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The Future Viability of the Singapore Armed Forces' Deterrence

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ABSTRACT

Deterrence has been one of the fundamental tenets of Singapore's military defence policy since its independence in 1965. Yet, against the unconventional and conventional threats assessed to be most consequential to Singapore's peace and security in the next 10 to 20 years, is the current deterrence posture adopted by the Singapore Armed Forces (SAF) likely to remain viable, or should alternative trajectories be considered? This thesis explains the evolutionary path that the SAF has followed over the years – from a rudimentary first generation (1G) army symbolised by a "poisonous shrimp," to the highly-sophisticated third generation (3G) fighting force today that is likened to a "dolphin." This thesis then identifies the key challenges that could work against the SAF's ability to deter future threats. Finally, this thesis suggests the possible ways and means for the SAF to become a stronger and more credible deterrence force. In closing, the otter was proposed a metaphor of the SAF's future deterrence posture.

ACKNOWLEDGEMENTS

FROM "POISONOUS SHRIMP" TO "OTTER":
EVALUATING THE FUTURE VIABILITY OF
THE SINGAPORE ARMED FORCES' DETERRENCE

CHAPTER 1

INTRODUCTION

Deterrence has been one of the fundamental tenets of Singapore's military defence policy since its independence in 1965. In the years following its independence, Singapore had to rapidly develop a stronger and more credible military force in order to safeguard its vital national interests from external interference. Accordingly, the SAF provided a rudimentary defence for the city-state with a deterrence posture likened to a "poisonous shrimp" – small, but indigestible to predators.[1] By the early 1980s, the SAF shed its "poisonous shrimp" policy and replaced it with that of a "porcupine" – able to ward off predators from afar and thereby avoid bodily harm.[2] Finally, from the mid-2000s, the SAF pursued an ambitious force development programme aimed at transforming it into "a strong and integrated force that operates across a full spectrum of operations."[3] This posture was likened to a "dolphin" – highly agile, intelligent, and versatile, while still possessing sharp teeth to defend itself against predators.[4]

While Singapore's record of peace and stability over the past few decades appears to back up the effectiveness of the SAF's current deterrence posture, recent

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[1] Bernard F. W. Loo, "Zoological analogies and military strategy," *Military Studies at RSIS* (blog), 4 August 2012, https://rsismilitarystudies.wordpress.com/2012/08/04/zoological-analogies-and-military-strategy/.
[2] *Ibid.*
[3] Ministry of Defence, "3G SAF," last modified 6 April 2021, https://www.mindef.gov.sg/web/portal/mindef/defence-matters/defence-topic/defence-topic-detail/3g-saf.
[4] Bernard F. W. Loo, "Zoological analogies and military strategy," *Military Studies at RSIS* (blog), 4 August 2012, https://rsismilitarystudies.wordpress.com/2012/08/04/zoological-analogies-and-military-strategy/.

unconventional threats such as cyber attacks, terrorism, and maritime incursions have

sparked debate as to whether the SAF would remain sufficiently capable of thwarting

attacks by potential adversaries. Furthermore, Russia's ongoing invasion of Ukraine has

signaled the end of the "peace dividend" for European states, while serving up a timely

reminder for small states like Singapore to never take their peace for granted, and to

continually enhance their deterrence against conventional military threats. Thus, an

evaluation of the viability of the SAF's deterrence posture going forward would yield

invaluable insight into the future prospects of Singapore's survival and success.

Definitions

For the purposes of this thesis, deterrence is defined as the attempt to dissuade

potential adversaries from initiating a specific action because the estimated costs cannot

be justified by the perceived benefits.[5] This definition encompasses deterrence by

punishment (also known as counter-value deterrence), which is applied through the

imposition of unacceptable costs on the society or government of the opponent;[6] as well

as deterrence by denial (also known as counter-force deterrence), which is applied by

convincing the adversary that its attempts to use force will be defeated or suffer losses so

significant that they would not justify the gains.[7]

It is also useful to distinguish deterrence from the concepts of defence and

compellence, with which it is often conflated. In this regard, Robert J. Art, a Christian A.

Herter Professor of International Relations at Brandeis University, dissects the three

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[5] John J. Mearsheimer, *Conventional Deterrence* (New York: Cornell University Press, 1983), 14.
[6] Charles T. Allan, "Extended Conventional Deterrence: In from the Cold and Out of the Nuclear Fire?" *The Washington Quarterly* 17, no. 3 (1994): 206.
[7] *Ibid.*

concepts into distinct functions that are served by military forces.[8] According to Art, although both defence and deterrence seek to dissuade potential adversaries from undertaking actions harmful to oneself, the former dissuades by pointing to the likelihood of failure whereas the latter dissuades with threats of intolerable pain.[9] He further differentiates between compellence and deterrence by arguing that the former involves the active use of force, whereas the latter seeks to achieve the same outcome without having to use force.[10]

Research Questions and Significance

With this in mind, this thesis sets out to answer the primary research question of "How might the SAF strengthen its deterrence posture against future threats to Singapore's peace and security?" This primary research question can be further dissected into three secondary research questions: first, what security threats would prove to be most consequential to Singapore in the future; next, what challenges could work against the SAF's ability to deter such threats; and finally, how might the SAF overcome these challenges?

The first secondary research question focuses on analysing the principal security threats that Singapore is likely to face over the next 10 to 20 years. It examines the imminent security concerns arising from unconventional threats, and discusses the lingering risk of conventional warfare. The next secondary research question deals with the viability of the SAF's deterrence posture against future threats. It deals with the specific challenges that might work against the SAF's ability to deter such threats. Based

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[8] Robert J. Art, "To What Ends Military Power?" *International Security* 4, no. 4 (1980): 5.
[9] Robert J. Art, "To What Ends Military Power?" *International Security* 4, no. 4 (1980): 7.
[10] *Ibid.*, 8.

on the context provided by the answers to these questions, the final secondary research question discusses the ways and means through which the SAF could overcome the challenges to its deterrence effectiveness, and suggests how these might be applied to strengthen the SAF's deterrence posture going forward.

Hence, this thesis aims to critically examine whether the current deterrence posture of the SAF is likely to remain viable going forward, or whether alternative trajectories should be considered. While this line of inquiry is not totally new to Singaporean defence planners, this thesis is intended to provide a unique perspective on the issue, given the author's experience of having attended a professional military command and staff course in the Canadian Armed Forces. In addition, it is hoped that the insights and findings from this thesis would be of value to states that are confronted with similar threats or share similar security dynamics and considerations with Singapore.

Assumption and Caveats

The underlying assumption made in this thesis is that the SAF's deterrence will continue to be operationalised through Singapore's "Total Defence" concept – a national security paradigm launched in 1984 to "unite all sectors of society – government, business, and the people – in the defence of the country."[11] Under this framework, Military Defence is just one of six pillars of Singapore's national deterrence strategy, alongside Civil Defence, Economic Defence, Social Defence, Psychological Defence, and Digital Defence (the newest pillar added to the framework in 2019 to signal the threats that cyber attacks and disinformation pose, as well as the importance of cyber security), which are all national security responsibilities delegated to other Ministries or

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[11] *Defence of Singapore 1994-95* (Singapore: Ministry of Defence, 1994), 5, quoted in Tim Huxley, *Defending the Lion City: The Armed Forces of Singapore* (Australia: Allen & Unwin, 2000), 49.

government agencies besides the SAF.[12] Thus, the SAF is not – and should not be – regarded as Singapore's sole instrument for dealing with every challenge to its peace and security.

Naturally, it follows that this thesis is not intended to evaluate the efficacy of deterrence against all threats that could endanger Singapore's interests. Rather, this thesis will apply a narrowed focus on issues that ostensibly involve the Military Defence pillar, in order to set up a fruitful analysis of the SAF's future approach to deterrence. For example, it will not attempt to address the threat of hostile foreign interference in Singapore's domestic affairs due to the lack of a clear military role in deterring it.[13]

In addition, it would be excessively hubristic to assume that the future may be examined with absolute certainty. In this regard, this thesis will refrain from speculating about "unknown unknowns" while describing currently known threats that are expected to remain most consequential going forward. Likewise, to avoid the spuriousness of "crystal ball gazing" into an indefinite future that is inherently unknowable, this thesis will limit the target horizon of analysis to the next 10 to 20 years.

Conclusion

An objective evaluation of the SAF's approach to deterrence will yield invaluable insight into the prospects of Singapore's continued survival and success as a nation. This thesis aims to contribute to that discussion, and its constituent parts may be read in different ways depending on the reader's need. Those familiar with the concept of

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[12] Ministry of Defence, "About Total Defence," last accessed 20 April 2022, https://www.mindef.gov.sg/oms/imindef/mindef_websites/topics/totaldefence/about.html.

[13] Justin Ong, "Singapore particularly vulnerable yet resilient to Chinese influence operations: French report," *The Straits Times*, 2 October 2021, last accessed 2 May 2022, https://www.straitstimes.com/singapore/politics/spore-particularly-vulnerable-yet-resilient-to-chinese-influence-operations.

deterrence as well as the evolutionary path that the SAF has followed over the years may skip directly to the analysis in Chapter 3, which begins by examining Singapore's future security environment and the challenges associated with achieving its desired deterrence, before concluding with a suggested strategy that the SAF can adopt to strengthen its deterrence posture. Most readers, however, are likely to seek a further appreciation of the context before the solution space is explored. For them, a full reading of Chapter 2, which identifies the principal motivations for the SAF's force development and examines the manner in which its deterrent posture has evolved since Singapore's independence, will prove to be more rewarding.

CHAPTER 2

LITERATURE REVIEW

This chapter is organised into two sections. Section I examines the main theories of deterrence as well as the factors that can influence the effectiveness of deterrence, in order to establish an objective framework of analysis for the SAF's deterrence posture. These theoretical underpinnings provide the context to approach the primary research question, which seeks to identify strategies that the SAF could adopt to ensure its continued ability to deter future threats to Singapore.

Section II is a review of the evolutionary path that the SAF has followed over the years. The objective is to identify the principal motivations for the SAF's force development, as well as the manner in which its deterrent posture has evolved since Singapore's independence. In particular, the evolution of the SAF's deterrence posture was examined in three distinct phases, namely the 1G SAF in the 1960s-1970s, the 2G SAF in the 1980s-1990s, and finally the 3G SAF spanning the 2000s to the present. The literature review in Section II facilitates the answering of the second and third secondary research questions, which correspond to the challenges associated with deterring threats in Singapore's future security environment, as well as the possible ways and means through which the SAF could overcome these challenges.

Section I: Theoretical Underpinnings

This section will review two areas of scholarship in order to establish an objective framework for the analysis of the SAF's deterrence posture. The first is the study of the theories of deterrence. In particular, this section will examine the roles played by

classical deterrence theory and perfect deterrence theory in conceptualising deterrence. The second area explores the factors that can influence the effectiveness of deterrence. A significant body of literature exists to address the necessary ingredients for states to apply deterrence successfully, namely the credibility of their retaliatory threats as well as the communication of the given credibility to the aggressor. It is necessary, however, for the deductions resulting from this strand of analysis to be paired with an understanding of the context within which that deterrence is practised – the subject of the subsequent section – in order to determine whether a given state's deterrence strategies would work. Nevertheless, this does not negate the utility of these theoretical underpinnings as a normative lens with which one might approach the primary research question, which seeks to identify strategies that the SAF could adopt to ensure its continued ability to deter future threats to Singapore.

Theories of Deterrence

According to Frank C. Zagare, the Distinguished Professor of Political Science at the University of Buffalo, and D. Marc Kilgour, a former Director of the Laurier Centre for Military Strategic and Disarmament Studies, two main theories of deterrence exist in the academic realm, namely classical deterrence theory and perfect deterrence theory.[14]

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[14] Frank C. Zagare and D. M. Kilgour, *Perfect Deterrence* (Cambridge: Cambridge University Press, 2000), 33.

more concerned with how the preferences and utilities of states influenced their responses to the security threats they faced.[20]

The underlying difference between the two forms of classical deterrence theory was summed up well by Russell J. Leng, the James Jermain Professor Emeritus of Political Economy and International Law at Middlebury College, when he observed that the structural deterrence theorist merely contends with the paradox that "one must prepare for war in order to maintain peace," whereas the decision-theoretic deterrence theorist contends with a second paradox, which is that "one must credibly threaten war in order to avoid it."[21]

Perfect Deterrence Theory

Zagare and Kilgour also proposed an alternative theoretical framework to classical deterrence theory, which they called perfect deterrence theory.[22] They argued that two key characteristics set perfect deterrence theory apart from classical deterrence theory: one, that perfect deterrence theory can be more generally applied to scenarios of conflict between states that do not have nuclear weapons, or even between non-state actors and individuals, unlike classical deterrence theory that is essentially restricted to analysing conflict between nuclear-armed states; and two, that perfect deterrence theory does not presuppose conflict as the worst possible outcome for both states as does

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[20] Frank C. Zagare, "Classical Deterrence Theory: A Critical Assessment," *International Interactions* 21, no. 4 (1996): 373.

[21] Russell J. Leng, *Interstate Crisis Behaviour, 1816-1990: Realism Versus Reciprocity* (New York: Cambridge University Press, 1993), 8.

[22] Frank C. Zagare and D. M. Kilgour, *Perfect Deterrence* (Cambridge: Cambridge University Press, 2000), 5.

classical deterrence theory.[23] To this end, perfect deterrence theory deals with the "most glaring deficiencies" of classical deterrence theory.[24]

Despite these differences, Zagare and Kilgour noted that both theories were predicated upon the assumption of rationality, in which potential aggressors will always opt for the course of action that maximises their expected utility after comparing expected costs and benefits.[25] Thus, they argued that the credibility of threats would be a function of their rationality[26]. This view was echoed by Lawrence Freedman, the Emeritus Professor of War Studies at King's College London, who described credibility as the "magic ingredient" of deterrence.[27] In other words, credible threats are those that are believed by potential adversaries, and their believability stems precisely from the fact that potential adversaries would find it rational for deterrers to carry them out. Thus, as Zagare and Kilgour argued, the only credible threats are those that are rational.[28]

Elements of Effective Deterrence

Having discussed in the preceding sub-section that deterrence viewed through the lens of the classical and perfect deterrence theories crucially depends on the rationality of the actors involved, this sub-section will examine in greater detail the factors that can influence the effectiveness of deterrence, namely the credibility of the deterrent threat, as well as the communication of that given credibility to the aggressor.

Credibility

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[23] Frank C. Zagare and D. M. Kilgour, *Perfect Deterrence* (Cambridge: Cambridge University Press, 2000), 6.
[24] *Ibid.*, xix.
[25] Glenn H. Snyder, *Deterrence and Defense* (Princeton: Princeton University Press, 1961), 268.
[26] Frank C. Zagare and D. M. Kilgour, *Perfect Deterrence* (Cambridge: Cambridge University Press, 2000), 66.
[27] Lawrence Freedman, *The Evolution of Nuclear Strategy*, 3rd ed. (New York: Palgrave Macmillan, 2003), 92.
[28] Frank C. Zagare and D. M. Kilgour, *Perfect Deterrence* …, 67.

Richard J. Harknett, a Professor of Political Science at the University of Cincinnati, defined the credibility of deterrence as a function of the defender's capability to inflict retaliatory threats, as well as its willingness to respond to the given aggression.[29] In particular, both military and non-military means must be considered in assessing a defender's capability to impose costs on potential aggressors. Besides the obvious option of threatening military strikes on the potential aggressor's population centres or critical infrastructure in retaliation for attacks, analysts such as Gary C. Haufbauer and Jeffrey J. Schott, both Senior Fellows at the Peterson Institute of International Economics, have studied the feasibility of achieving deterrence through the imposition of economic sanctions to bring pressure upon the aggressor.[30] Similarly, Joseph S. Nye, Jr., the Distinguished Service Professor in the John F. Kennedy School of Government at Harvard University, argued that deterrence may also be achieved through the application of punitive diplomatic or political measures so severe that they damage the potential aggressor's reputation beyond any gains it may potentially make from carrying out an attack.[31]

According to Harknett, however, possessing the capability to impose costs on potential aggressors alone does not guarantee credibility in deterring one's opponent.[32] Rather, the defender must also have the willingness to carry out its retaliatory threats.

[29] Richard J. Harknett, "The Logic of Conventional Deterrence and the End of the Cold War," *Security Studies* 4, no. 1 (1994): 89.

[30] Gary C. Hufbauer *et al.*, *Economic Sanctions Reconsidered: History and Current Policy*, 3rd ed. (Washington, D.C.: Peterson Institute for International Economics, 2007), quoted in Toms Rostoks, "The Evolution of Deterrence from the Cold War to Hybrid War," in *Deterring Russia in Europe: Defence Strategies for Neighbouring States*, ed. Nora Vanaga and Toms Rostoks, 1st ed. (n.p.: Routledge, 2019), 24.

[31] Joseph S. Nye, Jr., "Deterrence and Dissuasion in Cyberspace," *International Security* 41, no. 2 (2016-2017): 60.

[32] Richard J. Harknett, "The Logic of Conventional Deterrence and the End of the Cold War," *Security Studies* 4, no. 1 (1994): 89.

Harknett further contended that the greater the ambiguity surrounding the defender's expressed intention to respond to attacks, the more vigorous it should expect potential aggressors to test that will, which could in turn require the defender to reassert its commitment more strongly.

Thus, as alluded to above, credibility is ultimately the quality of being believed – potential aggressors should be convinced that the defender is not only capable of inflicting damage, but also willing to use that capability.[33] In the words of Austin G. Long, a Senior Political Scientist at the RAND Corporation, deterrence therefore requires the dual conditions of the "credible capability to do harm," as well as the "credible intent to carry out this harm."[34]

Communication

The review thus far establishes the credibility of deterrence as an ingredient for effective deterrence. However, this credibility must also be effectively communicated to potential aggressors if deterrence is to be effective.[35] Simply put, communication rests on the defender's ability to articulate its capability and willingness to make good its deterrent threat – the defender must therefore seek to convince potential aggressors that the threatened costs are unavoidable once it is attacked. Frank P. Harvey, the Eric Dennis Chair of Government and Politics at Dalhousie University, suggests that credibility is best conveyed through the use of "costly signals" – that is, any actions, statements, or conditions that increase the expected cost to potential aggressors from attacking the

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[33] Richard J. Harknett, "The Logic of Conventional Deterrence and the End of the Cold War," *Security Studies* 4, no. 1 (1994): 89.

[34] Austin G. Long, "Deterrence Then and Now," in *Deterrence: From Cold War to Long War* (Santa Monica: RAND Corporation, 2008): 64.

[35] Richard J. Harknett, "The Logic of Conventional Deterrence and the End of the Cold War," *Security Studies* 4, no. 1 (1994): 91.

defender, whilst reducing the defender's costs of initiating the retaliatory action to such challenges.[36] For example, the activation and deployment of military forces for defensive or counter-attack operations may be classified as actions that demonstrate the willingness to deter. On the other hand, ultimatums for the withdrawal of the aggressor's forces and public pronouncements of military retaliation are possible examples of deterrent statements. Finally, conditions to deter might include the canvassing of international and domestic support for retaliation, as well as the shaping of media coverage to express support for the defender's cause.[37]

Summary

In summary, based on the theories discussed, the concept of deterrence is rooted in the notion of rationality. In addition, the effectiveness of deterrence may be influenced by its credibility, which comprises the capability and willingness to dissuade potential aggressors from attacking, as well as the successful communication of this credibility to the aggressors.

Section II: Evolution of SAF's Deterrence Posture

Having examined the theoretical underpinnings for conceptualising deterrence as well as factors that can influence the effectiveness of deterrence, it is timely to set out the relevant context for a productive analysis of the SAF's deterrence posture. This section will therefore depart from the cerebral abstractions of deterrence theories and concepts, and home in on two specific strands of analysis. The first identifies the principal motivations for the SAF's force development, as epitomised by internal and external

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[36] Frank P. Harvey, "Rigor Mortis or Rigor, More Tests: Necessity, Sufficiency, and Deterrence Logic," *International Studies Quarterly* 42, no. 4 (1998): 676.
[37] *Ibid*.

security threats faced by Singapore since its independence. The second strand focuses specifically on the transformational changes that have occurred as regards the SAF's doctrine, organisation, and force structure. This section facilitates the answering of the second and third secondary research questions, which correspond to the challenges associated with deterring threats in Singapore's future security environment, as well as the possible ways and means through which the SAF could overcome these challenges.

1G SAF: 1960s-1970s

Singapore's deterrence policy was born out of the circumstances surrounding its independence in 1965. Prior to this, Singapore had joined the Federation of Malaysia on special terms that included it having more autonomy (such as its own Prime Minister) and smaller financial obligations as compared to other Malaysian states.[38] However, as disagreements between the Singapore government and the Malaysian federal government exceeded the latter's tolerance, it became apparent to the leaders of both sides that separation was the only feasible way to calm an increasingly strained relationship.[39] Thus, on 9 August 1965, Singapore announced its separation from the Malaysian Federation, and consequently proclaimed itself a sovereign republic.

On the home front, simmering tensions between the ethnic Malay and Chinese populace was the immediate concern of the Singapore government in the years following its independence. A record of violent clashes occurring between ethnic groups during the 1950s and the early 1960s called for a strong emphasis on domestic security – this was evidenced by two episodes of Chinese-Malay communal violence occurring just months

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[38] K. S. Nathan, "Malaysia-Singapore Relations: Retrospect and Prospect," *Contemporary Southeast Asia* 24, no. 2 (2002): 389-390.

[39] Leslie Fong, "Week Before Separation," *The Straits Times*, 9 August 1990, last accessed 2 May 2022, https://eresources.nlb.gov.sg/newspapers/Digitised/Article/straitstimes19900809-1.2.109.3.

apart in 1964, which left close to 40 dead and another 560 injured,[40] as well as the

massive racial riots in 1969 that occurred after Malaysia's ruling party, the United

Malays National Organisation, sustained significant electoral losses in the Malaysian

federal elections. Under these circumstances, the SAF was under no illusions that it

would be mobilised to keep peace and order in Singapore, should there be an outbreak of

large-scale communal violence.[41]

While it had to deal with racially-motivated agitators, the Singapore government

was also faced the task of combating the spread of communism at home. A key concern

at the time was the communist-aligned *Barisan Sosialis* (Socialist Front) party, which at

the time enjoyed a massive following of left-leaning workers, students, and trade

unionists.[42] As an example of the threat it posed to domestic order, the *Barisan* was

responsible for instigating violent protests by Chinese-medium students against the

imposition of compulsory National Service (NS) in 1967-1968.[43] Worse still, the early

1970s witnessed a spate of bombings and arson attacks in various parts of Singapore

carried out by guerilla fighters who operated out the jungles of Malaysia and numerous

underground cells spread out across Singapore.[44] Such dangerous conditions persisted

until the late 1980s, when it became clear that the collapse of the Soviet Union was

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[40] Jamie Han, "Communal riots of 1964," in *Singapore Infopedia*, last modified 18 September 2014, https://eresources.nlb.gov.sg/infopedia/articles/SIP_45_2005-01-06.html.

[41] Richard Clutterback, *Conflict and Violence in Singapore and Malaysia* (London: Graham Brash, 1984), 298.

[42] Joshua Y. J. Chia, "Barisan Socialis," in *Singapore Infopedia*, last accessed 13 April 2022, https://eresources.nlb.gov.sg/infopedia/articles/SIP_1148_2008-11-30.html.

[43] "Six men, girl held in anti-call up protest," *The Straits Times*, 30 March 1967, last accessed 2 May 2022, https://eresources.nlb.gov.sg/newspapers/Digitised/Article/straitstimes19670330-1.2.110.

[44] Shereen Tay, "Communist Party of Malaya," in *Singapore Infopedia*, last modified 30 March 2018, https://eresources.nlb.gov.sg/infopedia/articles/SIP_2018-03-28_141257.html.

imminent. Thereafter, the threat of communism waned, and was subsequently de-prioritised by the Singapore government.[45]

Beyond Singapore's shores, the continuation of Indonesia's policy of *Konfrontasi* (Confrontation) to destabilise the Malaysian Federation posed an existential threat to the city-state. Formerly part of the Federation, Singapore was not spared from the armed incursions as well as acts of subversion and sabotage ordered by the-then Indonesian President Sukarno, who strongly opposed the merger with Malaysia. At the height of the crisis, the MacDonald House at Orchard Road was targeted by terrorists who detonated a bomb at the building on 10 March 1965. The attack ultimately claimed the lives of three innocent civilians and wounded more than 30 others.[46] Meanwhile, both battalions of the Singapore Infantry Regiment (SIR) were placed under Malaysian command and deployed to Johor and Sabah to fight Indonesian infiltrators, which eventually resulted in several casualties.[47] As a grim indication of how close the *Konfrontasi* came to precipitating an all-out war, Indonesian forces were reportedly planning a full-scale amphibious invasion of Singapore from the south.[48] Although the *Konfrontasi* was brought to an end with Indonesia's formal recognition of Malaysia's (and by extension, Singapore's) sovereignty

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[45] Tim Huxley, *Defending the Lion City: The Armed Forces of Singapore* (Australia: Allen & Unwin, 2000), 42.

[46] "Terror Bomb Kills 2 Girls at Bank," *The Straits Times*, 11 March 1965, last accessed 2 May 2022, https://eresources.nlb.gov.sg/newspapers/Digitised/Article/straitstimes19650311.2.3; "Bomb Victim No. 3 Dies of Wounds," *The Straits Times*, 13 March 1965, last accessed 2 May 2022, https://eresources.nlb.gov.sg/newspapers/Digitised/Article/straitstimes19650313-1.2.19.

[47] Daniel W. B. Chua, "Konfrontasi: Why It Still Matters to Singapore," *RSIS Commentary*, no. 054 (16 March 2015): 2.

[48] Lee Kuan Yew, *From Third World to First – The Singapore Story: 1965-2000* (New York: Harper Collins, 2000), 21-23.

in a 1966 peace agreement, it left Singapore deeply suspicious of Indonesia's political intentions for many years to come.[49]

Finally, independent Singapore also suffered a difficult relationship with Malaysia right from the beginning. Indeed, the city-state quickly sobered to the fact that Malaysia had "intended to make life difficult" for it in more ways than one.[50] For example, an article covering defence issues in the separation agreement proved to be a major stumbling block to bilateral relations: while it was agreed that Singapore would allow Malaysia to "continue to maintain the bases and other facilities used by its military forces within Singapore and will permit… use of these bases… for the purpose of external defence," this clause was eventually exploited by Malaysia as a pretext to continue stationing its forces in Singapore's Temasek Camp.[51] As another example, the then-Malaysian Prime Minister Tunku Abdul Rahman had reportedly said that his government intended to influence Singapore's foreign policy by exploiting the city-state's reliance on Malaysia for its water supplies.[52] Indeed, from Singapore's standpoint, Malaysia's actions indicated a desire to pressure it into submission, and perhaps even to force it to agree to a re-merger with Malaysia on Kuala Lumpur's terms.[53]

Against this backdrop, the Singapore government moved quickly to boost the strength of its security forces. It established a Ministry of the Interior and Defence (MID)

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[49] Dewi F. Anwar, *Indonesia in ASEAN: Foreign Policy and Regionalism* (Singapore: Institute of Southeast Asian Studies, 1994), 41.

[50] Tim Huxley, *Defending the Lion City: The Armed Forces of Singapore* (Australia: Allen & Unwin, 2000), 37.

[51] *Ibid.*, 39.

[52] Confidential telegram dispatched by Anthony Head to British High Commissioner in Canberra, 9 August 1965, A1838/33 3006/10/4, Australian Archives, quoted in Narayanan Ganesan, "Malaysia-Singapore Relations: Some Recent Developments," *Asian Affairs, an American Review (New York)* 25, no. 1 (1998): 23.

[53] Tim Huxley, *Defending the Lion City: The Armed Forces of Singapore* (Australia: Allen & Unwin, 2000), 37.

that was placed in charge of replenishing the ranks of the SIR units, which had been depleted after significant numbers non-Singaporean troops were transferred back to the Malaysian army.[54] To exacerbate matters, the British government had just announced a full military withdrawal by 1969-1970, and this coincided with Malaysia's decision to pull out its police riot squad from Singapore.[55] Following this, multiple rounds of lacklustre recruitment campaigns for the regular SAF and the volunteer People's Defence Force eventually led the Singapore government to conclude that universal conscription would be the only viable means of generating the required number of battalions for the army.[56] Thus, it was eventually decided that the city-state would build up its own citizen army through the mandatory conscription of all 18-year-old male citizens and permanent residents, who would serve two years of full-time NS, followed by ten years as part-time reservists.[57]

The swift expansion of the SAF's order of battle through conscription was also accompanied by significant capability acquisitions and reorganisation within the individual services. For the army, this took the form of rapid development in its non-infantry branches. The SAF's first artillery unit, the 20th Singapore Artillery, was formed from a volunteer unit that traced its origins back to the mid-nineteenth century.[58] Furthermore, the SAF established an initial armoured capability in the form of the Vehicle Commando Unit, which was subsequently designated as the 41st Singapore

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[54] *Ibid.*, 38.
[55] *Singapore Year Book 1965* (Singapore: Government Printing Office, 1965), 156, quoted in Tim Huxley, *Defending the Lion City …*, 37.
[56] Mickey Chiang, *SAF and 30 Years of National Service* (Singapore: Armour Publishing, 1997), 16.
[57] "All Set For Call-Up Of First Batch," *The Straits Times*, 14 March 1967, last accessed 2 May 2022, https://eresources.nlb.gov.sg/newspapers/Digitised/Article/straitstimes19670314-1.2.129.
[58] Tim Huxley, *Defending the Lion City …*, 43.

Armoured Regiment.[59] On a similar note, the SAF's first combat engineer unit, the 30th Singapore Combat Engineers, took in its first batch of conscripts in 1968.[60] Concurrently, the first two full-time formations above the SIR echelon – the 2nd Singapore Infantry Brigade and the 3rd Singapore Infantry Brigade – were formed in 1968 and 1969 respectively.[61] Then, in 1972, these formations came under the formal command and control of the 3rd Singapore Division.[62]

In addition, urgent priority was given to initiate the development of the SAF's non-existent navy and air force, out of concern that Singapore would be left defenceless against threats from the sea and air.[63] For the navy, a substantial increase in funds allocated to the defence budget from 1968 enabled its acquisition of fast patrol craft, missile gun boats, and mine countermeasures vessels, which constituted a rudimentary maritime defence capability.[64] Likewise, the air force formed its first operational units after taking delivery of eight French helicopters in 1969, which was followed in 1970-1971 by the delivery of an assortment of British-manufactured jet trainers, fighter ground-attack aircraft, surface-to-air missile systems, and anti-aircraft guns.[65]

Thus, from Singapore's independence in 1965 to the 1970s, the SAF had introduced full-time conscription, and created a semi-conventional navy and a largely professional air force. Yet its capabilities were still rudimentary and defensively-oriented.[66] To this end, the SAF's deterrence posture was likened to a "poisonous

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[59] *Ibid.*
[60] *Ibid.*
[61] *Ibid.*
[62] R. Menon, *To command: The SAFTI Military Institute* (Singapore: Landmark Books, 1995), 49.
[63] Tim Huxley, *Defending the Lion City…*, 45.
[64] *Ibid.*
[65] *Ibid.*, 46.
[66] Tim Huxley, *Defending the Lion City…*, 46.

shrimp" – small, but indigestible to predators[67] – as it was thought that potential aggressors would deem the costs of invading and occupying Singapore too prohibitive to be justified by any conceivable benefits.[68]

2G SAF: 1980s-1990s

The next phase of the SAF's force development was marked by a shift from a defensively-oriented deterrence towards a more offensive posture, as the "poisonous shrimp" policy was criticised for being overly fatalistic.[69] Meanwhile, domestic security concerns faded, in part due to the waning appeal of ideological and racial extremists, as well as to recent successes in curbing subversion and communal disturbances. Ultimately, these factors led to the SAF to divert its focus away from internal security.[70] Accordingly, by August 1970, the MID was separated into two new ministries: the Ministry of Defence (MINDEF), which retained control over the SAF; and the Ministry of Home Affairs (MHA), which assumed command of the Singapore Police Force (SPF) and the Internal Security Department (ISD).[71] Thus, by the beginning of the 1980s, the SAF had in effect relegated its previously-held role in internal security, and pivoted back to the task of defending Singapore against external threats.[72]

Principal among these threats was the potential danger of Malaysian interference with Singapore's vital interests. Indeed, as the then-Singaporean Foreign Minister S.

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[67] Bernard F. W. Loo, "Zoological analogies and military strategy," *Military Studies at RSIS* (blog), 4 August 2012, https://rsismilitarystudies.wordpress.com/2012/08/04/zoological-analogies-and-military-strategy/.

[68] *Ibid.*

[69] "A Conversation with BG (Reservist) Lee Hsien Loong," *ASEAN Forecast* 4, no. 10 (1984): 164, quoted in Benson Chian. "Should the SAF Maintain its Existing Focus on Full-Spectrum Dominance or, Should the Organisation Return to its Core Deterrence and War-Fighting Mission?" *POINTER: Journal of the Singapore Armed Forces* 41, no. 2 (2015): 33.

[70] Tim Huxley, *Defending the Lion City ...*, 42.

[71] Tim Huxley, *Defending the Lion City ...*, 42.

[72] *Ibid.*, 43.

Jayakumar remarked, Malaysia's attitude towards Singapore especially during the first term of Mahatir Mohamad's premiership (1981-2003) was largely shaped by perceptions that Singapore was a "Chinese enclave occupying Malay land," and thereby formed Malaysian expectations of a subservient Singapore.[73] Likewise, Lee Kuan Yew observed that Malaysia exhibited an *abang-adik* mindset towards Singapore, in which Singapore as the *adik* (younger brother) was constantly expected to acquiesce to the wishes of its *abang* (older brother) Malaysia.[74] In particular, tensions in the bilateral relationship became particularly pronounced from the mid-1980s, as a result of several significant political disagreements, including those over the development of Malayan Railway land in Singapore,[75] as well as the dispute over the sovereign ownership of the outlying island of Pedra Branca.[76] Furthermore, disagreements over security-related issues continued to disrupt bilateral relations between the two states well into the 1990s, and these included Malaysia's allegations of repeated intrusions by Singaporean military aircraft into Malaysian airspace, as well as Malaysian suspicions regarding the close defence cooperation between Singapore and Indonesia, which culminated in Kuala Lumpur suspending all bilateral military exercises with Singapore in March 1990.[77]

Besides Malaysia, Indonesia remained a key external security concern for Singapore during this period, despite the closer political, economic, and security relations formed between both states after the *Konfrontasi*. Notably, the Asian Financial Crisis of

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[73] S. Jayakumar, *Diplomacy: A Singapore experience* (Singapore: Straits Times Press, 2011), 204.

[74] Lee Kuan Yew, *From Third World to First – The Singapore Story: 1965-2000* (New York: Harper Collins, 2000), 280.

[75] K. S. Nathan, "Malaysia-Singapore Relations: Retrospect and Prospect," *Contemporary Southeast Asia* 24, no. 2 (2002): 400-402.

[76] David G. X. Han, "Malaysian Foreign Policy Toward Singapore from Mahathir to Badawi and Najib: A Role Theory Assessment: Malaysian Foreign Policy Toward Singapore," *Asian Politics & Policy* 9, no. 2 (2017): 300.

[77] Tim Huxley, *Defending the Lion City …*, 67.

1997 wrought massive economic and political changes in Indonesia, including the

downfall of the then-Indonesian President Suharto. Amid these changes, bilateral ties

between Singapore and Indonesia nosedived suddenly.[78] For instance, B. J. Habbie,

Suharto's successor, was quoted in August 1998 as saying that he did not regard

Singapore as a friendly state, and even famously referred to the city state as nothing more

than a mere "red dot" on the map.[79] Furthermore, the emigration of large numbers of

Indonesian Chinese to Singapore during the Jakarta riots of May 1998 led to significant

funds being transferred into Singapore's banks that would otherwise have assisted

Indonesia's economic recovery, further increasing Jakarta's displeasure with Singapore.[80]

Thus, by the end of the 1990s, there was a growing perception in Singapore that it had

returned to the situation of the late 1960s, in which it was sandwiched between two

unstable and potentially threatening neighbours.[81]

Such was the prevailing security environment surrounding Singapore as the SAF

embarked on a period of transformation towards a conventionally-oriented combined

arms posture to provide a stronger deterrent against Singapore's immediate neighbours.

For the army, this was evidenced from its promulgation of a new amphibious operations

doctrine, which was in turn supported by the conversion of a full-time Brigade – the 7th

Singapore Infantry Brigade – into an "elite" infantry formation that focused on new

operational tasks of conducting coastal hook and airmobile insertions.[82] Likewise, the

Republic of Singapore Navy (RSN) acquired additional capabilities that included sonars,

[78] *Ibid.*, 72.
[79] Richard Borsuk and Reginald Chua, "Singapore Strains Relations with Indonesia's President," *The Wall Street Journal*, 4 August 1998, last accessed 2 May 2022, https://www.wsj.com/articles/SB902170180588248000.
[80] Tim Huxley, *Defending the Lion City ...*, 73.
[81] *Ibid.*
[82] Tim Huxley, *Defending the Lion City ...*, 43.

torpedos, and missile corvettes in order to back up its newly-acquired role of protecting Singapore's sea lines of communications (SLOCs).[83] Finally, the Republic of Singapore Air Force (RSAF) took multiple deliveries of multi-role fighters, military transport aircraft, in-flight refueling tankers, and airborne early warning aircraft during this period, which greatly extended its operational and information reach from mainland Singapore.[84]

Meanwhile, the SAF also focused on consolidating and adapting its erstwhile service-oriented strategic thinking towards the realisation of joint operations doctrine. Notably, in 1983, it established the Joint Staff headquarters as a permanent element of the General Staff, responsible for setting priorities as well as providing centralised direction for the SAF's force development and resource allocation efforts.[85] Furthermore, the promulgation of the "Integrated Warfare" concept in 1994 constituted the first attempts by the SAF leadership to establish a new doctrinal framework that integrated the capabilities of all three services into a joint force.[86] From the mid-1990s onwards, the frequency and scale of joint exercises and training was observed to grow exponentially – the most prominent being the Exercise *Golden Sand* series, which routinely puts the integration and operational readiness of all three SAF services to the test.[87]

Thus, all three services of the SAF continued to grow and mature in the 1980s-1990s. To replace its previous "poisonous shrimp strategy," the SAF transitioned to a more pre-emptive deterrence posture aimed not only at force projection into Singapore's littoral waters, but also focused on transferring a potential conflict beyond Singapore's

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[83] Peter H. L. Lim, *Navy: the vital force* (Singapore: Republic of Singapore Navy, 1992), 37-41, quoted in Tim Huxley, *Defending the Lion City …*, 45.
[84] Tim Huxley, *Defending the Lion City …*, 47.
[85] *Ibid.*, 97.
[86] *Ibid.*, 55.
[87] "Brothers in Arms," YouTube video, 7:05, posted by "Ministry of Defence Singapore," 13 June 2014, https://www.youtube.com/watch?v=_88Sn8z_oWU.

territory. This was likened to a "porcupine" – able to rattle its quills to ward off predators from afar, thereby avoiding any bodily harm.[88]

3G SAF: 2000s to present

The turn of the twenty-first century witnessed the emergence of highly complex security challenges for Singapore. Notwithstanding the SAF's perennial operational focus on deterring conventional attacks, a broader set of security threats that included terrorism, piracy, illegal immigration, infectious diseases, and environmental disasters constituted Singapore's highly unpredictable security environment.[89] Accordingly, the SAF embarked on a new phase of force development aimed at achieving full-spectrum dominance, which is essentially the ability to confront both conventional and unconventional security threats.

On the home front, the growing threat of transnational terrorism stemming from the 11 September 2001 attacks by the Al-Qaeda on the USA precipitated a significant shift in the SAF's policy focus to redouble efforts on the protection of key installations, integrated air defence, and naval patrols in Singapore's territorial waters.[90] Unsurprisingly, Singapore was known to present a particularly lucrative target to terrorists, on account of its close ties with Western nations and its long-time reputation of being safe and secure.[91] Of several plans for attacks on Singapore that were uncovered by the authorities, three were known to be relatively well-formulated: first, a plan to attack

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[88] Bernard F. W. Loo, "Zoological analogies and military strategy," *Military Studies at RSIS* (blog), 4 August 2012, https://rsismilitarystudies.wordpress.com/2012/08/04/zoological-analogies-and-military-strategy/.

[89] Ron Matthews and Nellie Z. Yan, "Small Country 'Total Defence': A Case Study of Singapore," *Defence Studies* 7, no. 3 (2007): 390.

[90] Ron Matthews and Nellie Z. Yan, "Small Country 'Total Defence': A Case Study of Singapore," *Defence Studies* 7, no. 3 (2007): 390.

[91] Bilveer Singh, "Why Singapore is a Terrorist Target," *The Diplomat*, 28 June 2017, last accessed 2 May 2022, https://thediplomat.com/2017/06/why-singapore-is-a-terrorist-target/.

US military personnel and their families in places that they frequented; second, a plan to use truck bombs to attack multiple foreign embassies in Singapore, including those of the USA, Israel, Australia, and the United Kingdom; and finally, plans to target US navy vessels anchored in Singapore. Concurrently, several Singapore targets, including water pipelines, the Changi Airport, as well as military camps, were also considered for attack.[92]

Furthermore, a "national health issue" sparked by the outbreak of the Severe Acute Respiratory Syndrome (SARS) in 2003 saw the SAF being called upon to support multi-ministry efforts to contain the spread of the disease.[93] At the height of the crisis, the SAF deployed more than 400 personnel to full-time roles for health screening, contact tracing, and the management of home quarantine orders.[94] SAF medics were also deployed with infrared temperature screening systems to screen arriving travelers at the Changi Airport for fever – one of the common symptoms of SARS infection.[95] Indeed, the SAF's involvement in the containment of the SARS epidemic in 2003 presaged its future participation in the fight against the Coronavirus Disease 2019 (COVID-19) some 16 years later, which saw the SAF deploying similar capabilities in contact tracing, case-monitoring of infected persons, as well as the provision of crucial logistics support.[96]

Beyond the home front, the transition of power in Malaysia from Mahatir to Abdullah Badawi (2003-2009) and Najib Razak (2009-2018) led to an exceptional

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[92] Ministry of Home Affairs, *The Jemaah Islamiyah Arrests and the Threat of Terrorism: White paper* (Singapore, 2003), 11-14.

[93] Eddie Lim and Benjamin Ho, "Peacetime SAF: Its Evolving Defence Role," *RSIS Commentary*, no. 095 (18 May 2020): 2.

[94] *Ibid*.

[95] Eddie Lim and Benjamin Ho, "Peacetime SAF: Its Evolving Defence Role," *RSIS Commentary*, no. 095 (18 May 2020): 2

[96] *Ibid*., 3.

rapprochement between Singapore and Malaysia. Indeed, efforts by the more moderate

and pragmatic Badawi and Najib to downplay the historical baggage between the two

states have been credited for helping bilateral ties progress towards greater

interdependence and cooperation.[97] Such was manifested early into Badawi's tenure

when he decided to shut down Malaysia's controversial plans to replace a segment of the

Singapore-Malaysia Causeway with a "scenic bridge" – a proposal that Singapore refused

to endorse unless Malaysia agreed to trade-offs on other bilateral issues.[98] In addition, the

Badawi administration's decision not to contest the 2008 decision by the International

Court of Justice to award Pedra Branca to Singapore also signified further improvement

in bilateral ties.[99] During Najib's premiership, resolution on the implementation of the

Points of Agreement on the Malayan Railway land dispute after a 20-year deadlock under

Mahatir's premiership also set the stage for a turnaround in Singapore-Malaysia bilateral

ties.[100] Yet this period of improved relations was ultimately brought to an end in 2018

when a watershed federal election unseated the ruling party and lifted the hawkish

Mahatir into his second term as Malaysia's Prime Minister.

     Likewise, the successive Indonesian presidencies of Susilo Bambang Yudhoyono

(2004-2014) and Joko Widodo (2014 to present) largely returned Singapore-Indonesia

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[97] David G. X. Han, "Malaysian Foreign Policy Toward Singapore from Mahathir to Badawi and Najib: A Role Theory Assessment: Malaysian Foreign Policy Toward Singapore," *Asian Politics & Policy* 9, no. 2 (2017): 290.

[98] "Najib, Mahatir on 'crooked bridge': What is the issue about," *The Straits Times*, 13 April 2015, last accessed 2 May 2022, https://www.straitstimes.com/asia/se-asia/najib-mahathir-on-crooked-bridge-what-is-the-issue-about.

[99] David G. X. Han, "Malaysian Foreign Policy Toward Singapore from Mahathir to Badawi and Najib: A Role Theory Assessment: Malaysian Foreign Policy Toward Singapore," *Asian Politics & Policy* 9, no. 2 (2017): 300.

[100] Walter Sim, "Railway land development charge case: 'Singapore, Malaysia both wanted win-win deal'," *The Straits Times*, 1 November 2014, last accessed 2 May 2022, https://www.straitstimes.com/singapore/railway-land-development-charge-case-singapore-malaysia-both-wanted-win-win-deal.

relations to the warmth and cordiality previously experienced during the presidency of Suharto.[101] However, particular issues of contention continued to disrupt bilateral relations, most notably during the mid-2010s. Among these included Indonesia's 2014 decision to name a naval vessel after the two Indonesian marines responsible for the deadly bombing of Singapore's MacDonald House during the *Konfrontasi* crisis, much to Singapore's consternation.[102] Other issues manifested themselves in chronic rather than acute form, such as the annual haze conditions that resulted from illegal "slash and burn" techniques practised in Indonesia in order to cheaply clear land for palm oil and rubber plantations.[103] A particularly sharp deterioration in bilateral ties took place in 2015 when haze levels reached record levels, prompting the then-Singaporean Minister for Foreign Affairs K. Shanmugam to criticise Indonesia for showing "complete disregard for… [the] people [of Singapore], and [for] their own."[104]

Finally, a growing expectation for militaries to be involved in delivering humanitarian assistance and disaster relief (HADR) to areas affected by environmental disaster took root amidst the occurrence of regional "complex emergencies."[105] The need to maintain the SAF's capability to rapidly deploy for humanitarian operations was clearly evidenced from Operation *Flying Eagle*, Singapore's rescue and relief mission in

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[101] Norshahril Saat and Siwage D. Negara, "Three issues set to define Singapore-Indonesia ties," *TODAY*, 11 September 2017, last updated 12 September 2019, https://www.todayonline.com/world/three-issues-set-define-singapore-indonesia-ties.

[102] "Singapore concerned over naming of Indonesian navy ship after executed commandos," *The Straits Times*, 6 February 2014, last accessed 2 May 2022, https://www.straitstimes.com/singapore/singapore-concerned-over-naming-of-indonesian-navy-ship-after-executed-commandos.

[103] "2015 haze 'covered half the globe at the Equator'," *The Straits Times*, 5 August 2016, last accessed 2 May 2022, https://www.straitstimes.com/asia/se-asia/2015-haze-covered-half-the-globe-at-the-equator.

[104] K. Shanmugam, "Haze – Walked around Chong Pang this morning," Facebook post, 24 September 2015, 6:45 p.m., last accessed 14 April 2022, https://www.facebook.com/k.shanmugam.page.

[105] Ron Matthews and Nellie Z. Yan, "Small Country 'Total Defence': A Case Study of Singapore," *Defence Studies* 7, no. 3 (2007), 390.

the aftermath of the Boxing Day 2004 tsunami disaster. The operation witnessed the

large-scale deployment of three landing ship tanks, 12 helicopters, eight transport aircraft,

and a total of more than 1,500 specialised personnel to Medan, Sumatra for a period of

two months between December 2004 and February 2005.[106] Notably, the SAF reprised

this role in multiple episodes following *Flying Eagle*, including during the aftermath of a

massive earthquake in Christchurch, New Zealand in 2011, which saw the SAF deploy a

116-man team to assist the New Zealand Defence Forces with rescue operations,

humanitarian aid provision, medical assistance, and cordon operations in the affected

areas.[107]

To ensure their effective deployability for a "full-spectrum" of operations, all

three services of the SAF underwent significant technological and force structural

changes to facilitate greater ease in configuring them into multiple units of different

scales to take on both traditional and non-traditional mission sets.[108] For example,

integrated task forces such as the Special Operations Task Force, the Island Defence Task

Force, the Joint Task Force, as well as the Maritime Security Task Force were formed by

the late 2000s to handle security threats across the peace-to-war nexus. Furthermore, in

2020, the SAF also stood up the Cyber Security Task Force to deal with emerging cyber

threats across the entire defence ecosystem.[109] Each of these task forces brought together

various units across the SAF under a centralised command and control, and were often

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[106] S. Deep, "Insights from Operation Flying Eagle – Four key success factors," *POINTER: Journal of the Singapore Armed Forces* 31, no. 1 (2005).

[107] Ministry of Defence, "SAF Assists NZDF in Christchurch," 22 February 2011, last accessed 2 May 2022, https://www.nas.gov.sg/archivesonline/data/pdfdoc/MINDEF_20110223001.pdf.

[108] Evan A. Laksmana, "Threats and civil-military relations: explaining Singapore's 'trickle-down' military innovation," *Defense & Security Analysis* 33, no. 4 (2017): 355.

[109] Ministry of Defence, "Fact Sheet: Strengthening MINDEF/SAF's Cyber Defence Capabilities," last modified 30 June 2021, https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2021/June/30jun21_fs7.

required to work in concert with other relevant ministries and agencies, including the

SPF, the Singapore Civil Defence Force (SCDF), and the ISD.[110]

    At the same time, the SAF also underwent a fundamental re-examination of its

doctrine, organisation, and force structures for its core warfighting mission, informed by

key lessons learnt from the ongoing Revolution in Military Affairs debates occurring

outside of Singapore.[111] This led to the birth of the "Integrated Knowledge-Based

Command and Control" concept, which envisioned the transformation of the SAF into a

"smart" networked force capable of leveraging precision fires, precision manoeuvre, and

information-superiority capabilities to stay ahead of Singapore's regional neighbours in

qualitative terms.[112] To this end, the SAF invested substantially to integrate niche

advanced weapons and systems into its conventional arsenal. Most notably, the army

acquired new platforms such as the upgraded *Leopard* 2SG main battle tank in 2008,[113]

as well as the indigenously-produced *Terrex* infantry carrier vehicle in 2009;[114] the navy

commissioned its *Formidable*-class multi-role stealth frigates with their S-70B *Seahawk*

naval helicopters in 2007, and took delivery of custom-built *Invincible*-class Type 218SG

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[110] Bernard Tay, "Is the SAF's Defence Posture Still Relevant as the Nature of Warfare Continues to Evolve?" *POINTER: Journal of the Singapore Armed Forces* 42, no. 2 (2016): 30.

[111] Evan A. Laksmana, "Threats and civil-military relations: explaining Singapore's 'trickle-down' military innovation," *Defense & Security Analysis* 33, no. 4 (2017): 354.

[112] Michael Raska, "The SAF After Next Incarnation," *RSIS Commentary*, no. 041 (8 March 2019): 1.

[113] Ministry of Defence, "Armour," last modified 29 October 2021, https://www.mindef.gov.sg/web/portal/army/our-forces/formations/formations-detail/armour/armour.

[114] Jermyn Chow, "Made-in-Singapore Terrex a key addition to the SAF," *The Straits Times*, 29 November 2016, last accessed 2 May 2022, https://www.straitstimes.com/singapore/made-in-spore-terrex-a-key-addition-to-saf.

submarines in 2019;[115] the air force acquired the F-15 fighters in 2009,[116] and in 2019 announced its decision to purchase the next-generation F-35 joint-strike fighters to replace its ageing fleet of F-16 fighters.[117]

    Thus, from the 2000s onwards, the SAF focused on embarking on high-technology innovations whilst strengthening its integration with its inter-service and inter-agency partners. To this end, its deterrence posture has been characterised as a "dolphin" – highly agile, intelligent, and versatile, while still possessing sharp teeth to defend itself against predators.[118]

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[115] Ministry of Defence, "Fact Sheet: The Republic of Singapore Navy's Formidable-class Frigates and Sikorsky S-70B Seahawk Naval Helicopters," last modified 24 July 2018, https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2018/july/21jul18_fs.

[116] Jermyn Chow, "Singapore's F-15 fighter jets are operationally ready: RSAF," *The Straits Times*, 18 September 2013, last accessed 2 May 2022, https://www.straitstimes.com/singapore/singapores-f-15-fighter-jets-are-operationally-ready-rsaf.

[117] Lim Min Zhang, "F-35 fighter jets identified as 'most suitable' to replace RSAF's F-16s: Mindef," *The Straits Times*, 18 January 2019, last accessed 2 May 2022, https://www.straitstimes.com/singapore/f-35-fighter-jets-identified-as-most-suitable-to-replace-rsafs-f-16s-mindef.

[118] Bernard F. W. Loo, "Zoological analogies and military strategy," *Military Studies at RSIS* (blog), 4 August 2012, https://rsismilitarystudies.wordpress.com/2012/08/04/zoological-analogies-and-military-strategy/.

Summary

In summary, the evolutionary path of the SAF's deterrence posture is reflected in the distinct zoological analogies that correspond to each phase of its force development. From Singapore's independence to the 1970s, the SAF was small, but assessed to be capable of a "Stalingrad-style defence" of the city-state,[119] and so its deterrence strategy was likened to a "poisonous shrimp." In the 1980s-1990s, the SAF transitioned to an offensively-oriented deterrence, which was likened to a "porcupine." However, by the 2000s, the SAF began developing concepts analogous to a "dolphin" strategy – by way of aspiring to become a "smart" or networked force capable of prosecuting full-spectrum operations.

Conclusion

The literature review was organised into two sections. Section I provided an examination of the main theories of deterrence, namely classical deterrence theory and perfect deterrence theory, both of which hinge on the fundamental assumption of rational actors. The review also examined the factors that can influence the effectiveness of deterrence, namely the credibility of their retaliatory threats as well as the communication of the given credibility to the aggressor, in order to provide a theoretical basis for determining the efficacy of a given state's deterrence strategies. In particular, the credibility of deterrence was examined as a function of the capability and willingness to dissuade potential aggressors from attacking.

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[119] Richard A. Deck, "Singapore: Comprehensive Security – Total Defence," in *Strategic Cultures in the Asia Pacific Region*, ed. Ken Booth and Russel Trood (Houndmills: Macmillan, 1999), 249.

Section II provided a review of the evolutionary path that the SAF's deterrence posture has followed over the years. The SAF's force development was principally motivated by the ebb and flow of internal and external security threats faced by Singapore since its independence. Consequently, the review identified three distinct phases of force development, namely the 1G SAF in the 1960s-1970s, likened to a "poisonous shrimp"; the 2G SAF in the 1980s-1990s, likened to a "porcupine"; and finally the 3G SAF spanning the 2000s to the present, likened to a "dolphin." Understanding the circumstances behind the evolution of the SAF's deterrence posture as well as the way in which that posture has developed over the years, should assist in framing a focused and fruitful analysis on Singapore's future approach to deterrence.

CHAPTER 3

ANALYSIS

This chapter addresses the research questions in three sections. Section I addresses the first secondary research question by analysing the principal security threats that Singapore is likely to face over the next 10 to 20 years. In particular, it examines three imminent security concerns arising from unconventional threats, namely cyber, terrorism, and maritime threats. It also discusses the lingering risk of conventional threats from Singapore's closest neighbours, namely Malaysia and Indonesia. It concludes that while the SAF would increasingly have to devote additional resources and capacity to contend with unconventional security threats, it is imperative that the force remains focused on its primary task of deterring a high-stakes conventional threat to Singapore's peace and security.

Section II addresses the next secondary research question by evaluating the SAF's continued ability to deter such threats vis-à-vis the factors of effective deterrence established in the preceding chapter. It discusses three challenges to the SAF's credibility, namely its vulnerability to asymmetric tactics, the vast differences that exist between conventional military operations and unconventional threat responses, as well as the extent to which the willingness to employ force may be eroded if support for defence and NS is undermined. Additionally, it also considers the challenge of having to communicate the credibility of the SAF's deterrence whilst minimising the likelihood of being perceived as a threat by others.

Section III addresses the final secondary research question by analysing the ways and means through which the SAF might overcome the challenges of deterring given threats. It proposes a four-pronged approach, which comprises the development of niche capabilities within the SAF to close its identified vulnerability gaps, the expansion of strategic partnerships with other national agencies and foreign partners in order to bring their collective strengths to bear upon the given threats, the maintenance of strong public support for defence and NS, as well as the application of defence diplomacy in order to circumvent the challenges associated with the communication of the SAF's deterrence posture. It concludes that while deterrence will remain a key plank of the SAF's defence policy in the foreseeable future, it must not be used in isolation.

Section I: Singapore's Future Security Environment

This section addresses the first secondary research question, which aims to outline the future security environment and the associated security challenges that Singapore would likely face over the next 10 to 20 years. The analysis covers three imminent security threats that the SAF would increasingly have to devote additional resources and capacity to contend with, namely the increasing frequency and scale of cyber attacks on Singapore's critical information infrastructure, Singapore's vulnerability to self-radicalised lone wolves conducting attacks against soft targets, as well as a spike in sea robberies and intrusions into Singapore's waters in recent years. In addition, the analysis also covers the lingering risk of conventional threats from Singapore's closest neighbours, namely Malaysia and Indonesia. The intent of this section is not to speculate about "unknown unknowns" that will confront Singapore over the next 10 to 20 years,

but rather to describe currently known threats that are expected to remain significant, thereby providing a basis to lay out Singapore's future security environment and the associated implications to the city-state's approach to deterrence.

Growing Prevalence of Unconventional Threats

The first of such threats is that of cyber attacks on essential service providers and key organisations in Singapore, which have increased in frequency and scope in recent years. Indeed, Singapore is far from immune from what has been described as a "new complex era of cyber threats" that has sprung up as a result of recent cyber attacks on Ukraine amid Russia's invasion.[120] Compounding this fact further is Singapore's push to become a Smart Nation – a national initiative to embrace digital transformation and greater connectivity within the key domains of health, transport, urban solutions, finance, and education[121] – a vision that has increasingly come under the threat of derailment by potential aggressors operating in the digital domain. Indeed, recognition of the growing threat of hostile cyber actors, state and non-state, is rooted in a sequence of high-profile cyber attacks on Singapore over the past decade. In 2013, following a controversial decision by the government to effect a set of web censorship regulations, multiple Singapore government websites, including that of a charitable organisation founded by the ruling People's Action Party as well as another belonging to the town council of Singapore Prime Minister Lee Hsien Loong's electoral ward, were hacked and defaced

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[120] Jean Iau, "Singapore organisations urged to step up cyber security following cyber attacks on Ukraine," *The Straits Times*, 27 February 2022, last accessed 2 May 2022, https://www.straitstimes.com/singapore/singapore-organisations-urged-to-step-up-cyber-security-following-cyber-attacks-on-ukraine.

[121] Smart Nation and Digital Government Office, *Smart Nation: The Way Forward* (Singapore, 2018), 1.

with taunts and threats.[122] Four years later, state-linked hackers pulled off a sophisticated

cyber heist targeting Singapore's two largest universities, namely the National University

of Singapore and Nanyang Technological University, in an attempt make off with

confidential government and research data.[123] However, it was not until 2018 that

Singapore suffered its "worst cyber attack," during which the personal particulars of

approximately 1.5 million patients, including the medical records of the Prime Minister

and other cabinet ministers, were stolen as a result of alleged state-sponsored hacking

into the databases of local healthcare institutions.[124] In tandem with these high-profile

attacks on government systems, a domestic spike in ransomware and phishing campaigns

targeting Singapore-based businesses mirrored global trends in cybercrime.[125] Thus, it

comes as no surprise that in a 2020 parliamentary debate speech on MINDEF's annual

spending plans, Minister for Defence Dr. Ng Eng Hen named cyber threats as one of

three "clear and present" threats facing Singapore.[126]

Equally as worrisome as the cyber threat is that of terrorism. In the immediate

years following the 11 September 2001 attacks by the Al-Qaeda on the USA, the primary

terror threat to Singapore came from well-organised groups, such as the regional

extremist group *Jemaah Islamiyah* (JI or Islamic Community), which sought to create a

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[122] Ian Poh, "Hacker who called himself 'The Messiah' jailed 4 years and 8 months," *The Straits Times*, 30 January 2015, last accessed 2 May 2022, https://www.straitstimes.com/singapore/courts-crime/hacker-who-called-himself-the-messiah-jailed-4-years-and-8-months.

[123] Irene Tham, "Hackers broke into NUS, NTU networks in search of government, research data," *The Straits Times*, 12 May 2017, last accessed 2 May 2022, https://www.straitstimes.com/singapore/hackers-broke-into-nus-ntu-networks-in-search-of-government-research-data.

[124] Irene Tham, "Personal info of 1.5m SingHealth patients, including PM Lee, stolen in Singapore's worst cyber attack," *The Straits Times*, 20 July 2018, last accessed 2 May 2022, https://www.straitstimes.com/singapore/personal-info-of-15m-singhealth-patients-including-pm-lee-stolen-in-singapores-most.

[125] Cyber Security Agency, *Singapore Cyber Landscape 2020* (Singapore, 2021), 19-20.

[126] Ng Eng Hen (speech), Committee of Supply Debates 2021, Parliament of Singapore, Singapore, 1 March 2021.

Daulah Islamiyah (Islamic State) that comprised Singapore, Malaysia, Indonesia,

southern Philippines, and Brunei.[127] Although Singapore has been a target of terrorists

even before the events of 9/11, namely during the 1974 Laju ferry hijacking incident and

the 1991 Singapore Airlines flight 117 hijacking incident, none hit as close to home as

the city-state's 2002 discovery of a local JI cell and its plans to carry out terror attacks

against Western establishments and personnel in Singapore.[128] It was not until the mid-

2010s that a "new moment" in terrorism took root – with the Internet-savvy Islamic State

in Iraq and Syria (ISIS) terror group gaining global prominence.[129] This was noted by

Prime Minister Lee Hsien Loong, who observed that digital media has "amplified the

poison [of extremist terrorism]," with terror groups such as the ISIS sustaining their

nefarious operations in the cyberspace despite having lost physical territory.[130]

Consequently, the rabid self-radicalisation of individuals influenced by extremist

materials online is now seen as the greatest risk to Singapore's domestic security – as

evidenced from the fact that approximately four-fifths of all individuals charged for

terrorism since 2015 were considered to be self-radicalised.[131] In fact, the recent foiling

of two attack plots by self-radicalised Singaporean youths against places of worship

further underscores the need for continued vigilance and preparedness against terrorism,

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[127] Ministry of Home Affairs, *The Jemaah Islamiyah Arrests and the Threat of Terrorism: White paper* (Singapore, 2003), 6.

[128] *Ibid.*, 11-14.

[129] Raffaello Pantucci and Shashi Jayakumar, "Shape-shifting terrorism: The new challenge," *The Straits Times*, 9 September 2021, last accessed 2 May 2022, https://www.straitstimes.com/opinion/shape-shifting-terrorism-the-new-challenge.

[130] Lee Hsien Loong, "The lessons from 9/11 for Singapore," *The Straits* Times, 11 September 2021, last accessed 2 May 2022, https://www.straitstimes.com/opinion/the-lessons-from-911-for-singapore.

[131] Ministry of Home Affairs, *Singapore Terrorism Threat Assessment Report 2021* (Singapore, 2021), 7.

notwithstanding the absence of any specific or credible intelligence indicating an imminent attack on Singapore.[132]

Finally, the third category of unconventional threats to Singapore refers to the occurrences of piracy and armed robbery in the Singapore Straits. Indeed, as a tiny island-state with a complete lack of natural resources, Singapore's unshakeable dependence on maritime trade for virtually all its fuel and food supplies has generated an unrelenting focus on defending its SLOCs from threats posed to international shipping. Interestingly, while piracy and sea robberies have been on a downward trend across Asia in recent years, they have spiked considerably in the Singapore Straits, with the total number of cases hitting a six-year high in 2021.[133] While this state of affairs might have resulted from a confluence of several factors, there is some consensus that the spike in piracy and armed robbery cases stem principally from the impact of the ongoing COVID-19 pandemic. One possible explanation pertains to the increased economic hardship in fishing communities due to a dampening in global demand for fish, which has led more individuals to resort to crime in order to make ends meet.[134] Another possible explanation is that reduced enforcement due to the diversion of security agencies' manpower towards pandemic needs has created a security vacuum in the maritime domain, enticing would-be perpetrators to carry out criminal acts in the Straits.[135] Finally, longer vessel waiting times in anchorage areas due to a slowdown in port operations might have rendered them

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[132] Ministry of Home Affairs, *Singapore Terrorism Threat Assessment Report 2021* (Singapore, 2021), 12.

[133] Wong Shiying, "Piracy and armed robbery cases in Singapore Strait hit 6-year high in 2021," *The Straits Times*, 18 January 2022, last accessed 2 May 2022, https://www.straitstimes.com/singapore/piracy-and-armed-robbery-cases-in-singapore-strait-hit-6-year-high-in-2021.

[134] *Ibid*.

[135] Fabian Koh, "Why piracy in Singapore Strait persists in the Covid-19 pandemic," *The Straits Times*, 1 December 2020, last accessed 2 May 2022, https://www.straitstimes.com/singapore/why-piracy-persists-in-the-pandemic.

more vulnerable to attacks as well.[136] Thus, as long as the socio-economic grievances wrought by the COVID-19 pandemic continue to persist in regional states, the need for Singapore to deal with elevated threat levels of piracy and armed robberies at sea is here to stay.

Revisiting Conventional Threats

Up to this point, the analysis has discussed the growing prevalence of unconventional threats as a challenge to Singapore's peace and security. Notwithstanding, Russia's ongoing invasion of Ukraine has brought the question of deterring conventional threats back into the spotlight. As a small state that is geopolitically vulnerable, Singapore, too, has to be perpetually wary of a high-stakes military challenge to its sovereignty and territorial integrity, no matter how remote its possibility might seem now.

In this regard, Malaysia is often identified as Singapore's most likely external challenger, given the considerable tension and mutual distrust that have plagued their relations since Singapore's independence in 1965. Commentators like Tim Huxley have observed that the ethnic composition of both states as well as divergent political ideologies adopted by their governments account for the intractable differences embedded in their bilateral relationship, which have time and again played out over particular issues of contention.[137] One such issue concerns Singapore's reliance on imported raw water from Malaysia, which the city-state has historically viewed as prone

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[136] Fabian Koh, "Why piracy in Singapore Strait persists in the Covid-19 pandemic," *The Straits Times*, 1 December 2020, last accessed 2 May 2022, https://www.straitstimes.com/singapore/why-piracy-persists-in-the-pandemic.

[137] Tim Huxley, *Defending the Lion City …*, 66.

to denial or even to sabotage by Kuala Lumpur.[138] Consequently, the need to secure

control over water pumping stations in Johor that provide Singapore its vital water supply

has prominently featured as one of several justifications for which the Singapore

government might actually resort to the use of force.[139] Territorial sovereignty is another

tricky issue affecting bilateral ties, manifested over the years in prickly disagreements

over the ownership of Pedra Branca, the development of Malayan railway land in

Singapore, as well as the relocation of the immigration checkpoint.[140] Above all, recent

examples of Malaysia's tendency to flex its military power at Singapore reinforce an

enduring perception of vulnerability: a video posted by an elite airborne unit of the

Malaysian army during Singapore's National Day last year drew references to "crossing

the enemy line" and "securing two crossing sites,"[141] which prompted a number of

Singapore politicians to comment on the highly-provocative nature of the video's

"timing, context, setting, and language."[142] Thus, Huxley's observation that the SAF's

capabilities have been developed and refined over the years with the specific objective of

responding to scenarios for conflict with or in Malaysia is understandable.[143]

But if Malaysia is indeed Singapore's most likely challenger in conventional

terms, then it would only be apt to designate Indonesia as a secondary concern. Huxley

observes that despite the multi-faceted collaboration between both states during Suharto's

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[138] Tim Huxley, *Defending the Lion City …*, 76.
[139] *Ibid*.
[140] David G. X. Han, "Malaysian Foreign Policy Toward Singapore from Mahathir to Badawi and Najib: A Role Theory Assessment: Malaysian Foreign Policy Toward Singapore," *Asian Politics & Policy* 9, no. 2 (2017): 297.
[141] " 'We are on PARA PREDATOR mode!' – Panglima 10 Briged (Para)," Facebook video, 4:12, posted by "Tentera Darat Malaysia," 21 August 2021, https://www.facebook.com/TenteraDaratMY/videos/348690103661290/.
[142] Tan Chuan-Jin, "This video is making its rounds in WhatsApp and elsewhere," Facebook post, 22 August 2021, 6:50 p.m., last accessed 4 April 2022, https://www.facebook.com/TanChuanJin1.
[143] Tim Huxley, *Defending the Lion City …*, 76.

New Order regime of the 1980s and 1990s, Indonesia has never stopped being a

significant security concern for the city-state.[144] The searing memory of Indonesia's

hostile policy of *Konfrontasi* during the 1960s, which saw more than 40 attacks carried

out against Singapore's civilian population in a bid to destabilise the city-state, left

Singapore's leaders wary of the latent possibility that Indonesia might eventually return

to its past aggressive posture.[145] Such suspicions would later be exacerbated by violent

anti-Chinese, anti-Singapore demonstrations and rioting in Indonesia in 1998, instigated

by resentment towards Singapore's leaders for their alleged complicity in disrupting

Indonesia's development plans, as well as a broad perception that Singapore was

unsympathetic to Indonesia's predicament during the 1997 Asian Financial Crisis.[146]

Accordingly, former Indonesian President B. J. Habibie's disparaging remarks about

Singapore being nothing more than a mere "red dot" on the map sums up the city-state's

fears surrounding the smallness of its statehood vis-à-vis the vastness of Indonesia.[147]

Such rhetoric has resurfaced time and again, most notably in 2015 when former

Indonesian Vice-President chided Singapore for grumbling "like children" about a trans-

boundary haze situation caused by Indonesian forest fires.[148] Thus, historical baggage

explains the uneasiness that continues to fester beneath the surface of warm and cordial

Singapore-Indonesia relations. Consequently, the anticipation of a future Indonesian

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[144] Tim Huxley, *Defending the Lion City …*, 70.

[145] Bernard F. W. Loo, "Goh Keng Swee and the Emergence of a Modern SAF: The Rearing of a Poisonous Shrimp," in *Goh Keng Swee: A Legacy of Public Service*, ed. Emrys Chew and Chong Guan Kwa (Singapore: World Scientific, 2012), 131.

[146] Tim Huxley, *Defending the Lion City …*, 72.

[147] Richard Borsuk and Reginald Chua, "Singapore Strains Relations with Indonesia's President," *The Wall Street Journal*, 4 August 1998, last accessed 2 May 2022, https://www.wsj.com/articles/SB902170180588248000.

[148] "Indonesia's Vice-President Jusuf Kalla criticises neighbours for grumbling about haze," *The Straits Times*, 5 March 2015, last accessed 2 May 2022, https://www.straitstimes.com/asia/se-asia/indonesias-vice-president-jusuf-kalla-criticises-neighbours-for-grumbling-about-haze.

regime that is less inclined towards Singapore and more likely to interfere with Singapore's political and economic freedom of action vindicates the SAF's focus on providing a strong deterrent to safeguard Singapore's vital national interests.

Summary

In summary, Singapore's peace and security over the next 10 to 20 years is likely to be challenged by an assortment of unconventional and conventional threats. Whereas the threats posed by hostile cyber actors, terrorists, as well as pirates and armed robbers at sea form the "most probable" scenario, the risk of conventional threats from Singapore's closest neighbours, namely Malaysia and Indonesia, constitutes the "most dangerous" scenario, however unlikely this might seem to be. To this end, it is imperative that the SAF remains focused on its primary task of deterring a high-stakes, conventional threat to Singapore's peace and security, even as it devotes additional resources and capacity to deal with a growing prevalence of unconventional threats.

Section II: Challenges of Sustaining the SAF's Deterrence

This section addresses the next secondary research question, which aims to identify the key challenges of sustaining the SAF's deterrence to threats that Singapore would likely face in its future security environment. Having established credibility and communication as the key factors influencing the effectiveness of deterrence, the analysis examines potential challenges to the efficacy of the SAF's deterrence. In particular, the analysis covers three challenges pertaining to the SAF's credibility, namely its vulnerability to asymmetric tactics that seek to overturn its conventional strengths, the vast differences that exist between conventional military operations and unconventional threat responses, as well as the extent to which the willingness to fight may be eroded if

Singapore's populace does not buy into the purpose of defence and NS. Additionally, the analysis also covers the dilemma faced by the SAF in having to take sufficiently strong actions to communicate its credibility for deterrence whilst minimising the likelihood of being perceived as a threat by others.

Challenges to Credibility

From a capability perspective, the SAF's credibility for deterrence may be undermined by its vulnerability to asymmetric methods and tactics adopted by its adversaries. Michail Ploumis notes that weaker belligerents, usually non-state actors, have found themselves capable of confronting their opponents through asymmetric means, without needing to raise, train, and sustain sizeable military forces.[149] Moreover, the art of war unfailingly makes a statement about avoiding the strong points of one's opponent while attacking their weak ones.[150] Consequently, this makes for sobering thoughts from the standpoint of the conventionally-oriented SAF: having compensated for its numerical disadvantage with heavy investments in technology, the SAF's principal strength today lies in its formidable array of advanced military technologies and platforms linked together as a coherent force package.[151] Yet it is precisely these strengths that a shrewd adversary will avoid at all costs to wrest the upper hand from the SAF. For example, given the heavily-networked force configuration of the SAF, it is not inconceivable that a shrewd adversary might seek to temporarily disable the SAF's critical systems and processes through the conduct of debilitating cyber attacks, before

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[149] Michail Ploumis, "Comprehending and Countering Hybrid Warfare Strategies by Utilizing the Principles of Sun Tzu," *Journal of Balkan and Near Eastern Studies* (2021): 3-4.

[150] *Ibid*.

[151] Michael Raska, "The SAF After Next Incarnation," *RSIS Commentary*, no. 041 (8 March 2019): 1.

launching physical attacks to take advantage of systems being crippled.[152] As another example, the growing scale and complexity of maritime security threats have profoundly challenged the relevance of the grey hull-heavy RSN. A case in point would be the 2018 port limits dispute between Singapore and Malaysia, during which Malaysia anchored several civilian vessels within Singapore's territorial waters, sparking a months-long standoff at sea in which the RSN found itself in need of specialised capabilities to fend off persistent incursions into Singapore's territorial waters.[153]

Next, the SAF's credibility for deterrence might also be challenged by vast differences that exist between conventional military operations and unconventional threat responses. Despite the draw of achieving "full-spectrum dominance," the SAF must not forget that the maintenance of its operational readiness is a non-negotiable task, particularly given its unique make-up as a conscript-based force whose primary mission is to fend off external aggression. Benson Chian observes that the nature of the conscript system is such that the SAF cannot afford to send its conscripts for non-conventional training in specialised fields outside of their traditional warfighting roles,[154] echoing Bernard Loo's description of Singapore's conscript army as potentially becoming a "dumb" version of its "smart" active service.[155] As an example, the skillsets required for

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[152] Ng Yeow Choon, "How a Good Offence is Not the Best Defence: An Analysis of SAF's Approach to Cyber Warfare," *POINTER: Journal of the Singapore Armed Forces* 41, no. 1 (2015): 72.

[153] Zakir Hussain, "Singapore lodges protest with Malaysia over actions that infringe on Republic's sovereignty," *The Straits Times*, 4 December 2018, last accessed 2 May 2022, https://www.straitstimes.com/singapore/singapore-lodges-protest-with-malaysia-over-actions-that-infringe-on-singapores.

[154] Benson Chian, "Should the SAF Maintain its Existing Focus on Full-Spectrum Dominance or, Should the Organisation Return to its Core Deterrence and War-Fighting Mission?" *POINTER: Journal of the Singapore Armed Forces* 41, no. 2 (2015): 38.

[155] Bernard F. W. Loo, "New Problems, New Answers? The Revolution in Military Affairs in an Era of Changing Security Concerns," in *Proceedings of the NIDS International Symposium on Security Affairs* (Tokyo: National Institute of Defence Affairs, 2006): 35.

prosecuting unconventional mission sets such as HADR, peace support operations, and counter-terrorism differ so greatly from those required by conventional military operations that they have remained the exclusive preserve of highly-specialised, all-Regular SAF units. Furthermore, maintaining a broad spectrum of operations at the force level requires the development of specialised capabilities in certain units, which could reduce their suitability for deployment in conventional warfare. A case in point would be the Army Deployment Force, established in 2016 primarily to assist the SOTF in neutralising terrorist threats and rescuing hostages.[156] Should the Army Deployment Force be called upon for high-end warfare one day, its training in counter-terrorism operations in terms of exercising restraint in the use of force could indeed run against the grain of the military mindset.[157] Thus, whilst departing from its time-worn focus on core deterrence has opened up avenues for the SAF to develop newer capabilities, it is imperative that the force carefully balances its growing operational tempo against the need to focus on its core warfighting mission, in order to sustain its ability to generate battle-ready conscripts for Singapore's defence in war.

Thus far, the analysis has addressed challenges to the SAF's credibility for deterrence from a capability standpoint. Notwithstanding, one must also consider the will to fight as a significant determinant of the SAF's credibility to deter threats, given its conscript-heavy make-up. For now, the NS system appears to work well for Singapore: a 2013 survey conducted by the Institute of Policy Studies indicated strong support for NS

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[156] Olli Suorsa, "The Growing Role of the Military in Counter-Terrorism in Southeast Asia," *ISEAS PERSPECTIVE*, no. 69 (2 November 2018): 2.

[157] Bernard F. W. Loo, "The Management of Military Change: The Case Study of the Singapore Armed Forces," in *Security, Strategy and Military Change in the 21ˢᵗ Century: Cross-Regional Perspectives*, ed. Jo I. Bekkevold, Ian Bowers, and Michael Raska (New York, Routledge: 2015), 82.

amongst Singaporeans, with more than 98 per cent of respondents agreeing that "NS is necessary for the defence of Singapore," and that "NS provides the security needed for Singapore to develop and prosper."[158] Furthermore, the consistently higher than 95 per cent mobilisation response rates of national servicemen corroborate official statements that public support for Singapore's defence policies is strong.[159] However, it is imperative that the SAF does not take this state of affairs for granted going forward, amid perennial concerns over the need to carefully manage the population's perceived opportunity costs of conscription. In this regard, Wilson Low points out that the voices critical of conscription will only grow louder amidst growing requirements for manpower and financial resources to sustain a military that is increasingly dependent on sophisticated equipment and platforms.[160] Moreover, having a large segment population spend "unproductive" time in the military as opposed to working and contributing productively to the economy might appear counterintuitive from a manpower perspective.[161] This is especially so coming out of major economic disruptions wrought by the COVID-19 pandemic. Thus, now more than ever before, the SAF must be on guard against the tendency for governments to reap "peace dividends," whilst enhancing the reach of its strategic communications to assure Singaporeans of the criticality of defence and NS to the city-state's continued survival and success.

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[158] Leong Chan-Hoong, Yang Wai Wai, and Henry Ho, *Survey Report on Singaporeans' Attitude to National Service* (Singapore: Institute of Policy Studies, 2013).

[159] Teo Chee Hean (speech), Committee of Supply Debates 2005, Parliament of Singapore, Singapore, 2 March 2005.

[160] Wilson Low, "Whither Conscription in Singapore?" (master's thesis, U.S. Army Command and General Staff College, 2011), 2.

[161] *Ibid.*, 14-15.

Challenge to Communication

Finally, even if one assumes that the SAF would be able to circumvent challenges to its credibility for deterrence, a persistent dilemma exists as to how actions undertaken by the SAF to communicate its credibility might be misconstrued as an increased capability or will to attack others, which could in turn undermine the effectiveness of the SAF's deterrence posture. Indeed, the deterrence that the SAF projects must be sufficiently strong in order to dissuade would-be attackers from engaging in aggression. One only needs to look to the events of the 1969-1970 Israeli-Egyptian War of Attrition, or the 1982 Falklands War for cautionary tales about the significant consequences that have resulted from allowing would-be aggressors to underestimate one's will and resolve to defend a given interest. On the other hand, persistent and pervasive "swaggering" by the defender could end up triggering hostilities as well, because would-be attackers are compelled to neutralise the perceived threat to their own peace and security. Consequently, in the context of Southeast Asia, the SAF must be mindful of the dangers of triggering extant fears of a "continuing arms race and power projection" due to its extensive procurement of the most advanced weapon systems and equipment, and even the showcasing of its military might at military exercises or parades.[162] Thus, the SAF must persistently contend with the complex dynamics of a security dilemma that entails a careful balancing act to avoid being perceived as too feeble or too aggressive in the communication of its deterrence posture.

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[162] William Choong and Ian Storey, "Southeast Asian Responses to AUKUS: Arms Racing, Non-Proliferation and Regional Stability," *ISEAS PERSPECTIVE*, no. 134 (14 October 2021): 4.

Summary

In summary, four key challenges are identified as most likely to prevent the SAF from achieving its desired deterrent effect going forward. From a capability perspective, the SAF's credibility for deterrence may be undermined by its vulnerability to the asymmetric methods and tactics adopted by its adversaries, as well as the vast differences that exist between conventional military operations and unconventional threat responses. This credibility for deterrence may also be impacted by the need to continually assure Singaporeans of the criticality of defence and NS to Singapore's continued survival and success as a city-state. Finally, even if one could assume away the challenges of sustaining the credibility of the SAF's deterrence, the need to strike a fine balance between undertaking sufficiently strong actions to demonstrate its credibility, whilst ensuring that such actions are not misconstrued as an increased capability or willingness to attack others is unavoidable. The question of how might the SAF overcome the aforementioned challenges of strengthening its deterrence against future threats makes for a promising topic of discussion in the subsequent section.

Section III: Ways and Means of Strengthening the SAF's Deterrence

This section addresses the final secondary research question, which aims to analyse the ways and means through which the SAF might overcome the challenges of deterring given threats. It is important to emphasise that the aim of this section is not to prescribe in exhaustive detail the full range of possible approaches to be undertaken by the SAF, but rather to sketch out the broad categories that can encompass various courses of action it might consider implementing over the next 10 to 20 years, with specific examples provided where relevant. Consequently, the analysis proposes a four-pronged

strategy, which encompasses the development of niche capabilities within the SAF to close its identified vulnerability gaps, the deepening of strategic partnerships with other national agencies and foreign partners to bring their collective strengths to bear upon the given threats, the maintenance of strong public support for defence and NS, as well as the use of defence diplomacy to circumvent the challenges associated with the communication of the SAF's deterrence.

Acquisition of Niche Capabilities

First, the proposed strategy entails the acquisition of niche capabilities by the SAF in order to close identified vulnerability gaps. In particular, the SAF should be prepared to respond to a wide range of contingencies in order to enhance its overall credibility to deter threats across the full operational spectrum. This would require the SAF to place a premium on agility, flexibility, and innovation, in order to provide more timely and effective responses to future threats.

For example, the SAF could explore developing counter-cyber capabilities as a means to bolster its credibility for deterring cyber threats. Notably, scholars like Martin C. Libicki, the Keyser Chair of Cybersecurity Studies at the US Naval Academy, have pointed out the inherent difficulties surrounding cyber deterrence, particularly in terms of the challenges of knowing who did it, as well as the fact that attackers might not necessarily have assets that would be vulnerable to retaliation in the cyberspace.[163] However, scholars Erica D. Borghard, an Assistant Professor of Social Sciences at the US Military Academy at West Point, and Shawn W. Lonergan, a Senior Advisor to the US Cyberspace Solarium Commission, contend that a more offensive deterrence by denial

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[163] Martin C. Libicki, *Cyberdeterrence and Cyberwar* (Santa Monica: RAND Corporation, 2009), xvi-xvii.

approach might be feasible under certain conditions.[164] Hence, rather than merely

improving its cyber defenses, the SAF could explore the acquisition of counter-cyber

capabilities that target adversarial offensive forces, tools, and infrastructure – not unlike

the direct action missions prosecuted by Special Forces units against high-value, high-

payoff targets. In the longer run, however, dedicated counter-cyber forces might be more

efficiently generated under the organic command of the SAF's newest service – the

Digital and Intelligence Service – to safeguard Singapore's digital borders in the same

way that the Army's counter-attack units are capable of recapturing any territory that falls

into enemy hands during conventional warfare.[165]

Another case in point is the development of calibrated response capabilities by the

RSN to enhance maritime security. The recent inauguration of the RSN's Maritime and

Security Response Flotilla (MSRF), which seeks to develop and operate calibrated

capabilities as part of an expanded menu of options to respond to maritime incidents,

clearly demonstrates this focus.[166] In particular, examples of calibrated capabilities that

have already been operationalised by the MSRF include the Long-Range Acoustic

Device and the Laser Dazzler System, which enable the projection of verbal and visual

warnings to warn and chase away vessels from intruding into Singapore's territorial

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[164] Erica D. Borghard and Shawn Lonergan, "Deterrence by denial in cyberspace," *Journal of Strategic Studies* (2021): 19.

[165] Ministry of Defence, "Fact Sheet: Timely Establishment of Digital and Intelligence Service," last modified 2 March 2022, https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2022/March/02mar22_fs.

[166] Ministry of Defence, "Fact Sheet: New Maritime Security and Response Flotilla to Enhance Maritime Security," last modified 26 January 2021, https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2021/January/26jan21_fs.

waters, thereby enabling the SAF to raise the operating cost to potential adversaries from committing maritime incursions against Singapore.[167]

However, critics might argue that the acquisition of niche capabilities is a prohibitively costly approach, even for a state like Singapore that spends heavily on its defence relative to other states. In arguing that traditional defence planning strategies are less effective under conditions of increased strategic uncertainty, Michael Raska, an Assistant Professor of Military Transformation at Nanyang Technological University, posits that the SAF would need to "hedge" and develop a menu of capabilities to achieve a wider range of operational effects across different possible futures, which is a "very expensive" affair.[168] In fact, this challenge is set to become even more pronounced in the future, as competition from the fields of healthcare, social welfare, education, and public transportation to secure a greater share of the national budget intensifies further.[169] Yet this should not be seen as an insurmountable hurdle for the SAF. Rather, it further demonstrates the critical need for the SAF to achieve greater buy-in of the future security threats that will confront Singapore, and promulgate a clearly-articulated strategy to respond to such threats. At the same time, the SAF must also continue to maintain the good stewardship of financial resources entrusted to its use, in order to preserve the trust that the wider Singaporean society has invested in it.

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[167] Chen Chuanren, "Little to Lethal," *Asia-Pacific Defence Reporter (2002)* 42, no. 9 (November 2016): 32.

[168] Michael Raska, "4G SAF: Creating New Advantages," *RSIS Commentary*, no. 102 (24 May 2017): 2.

[169] Bernard Tay, "Is the SAF's Defence Posture Still Relevant as the Nature of Warfare Continues to Evolve?" *POINTER: Journal of the Singapore Armed Forces* 42, no. 2 (2016): 32.

Integration with Strategic Partners

Next, the proposed strategy also envisages the SAF becoming more closely involved with other national agencies and foreign partners in order to shore up its credibility to deter future security threats. This is because the SAF is but one instrument of Singapore's national security toolkit that should be augmented by capabilities residing within other segments of the Whole-of-Government. Moreover, when faced with transnational challenges that cannot be addressed by any single nation, the SAF would benefit greatly from increasing its involvement in cooperative security arrangements with its foreign partners.

The cyber domain presents a unique challenge in this respect because there currently exists no internationally binding rules of the road for the conduct of states within the cyberspace. For example, an issue of concern for cyber deterrence relates to the thresholds that states set for their response. In particular, unless a state declares that all cyber attacks, no matter how minor, merit retaliation, it is incumbent upon that state to define an actionable threshold that is reasonable and practicable.[170] In this regard, the SAF and other relevant homefront agencies, through the Cyber Security Agency, should proactively lean forward to help develop and promote adherence to such norms at home and abroad.[171] A promising area of cooperation worth considering is the Tallinn Manual project, which invites contributions from legal and policy experts worldwide to offer a researched perspective on the application and interpretation of international law in the

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[170] Martin C. Libicki, *Cyberdeterrence and Cyberwar* (Santa Monica: RAND Corporation, 2009), xvii.
[171] Kenny Chee, "S'pore has moved from preventing cyber threats to assuming breaches have occurred: Josephine Teo," *The Straits Times*, 8 September 2021, last accessed 2 May 2022, https://www.straitstimes.com/tech/tech-news/singapore-to-work-with-estonia-on-cyber-security-helping-firms-to-go-digital.

cyber context.[172] Thus, having a consensus with international partners on how international law should be interpreted in the context of cyber operations and cyber warfare would go a long way to circumvent the possibility that any future retaliatory actions taken by Singapore against hostile cyber actors would be misconstrued by outsiders as an act of aggression.

As another example, the SAF should continue to place emphasis on enhancing collaboration with its intra-governmental and international partners on counterterrorism. Recent concerns about the trend of self-radicalisation in Singapore have informed the SAF's close partnership with its defence technology partners to develop and acquire intelligent systems that are capable of uncovering, investigating, and monitoring threat concerns as they emerge.[173] While these capabilities would certainly enhance the SAF's ability to deal more effectively with an expanded "attack surface" of self-radicalised lone wolves, defence planners should not overlook the considerable synergies to be reaped from providing and, in turn, drawing from the array of capabilities that exist outside of the defence establishment, particularly those that are organic to the MHA. This may be achieved through the conduct of joint counter-terrorism training exercises involving the SAF as well as the SPF, such as the Exercise *Northstar* and Exercise *Highcrest* series.[174] Furthermore, to expand avenues of collaboration with its like-minded international partners to combat the terrorist threat, the SAF should also leverage existing structures

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[172] Cooperative Cyber Defence Centre of Excellence, "The Tallinn Manual," last accessed 3 May 2022, https://ccdcoe.org/research/tallinn-manual/.

[173] Ministry of Defence, "Fact Sheet: A Restructured SAF to Better Meet New Security Threats," last modified 13 March 2020, https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2020/March/02mar20_fs.

[174] Ministry of Defence, "Counter Terrorism," last modified 6 April 2021, https://www.mindef.gov.sg/web/portal/mindef/defence-matters/defence-topic/defence-topic-detail/counter-terrorism.

for information-sharing and sense-making, such as the recently-established SAF Counter-Terrorism Information Facility, which is a multilateral fusion centre based in Singapore responsible for promoting closer collaboration amongst regional militaries and law enforcement agencies.[175]

However, a note of caution is in order here, as there are those who argue that militaries will inevitably find themselves impaired by an absence of doctrine to guide military commanders in dealing with complex situations at the transnational level. Paul T. Mitchell, a Professor of Defence Studies at the Canadian Forces College, observes that no procedures or techniques empirically grounded in tested operations currently exist to offer guidance to the realities of "coalitions of the willing," or even to "whole of humanity operations."[176] Thus, it is imperative for the SAF to be diligent in recording and disseminating the best practices gleaned from multinational operations worldwide, so as to enable vicarious learning by future SAF commanders to the fullest extent possible.

Public Support for Defence and NS

Besides relying on niche capabilities and strategic partnerships to strengthen the credibility of Singapore's deterrence, the SAF should also seek to continually and persistently reinforce the defence narrative of sustaining a strong and credible military. Indeed, defence watchers like Ong Wei Chong have stressed the importance of increasing the level of public engagement on defence policies in order to win over the hearts and

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[175] Ng Eng Hen (speech), Committee of Supply Debates 2021, Parliament of Singapore, Singapore, 1 March 2021.

[176] Paul T. Mitchell, "Educating Strategic Leaders: The Foundations of Strategic Level PME at Canadian Forces College," in *Educating Air Forces: Global Perspectives on Airpower Learning*, ed. Randall Wakelam, David Varey, and Emanuele Sica (Lexington: The University Press of Kentucky, 2020), 9-10.

minds of the SAF's conscript-based force.[177] To this end, MINDEF has routinely initiated efforts over the last decade aimed at maintaining strong public support for NS: it set up the Committee to Strengthen National Service in 2013 to crowdsource ideas and suggestions on how to strengthen the NS system for the future;[178] in 2020, it revisited the issue again with the establishment of the National Service Review Committee. The Committee subsequently undertook a fundamental review of the NS system to assess its relevance to operational demands as well as the needs of national servicemen, and was officially concluded in 2022.[179] Besides the above, the SAF must also take into account the important role played by the media in the information age, as it strives to win over the hearts and minds of its conscript force. This may be achieved by seeking out innovative means of conducting its strategic communications, whilst being adept at harnessing a broad range of media platforms available to shape perceptions and secure the mindshare of the force's intended target audience.[180] Thus, the relentless task of securing the commitment of every generation of citizen soldiers is one that the SAF cannot underestimate, given its direct bearing on the ostensible will – and therefore credibility – to deter threats to Singapore's peace and security.

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[177] Ong Wei Chong, "The Need for Engagement in Singapore's Defence Policies," *RSIS Commentary*, no. 060 (21 April 2011): 2.

[178] Ministry of Defence, "Strengthening National Service," last modified 31 August 2018, https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2017/december/strengthen-ns.

[179] Ministry of Defence, "Fact Sheet: Conclusion of Review by National Service Review Committee," last modified 3 March 2022, https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2022/march/03mar22_fs.

[180] Bernard Tay, "Is the SAF's Defence Posture Still Relevant as the Nature of Warfare Continues to Evolve?" *POINTER: Journal of the Singapore Armed Forces* 42, no. 2 (2016): 32.

Defence Diplomacy

Finally, the proposed strategy also envisions the use of defence diplomacy as a complement to deterrence, in order to circumvent the challenges associated with communicating the SAF's deterrence posture. Indeed, as the then-Minister for Defence Goh Chok Tong opined, states need to foster "common interests and understanding" based on "mutual respect, intertwined interests, and a shared destiny," because a strategy purely based on deterrence alone would likely lead states down the path of misreading one another.[181] Since the 1990s, Singapore's defence policy has been based upon the twin pillars of deterrence and diplomacy: the SAF's mission is to enhance Singapore's peace and security through deterrence and diplomacy, and should these fail, to secure a swift and decisive victory.[182] Accordingly, the workings of diplomacy would necessitate frequent dialogue and a demonstrated willingness to work together, in order to achieve mutual trust and confidence between states. This yields two important implications for Singapore at the strategic and operational levels: first, there is a need to ensure that the regional security architecture – centred primarily on the ASEAN – remains open and conducive for regional states to engage constructively in issues of regional importance while benefiting from mutual cooperation; next, the SAF must be determined to seek out opportunities for overseas deployments and training, in order to build and maintain close friendships and collaboration with other foreign militaries.

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[181] Goh Chok Tong (speech), 6th Reservist Officers' Staff Course Graduation Ceremony and Dinner, Singapore, 4 December 1988.

[182] Ministry of Defence, "Defence policy and diplomacy," last modified 6 April 2021, https://www.mindef.gov.sg/web/portal/mindef/defence-matters/defence-topic/defence-topic-detail/defence-policy-and-diplomacy.

Summary

In summary, a four-pronged strategy provides a useful framework for defence planners to envision the possible ways and means of overcoming challenges to Singapore's deterrence posture in the future security environment. First, it is imperative that the SAF acquires niche capabilities to close identified vulnerability gaps against asymmetric methods and tactics that might be adopted by its adversaries. Second, the SAF should strive to become more closely involved with other national agencies and foreign partners, as it is but one of several stakeholders responsible for dealing with the spectrum of threats to Singapore. Beyond niche capabilities and strategic partnerships, the SAF should also seek to strengthen its credibility for deterrence through continual reinforcement of the need to sustain a strong military. Finally, while deterrence will remain a key plank of the SAF's defence policy in the foreseeable future, it must not be used in isolation from defence diplomacy, which serves to circumvent the challenges associated with communicating the SAF's credibility for deterrence.

Conclusion

The analysis was organised into three sections to address the three secondary research questions. Section I described the future security environment and the associated security challenges that Singapore is likely to face over the next 10 to 20 years. Of note, a growing prevalence of cyber, terrorism, and maritime threats, as well as the risk of conventional threats from Malaysia and Indonesia constitute the principal security threats currently known to Singapore. To this end, it is imperative that the SAF remains focused on its primary task of deterring a high-stakes, conventional threat to Singapore's peace

and security, even as it dedicates additional resources and capacity to deal with a growing prevalence of unconventional threats.

Having established credibility and communication as the key factors influencing the effectiveness of deterrence, Section II then examined the potential challenges to the efficacy of the SAF's deterrence arising from an absence of credibility or an incidence of miscommunication. In particular, the SAF's credibility for deterrence may be undermined by its vulnerability to asymmetric methods and tactics adopted by its adversaries, the vast differences that exist between conventional military operations and unconventional threat responses, as well as a lack of buy-in from Singapore's populace towards defence and NS. In addition, the SAF would also have to strike a fine balance between undertaking sufficiently strong actions to demonstrate its credibility, whilst ensuring that such actions are not misconstrued as an increased capability or willingness to attack others.

Given the principal sources of security threats discussed in Section I and the challenges of strengthening the SAF's deterrence discussed in Section II, Section III proposed a four-pronged strategy as a useful framework for defence planners to envision the possible ways and means of strengthening Singapore's deterrence posture. Apart from enhancing the SAF's ability to overcome its vulnerabilities and work more closely with other national agencies and foreign partners, it is also imperative that the force strengthens its credibility to deter through continual reinforcement of the need to sustain a strong military. Finally, while deterrence will remain a key plank of the SAF's defence policy in the foreseeable future, it must not be used in isolation from its useful complement – defence diplomacy.

CHAPTER 4

CONCLUSION

This thesis began by painting the importance of evaluating the viability of the SAF's future deterrence posture against threats assessed to be most consequential to Singapore's peace and security in the future. Subsequently, the analysis of the principal sources of security threats as well as the challenges associated with projecting the SAF's deterrence vis-à-vis such threats indicated that there is a need to strengthen the SAF's deterrence posture in order to ensure Singapore's continued survival and success as a nation. This concluding chapter restates and relates the key findings of each of the secondary research questions to answer the primary research question, which is "How might the SAF strengthen its deterrence posture against future threats to Singapore's peace and security?" To close this thesis, this chapter then examines how the otter might be used to symbolise the next phase of the SAF's force development.

Summary of Key Findings

This thesis identified a total of five threats assessed to be the most consequential to Singapore's peace and security over the next 10 to 20 years. On the one hand, hostile cyber actors, terrorists, as well as pirates and armed robbers at sea pose "clear and present" unconventional security threats. Collectively, they form the "most probable" scenario. On the other hand, Singapore's closest neighbours, namely Malaysia and Indonesia present the greatest, if unlikely, conventional threats to the city-state, and constitute the "most dangerous" scenario. As the ultimate guarantor of Singapore's independence and sovereignty, the SAF must remain focused on its primary task of

deterring a high-stakes, conventional threat to Singapore, even as it devotes additional resources and capacity to deal with a growing prevalence of unconventional threats. After all, failure is not an option for the SAF as the existential survival of Singapore as a sovereign state depends solely on it.

This thesis then proceeded to identify four key challenges that will most likely prevent the SAF from achieving its desired deterrent effect going forward. From a capability perspective, the SAF's credibility for deterrence may be undermined by its vulnerability to the asymmetric methods and tactics adopted by its adversaries, as well as the vast differences that exist between conventional military operations and unconventional threat responses. This credibility for deterrence may also be impacted by the need to continually assure Singaporeans of the criticality of defence and NS to Singapore's continued survival and success. Finally, even if one could assume away the challenges of sustaining the credibility of the SAF's deterrence, the SAF must strike a fine balance between undertaking sufficiently strong actions to demonstrate its credibility, whilst ensuring that such actions are not misconstrued as an increased capability or willingness to attack others.

Finally, the thesis proposed a four-pronged strategy that is optimal, given the aforementioned future security environment and the challenges associated with strengthening the SAF's deterrence. This is because the strategy comprehensively addresses both factors – credibility and communication – that can influence the effectiveness of deterrence. First, the SAF should enhance its capability to deter by acquiring niche capabilities to close identified vulnerability gaps against the asymmetric tactics adopted by its adversaries, as well as striving to become more closely involved

with other national agencies and foreign partners. Second, the SAF should strengthen its willingness to deter through the continual reinforcement of the need to sustain a strong military. Third, the SAF should exercise defence diplomacy in tandem with its deterrence, in order to circumvent the challenges associated with communicating the SAF's credibility for deterrence. Yet the question of whether the SAF can successfully implement this four-pronged strategy depends on how well it addresses specific risk factors, namely the prohibitive cost of acquiring niche capabilities, as well as the absence of a supranational doctrine to guide military commanders. These will certainly make for pertinent areas of further research.

Final Thoughts

In the preceding chapters, this thesis has discussed how the poisonous shrimp, porcupine, and dolphin symbolise the evolutionary path of the SAF's deterrence posture from 1G to 3G. Given the future deterrence posture of the SAF envisioned by this thesis, the otter could well symbolise the next phase of the SAF's force development, for three reasons.

First, otters are highly versatile creatures capable of changing their behaviour in the face of existential threats – examples of these creatures denning in concrete built-up areas despite being native to mangrove habitats, or feeding on ornamental fishes despite being the natural predators of clams and wild fish are well-documented in Singapore.[183] This mirrors the recommendation that the SAF unlock game-changing operational

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[183] Claire Turrell, "Cheeky otters are thriving in Singapore – and adapting quickly to big city life," *National Geographic*, 10 March 2020, last accessed 2 May 2022, https://www.nationalgeographic.com/animals/article/urban-otters-singapore-wildlife.

concepts and technologies against the asymmetric methods and tactics of its adversaries, as a means of enhancing the force's credibility for deterrence.

Second, otters typically aggregate in social groups, driving away predators and other enemies through highly coordinated attacks.[184] This relates directly to the other proposed measure of enhancing the SAF's credibility for deterrence, which essentially calls for the force to leverage potential synergies with other national agencies and foreign partners in order to bring their collective strengths to bear on future security threats.

Third, otters are known to have highly sophisticated communication abilities with each other that involve a unique combination of smells and calls.[185] Likewise, this thesis has advocated that the SAF hone the communication aspect of its deterrence through the use of defence diplomacy, in order to avoid the potential pitfalls of a deterrence-only approach.

Conclusion

This chapter summarised the key findings in this thesis by answering the primary research question, which is "How might the SAF strengthen its deterrence posture against future threats to Singapore's peace and security?" A growing prevalence of cyber, terrorism, and maritime threats, as well as the lingering threat of external aggression from Malaysia and Indonesia are all assessed to be most consequential to Singapore's peace and security over the next 10 to 20 years. Furthermore, a loss of credibility or an incidence of miscommunication are both likely to challenge the efficacy of the SAF's deterrence going forward. Overall, the four-pronged strategy proposed by this thesis is

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[184] National Parks Board, "Otters," last modified 7 March 2022, last accessed 2 May 2022, https://www.nparks.gov.sg/gardens-parks-and-nature/dos-and-donts/animal-advisories/otters.
[185] *Ibid.*

optimal as it comprehensively addresses both factors that can influence the effectiveness of deterrence, namely credibility and communication. Notwithstanding, further research is still required to illuminate whether and how the risk factors in strengthening the SAF's future deterrence may be mitigated. To close this thesis, the otter was proposed a metaphor of the SAF's future deterrence posture.

BIBLIOGRAPHY

Books / Reports

Anwar, Dewi F. *Indonesia in ASEAN: Foreign Policy and Regionalism*. Singapore: Institute of Southeast Asian Studies, 1994.

Brodie, Bernard. *The Absolute Weapon: Atomic Power and World Order*. New York: Harcout Brace, 1946.

Chiang, Mickey. *SAF and 30 Years of National Service*. Singapore: Armour Publishing, 1997.

Clutterback, Richard. *Conflict and Violence in Singapore and Malaysia*. London: Graham Brash, 1984.

Deck, Richard A. "Singapore: Comprehensive Security – Total Defence." In *Strategic Cultures in the Asia Pacific Region*, edited by Ken Booth and Russel Trood, 247-272. Houndmills: Macmillan, 1999.

Freedman, Lawrence. *The Evolution of Nuclear Strategy*, 3rd ed. New York: Palgrave Macmillan, 2003.

Huxley, Tim. *Defending the Lion City: The Armed Forces of Singapore*. Australia: Allen & Unwin, 2000.

Jayakumar, S. *Diplomacy: A Singapore experience*. Singapore: Straits Times Press, 2011.

Lee, Kuan Yew. *From Third World to First – The Singapore Story: 1965-2000*. New York: Harper Collins, 2000.

Leng, Russell J. *Interstate Crisis Behaviour, 1816-1990: Realism Versus Reciprocity*. New York: Cambridge University Press, 1993.

Leong, Chan-Hoong, Yang Wai Wai, and Henry Ho. *Survey Report on Singaporeans' Attitude to National Service*. Singapore: Institute of Policy Studies, 2013.

Libicki, Martin C. *Cyberdeterrence and Cyberwar*. Santa Monica: RAND Corporation, 2009.

Long, Austin G. *Deterrence: From Cold War to Long War*. Santa Monica: RAND Corporation, 2008.

Loo, Bernard F. W. "Goh Keng Swee and the Emergence of a Modern SAF: The Rearing of a Poisonous Shrimp." In *Goh Keng Swee: A Legacy of Public Service*, ed. Emrys Chew and Chong Guan Kwa, 127-182. Singapore: World Scientific, 2012.

————. "New Problems, New Answers? The Revolution in Military Affairs in an Era of Changing Security Concerns." In *Proceedings of the NIDS International Symposium on Security Affairs* (Tokyo: National Institute of Defence Affairs, 2006): 33-44.

————. "The Management of Military Change: The Case Study of the Singapore Armed Forces." In *Security, Strategy and Military Change in the 21st Century: Cross-Regional Perspectives*, ed. Jo I. Bekkevold, Ian Bowers, and Michael Raska, 70-88. New York, Routledge: 2015.

Mearsheimer, John J. *Conventional Deterrence*. New York: Cornell University Press, 1983.

Menon, R. *To command: The SAFTI Military Institute*. Singapore: Landmark Books, 1995.

Mitchell, Paul T. "Educating Strategic Leaders: The Foundations of Strategic Level PME at Canadian Forces College." In *Educating Air Forces: Global Perspectives on Airpower Learning*, edited by Randall Wakelam, David Varey, and Emanuele Sica. Lexington: The University Press of Kentucky, 2020.

Singapore. Cyber Security Agency. *Singapore Cyber Landscape 2020*. Singapore, 2021.

Singapore. Ministry of Home Affairs. *Singapore Terrorism Threat Assessment Report 2021*. Singapore, 2021.

———. *The Jemaah Islamiyah Arrests and the Threat of Terrorism: White paper.* Singapore, 2003.

Singapore. Smart Nation and Digital Government Office. *Smart Nation: The Way Forward*. Singapore, 2018.

Snyder, Glenn H. *Deterrence and Defense*. Princeton: Princeton University Press, 1961.

Snyder, Glenn H., and Paul Deising. *Conflict Among Nations: Bargaining, Decision Making, and System Structure in International Crises.* Princeton: Princeton University Press, 1977.

Zagare, Frank C., and D. M. Kilgour. *Perfect Deterrence*. Cambridge: Cambridge University Press, 2000.

Periodicals

Allan, Charles T. "Extended Conventional Deterrence: In from the Cold and Out of the Nuclear Fire?" *The Washington Quarterly* 17, no. 3 (1994): 203-233.

Art, Robert J. "To What Ends Military Power?" *International Security* 4, no. 4 (1980): 3-35.

Borghard, Erica D., and Shawn Lonergan, "Deterrence by denial in cyberspace," *Journal of Strategic Studies* (2021).

Chen, Chuanren. "Little to Lethal." *Asia-Pacific Defence Reporter (2002)* 42, no. 9 (November 2016): 30-34.

Chian, Benson. "Should the SAF Maintain its Existing Focus on Full-Spectrum Dominance or, Should the Organisation Return to its Core Deterrence and War-Fighting Mission?" *POINTER: Journal of the Singapore Armed Forces* 41, no. 2 (2015): 32-41.

Choong, William, and Ian Storey. "Southeast Asian Responses to AUKUS: Arms Racing, Non-Proliferation and Regional Stability." *ISEAS PERSPECTIVE*, no. 134 (14 October 2021).

Chua, Daniel W. B. "Konfrontasi: Why It Still Matters to Singapore." *RSIS Commentary*, no. 054 (16 March 2015).

Deep, S. "Insights from Operation Flying Eagle – Four key success factors." *POINTER: Journal of the Singapore Armed Forces* 31, no. 1 (2005).

Ganesan, Narayanan. "Malaysia-Singapore Relations: Some Recent Developments." *Asian Affairs, an American Review (New York)* 25, no. 1 (1998): 21-36.

Han, David G. X. "Malaysian Foreign Policy Toward Singapore from Mahathir to Badawi and Najib: A Role Theory Assessment: Malaysian Foreign Policy Toward Singapore." *Asian Politics & Policy* 9, no. 2 (2017): 289-309.

Harknett, Richard J. "The Logic of Conventional Deterrence and the End of the Cold War." *Security Studies* 4, no. 1 (1994): 86-114.

Harvey, Frank P. "Rigor Mortis or Rigor, More Tests: Necessity, Sufficiency, and Deterrence Logic." *International Studies Quarterly* 42, no. 4 (1998): 675-707.

Laksmana, Evan A. "Threats and civil-military relations: explaining Singapore's 'trickle-down' military innovation." *Defense & Security Analysis* 33, no. 4 (2017): 347-365.

Lim, Eddie, and Benjamin Ho. "Peacetime SAF: Its Evolving Defence Role." *RSIS Commentary*, no. 095 (18 May 2020).

Matthews, Ron, and Nellie Z. Yan. "Small Country 'Total Defence': A Case Study of Singapore." *Defence Studies* 7, no. 3 (2007): 376-395.

Nathan, K. S. "Malaysia-Singapore Relations: Retrospect and Prospect." *Contemporary Southeast Asia* 24, no. 2 (2002): 385-410.

Ng, Yeow Choon. "How a Good Offence is Not the Best Defence: An Analysis of SAF's Approach to Cyber Warfare." *POINTER: Journal of the Singapore Armed Forces* 41, no. 1 (2015): 71-79.

Nye, Jr., Joseph S. "Deterrence and Dissuasion in Cyberspace." *International Security* 41, no. 2 (2016-2017): 44-71.

Ong, Wei Chong. "The Need for Engagement in Singapore's Defence Policies." *RSIS Commentary*, no. 060 (21 April 2011).

Ploumis, Michail. "Comprehending and Countering Hybrid Warfare Strategies by Utilizing the Principles of Sun Tzu." *Journal of Balkan and Near Eastern Studies* (2021).

Raska, Michael. "4G SAF: Creating New Advantages." *RSIS Commentary*, no. 102 (24 May 2017).

———. "The SAF After Next Incarnation." *RSIS Commentary*, no. 041 (8 March 2019).

Rostoks, Toms. "The Evolution of Deterrence from the Cold War to Hybrid War." In *Deterring Russia in Europe: Defence Strategies for Neighbouring States*, edited by Nora Vanaga and Toms Rostoks, 1st ed., 19-35. n.p.: Routledge, 2019.

Suorsa, Olli. "The Growing Role of the Military in Counter-Terrorism in Southeast Asia." *ISEAS PERSPECTIVE*, no. 69 (2 November 2018).

Tay, Bernard. "Is the SAF's Defence Posture Still Relevant as the Nature of Warfare Continues to Evolve?" *POINTER: Journal of the Singapore Armed Forces* 42, no. 2 (2016): 25-34.

Zagare, Frank C. "Classical Deterrence Theory: A Critical Assessment." *International Interactions* 21, no. 4 (1996): 365-387.

Electronic Sources

Borsuk, Richard, and Reginald Chua. "Singapore Strains Relations with Indonesia's President." *The Wall Street Journal*. 4 August 1998. Last accessed 2 May 2022. https://www.wsj.com/articles/SB902170180588248000.

"Brothers in Arms." YouTube video, 7:05. Posted by "Ministry of Defence Singapore," 13 June 2014. https://www.youtube.com/watch?v=_88Sn8z_oWU.

Chia, Joshua Y. J. "Barisan Socialis." In *Singapore Infopedia*. Last accessed 13 April 2022. https://eresources.nlb.gov.sg/infopedia/articles/SIP_1148_2008-11-30.html.

Cooperative Cyber Defence Centre of Excellence. "The Tallinn Manual." Last accessed 3 May 2022. https://ccdcoe.org/research/tallinn-manual/.

Han, Jamie. "Communal riots of 1964." In *Singapore Infopedia*. Last modified 18 September 2014. https://eresources.nlb.gov.sg/infopedia/articles/SIP_45_2005-01-06.html.

Lee, Hsien Loong. "The lessons from 9/11 for Singapore." *The Straits* Times. 11 September 2021. Last accessed 2 May 2022 https://www.straitstimes.com/opinion/the-lessons-from-911-for-singapore.

Pantucci, Raffaello, and Shashi Jayakumar. "Shape-shifting terrorism: The new challenge." *The Straits Times*. 9 September 2021. Last accessed 2 May 2022. https://www.straitstimes.com/opinion/shape-shifting-terrorism-the-new-challenge.

Singapore. Ministry of Defence. "3G SAF." Last modified 6 April 2021. https://www.mindef.gov.sg/web/portal/mindef/defence-matters/defence-topic/defence-topic-detail/3g-saf.

———. "About Total Defence." Last accessed 20 April 2022. https://www.mindef.gov.sg/oms/imindef/mindef_websites/topics/totaldefence/about.html.

———. "Armour." Last modified 29 October 2021. https://www.mindef.gov.sg/web/portal/army/our-forces/formations/formations-detail/armour/armour.

———. "Counter Terrorism." Last modified 6 April 2021. https://www.mindef.gov.sg/web/portal/mindef/defence-matters/defence-topic/defence-topic-detail/counter-terrorism.

———. "Defence policy and diplomacy." Last modified 6 April 2021. https://www.mindef.gov.sg/web/portal/mindef/defence-matters/defence-topic/defence-topic-detail/defence-policy-and-diplomacy.

———. "Fact Sheet: A Restructured SAF to Better Meet New Security Threats." Last modified 13 March 2020. https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2020/March/02mar20_fs.

———. "Fact Sheet: Conclusion of Review by National Service Review Committee." Last modified 3 March 2022. https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2022/march/03mar22_fs.

———. "Fact Sheet: New Maritime Security and Response Flotilla to Enhance Maritime Security." Last modified 26 January 2021. https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2021/January/26jan21_fs.

———. "Fact Sheet: Strengthening MINDEF/SAF's Cyber Defence Capabilities." Last modified 30 June 2021. https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2021/June/30jun21_fs7.

———. "Fact Sheet: The Republic of Singapore Navy's Formidable-class Frigates and Sikorsky S-70B Seahawk Naval Helicopters." Last modified 24 July 2018. https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2018/july/21jul18_fs.

———. "Fact Sheet: Timely Establishment of Digital and Intelligence Service." Last modified 2 March 2022. https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2022/March/02mar22_fs.

———. "SAF Assists NZDF in Christchurch." 22 February 2011. Last accessed 2 May 2022. https://www.nas.gov.sg/archivesonline/data/pdfdoc/MINDEF_20110223001.pdf.

———. "Strengthening National Service." Last modified 31 August 2018. https://www.mindef.gov.sg/web/portal/mindef/news-and-events/latest-releases/article-detail/2017/december/strengthen-ns.

Singapore. National Parks Board. "Otters." Last modified 7 March 2022. https://www.nparks.gov.sg/gardens-parks-and-nature/dos-and-donts/animal-advisories/otters.

Singh, Bilveer. "Why Singapore is a Terrorist Target." *The Diplomat*. 28 June 2017. Last accessed 2 May 2022. https://thediplomat.com/2017/06/why-singapore-is-a-terrorist-target/.

Tay, Shereen. "Communist Party of Malaya." In *Singapore Infopedia*. Last modified 30 March 2018. https://eresources.nlb.gov.sg/infopedia/articles/SIP_2018-03-28_141257.html.

Turrell, Claire. "Cheeky otters are thriving in Singapore – and adapting quickly to big city life." *National Geographic*. 10 March 2020. Last accessed 2 May 2022. https://www.nationalgeographic.com/animals/article/urban-otters-singapore-wildlife.

" 'We are on PARA PREDATOR mode!' – Panglima 10 Briged (Para)." Facebook video, 4:12. Posted by "Tentera Darat Malaysia," 21 August 2021. https://www.facebook.com/TenteraDaratMY/videos/348690103661290/.

Speeches

Goh, Chok Tong. Speech, 6th Reservist Officers' Staff Course Graduation Ceremony and Dinner, Singapore, 4 December 1988.

Ng, Eng Hen. Speech, Committee of Supply Debates 2021, Parliament of Singapore, Singapore, 1 March 2021.

Teo, Chee Hean. Speech, Committee of Supply Debates 2005, Parliament of Singapore, Singapore, 2 March 2005.

Unpublished Materials

Low, Wilson. "Whither Conscription in Singapore?" Master's thesis, U.S. Army Command and General Staff College, 2011.