn addition to the 124 warheads estimated to be assigned to fielded launchers, warheads for additional K-15 SLBMs, Agni-III MRBMs, and future Agni-IV MRBMs may already have been produced for an estimated total stockpile of 130–140 warheads.

*Image 3 - Indian nuclear forces, 2018*¹⁹⁹

¹⁹⁷ Dinakar Peri, “India successfully test-fires 3,500-km range submarine-launched ballistic missile K-4” *The Hindu*, 19 January 2020. Retrieved at: <https://www.thehindu.com/news/national/india-successfully-test-fires-3500-km-k-4-slbm/article30601739.ece> (retrieved 22 August 2020).

¹⁹⁸ Kristensen & Korda, “Indian nuclear forces”, 365.

¹⁹⁹ *Ibidem*, 362.

Indian command and control measures

How has India solved the always/never dilemma in its command and control measures?

Throughout much of its history, India has chosen to privilege assertive control of its nuclear weapons over the ability to rapidly constitute the bulk of its nuclear weapons. Tellis noted that “key subcomponents” of the weapons and delivery systems are developed and produced under civilian custody and are maintained in distributed form, “with different custodians exercising strict stewardship over the components entrusted to them for safekeeping.”²⁰⁰ Tellis’ claim that India maintains its nuclear forces in a disassembled state, distributed among various civilian agencies is one that persists in academia today. This section will look at how India has solved the always/never dilemma in its command and control measures, in order to examine whether Tellis’ claim still holds, or whether India has increased the readiness of its nuclear deterrent.

Control

On the whole, India continues to maintain its land- and air-based nuclear capability in a state of disassembly. Stewardship of different components lies with respective civilian agencies: nuclear pits with the Department of Atomic Energy, the non-fissile components with DRDO, the delivery vehicle with the SFC.²⁰¹ Each of these civilian agencies store reserves of their respective components in dispersed locations, in order to ensure survivability in case of a first strike.²⁰² In addition, there has been geographic separation of the military missile brigade (the end users) from the actual missiles themselves. These measures produce a time lag of up to a day in the readiness of India’s nuclear deterrent, lending credibility to India’s posture of assured retaliation.

However, over the past fifteen years, India has increased the readiness of (at least) a part of its nuclear forces. Co-location of assets and users has become the standard operating procedure. Former SFC officers have confirmed that a part of India’s land-based missiles are kept at very high readiness levels even in peacetime, and several nuclear bombs for aircraft are co-located with the aircraft on bases for rapid mating and use.²⁰³ In addition, India has developed a nuclear capability consisting largely of ‘canisterised’ systems, in which the warhead is pre-mated to the delivery vehicle and sealed for storage and transport.²⁰⁴ Canisterisation enhances missile longevity by protecting the solid fuel from the elements, but it also challenges Tellis’ view of India’s nuclear forces being retained in a disassembled state. In 2013, DRDO head Dr. Avinash Chander revealed that India is “working on canisterised systems that can launch from anywhere at any time” for all of its nuclear missile systems.²⁰⁵ Several variants of the Agni missile are already deployed in canisterised form, and India’s

²⁰⁰ Ashley Tellis, *India’s emerging nuclear posture: Between recessed deterrent and ready arsenal* (Santa Monica 2001) 367.

²⁰¹ Vipin Narang, *Nuclear Strategy in the Modern Era* (Princeton 2014) 101.

²⁰² Narang, *Nuclear Strategy in the Modern Era*, 103-104.

²⁰³ *Ibidem*, 104-105.

²⁰⁴ Rajat Pandit, “Agni-V to be Tested Twice this Year, Could be Inducted by 2015,” *Times of India*, 29 June 2013. Retrieved at: http://articles.timesofindia.indiatimes.com/2013-/06-/29/india/40271026_1_agni-iv-/agni-vi-/missile-/defence (retrieved 22 August 2020).

²⁰⁵ Shiv Aroor, “New Chief of India’s Military Research Complex Reveals Brave New Mandate,” *India Today*, 3 July 2013. Retrieved at: <http://indiatoday.intoday.in/story/indias-/nuclear-/counterstrike-/response-/time-/to-/be-/in-/minutes-/drdo-/chief/1/286691.html> (retrieved 22 August 2020).

SLBM capability will also have to be pre-mated due to the inherent requirements of submarine capabilities.²⁰⁶

One of the biggest challenges for India's assertive nuclear command and control structure is its sea-based nuclear capability. For the 'Dhanush' missiles launched from surface ships the problem is less acute, since missile components could be physically separated and stewarded by civilians on the ship until authorisation from the PMO was received. However, for India's developing nuclear ballistic submarines (SSBNs), procedures would have to compromise on assertive control or on the usability of their SSBNs. India would either have to pre-mate and arm its submarine-launched ballistic missiles (SLBMs) or mate the SLBMs at a predetermined alert level before going out on deterrent patrol, in both cases relying on technological and procedural controls to prevent unwanted use. To retain centralised control over submerged nuclear assets, the political leadership could even go so far as to require civilians to release the SLBMs, but this would encounter strong objections from the Indian Navy, which explicitly forbids civilians on board nuclear submarines.²⁰⁷

(Chain of) Command

Only the Prime Minister (or his designated successor in case of decapitation) possesses the authority to order the assembly, movement and use of nuclear weapons. In peacetime and during crises, India's nuclear arsenal is kept under civilian control, minimising the risk of unwanted use. Organisationally, this is achieved by having the Prime Minister's Office (PMO) at the top of a command structure that excludes the military chain of command, so that any order for nuclear use coming from the armed forces would have no authority.²⁰⁸ However, since the military is supposed to be the end user of the nuclear deterrent, fully eliminating them from the nuclear command structure is impossible. Therefore, there exists a tension between maintaining assertive control and retaining an effective deterrent.

India's long-standing tradition of strict civilian control of the military was established in the nuclear command structure by the establishment of the Nuclear Command Authority (NCA) in 2003. The NCA is the authority responsible for command, control and operationalising India's nuclear weapons programme. The NCA is composed of an Executive Council and a Political Council. The Executive Council is led by the National Security Advisor and advises the Political Council, which is chaired by the Prime Minister and has launch authority over India's nuclear forces.²⁰⁹ The directives of the NCA are operationalised by the Strategic Forces Command (SFC), which is in charge of the management and administration of India's nuclear capability. The SFC serves as the link between the prime minister's authority and the operationalisation of India's nuclear capability, and would work out plans and targets in case of a nuclear exchange.²¹⁰ The military is well-represented in the SFC, but it is subservient to the prime minister's authority through the NCA, and stands outside the military chain of command.

²⁰⁶ Narang, *Nuclear Strategy in the Modern Era*, 104-105.

²⁰⁷ *Ibidem*, 109.

²⁰⁸ *Ibidem*, 105.

²⁰⁹ Harsh V. Pant, "India's Nuclear Doctrine and Command Structure: Implications for India and the World," *Comparative Strategy* 24 (2005), 249-250.

²¹⁰ Prime Minister's Office of India, "Cabinet Committee on Security Reviews Progress in Operationalising India's Nuclear Doctrine", 4 January 2003. Retrieved at: https://mea.gov.in/press-releases.htm?dtl/20131/The_Cabinet_Committee_on_Security_Reviews_perationalization_of_Indias_Nuclear_Doctrine+Report+of+National+Security+Advisory+Board+on+Indian+Nuclear+Doctrine (retrieved 22 August 2020).

The crux of India's assertive control within its nuclear command structure is the custodian/controller relationship. Civilians not only maintain control over India's nuclear forces, they also maintain custody over it. The custodians of India's nuclear weapons are civilians from DRDO and the Department of Atomic Energy who cannot arm or assemble a nuclear weapon without authorisation from the prime minister via the NCA.²¹¹ Only after an express order would the civilian custodians transfer nuclear assets to the controllers from the SFC in order to prepare the nuclear system for use. There are a number of escalatory alert stages (four, according to Indian government officials) which the prime minister would have to explicitly order, before a release order would be issued to the SFC.²¹² Regardless of their state of readiness, all nuclear systems are subject to the two-man rule at every alert stage and at release in addition to direct inputs from the prime minister via the NCA.²¹³ Therefore, no SFC commander can use a nuclear system (even a fully mated weapon) without authorisation from the prime minister.

Conclusion

On the whole, Tellis' claim that India maintains its nuclear forces in a disassembled state, distributed among various civilian agencies, cannot hold today. Co-location of nuclear components has decreased Indian response time, and the development of pre-mated, 'canisterised' nuclear systems has moved at least a section of India's nuclear capability onto hair-trigger.

Civilian control of the nuclear command structure remains strong, with the prime minister of India heading a civilian chain of command for the authorisation of nuclear use. Any assembly, movement or use of nuclear weapons must be preceded by an explicit order of the NCA, which is headed by the prime minister. In addition, the guardianship of nuclear weapons is the responsibility of civilian representatives of the Department of Nuclear Energy and DRDO until the prime minister orders their transfer to the military controllers of the SFC, who will then ready the nuclear systems for use.

Conclusion

In his authoritative study on India's nuclear programme *India's Emerging Posture* from 2001, Ashley Tellis described India's nuclear capability as "limited in size, separated in disposition, and centralised in control".²¹⁴ It is clear that Ashley Tellis' understanding of India's nuclear programme longer holds true. In the twenty years since Tellis wrote *India's Emerging Posture*, India's nuclear programme has undergone a transformation. It remains the case that, due to India's poor civil-military relationship, the production of nuclear materials, non-fissile components and delivery vehicles is entirely under control of India's civilian leadership. Any change in production can therefore be seen as part of India's nuclear strategy. However, this chapter has identified two developments in India's nuclear command-and-control structure which indicate that India's nuclear strategy is less defensive than declared doctrine would suggest.

The development of India's nuclear forces shows that it is expanding its nuclear arsenal, both in size and in depth. While India's expansion of its short-range nuclear use options can still be seen as oriented toward against Pakistan, these forces do not typically form part of a nuclear strategy of assured retaliation. India's longer-range options Agni-4 and Agni-5 are postured toward China both in

²¹¹ Narang, *Nuclear Strategy in the Modern Era*, 106.

²¹² Vijay Shankar, "A Covenant Sans Sword: Evolution of Nuclear Strategies & Doctrines" *IPCS NIAS Nuclear Workshop*, 5 May 2015, 5. Retrieved at: <http://issp.in/wp-content/uploads/2015/06/7-Evolution-of-Nuclear-Strategies-and-Doctrines-Vijay-Shankar.pdf> (retrieved 22 August 2020).

²¹³ Shankar, "A Covenant Sans Sword", 5. Retrieved at: <http://issp.in/wp-content/uploads/2015/06/7-Evolution-of-Nuclear-Strategies-and-Doctrines-Vijay-Shankar.pdf> (retrieved 22 August 2020).

²¹⁴ Tellis, *India's Emerging Nuclear Posture*, 374-378.

their capabilities and their deployment locations. In addition, the development of SSBNs to complete India's nuclear triad with a sea-based capability serves to harden the survivability of India's nuclear deterrent. Although India's declaratory nuclear doctrine is 'credible minimum deterrence', its operational nuclear posture is anything but 'minimal' towards Pakistan. India's declared doctrine of minimum credible deterrence can therefore no longer be squared with the development of its nuclear capability.

India's nuclear forces are no longer kept in a state of disassembly. This means that India has significantly increased the readiness of its nuclear deterrent, at the cost of negative control. The nuclear command structure remains in civilian hands, with the prime minister heading the NCA at the top of the chain of command. India relies more on technological and procedural limitations, rather than physical de-mating and disassembly to achieve negative control. This has led to changes in deployment and procedures that increase the readiness of India's nuclear capability, but also the risk of unwanted use.

In conclusion, my hypothesis that India has adopted an assured retaliation posture towards Pakistan is incorrect. India's two pillars of its nuclear doctrine, minimum credible deterrence and no-first-use are increasingly not reflected in its command-and-control structure. It is clear that India is developing its nuclear capability to deter China, leading to a very different set of force requirements. The development of India's nuclear capability exceeds any semblance of minimum credible deterrence towards Pakistan. The vertical development (more missiles) of India's nuclear capability increases the cost of nuclear escalation, as it increases the amount of warheads deployed. What's more, the horizontal development (more capabilities) of India's nuclear capability increases the risk of nuclear escalation, as it increases the chance of deterrence failure.

Chapter 8 – Conclusions

In this chapter, I will connect my research from chapters 4-7 with the academic and historical context from chapters 1-3 to provide an analytical overview of India and Pakistan's nuclear strategy development and the security implications thereof. I will do so by recapitalising the main conclusions of the research chapters and connecting them to the security context of South Asia, as outlined in Chapter 3. After that I will use my hypothesis from the introduction of this thesis to deliver my answer to the research question, based on my research. I will then offer suggestions for further research

Recapitulation of method used

Academic context

In chapter one, I have introduced the academic debate on nuclear deterrence, describing how constructivists identify three critiques of the neorealist theory on nuclear deterrence, 'rational deterrence'. Firstly, constructivists charge that the neorealists assume that because it seems irrational to start a nuclear war, states can be assumed to be deterred from fighting nuclear war. This argument for universal deterrence has led to a pervasive "existential bias" in the literature, with the main body of academic work focused on the question of whether states develop nuclear weapons or not (nuclear proliferation), rather than on the question of how states operationalise their nuclear capability, once they have attained it (nuclear strategy). Secondly, neorealist theory assumes that the state is the central actor in the international system, that it is a rational actor which always acts to preserve or further its own security, and that it is unitary with regard to the operationalisation of the nuclear capability of said state.²¹⁵ However, it is only possible to assume the rationality and unitarity of the state if one denies that interests are the products of the social practices that mutually constitute actors and structures. Thirdly, current scholarship on the deterrence of nuclear weapons in both quantitative and qualitative research does not adequately address the deterrence challenges of regional nuclear powers, because it is focused on the experiences of the United States and the Soviet Union during the Cold War. As regional powers operate on thinner margins, superpower nuclear arms racing is a poor guide to analysing the relationship between nuclear weapons and deterrence.

Theoretical framework

Consequently, I have offered three solutions for these problems in the second chapter, in order to develop a theoretical framework for the resolution of the question of nuclear deterrence which is at the centre of my research question. Firstly, to solve the problem of existential bias, I have shifted the question of proliferation to a question of deterrence. The deterrent value of a state's nuclear capability is determined by its nuclear strategy. Nuclear strategy is composed of nuclear doctrine and nuclear command-and-control. The analytical value of doctrine is limited, because doctrine is essentially a state signalling its nuclear capability to an audience, be that its allies, adversaries or domestic public. Secondly, in order to counter the actor bias of rational deterrence, I have shifted the unit of analysis from actor to structure. I will study India and Pakistan's nuclear force deployment, command structure, and command-and-control measures, and analyse the choices which have been made to emphasise either the reliability or the security of respective states' nuclear deterrent. Thirdly, I have used Narang's posture model to describe the collection of choices within states' nuclear command-and-control structures. These postures have helped translate my research findings

²¹⁵ Mearsheimer, John J, *The Tragedy of Great Power Politics* (New York, 2014) 3.

into coherent conclusions about the security implications of the nuclear posture developments of India and Pakistan.

Historical context

In chapter three, I have offered a historical context of the India-Pakistan relationship, in order to contextualise the nuclearisation of South Asia and how both states' nuclear strategies are related to their conventional approaches toward each other. I have explained how India and Pakistan have a history of mutual tension punctuated by wars in 1947, 1965, 1971 and 1999. I have explained how India's growing conventional military superiority has left Pakistan searching for a strategy to counterbalance, developing a strategy of 'bleeding India by a thousand cuts': destabilising India by small, irregular conflicts and supporting insurrections and militant groups inside India. After the nuclearisation of South Asia in 1999, India struggled to find a way to bring its conventional superiority to bear upon Pakistan, without risking nuclear escalation. Its 'compellence by limited war' strategy was exposed as a failure during the 2001/2002 standoff, leading to the development of the Cold Start plan, which aims to inflict a rapid and debilitating blow to the Pakistani military, without threatening the survival of the Pakistani state and risking nuclear escalation.

Recapitulation of research conducted

After having laid out the academic and historical context of my thesis in the first three chapters, I moved on to present my research on Indian and Pakistani nuclear strategy.

Pakistan's nuclear strategy

In chapter four and five, I have analysed the development of Pakistan's nuclear strategy. I have first examined the way Pakistan has stated its nuclear strategy through the analysis of its declared nuclear doctrine. I have established that Pakistan's nuclear doctrine is based on the principle of first use against India. Based on my analysis, I have developed the hypothesis that Pakistan has developed an asymmetric escalation posture. In chapter five, I have researched the command-and-control structures of Pakistan, in order to test whether the hypothesis that Pakistan has developed an asymmetric escalation is correct. I have found that this is the case, although Pakistan's nuclear force development increases the cost of nuclear escalation. In addition, its delegative nuclear command-and-control measures increases the risk of nuclear escalation.

India's nuclear strategy

In chapter six and seven, I have analysed the development of India's nuclear strategy. In chapter six, I have examined the way India has said its nuclear strategy is developed, through the analysis of its declared nuclear doctrine. India's doctrine is based on the principles of minimum credible deterrence and no-first-use of nuclear weapons. Based on the analysis of its nuclear doctrine, I have developed my hypothesis that India's nuclear posture is that of assured retaliation against Pakistan. In chapter seven I have researched the command-and-control structures of India, in order to test the hypothesis that India has developed an assured retaliation posture. I have found that my hypothesis is incorrect, and that the focus of India's nuclear posture is not Pakistan, but China. In the process of deterring China, India has developed its nuclear capability to far exceed the principle of minimum credible deterrence and has also developed tactical nuclear weapons which are meant for first use against conventional forces. Whether it is too early to claim that India is changing its nuclear posture to one of asymmetric escalation toward China, it is clear that India's nuclear weapons development is no longer commensurate with an assured retaliation posture towards Pakistan. The development of India's nuclear capability has increased the risk of deterrence failure between India and Pakistan, and therefore increased the risk of nuclear escalation in South Asia.

The research question

After having summarised the conclusions from my research on India and Pakistan's nuclear strategy, I will now answer my research question, "How has India and Pakistan's nuclear strategy development changed the security environment in South Asia?"

Hypothesis

In the introduction, I offered three hypotheses that would together answer the research question. Firstly, I expected that Pakistan's nuclear capability would further inhibit India's ability to compel Pakistan, as it has done since 1998. I based this on the assumption that the stability-instability paradox would continue to hold in South Asia, and that Pakistan could continue to use its nuclear capability as an umbrella under which it could carry out lower-level conflict actions versus India, such as the support of terrorist groups within India, without fearing retribution from India's superior conventional forces. In addition, I predicted that Pakistan and India would undertake efforts to increase their nuclear capability horizontally based on the assumption that both states would continue to modernise their nuclear arsenals, an assumption supported by analysis of the US Defense Intelligence Agency. Thus, I expected that both Pakistan and India would expand the number of warheads in their possession, raising the cost of nuclear escalation. Thirdly, I offered the hypothesis that while India would have an assertive nuclear command-and-control structure, Pakistan would possess a delegative nuclear command-and-control structure. India's assertive control structure would ensure that no unwanted use of its nuclear weapons would occur, accidental or unauthorised. However, the delegative nature of Pakistan's nuclear command-and-control structure would increase the risk of an accidental launch by field commanders, or terrorists gaining control of nuclear weapons.

Strategy

After having researched the nuclear strategies of India and Pakistan, I can conclude that my hypothesis was only partly correct. It is true that Pakistan's nuclear posture of asymmetric escalation continues to inhibit India's ability to compel Pakistan. Despite its efforts to compel Pakistan to cease its support for terrorist groups operating in India through the development of Cold Start, India is still unable to respond in a way it sees as proportionate without risking nuclear escalation.

The result of the success of Pakistan's strategy vis-à-vis India is that it makes South Asia less secure. Because India cannot compel Pakistan to stop its efforts to destabilise India, Pakistan is emboldened to take ever further steps. The Indian people, in turn, will be outraged by increased attacks which can be connected to Pakistan and demand retribution. Pakistan is likely to push India further and further under its nuclear umbrella, but when will it go too far? If India breaks the stability-instability paradox and retaliates, its Cold Start plan calls for a debilitating blow to Pakistan's armed forces. Given Pakistan's first use doctrine and nuclear force thresholds as discussed in chapter four, the activation of the Cold Start plan by India would pose a significant risk of nuclear escalation.

Horizontal expansion

My hypothesis that India and Pakistan would horizontally expand their nuclear capability by expanding the number of warheads deployed has also proved to be correct. Especially Pakistan continues to expand its nuclear arsenal with more warheads, more delivery systems, and a growing fissile materials production industry. Pakistan is expected to increase its number of nuclear weapons to 220 to 250 warheads by 2025, while India is estimated to possess a total of 130-140 nuclear warheads, with further warhead development expected to match India's new missile development.

As discussed, Pakistan and India's evident horizontal expansion of their nuclear capability raises the cost of nuclear escalation. That an increasing number of nuclear warheads deployed would make nuclear escalation more costly is a question of simple math. If more nuclear weapons are deployed, any nuclear exchange would occur at a larger scale, leading to more death and destruction.

Command-and-control measures

Pakistan's command-and-control structure

With regard to the command-and-control measures, it is clear that I was correct in predicting that Pakistan has a delegative command-and-control structure. Its few negative control measures are weakened by design, so that they can be circumvented without authorisation. Positive control measures such as pre-delegation of launch authority reflect one of the most delegative nuclear command-and-control systems in the world. Pakistan's command-and-control setup has two main consequences for the South Asian security environment.

Firstly, the delegative system of Pakistan allows for unauthorised use, given that the negative control measures can be circumvented without authorisation. This, combined with pre-delegation of launch authority can lead to a field commander with launch authority for tactical missiles being placed in a conflict situation without communication from his superiors. Nothing in the command-and-control structure of Pakistan would be able to stop him, were he to choose to launch his weapons. Secondly, the lack of negative control measures in Pakistan's nuclear command-and-control system leave it vulnerable to unwanted use by third parties. If a nuclear device is already mated and co-located with its delivery vehicle, it is relatively easy to steal, compared with a disassembled nuclear weapon, whose components are stored in different locations. This is an especially acute risk for Pakistan, given the proliferation of terrorist groups in Pakistan, intent on provoking conflict with India. If a militant group such as Lashkar-e-Taiba were to get its hands on nuclear materials, it could make an improvised nuclear device, or 'dirty bomb' and set it off in an Indian city, killing hundreds and causing mass panic.

India's command-and-control structure

India's nuclear command-and-control system has developed into a much less assertive system than I had predicted. India's assured retaliation posture did not place a premium on readiness, as retaliation need not be immediate (indeed, Indian doctrine used to include a 12-hour delay in retaliation, to allow for assembly). While its chain of command is still strictly civilian, meaning that no launch order can be given without authorisation from the prime minister, its nuclear forces are no longer kept in a state of disassembly. Instead of relying on physical de-mating and disassembly to achieve negative control, India relies more on procedural limitations. The Indian nuclear command-and-control system's focus on positive control has increased the readiness of its nuclear capability.

The flipside of increased positive control is that it has necessarily come at the cost of negative control. Because the Indian chain of command is still civilian-controlled, India is not at the same risk of unauthorised or accidental use as Pakistan's super-delegative command-and-control system is. However, the reduced response time of its nuclear capability does increase the stakes in a crisis. Because India can immediately retaliate against any adversary releasing nuclear weapons, there is no possibility to wait-and-see whether the nuclear use may be accidental or otherwise unintended. When India previously took up to several hours to assemble its weapons to respond to nuclear first use by an adversary, the time to check whether it actually *needed* to retaliate was built-in.

Vertical expansion

Pakistan's nuclear capability

India and Pakistan's development of their nuclear capability is not limited to horizontal expansion. Pakistan's development of three missile types betrays the vertical expansion of its nuclear forces. The short-range NASR missile is a tactical nuclear device aimed at battlefield use against invading Indian Army troops. The medium-range Shaheen-3 missile brings the whole of India into range, including the Indian naval base on the Andaman and Nicobar Islands. If deployed in western Pakistan, Shaheen-3's 2,500 km range would bring many Middle Eastern countries into range, including Pakistan. The Ababeel missile is capable of carrying multiple warheads, using Multiple Independent Re-entry Vehicle (MIRV) technology. MIRV technology is aimed at improving the survivability of a state's nuclear capability. In addition, Pakistan is developing the Babur-3 missile for submarine-based use, completing the nuclear triad of land-, air- and sea-based nuclear capabilities.

The development of short-range tactical nuclear missiles by Pakistan has lowered the threshold for nuclear use, given that tactical weapons must be used early on in a conflict. Due to their limited range, tactical nuclear weapons can only be deployed close to the border with India. In case of invasion by the Indian Army, Pakistan is faced with a 'use it or lose it' situation: it can choose to launch its tactical nuclear weapons, or it could risk losing them to the advancing Indian forces. Given Pakistan's delegative command-and-control structure, it would likely fall to field commanders to make this decision. Any nuclear use by Pakistan would likely be followed by a retaliatory strike by India.

India's nuclear capability

India's nuclear weapons development appears to be aimed at meeting China deterrent needs, instead of Pakistan's. Differences between China and Pakistan in geography, nuclear force structure and conventional strength mean that deterring China requires a far more robust nuclear capability than Pakistan would require. In addition to its four operational nuclear-capable ballistic missile types, India is developing at least two other longer-range missiles with ranges of 3,500 km and 5,000 kms, respectively. Given that the outer bounds of Pakistan are located within a range of 1,000 km from India, it is obvious that these missiles are aimed at China. In addition, the development of Indian nuclear ballistic missile submarines (SSBNs) as part of India's sea-based capabilities serves to complete India's nuclear triad, thus increasing the survivability of India's nuclear capability.

Given that India's nuclear strategy is postured toward China, and that nuclear strategy is 'sticky' (meaning that one can only deploy its forces in one way at a time), India possesses with a nuclear capability which is not postured for the deterrent requirements of Pakistan. This means that capabilities which were meant to deter China, such as tactical nuclear weapons, longer-range missiles and SSBNs are necessarily included in India's deterrent of Pakistan. This leads to a further decrease in the nuclear force threshold in South Asia.

Conclusion

In conclusion, the research I have done in this thesis has caused me to amend my hypothesis in a significant way. Not only did the horizontal development of India and Pakistan's nuclear forces raise the cost of nuclear escalation, vertical escalation of the states' nuclear capability actually raised the risk of nuclear escalation happening as well. In addition, I had not foreseen the delegative development of India's nuclear command-and-control measures, lowering the threshold of nuclear use in South Asia. The conclusions I have reached in this thesis have led me to answer the research question in the following four points.

How has India and Pakistan's nuclear strategy development changed the security environment in South Asia?

- 1) Pakistan's nuclear posture continues to inhibit India's ability to compel Pakistan, raising the risk of nuclear escalation.
- 2) India and Pakistan are horizontally developing their nuclear forces, raising the cost of nuclear escalation.
- 3) India and Pakistan's nuclear command-and control measures are respectively trending more towards positive control, or are already positive control-oriented, increasing the risk of unwanted nuclear use.
- 4) India and Pakistan are vertically developing their nuclear forces as well, expanding their capabilities to include tactical nuclear weapons and sea-based missiles, thus lowering the threshold for nuclear use.

India and Pakistan's nuclear posture development has opened up new avenues for a crisis to escalate to the nuclear level, and increased the number of nuclear missiles that would be involved. Having attained an understanding of the states' nuclear strategy, I do not have confidence in India and Pakistan resolving a crisis in the style of the 2001-2002 standoff peacefully, should such a crisis occur. India and Pakistan's nuclear posture development has changed (and is changing) the security situation in South Asia for the worse, raising both the risk and the cost of nuclear escalation between India and Pakistan.

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