



ADF
Australian Defence Force

The Australian War College Shedden Papers 2023/2024



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The Shedden Papers

The Shedden Papers are named after Sir Frederick Shedden KCMG, OBE who was Secretary of the Defence Department from 1937-1956, including the Second World War, the onset of the Cold War and Australia's commitment to the Korean War and the Malayan Emergency.

Sir Frederick Shedden's role went far beyond that of the traditional public servant. He was a central player in some of the most important events in Australian history. He was the key confidant of the Second World War Prime Ministers Robert Menzies and John Curtin, accompanying them in discussions with Prime Minister Winston Churchill and President Franklin Roosevelt. As secretary of the War Cabinet and the Advisory War Council, he was at the heart of the national defence effort when Australia was under threat of invasion. He became the trusted link between Curtin and American General Douglas MacArthur.

On the basis of experience during World War II, Sir Frederick Shedden had developed arrangements in the Defence Department which had laid the foundations for closer co-ordination and direction of defence policy and administration.

The Shedden Papers are produced by the Australian Defence College on behalf of the Commandant of the Australian War College. These papers represent the best capstone research papers of the previous year's Defence and Strategic Studies Course graduates and have been chosen for publication based on their scholarly attributes and the timeliness of their topic. This year's collection includes papers from both 2023 and 2024 give the publication has been on a short hiatus in recent years.



Contents

Dinosaurs Can't Surf: Is the Australian Defence Organisation Change Resistant?	7
About the Author	9
Acknowledgements	10
Abstract.....	11
Chapter 1 Introduction	13
Chapter 2 The Theory.....	19
Chapter 3 Intersecting Theories	27
Chapter 4 Military Organisational Change	33
Chapter 5 The Logic of Military Conservatism.....	41
Chapter 6 Enhanced CAS and Next Steps	45
References.....	51
Punched in the Face: Towards an Ontology of Strategic Surprise .	71
About the Author	73
Acknowledgments	74
Abstract.....	74
Introduction.....	75
Chapter 1 Thinking about Surprise: A Review of the Literature	83
Chapter 2 Expanding Our Approaches to Surprise: Integrating Inter-Disciplinary Literature	93
Chapter 3 Qualifying Surprise: Developing Dimensions.....	99
Conclusions and Future Research	111
References.....	113
Quantum Statecraft: A New Narrative for International Relations .	121
About the Author	123
Acknowledgement.....	124
Summary.....	124
Introduction.....	125
Chapter 1 Literature Review.....	131

Chapter 2 The Utility of a Quantum Statecraft Narrative 143

Chapter 3 The Value of a Quantum Statecraft Narrative..... 153

Conclusion..... 159

References 161

The Royal New Zealand Navy: An Agile or Fragile Navy for a Large Maritime Nation 171

About the Author 172

Acknowledgements 174

Summary..... 175

Chapter 1: Framing the Problem 177

Chapter 2: Evolving Maritime Strategies post-Cold War 181

Chapter 3: What is in the National Interest? 184

Chapter 4: The Changing Shape of the Navy..... 189

Chapter 5: Perfectly Formed or a Hot Mess? 195

Chapter 6: Investing in Resilience..... 203

References 208



ADF
Australian Defence Force

Dinosaurs Can't Surf: Is the Australian Defence Organisation Change Resistant?

Brigadier Jennifer Harris CSC





This thesis is submitted in partial fulfilment of the requirements for the
Master of National Security and Strategy

About the Author



Drawing on almost 30 years in the Australian Army, building and leading great teams, in 2025 Brigadier Jen Harris has lead Defence's flagship regional engagement program Indo-Pacific Endeavour, and she will assume command of the 7th Brigade in December. Her Army service has included combat and peacekeeping experience in Iraq, Afghanistan, Lebanon and Syria and through a wide range of command, leadership and operational roles around Australia. She was awarded the Conspicuous Service Cross for her efforts in leading major organisational change in 6th Combat Support Brigade. It is leading teams through change, and embedding a culture of continuous improvement that continues to drive her passion for work and people centric approach. As a combat engineer and proud STEM professional she brings a unique blend of technical knowledge and military experience to every role. Her technical grounding includes

a Bachelor of Civil Engineering from UNSW, and a Master's in Science of Weapons Effects on Structures from Cranfield University, UK. She is a graduate of the Joint Services Command and Staff College, UK, where she completed a Master's in Defence Studies from Kings College, and most recently has relished the opportunity to study military organisational change through a Master's in National Security and Strategy from Deakin University. A Chartered Professional Engineer and Fellow of Engineers Australia she continues to invest in developing the future generation of leaders in Defence, Engineers Australia, STEM Women and most recently as a mind in residence at Questacon.

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To the key members of the Army War College team, who were instrumental in turning my frustrating and painful experiences of change into a positive exploration seeking to help the Australian Defence Organisation to it better: Pichamon, Michael (x2), and Nick, thank you for your time, consideration, and willingness to explore - invaluable.

To Stephen, you inspire me daily to fight the good fight, tackle the challenging roles and pursue excellence. Thank you for your tireless patience, frank advice, and unwavering support. I could not have done it without you!

Dedication

To the dinosaurs, the change leaders, and everyone in between, surf's up, let's catch the wave!

Abstract

This thesis explores military organisational change, specifically whether the Australian Defence Organisation (ADO) is postured to evolve to meet the challenge directed by the 2023 Defence Strategic Review (DSR) and the 2024 National Defence Strategy (NDS). It must evolve warfighting capability whilst simultaneously overhauling the machine delivering that capability, the business of Defence. This challenge is further compounded by today's strategic environment, characterised by multiple megatrends occurring simultaneously at pace.

Motivated by the author's experience and enabled by an exploration of theory and academic inquiry, it highlights the perpetual challenge of organisational change. It recognises that despite a reputation for change resistance, there is no universally applied model of military organisational change to validate this claim.

This exploratory thesis seeks to merge perspectives from organisational change and intersecting disciplines, including balancing military conservatism, to assemble a model of military organisational change. Using Dooley's Complex Adaptive System (CAS) as the foundation, it brings together an enhanced assemblage capable of capturing the complexity of contemporary militaries with the explanatory power to understand and optimise organisational change outcomes.

This thesis takes the initial step toward advancing knowledge of military organisational change, proposing a model for future PhD research that incorporates primary-source engagement to examine whether ADO resists change and how this can be overcome.

List of Acronyms

ADF – Australian Defence Force

ADO - Australian Defence Organisation

AI - Artificial Intelligence

AUKUS – Australia, United Kingdom, United States

CAS – Complex Adaptive System

eCAS – Enhanced Complex Adaptive System

DSR - Defence Strategic Review

ERP - Enterprise Reform Program

HR - Human Resource

ICT – Information and Communication Technology

ISR - Intelligence, Surveillance, and Reconnaissance

NDS - National Defence Strategy

PPBS - Planning Programming Budgeting System

RMA - Revolution of Military Affairs

Chapter 1 Introduction

The 2023 Defence Strategic Review (DSR), endorsed by the Government, is direction from the top, demanding pan-organisation transformation. This translated into the inaugural 2024 National Defence Strategy (NDS), and is not confined to evolving warfighting capability. It requires simultaneous and far-reaching changes to the business of Defence, the machine delivering warfighting capability.¹ This comes amid Australia's contemplation of a dynamic strategic environment and a digital future, with all Sectors pursuing similar transformative change. As the waves of change rise, is the Australian Defence Organisation (ADO)² ready to surf?

Organisational change is a perpetual challenge, and modern militaries are no exception. McKinsey's recent study highlights '60 percent of senior military leaders surveyed see organisational change efforts as unsuccessful or at best achieving sub-optimal outcomes.'³ This underscores the tough road ahead of the ADO, emphasising the need to assess whether it is effectively postured to tackle this challenge.

Exploring the research on military transformation reveals a recurring theme: resistance to change. B.H. Liddell Hart's perspective on military change captures this well, 'two thousand years of experience tells us the only thing harder than getting a new idea into the military mind is getting an old idea out.'⁴ This reluctance isn't exclusive to the military; studies on organisational development and change management contain similar findings. Yet, as Schuyler points out, despite substantial investments in these fields, it is perplexing to understand why organisational change remains such a challenge.⁵ Understanding how the ADO navigates change, whether resistance is present, and how it can be diminished is critical to achieving the NDS vision. Crucially, this work will contribute to the body of knowledge on organisational change, empowering contemporary militaries to thrive into the future.

The current strategic environment is characterised by a dynamic, mutually reinforcing set of circumstances confronting all Sectors. Dobbs et al. describe the multiple forces, or megatrends, driving change simultaneously, at pace, and all reinforcing each other.⁶ This is often referred to as the emerging Fourth Industrial Revolution.⁷ Unlike previous revolutions characterised by a singular trend, the world currently faces multiple

¹ The Cove, 'The Cove's Defence Strategic Review Report Digest | The Cove', accessed 6 May 2024, <https://cove.army.gov.au/article/coves-defence-strategic-review-report-digest>; Commonwealth of Australia, 'National Defence Strategy 2024' (Defence, 17 April 2024), <https://www.defence.gov.au/about/strategic-planning/2024-national-defence-strategy-2024-integrated-investment-program>.

² The ADO is an integrated organisation consisting of the Australian Defence Force and the Department of Defence. This integrated nature is a unique context necessitating investigation. Change cannot be investigated in one component without considering the other.

³ David Chinn and John Dowdy, 'Five Principles to Manage Change in the Military', n.d., 41.

⁴ B.H. Liddell Hart, *Thoughts on War*, Loddon Fadden, 1944, 115.

⁵ Kathryn Goldman Schuyler, 'Senge, Peter: "Everything That We Do Is About Shifting the Capability for Collective Action..."', in *The Palgrave Handbook of Organizational Change Thinkers*, ed. David B. Szabla (Cham: Springer International Publishing, 2021), 1582, https://doi.org/10.1007/978-3-030-38324-4_100.

⁶ The four trends urbanisation, accelerating technological change, aging population, and increased global connection (economic). Richard Dobbs, James Manyika, and Jonathan Woetzel, *No Ordinary Disruption: The Four Global Forces Breaking All the Trends* (New York, UNITED STATES: PublicAffairs, 2015), <http://ebookcentral.proquest.com/lib/deakin/detail.action?docID=1948759>; Scott Holmes, 'Military Revolution: Preparing the Australian Army for the Fourth Industrial Revolution' (Thesis, UNSW Sydney, 2021), <https://doi.org/10.26190/unsworks/2358>.

⁷ Holmes, 'Military Revolution'.

megatrends, all reinforcing each other.⁸ These compounding factors drive an urgent narrative where transformation, innovation, change, and adaption are essential for organisational survival.

This exploratory thesis seeks to merge perspectives from organisational change and intersecting disciplines to formulate a model of military organisational change. In doing so, it aims to provide a foundation for future research, establishing a framework to evaluate ADO organisational change efforts and determine how resistant the ADO is to change. Applying this model of military organisational change can illuminate strategies to optimise future transformation outcomes.

Section 1.1 My Experience - Motivation

Those currently working with the ADO would agree the only constant is change,⁹ perhaps nostalgically yearning for a bygone simple era of stability. This perspective does not accord with the author's experience. Graduating from the Royal Military College in 1999, over 50 percent of the positions and half the units were closed to women. Fast forward to 2017, she would command one of these units. She has consistently navigated change throughout her career, surfing the wave. Yet many have dropped off the back of the wave, and at times, the waves themselves felt weak, breaking violently against underground reefs.

The author has keenly felt the adverse effects of organisational change efforts. When General Morrison's words resonated globally in 2013, 'the standard you walk past is the standard you accept.'¹⁰ Many hoped it heralded the realisation of an organisation where all could reach their potential. Instead, as a woman, this author felt isolated, a pariah, the symbol of a change effort, many viewed, would result in the degradation of warfighting capability. General Morrison was clear and determined in his approach; he could not afford to take the organisation on a long, arduous incremental journey. Instead, he chose to rip the Band-Aid off, exposing the wound, forcing change at speed. His approach created a significant challenge for serving women, including the author. Many suffered at the hands of those resisting the change, and despite early promise, hegemonic masculinity still endures.¹¹ There had to be a better way.

Transitioning from experiencing change to leading transformation ignited her fascination with how teams navigate organisational change and continual improvement. Leading a 'skunkworks' team tackling recruitment and retention issues in the ADO, she faced unexpected resistance from the Army's Human Resources (HR) experts.¹² This experience introduced her to change management theory and the diverse individual responses to change. Far from being malicious, Army's HR experts were stabilising, reluctant to pursue untested innovation, and fearful of the impact of change on the

⁸ Holmes; Dobbs, Manyika, and Woetzel, *No Ordinary Disruption*.

⁹ Commonwealth of Australia, 'National Defence Strategy 2024', 11.

¹⁰ *Australian Chief of Army to Sexist Soldiers: Respect Women or GET OUT*, 2013, <https://www.youtube.com/watch?v=dRQBtDtZTGA>.

¹¹ Ben Wadham et al., "'War-Fighting and Left-Wing Feminist Agendas': Gender and Change in the Australian Defence Force", *Critical Military Studies* 4, no. 3 (2 September 2018): 264–80, <https://doi.org/10.1080/23337486.2016.1268371>; Cate Carter, 'Being One of the Boys in the Military | Lowy Institute', 20 February 2020, <https://www.lowyinstitute.org/the-interpreter/being-one-boys-military>.

¹² Future Ready Workforce was an Army People System initiative to trial new initiatives to enhance recruitment and retention. Skunkworks refers to the concept of trialing various initiatives in a fail-fast construct to challenge mental models and biases and find new ways of doing things.

existing systems.¹³ Developing knowledge to assist individuals, teams, and the ADO in becoming more adept at navigating change sparked a curiosity to delve deeper.

Most recently, navigating the Land Capability System through post-DSR change illuminated challenges unique to digital transformation. The Land Domain Digital Twin, co-designed by Army and an Industry Partner, faced significant organisational resistance. The system connected the desk officer to the senior decision-maker in an aggregated live environment. Three unique behaviours emerged. First, was a misconception analytical environments are just another tool, leading to superficial innovation, integrating new tools into old ways of doing things, rather than revolutionising how work is done to enable decision-making by design.¹⁴ Second, a prevailing black-box approach to analytical tools similar to platform procurement. Adoption is premised on perfection and proven results rather than on iterative development approaches that integrate users, which are essential to success in the digital environment.¹⁵ Finally, an unfocused approach to data, where instead of starting with specific questions, connecting data and iterating, the emphasis was on accumulating all data into a swamp, hoping insights would emerge. The author has learned how these behaviours add complexity to the organisational change challenge. A model of military organisational change must be agile, accommodating the realities of the strategic environment, including a digital future.

This section explored the motivation for this thesis. The author's frustration and thus enthusiasm to connect deeply to the theory to do change better. Recognising that change is constant, it is critical to acknowledge that the change process is not an outcome and is not always beneficial. Many military leaders frequently avoid terms like evolution and transformation in this dynamic strategic environment to avoid disrupting their teams. They sense an exhausted organisation, change fatigued, needing instead to concentrate on its warfighting mission. This thesis proposes a model for military organisational change, incorporating a logic of military conservatism, balancing the prevailing narrative depicting anyone opposing innovation or change as a dinosaur – obsolete. Through this research, there lies an opportunity to delve deeper into the theory, assembling a model for military organisational change that tackles complexity, accommodates uniqueness, and enhances future transformation outcomes.

Section 1.2 The Gap

The extensive and continually evolving body of research on organisational change underscores the challenge ahead of the ADO. Change of military organisations is comprehensively studied, yet there is a noticeable lack of a universally accepted model designed explicitly for this context. It is crucial to understand whether militaries exhibit unique responses to change, and to identify any distinctive characteristics making resistance more likely than other organisations. This includes examining the military's unique role and understanding whether a peacetime versus wartime context is determinative.

This thesis contributes to the organisational change body of knowledge, using assemblage theory to build a model for military organisational change. In addition to exploring organisational change theory in Chapter Two, it explores intersecting fields of study in Chapter Three, enhancing the accuracy and explanatory capacity of the model.

¹³ Stabilisers, as discussed in the Berkana Two Loops Model Sect 2.2, seek to protect a declining system until a new, improved emerging system is formed.

¹⁴ Discussed in the context of creative destruction and disruptive innovation in Section 3.2. It is also referred to as a tech fetish, a focus on technology rather than the pan-system changes required.

¹⁵ Eric Lamarre, Kate Smaje, and Rodney Zimmel, *Rewired: The McKinsey Guide to Outcompeting in the Age of Digital and AI* (Hoboken, New Jersey: Wiley, 2023), 335–39.

This approach contributes to scholarly research and adapts applications primarily developed in the private sector to incorporate better the unique challenges of pursuing change in a military context.

Furthermore, whilst interwar periods have been studied extensively in the United States, United Kingdom, Germany, and France, little speaks to the Australian experience. Exploring studies of Western military organisational change in Chapter Four provides initial validation and further model enhancement. To understand if the ADO resists change, deliberate analysis is required. However, lack of learning, analysis, or deliberate review of past organisational change efforts challenges the application of the model to the ADO in this thesis. Instead, this thesis sets a foundation for future PhD research, incorporating primary source engagement, to understand if the ADO resists change and how this can be overcome.

This thesis explores organisational change and intersecting theory from a position where change is necessary. However, as Zegart highlights, not all reforms or evolutions are required.¹⁶ Ensuring a balanced and pragmatic exploration of military organisational change, this thesis explores the logic of military conservatism in Chapter Five, balancing the narrative that the mere presence of change and innovation equates to positive organisational outcomes.

Chapter Six takes the initial step of advancing the knowledge of military organisational change and building a foundation model to take forward into primary source engagement to more effectively understand the ADO and its approach to change. It aims to contribute to the future study and practice of organisational change by enhancing models focusing on public organisations, specifically militaries. Assembling a model of military organisational change and enhancing understanding will surface opportunities to ensure more successful transformation outcomes.

Section 1.3 Definitions

The terminology across the theoretical fields exploring organisational change is inconsistent. This section defines key terms to enable clarity and consistency, supporting the assembly of a model of military organisational change. An organisation is a structured group of individuals working collaboratively towards common goals. The character or type of organisation shapes its response to change. Galvin characterises three types: businesses, enterprises, and firms. Militaries most closely resemble an enterprise conducting economic and purposeful activities yet behave similarly to a firm of professionals.¹⁷ This research focuses on contemporary Western militaries, defined by Kilcullen as those subscribing to a warfighting approach 'emphasising battlefield dominance achieved through high-tech precision engagement, networked communications, and pervasive intelligence, surveillance, and reconnaissance (ISR).'¹⁸

Change is the action or process of becoming different.¹⁹ In an organisational context, it involves transitioning from a current to a desired future state. Zegart highlights the shift

¹⁶ Amy B. Zegart, 'Agency Design and Evolution', in *The Oxford Handbook of American Bureaucracy*, ed. Robert F. Durant (Oxford University Press, 2010), 208, <https://doi.org/10.1093/oxfordhb/9780199238958.003.0009>.

¹⁷ Tom Galvin, 'Leading Change in Military Organizations: Primer for Senior Leaders' (US Army War College, n.d.), 4.

¹⁸ David Kilcullen, *The Dragons and the Snakes: How the Rest Learned to Fight the West* (Brunswick, Victoria, AUSTRALIA: Scribe Publications, 2020), 13, <http://ebookcentral.proquest.com/lib/dlsau-ebooks/detail.action?docID=6151462>.

¹⁹ Oxford English Dictionary, 'Change, n.' (Oxford University Press, September 2024), Oxford English Dictionary, <https://doi.org/10.1093/OED/5725214838>.

must improve the fit with the external environment.²⁰ The term transformation and organisational change are used interchangeably, emphasising scale and organisational-wide change, as described by Murray and Farrell, encompassing social and organisational structures, doctrinal and technological aspects.²¹ Murray's distinction between peace and wartime is used extensively when examining military transformation.²² Murray defines transformation in peacetime as innovation, where the environment is fundamentally different, resources may be constrained, but there is time to think, experiment and evaluate ideas and concepts. The adversary is indeterminate, and multiple futures drive action.²³ In contrast, processes during wartime are known as adaption. Whilst there may be an abundance of resources, time is limited. There is the immediate feedback loop of combat results and the added complexity of an adversary adapting, necessitating constant, ongoing change.²⁴

Resistance to change involves actions or behaviours deliberately hindering or preventing change from occurring. This differs from inefficiency or indifference, which neither support nor contest change.²⁵ It is also separate from military conservatism, which aims for a pragmatic balance focused on assuring an improved desired end state, not simply the presence of change.

Organisational change theory encompasses change management processes and organisational development strategies that inform the foundation of this thesis.²⁶ Organisational development is a broad field of study originating in the social sciences, focused on improving organisational effectiveness. As Szabla describes, it assists organisations fulfil their purpose and simultaneously offers greater dignity and meaning to the people within them or who are impacted by their existence.²⁷ Change management focuses on a structured approach to transitioning individuals, teams, and organisations from a current to a future state.²⁸

This chapter has introduced and outlined motivations for this exploratory thesis, which aims to advance the knowledge of organisational change by developing a model tailored for use in militaries. The definitions provide a common language to build a model that draws on multiple intersecting fields of study. The next chapter will lay the foundation for the model, exploring organisational change theory.

²⁰ Amy B Zegart, 'Agency Design and Evolution', in *The Oxford Handbook of American Bureaucracy* (Oxford University Press, 2010), 217.

²¹ Theo Farrell, Sten Rynning, and Terry Terriff, *Transforming Military Power since the Cold War: Britain, France, and the United States, 1991-2012* (New York: Cambridge University Press, 2013), 2; Williamson Murray and Thomas O'Leary, 'Military Transformation and Legacy Forces': (Fort Belvoir, VA: Defense Technical Information Center, 1 April 2002), 21, <https://doi.org/10.21236/ADA411749>.

²² David Barno and Nora Bensahel, *Adaptation under Fire : How Militaries Change in Wartime* (Oxford, UNITED STATES: Oxford University Press, Incorporated, 2020), 18, <http://ebookcentral.proquest.com/lib/dlsau-ebooks/detail.action?docID=6268800>.

²³ Williamson Murray, *Military Adaptation in War: With Fear of Change*, 1st ed. (Cambridge University Press, 2011), 309–10, <https://doi.org/10.1017/CBO9781139005241>.

²⁴ Murray, 309–10.

²⁵ Chris Argyris, 'Skilled Incompetence', *Harvard Business Review*, 1 September 1986, <https://hbr.org/1986/09/skilled-incompetence>.

²⁶ Introduction David B. Szabla, ed., *The Palgrave Handbook of Organizational Change Thinkers* (Cham: Springer International Publishing, 2021), <https://doi.org/10.1007/978-3-030-38324-4>.

²⁷ Introduction Szabla.

²⁸ Introduction Szabla.

Chapter 2 The Theory

This chapter interrogates the dynamic field of organisational change theory, building the foundation of a model of military organisational change. Exploring the field's development from the 1940s illuminates potential models capable of capturing the complexity of contemporary militaries with the explanatory power to understand and optimise change.

Section 2.1 Organisational Change

Kurt Lewin's contribution is foundational to the study of organisational change. As Burnes explains, Lewin's Planned Approach visualises organisational change as a three-step process. Developed in the 1940s, it endures today, influencing contemporary approaches.²⁹ Lewin challenged Frederick Taylor's Scientific Management, which focused on efficiency and productivity. Instead, Lewin prioritised democratic participation through action research theory.³⁰ As Adelman explains, action research reveals participants are not simply impacted by change; they are simultaneously active in shaping change.³¹ A concept that endures in both academic inquiry and practical application today.

Lewin's Planned Approach laid the field's groundwork, highlighting that top-down direction and autocratic influence are insufficient to assure organisational change outcomes. This is a critical insight for a highly hierarchical organisation like the military. As Dooley highlights, control, organisational structure and bureaucratic process are essential to effective operation, but relying solely on these for change outcomes is insufficient.³² Although Lewin's model offers a solid starting point, its straightforward nature and origin in the private sector challenge its ability to account for the complexities of change in public institutions, including militaries, necessitating additional understanding.

Evolving theories challenge Lewin's model and better represent the complexity of modern organisations and how they navigate change. As Burnes, Cummings et al. note, critics argue the planned approach is too linear and fails to consider the interdependency of the individuals, teams, organisation, and their social contexts.³³ For militaries, two factors challenge Lewin's model: its simplicity fails to account for the influence of external factors and complex networks crossing organisational boundaries, and its linear nature implies a stable start and end state. As highlighted in Chapter One and reinforced by the NDS and DSR, a state of constant change is more reflective of the ADO navigating the current strategic environment.

Proceduralists like Andrew Pettigrew emphasise change as continuous and open-

²⁹ Including change as a three-step process, Unfreezing – Moving Forward – Freezing, Bernard Burnes, 'Kurt Lewin and the Planned Approach to Change: A Re-Appraisal', *Journal of Management Studies* 41, no. 6 (2004): 977, <https://doi.org/10.1111/j.1467-6486.2004.00463.x>.

³⁰ Kevin Dooley, 'A Complex Adaptive Systems Model of Organization Change', *Nonlinear Dynamics Psychology and Life Sciences* 1 (1 January 1997): 69–97, <https://doi.org/10.1023/A:1022375910940>.

³¹ Clem Adelman, 'Kurt Lewin and the Origins of Action Research', *Educational Action Research* 1, no. 1 (January 1993): 7, <https://doi.org/10.1080/0965079930010102>.

³² Dooley, 'A Complex Adaptive Systems Model of Organization Change', 70.

³³ Burnes, 'Kurt Lewin and the Planned Approach to Change', 99; Stephen Cummings, Todd Bridgman, and Kenneth G Brown, 'Unfreezing Change as Three Steps: Rethinking Kurt Lewin's Legacy for Change Management', *Human Relations* 69, no. 1 (1 January 2016): 34–35, <https://doi.org/10.1177/0018726715577707>.

ended. According to Burnes and Sminia, Pettigrew focused on better understanding internal organisational dynamics and influences of external context.³⁴ His triangle framework and complementary tools focus on understanding an organisation's acumen for change, illuminating organisational indicators assuring change outcomes.³⁵ Pettigrew's approach complements rather than contests Lewin's model, providing insights into change resistance in organisations and the influence of external factors.

Whilst Pettigrew emphasised the importance of understanding an organisation's acumen for change, John Galbraith and Malcolm Baldrige focused on organisational design to enhance performance and development. Galbraith emphasises effective information processing to support decision-making, advocating for holistic design to maintain agility and flexibility.³⁶ His Star Model has endured through adaptations and is used by consultancies such as McKinsey.³⁷ The greater fidelity provided by Pettigrew, Galbraith and Baldrige enhances understanding of the modern organisation's complexity and external factor influences. They also share a resistance to universally applied frameworks.³⁸ Instead, their tools incorporate tailorable aspects to appreciate the unique nature of the organisation in question. Curiously, in the author's experience, this adaptability is not evidenced in the approaches employed by many managerial consultants working with the ADO today. An enhanced understanding of models informed by practical application may offer greater insight into organisational change in militaries.

Translating theory into practice, the realm of managerial consultants has contributed significantly to organisational change. As Clay discusses, John Kotter's Eight-Step Process exemplifies practitioner-informed contributions.³⁹ As an educator of managers at the Harvard Business School, Kotter's focus on management and leadership provided insight into the challenges of achieving organisational change. Kotter coalesced the eight critical mistakes organisations make when implementing change into an eight-step model to overcome them. Many scholars argue Kotter's model lacked formal academic research and validation. However, there was little evidence presented against the model and support for one or more of the 'steps' is evident across the broader literature.⁴⁰ It resonated with practitioners who saw themselves in the challenges underpinning the model. His later work expanded this approach, focusing beyond management to multifaceted action across all levels of organisations. He challenged linear step-by-step models and instead approached change more expansively and organically. This highlights the complexity of modelling organisational change. While individual models have limitations in understanding the complete organisation within its eternal context, considering them collectively enhances their explanatory power.

³⁴ Harry Sminia, 'Pettigrew, Andrew M.: A Groundbreaking Process Scholar', in *The Palgrave Handbook of Organizational Change Thinkers*, ed. David B. Szabla (Cham: Springer International Publishing, 2021), 1346, https://doi.org/10.1007/978-3-030-38324-4_53.

³⁵ Whilst primarily focused on comprehensive organisational research models, Pettigrew's complimentary tools include five factors for assessing an organisation's strategic change acumen, and his nine mutually reinforcing indicators of innovative organisations. Sminia, 1347–51.

³⁶ Sasha Galbraith, 'Galbraith, Jay R.: Master of Organization Design – Recognizing Patterns from Living, Breathing Organizations', in *The Palgrave Handbook of Organizational Change Thinkers*, ed. David B. Szabla (Cham: Springer International Publishing, 2021), 640–41, https://doi.org/10.1007/978-3-030-38324-4_39.

³⁷ Galbraith, 640–41.

³⁸ Sminia, 'Pettigrew, Andrew M.: A Groundbreaking Process Scholar', 1347.

³⁹ Brett Clay, 'Kotter, John: A Pragmatic Observer of Managers' Life Worlds', in *The Palgrave Handbook of Organizational Change Thinkers*, ed. David B. Szabla (Cham: Springer International Publishing, 2021), 52, https://doi.org/10.1007/978-3-030-38324-4_47.

⁴⁰ Clay, 881.

Section 2.2 Complex Adaptive Systems

Modern organisational change theory increasingly highlights the crucial role of humans and the complexity they cultivate in the system. Glenda Eoyang delves into Kevin Dooley's contribution, using complexity theory to understand and influence change in the complex human system of the modern organisation.⁴¹ Dooley's Complex Adaptive System (CAS) model of organisational change aggregates insights from models described earlier in this chapter, enhancing understanding of contemporary organisations. As Eoyang describes, Dooley, influenced by Lewin, rejected command-and-control approaches and clinical views of information processing, instead incorporating a deeper exploration of influence.⁴² Dooley's CAS appreciates the organisation as an entity but simultaneously looks deeper to understand its behaviour as an organism, and the humans central to the system.

Dooley draws on the physical sciences, chaos theory and self-organisation to enable a more holistic view of the modern organisation. The CAS integrates three views of organisational change: 'organic (systems theory), organismic (population ecology), and cognitive (information processing and organisational learning).'⁴³ Leveraging complexity paradigms and exploring chaotic dynamics of system behaviours, he contests Newtonian views, where equilibrium is considered the natural state of the system.⁴⁴ This Newtonian view influenced early concepts of planned organisational change, framing its commencement and conclusion from a stable state. In the complexity paradigm, equilibrium is just one of several possible states.

The CAS comprises semi-autonomous organisational agents, interacting at many levels of cognition and action, whose interactions produce system-wide patterns.⁴⁵ It is self-organising and self-creating through continual learning.⁴⁶ Agents form the critical building blocks of the CAS; they scan their local environment, including other agents, and develop schema, mental models, to interpret information (values, symbols, myths, norms, assumptions).⁴⁷ When observations are incongruent with an agent's schema, they can adapt the observation to fit or alter their schema through learning.⁴⁸ Patterns can be identified from the interdependent interaction of agents, describing potential system evolution. These patterns can be viewed from the organic (whole of entity), the organismic (internal system), and the cognitive (agent) level.

Early systems thinking developed alongside organisational theory, influencing the view of organisations as organic entities. Contingency theory describes how the entity adjusted to environmental fluctuations, particularly market forces, in the private sector.⁴⁹ As systems theory evolved, more organismic perspectives emerged, exploring how internal organisational structures and processes could be optimised to perform in stable versus unstable markets.

⁴¹ Glenda H. Eoyang, 'Dooley, Kevin J: Complexity – Simple and Useful', in *The Palgrave Handbook of Organizational Change Thinkers*, ed. David B. Szabla (Cham: Springer International Publishing, 2021), 541–56, https://doi.org/10.1007/978-3-030-38324-4_75.

⁴² Eoyang, 543.

⁴³ Dooley, 'A Complex Adaptive Systems Model of Organization Change', 76.

⁴⁴ Dooley, 76.

⁴⁵ Eoyang, 'Dooley, Kevin J: Complexity – Simple and Useful', 69; Kevin Dooley, 'A Nominal Definition of Complex Adaptive Systems', *Chaos Network* 8 (1 January 1996): 2–3.

⁴⁶ Similar systems include ecologies, cultures, politics and weather. Dooley, 'A Complex Adaptive Systems Model of Organization Change', 77.

⁴⁷ Dooley, 80.

⁴⁸ Dooley, 'A Nominal Definition of Complex Adaptive Systems'.

⁴⁹ Dooley, 'A Complex Adaptive Systems Model of Organization Change', 71–72.

The organismic view influenced by population ecology studies illuminated how changes in the system could be random (internally generated) or planned (externally driven).⁵⁰ Dooley describes Van de Ven and Guard's use of hereditary aspects of ecology to explain how cultural traits such as biases could be transmitted between system agents.⁵¹ This transmission enables diffusion and adoption of innovation. Adoption occurs when diffusion of ideas reaches a critical mass of agents, and innovation displaces old ways of doing things. This enables exploration of the socio-technology view of how the organisation and technology coevolve, influencing each other over time.⁵² This view is powerful in exploring how the technology acceleration trend, a critical factor in the current strategic environment, motivates organisational change.

At the organism level, punctuated equilibrium provides insight into the paradigm of continuous change. Rather than stability, the CAS visualises organisations moving through periods of relative equilibrium punctuated by revolutionary change.⁵³ Revolutionary change may be motivated externally or triggered internally by inducing a far-from-equilibrium state, a crisis within the system. The recovery from this far-from-equilibrium state drives change. Dooley uses Jack Welch and General Electric Company to describe this approach,⁵⁴ which resonates with Morrison's approach, described in Chapter One. While effective in accelerating change, in the author's experience, it was not without significant collateral damage.

The final component of the CAS focuses on the cognitive level and agent decision-making. Dooley draws on Galbraith's insights on information processing and how optimising acquiring, storing, retrieving, and analysing information improves decision-making superiority.⁵⁵ The CAS cognitive level focuses on how agents adjust schema through learning and the translation of this into collective organisation patterns.⁵⁶ Dooley heavily references the work of Argyris and Schön to develop this cognitive level, which will be further explored in the next section.

Within the holistic model of the CAS, Dooley's examination of ontogeny through the lens of autopoiesis illustrates its explanatory potential.⁵⁷ Ontogeny refers to the history of structural change within an entity, which occurs without compromising its organisational integrity. Despite changes motivated by internal dynamics or external interactions, the fundamental structure defining the entity remains constant. While earlier theories of organisational change viewed the interaction between an organisation and its environment as open, the CAS suggests its future configuration is already coded within the system when change is triggered.⁵⁸ By comprehending the organisation at the

⁵⁰ Dooley, 71–72.

⁵¹ Dooley, 73.

⁵² Dooley, 73; William Pasmore et al., 'Reflections: Sociotechnical Systems Design and Organization Change', *Journal of Change Management* 19, no. 2 (3 April 2019): 67–85, <https://doi.org/10.1080/14697017.2018.1553761>.

⁵³ Dooley, 'A Complex Adaptive Systems Model of Organization Change', 74.

⁵⁴ Jack Welch is an example of a leader who generated crisis to drive change, however there are also leaders who have capitalised on crisis, such as Churchill in WW2 'Never let a good crisis go to waste' Dooley, 78.

⁵⁵ Dooley, 75.

⁵⁶ Dooley, 75–76.

⁵⁷ Autopoiesis comes from the Greek self-creation, it offers a framework for understanding both living systems and social structures as self-sustaining entities that continuously produce and reproduce their own components and boundaries Jakob Arnoldi, 'Autopoiesis.', *Theory, Culture & Society* 23, no. 2/3 (1 March 2006): 116–17, <https://doi.org/10.1177/026327640602300220>.

⁵⁸ Structure denotes the specific network at a specific time (which can change) differentiated from the general organisation form of the entity. Humberto R. Maturana and Francisco J. Varela, *The Tree of Knowledge: The Biological Roots of Human Understanding*, The Tree of

CAS's organic, organismic and cognitive level, it becomes possible to visualise potential futures, identify vectors of resistance and implement adaptive strategies to overcome them.

Section 2.3 The Agents - People

A recurring theme in organisational change research is the centrality of people, specifically, how humans can be cultivated to initiate, facilitate, and manage change effectively. Understanding resistance to change necessitates examining this human factor. This aligns closely with the CAS cognitive level, which focuses on agents and their schema. This section explores people-centric theories of organisational change to enhance the CAS, particularly considering distinct characteristics of military organisations like the ADO.

William Bridges pioneered the Bridges Transition Model, which, like Lewin, visualised an entity 'moving through' phases of change to achieve new, improved stability. He differentiated the external functional change of the organisation from the inner psychological process people move through as they internalise the resultant new situation.⁵⁹ His three phases, Ending, Neutral Zone and New Beginning, are designed to clarify the emotional journey of people inside the organisation, with proposed strategies to support each phase.⁶⁰ Whilst still a linear process, it appreciated these phases could overlap and co-exist within one organisation, highlighting challenges for those experiencing and managing change.⁶¹ The modern organisation's multifaceted web of agents navigating these intertwined phases, sometimes concurrently at different paces, whilst simultaneously influencing one another, reveals the Bridges Transition Model's practical limitations.

An alternate and potentially more comprehensive model incorporating how people trigger and navigate change is Margaret Wheatley and Deborah Frieze's (Berkana) Two Loops Model. This model, illustrated in Figure 1, explains the evolution of social systems and leverages the same theoretical basis as the CAS.⁶² According to Wheatley and Frieze, two systems cannot exist in parallel; people respond to and influence both the decline of the old system and the emergence of the new system simultaneously.⁶³ Their focus on people within changing social systems has strong application in organisational change settings.⁶⁴

Dooley, Wheatley, and Frieze challenge notions of change occurring solely due to 'top-down' strategies or directives from an individual.⁶⁵ Instead, they argue change begins through localised innovations, Pioneers, which, if coalesced into networks, ultimately

Knowledge: The Biological Roots of Human Understanding. (Boston, MA, US: New Science Library/Shambhala Publications, 1987).

⁵⁹ Esther Cameron and Mike Green, *Making Sense of Change Management: A Complete Guide to the Models, Tools and Techniques of Organizational Change*, Fourth edition. (Kogan Page, 2015), 118, <https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,sso&db=cat08417a&AN=do d.963632&site=eds-live&custid=s3330841>.

⁶⁰ Cameron and Green, 119–20.

⁶¹ Cameron and Green, 121.

⁶² Margaret Wheatley and Deborah Frieze, 'Using Emergence to Take Social Innovation to Scale', n.d., 2.

⁶³ Wheatley and Frieze, 2.

⁶⁴ This model was revolutionary in understanding the resistance to the future ready workforce initiatives. Matt Berry, 'The Berkana Institute's "Two Loops"', *Innovation Unit* (blog), 11 November 2022, <https://www.innovationunit.org/thoughts/the-berkana-institutes-two-loops/>.

⁶⁵ Wheatley and Frieze, 'Using Emergence to Take Social Innovation to Scale', 3.

create a new system, supplanting the old dominant System.⁶⁶

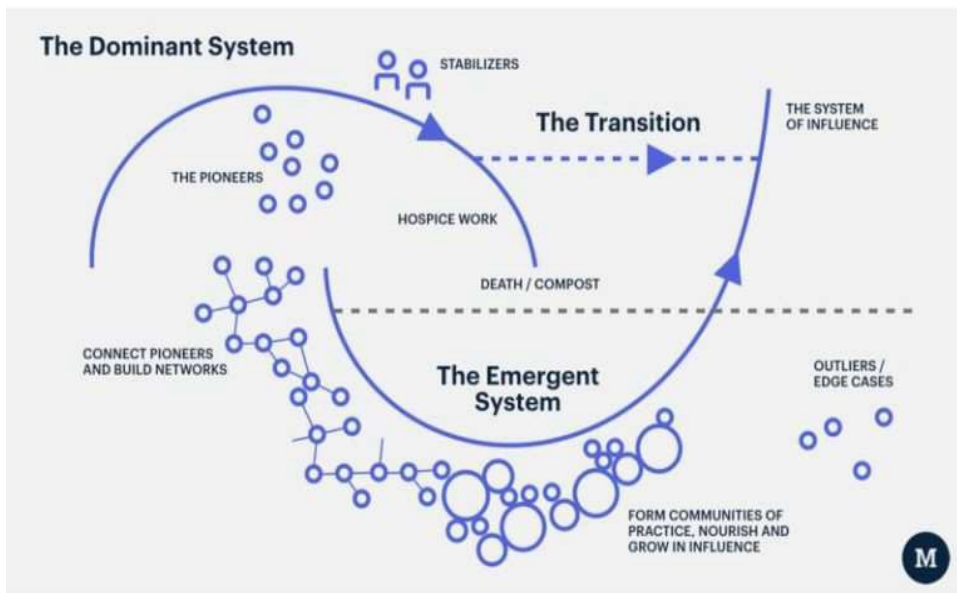


Figure 1 - The Berkana Two Loops Model⁶⁷

The Stabilisers, often misinterpreted as Resisters or Dinosaurs, focus on maintaining the function of the old system.⁶⁸ Their motivations are varied and complex. It is crucial to understand this nuance. Primarily, the current system must continue to operate, as no organisation, particularly the ADO, can afford to halt operations until a new system emerges. Whilst Stabilisers provide the necessary support for this, they can be constrained by their existing schema, potentially hindering the emergence of the new system. Ultimately, deliberate effort is required to transition them to the new emergent system and compost the old.⁶⁹ These roles or change responses resonate with Spencer Johnson's parable, 'Who Moved My Cheese.'⁷⁰ Understanding these responses and the roles agents play enables individuals and leaders to contribute to, and navigate change, more effectively.

This model was revolutionary in addressing the author's frustration when navigating the visceral resistance to developing a new 'Future Ready' Army HR System. The Future Ready Workforce Program was focused on the Pioneers and coalescing them into the emergent system; what was missing was the holistic view of the CAS encompassing the other agents, the Stabilisers, in the Army HR System, wider Army and the ADO. An enhanced understanding of the model provided insight into cultivating organisational change more effectively. It also exposed a phenomenon in the ADO, a layer of resistance beyond the stabilising function, requiring further exploration.

This layer, the Iron Colonels, is an individual or group representing barriers to

⁶⁶ This is the concept of system emergence Wheatley and Frieze, 3–4.

⁶⁷ Berry, 'The Berkana Institute's "Two Loops"'.

⁶⁸ Berry.

⁶⁹ Berry.

⁷⁰ In Johnson's parable, Hem and Haw represent the Stabilisers and, importantly, Hem, those who can cultivate transition. Sniff and Scurry represent the innovators and the network of adopters that ultimately form the emergent system. Spencer Johnson, *Who Moved My Cheese? An Amazing Way to Deal with Change in Your Work and in Your Life*, reissued, Personal Development (London: Vermilion, 2002).

organisational change in the ADO.⁷¹ Whilst they can be mistaken for Stabilisers, their enduring allegiance to the old system (under which they had thrived) results in behaviours resisting change and, at worst, undermining the emergence of the new system. Chris Argyris and David Schön potentially provide insight into this phenomenon and how it might be mitigated.

Integral to the CAS cognitive level Argyris' insight into learning and mental models is key to understanding how agent schema are shaped. With his colleague Schön, his Single and Double-loop learning concept provided indicators to assess the learning ability of organisations, translating into solid change acumen. These signposts include enhanced learning, identifying errors and ensuring they are corrected, competence to solve problems so they remain solved, and justice through universally agreed-upon values and rules.⁷²

This enhanced learning is key to ensuring accepted norms, goals, values, and frameworks are explicit, not taken for granted, and significantly, do not contribute to resistance or perverse behaviours. Single-loop learning is focused on solving the problem presented and correcting mistakes without questioning the underlying values or assumptions. It does not focus on why the problem exists; the focus is on doing things right.⁷³ This is the space where iron colonels reside, adhering to process and accepted assumptions. Double-loop learning goes deeper by questioning the assumptions and values that guide actions; the underlying cause can be exposed. This focused on doing the right things.⁷⁴ As Smith reinforces, Argyris and Schön's research focuses on increasing the organisation's capacity for Double-loop learning, especially at the leadership/executive level.⁷⁵ This is essential to making informed decisions in a rapidly changing and uncertain context.

This thinking has been developed further to include the most profound level of Triple-loop Learning. Mathews highlights Argyris and Schön, building on Baston's work, do not directly explore, but it is present in their model, focusing on the fundamental values and beliefs shaping decision-making processes, 'where one stands and their way of being, drives their thinking.'⁷⁶ Ben Zweibelson explores Triple-loop learning in the military context as a means of challenging mental models and better enabling people to navigate and cultivate positive organisational change. He emphasises Single and Double-loop learning constrain agents within the assumptions the organisation has established and rationally employed.⁷⁷ This results in adherence to rules contained within the linear, mechanistic decision-making methodologies perpetuated in military doctrine.⁷⁸ The challenge, particularly in organisational change, is complexity violates this precept. Concepts of what is rational differ between agents and conflict with the

⁷¹ Mike Kalms, 'Cultural Reform in Middle Army – Melting Iron Colonels | The Cove', accessed 10 September 2024, <https://cove.army.gov.au/article/cultural-reform-middle-army-melting-iron-colonels>.

⁷² Chris Argyris, *Overcoming Organizational Defenses: Facilitating Organizational Learning* (Boston: Allyn and Bacon, 1990).xi

⁷³ Argyris, 92.

⁷⁴ Argyris, 94.

⁷⁵ Mark. K Smith, 'Chris Argyris: Theories of Action, Double-Loop Learning and Organizational Learning – Infed.Org', the encyclopaedia of pedagogy and informal education, infed.org, 2013 2001, <https://infed.org/mobi/chris-argyris-theories-of-action-double-loop-learning-and-organizational-learning/>.

⁷⁶ Sheril Mathews, 'How Double-Loop Learning Improves Performance', Leading Sapiens, 10 March 2023, <https://www.leading sapiens.com/double-loop-learning-leadership-performance/>.

⁷⁷ Ben Zweibelson, 'Beyond the Pale : Designing Military Decision-Making Anew / Ben Zweibelson.', 1 January 2023, 32, <https://research.ebsco.com/linkprocessor/plink?id=5d5ae84c-902b-30cb-98fe-61e9c3348d17>.

⁷⁸ Zweibelson, 32–33.

organisational norms.⁷⁹ Zweibelson draws on the ideas of reflective practice and reflexivity to describe how Triple-loop learning enables agents to think paradoxically, exploring the tensions between how different agents interpret reality in strikingly different ways yet do so whilst systematically acting within the same dynamic complex and emergent system.⁸⁰ Argyris and Schön's learning concepts, enhanced by Zweibelson, are critical to understanding the CAS cognitive level.

An intersecting body of work speaks to the ability to shape agent behaviour and schema without changing core beliefs. Elizabeth Paluk's work in post-genocide Rwanda potentially enhances the CAS intersecting at the organism and cognitive levels. Paluck's work using influence mediums demonstrates how collective interactions can be shaped by shifting collective culture and schema without shifting an individual's beliefs.⁸¹ This provides a vector to understand how resistant groups like Iron Colonels could be simultaneously influenced through deepened individual learning and collective behaviour-shaping initiatives.

This chapter explored organisational change theory, illuminating the CAS as a robust foundation for a model of military organisational change. The deeper exploration of people-centric organisational change underscores the CAS cognitive level, providing enhanced insights into change resistance groups, such as Iron Colonels. The Berkana model and Paluk's behaviour-shaping work offer further insight into agent behaviour and how schema evolves, enhancing the CAS further. This illuminates the opportunity to build the CAS beyond Dooley's original conception, enhancing ADO applicability. The next chapter explores enhancements focusing on CAS organic and organismic levels, better accounting for external context and internal system dynamics unique to contemporary public institutions.

⁷⁹ Zweibelson, 33.

⁸⁰ Zweibelson, 34–35.

⁸¹ Mediums such as soap operas were used to model behaviour, without changing beliefs. Elizabeth Paluk and Donald Green, 'Deference, Dissent, and Dispute Resolution: An Experimental Intervention Using Mass Media to Change Norms and Behaviour in Rwanda', *The American Political Science Review* 103, no. 4 (2009): 622–44.

Chapter 3 Intersecting Theories

Intersecting fields of study provide insights that can enhance the CAS' explanatory power, including accommodating unique aspects of militaries. Exploring organisational change literature in public organisations, there is substantial use of assemblages of theories, hybrid models seeking to account for this unique context. This chapter explores intersecting theories and, leveraging the concept of assemblage, focuses on how CAS could be improved to understand military organisational change better.

Section 3.1 Agency Design and Bureaucracy

The study of public agencies and bureaucracies helps understand change resistance in the ADO and potential interventions. Unlike private companies driven by market forces, public institutions lack this external motivation for change, highlighted in Chapter Two. Amy Zegart combines organisational change theory and rational choice or new institutionalism to explore change failure in American bureaucracies. This assemblage addresses inadequacies in organisational theory and institutionalism when applied singularly.

Zegart presents a cyclic 'Groundhog Day' of failure, reform, and resistance.⁸² Whilst acknowledging not all reforms are good ideas, this cyclic failure warrants enhanced understanding.⁸³ She notes studies of public institutions have overly focused on initial design rather than evolution or transformation failures.⁸⁴ This resonates with the author's motivation to understand the ADO's organisational change record and the importance of enhancing knowledge of how public institutions evolve. Whilst her model could provide insights into private organisations, public institutions' unique challenges illuminate enhancements to the CAS, specifically applicable to militaries.

The unique external context militaries operate in is a weakness at the CAS organic level. In a private company, market forces and the threat of unemployment and bankruptcy create strong incentives to adapt. Unlike private companies who die if they fail to adapt, public institutions endure regardless of how costly.⁸⁵ In the peacetime military context absence of external, existential motivation (an adversary) has the potential to retard military organisational change.

The CAS' networks incorporate external agents whose influence and motivation towards successful adaptation must be considered. As Zegart highlights, in a private setting, agents (creators and employees) are invested in successful organisational change; this is not always the case in the public sector.⁸⁶ Government agencies are co-created. In politics, machinery of government is forced by winning political coalitions, who impose their will. However, wins are never complete; the opposition influences the agency's initial organisational design, and they possess the interests and capabilities to constrain longitudinal agency evolution.⁸⁷ Robert Durant reinforces this analysis by highlighting the significant influence of senior bureaucrats external to the organisation,

⁸² Groundhog Day referring to the 1993 movie where the same day repeats. Zegart, 'Agency Design and Evolution', 2010, 208.

⁸³ Zegart, 208.

⁸⁴ Zegart, 213.

⁸⁵ Zegart highlights the costly failed IT transformation of the FBI that cost \$170M. Zegart, 218.

⁸⁶ Zegart, 219.

⁸⁷ Zegart, 218.

such as the National Security Council.⁸⁸ Whilst a US analysis, this resonates with the DSR and NDS, representing a significant change in direction imposed by the Labour Government after securing power in 2022.

Internally, public institutions face unique constraints compared to their private sector counterparts. Wilson highlights the constrained ability of leaders to influence the system.⁸⁹ Setting the mission, evolving the workforce, building and restructuring teams, and instituting new procedures, policies, and customs all require external agent (for the ADO, Government-level) oversight and involvement. Drawing from organisational theory, Zegart reinforces the CAS cognitive level further constrain organisational change. She illuminates how agents in public organisations become wedded to their schema, noting the constraining impact of doctrine or standard operating procedures (SOP). The process becomes so accepted it assumes moral/political importance, entrenching schema and constraining organisational change efforts.⁹⁰ This reinforces how Single-loop learning constrains change at the CAS cognitive level.

Durant and Zegart explore the limits of theories such as rational choice institutionalism and offer adaptations and assemblages to better account for the unique nature of public institutions and bureaucracies.⁹¹ Their insights reinforce all three levels of the CAS, providing unique insight into challenges specific to public institutions, enhancing the CAS' explanatory power as a model of military organisational change. The following section seeks to improve the CAS further, exploring the intersection between the ADO and today's strategic environment.

Section 3.2 Innovation

The relentless pursuit of innovation is a pervasive narrative as all sectors confront today's strategic environment. The exponential rate of technology change simultaneously offering enticing opportunities, unfathomable unknowns, and potential threats.⁹² Exploring innovation theory provides insights to enhance the CAS' explanatory power, accommodating intersections between the ADO and today's strategic environment.

This exploration of innovation theory goes beyond Murray's military definition in Chapter One, a broader view defining innovation as introducing novelties, new ideas, methods or inventions altering what is established.⁹³

Traditionally, innovation occurred within the boundaries of an organisation with integral research and development resources. In contrast, Ron Adner's insights on Innovation Ecosystems embrace open innovation, collaborating across organisational boundaries and mobilising a diverse network to harness collective intelligence. This recognises ground breaking ideas emerge internally and externally.⁹⁴ Adner describes equally

⁸⁸ Robert F. Durant, 'Agency Evolution, New Institutionalism, and "Hybrid" Policy Domains: Lessons from the "Greening" of the U.S. Military', *Policy Studies Journal* 34, no. 4 (November 2006): 470, <https://doi.org/10.1111/j.1541-0072.2006.00187.x>.

⁸⁹ Bill Gormley, 'James Q. Wilson, Bureaucracy: What Government Agencies Do and Why They Do It', in *The Oxford Handbook of Classics in Public Policy and Administration*, ed. Martin Lodge, Edward C. Page, and Steven J. Balla (Oxford University Press, 2015), 522, <https://doi.org/10.1093/oxfordhb/9780199646135.013.2>.

⁹⁰ Zegart, 'Agency Design and Evolution', 2010, 219.

⁹¹ Zegart, 220.

⁹² Dobbs, Manyika, and Woetzel, *No Ordinary Disruption*.

⁹³ Oxford English Dictionary, 'Innovation, n.' (Oxford University Press, June 2024), Oxford English Dictionary, <https://doi.org/10.1093/OED/3967393416>.

⁹⁴ Moinul Alam, 'What Is Open Innovation? Definition, Types, Model and Best Practices', *IdeaScale* (blog), 14 July 2023, <https://ideascale.com/blog/what-is-open-innovation/>.

compelling examples of failed innovation ecosystems, emphasising the importance of understanding risk, dependencies and influence beyond the organisation's boundaries.⁹⁵ The DSR and NDS encourage ADO to embrace open innovation.⁹⁶ In light of this direction, Adner's model provides insights for the CAS organism level, enhancing understanding of external agents, intersecting networks, their schema and how their influence might accelerate or constrain innovation and, ultimately, organisational change.

Adner and Dan Levinthal's concept of creative destruction provides insight into system emergence triggered by innovation, explaining how technology invades new market niches.⁹⁷ There is military precedence, adopting wireless communication despite the high cost and poorer sound quality to gain mobility and flexibility not offered by traditional wire systems. The military and police represented an initial niche where the benefits outweighed costs.⁹⁸ As the ADO contemplates a digital future, embracing creative destruction to challenge mental models and consider technology beyond its original application is essential. This intersects with the CAS cognitive level and offers opportunities to overcome the unhelpful behaviours associated with ADO digital transformation discussed in Chapter One.

Clayton Christensen explores an alternate but complementary view of creative destruction, known as disruptive innovation. The process where a new technology (product or service) emerges in a simple application at the bottom of the market and, over time, moves upward, displacing competitor technologies. He differentiates this from sustaining innovation, which focuses on incremental improvement in the current context.⁹⁹ Creative destruction focuses on the displacing effect of new technology; Christensen's analysis focuses on the technology, tracking its trajectory compared with the market. He notes many technologies never surpassed the old dominant technology.¹⁰⁰ Like Adner, Christensen highlights emerging new markets as the strongest signal of potential opportunity; however, these new markets are unknowable, requiring the organisation to focus on learning and discovery rather than executing a plan.¹⁰¹ Importantly, these technologies require cultivation and protection from processes and incentives designed to optimise current markets and serving mainstream customers.¹⁰² This resonates with leaders' role in protecting the pioneers in the Berkana model discussed in Chapter Two.

Christensen visualises emerging markets and disruption as waves requiring organisations to cultivate technology and be positioned to catch the wave of change. Adner and Christensen's approaches stress the benefit of cultivating Double and Triple-loop learning in the CAS cognitive level. For the ADO to navigate today's strategic

⁹⁵ Ron Adner, 'Match Your Innovation Strategy to Your Innovation Ecosystem', *Harvard Business Review*, 2006, 3.

⁹⁶ Commonwealth of Australia, 'National Defence Strategy 2024', 63.

⁹⁷ Speciation comes from biology, the evolutionary process where a population emerges to become its own species. Ron Adner and Daniel A. Levinthal, 'The Emergence of Emerging Technologies', *California Management Review* 45, no. 1 (1 October 2002): 54, <https://doi.org/10.2307/41166153>.

⁹⁸ Adner and Levinthal, 56–57.

⁹⁹ Clayton M. Christensen, 'The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail / Clayton M. Christensen.', 1 January 1997, 138, <https://research.ebsco.com/linkprocessor/plink?id=7d58d6ab-bc0b-3488-8e01-e00950ad96e3>.

¹⁰⁰ Joseph L. Bower and Clayton M. Christensen, 'Disruptive Technologies: Catching the Wave', *Harvard Business Review*, 1 January 1995, 43–45, <https://hbr.org/1995/01/disruptive-technologies-catching-the-wave>.

¹⁰¹ Christensen, 'The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail / Clayton M. Christensen.', 138.

¹⁰² Bower and Christensen, 'Disruptive Technologies'.

environment, incorporating these concepts ensures agile thinking and adaptable mental models. It also offers insights at the CAS organism level, examining if the ADO is structured to enable this type of exploration and, once identified, how it cultivates adoption, ensuring the dinosaurs catch the wave.

When considering the current strategic environment, technologies such as Artificial Intelligence (AI), Robotics, and Automation are rapidly changing. Peter Singer's exploration of the ethical consideration of robots, especially if they become sentient, the terminator conundrum described also by Campbell, challenges the mental models shaping how humans interact with technology.¹⁰³ This philosophical intersection will challenge moral and ethical frameworks, particularly for the military. What constitutes agents in the system, how are their schema influenced, and how do they interact and connect as networks? Singer's approach requires a deeper exploration of CAS cognitive level, challenging mental models framing current approaches to technology. This could be key in cultivating organisations to pursue disruptive innovation and shifting mental models to overcome resistance to change.

Section 3.3 Assemblage

Chapter Two explored organisational change theory, identifying the CAS as a foundational model. This chapter investigates intersecting theories, improving the explanatory power of the CAS for militaries. The emerging theme, described by Marshall Poole and Andre Van de Ven, is no single theory has the explanatory power to understand modern organisations. Organisational change and innovation transpire in complex ways across multiple levels of the organisation, interfacing across boundaries with agents drawing on diverse dynamic (and some not-so) schema to process information and drive action.¹⁰⁴ Poole and Van der Ven's visualise the concept of assemblage through an early renaissance image from *L'atmosphère: météorologie Populaire*, pictured at figure 2.¹⁰⁵ The Monk claims to have found the point where the earth and heaven touch. Peering through, hoping to see a glorious order behind the complex movement of the stars and the planets, only to find more complexity, with pockets of interconnected order.

¹⁰³ Peter Singer and Yip Fai Tse, 'AI Ethics: The Case for Including Animals', *AI and Ethics* 3, no. 2 (1 May 2023): 539–51, <https://doi.org/10.1007/s43681-022-00187-z>; Tom Campbell, 'Terminator Conundrum: Perhaps a Middle Ground?', 10 August 2018, <https://www.futuregrasp.com/terminator-conundrum>.

¹⁰⁴ Marshall Scott Poole and Andrew H. Van de Ven, 'Theories of Organizational Change as Assemblages', in *The Oxford Handbook of Organizational Change and Innovation*, ed. Marshall Scott Poole and Andrew H. Van de Ven (Oxford University Press, 2021), 817, <https://doi.org/10.1093/oxfordhb/9780198845973.013.31>.

¹⁰⁵ Camille Flammarion, *L'atmosphère météorologie populaire : ouvrage contenant quinze planches tirées en chromotypographie, deux cartes en couleur et trois cent sept figures insérées dans le texte* (Paris : Librairie Hachette et cie., 1888), 163, <http://archive.org/details/McGillLibrary-125043-2586>.



Figure 2 - Un missionnaire du moyen Age raconte qu'il avait trouvé le point où le ciel et la Terre se touchent.

The challenge is how the viewer discerns, makes sense, and navigates the space. Poole and Van de Ven's theory of assemblage leverages a combination of models to make sense of the complexity. This thesis leverages assemblage to integrate intersecting theories and models to better appreciate militaries' unique nature and enhance the CAS' explanatory power.

The organisational change literature is rich and diverse. Chapters Two and Three illuminated the evolution and potential intersecting fields of study, yet Schuyler's reflection from Chapter One reinforces the perplexing challenge that still confronts those pursuing organisational change. The challenge of any theory is to be 'accurate enough to explain the complexity, yet simple enough to understand and guide behaviour.'¹⁰⁶ This Chapter drew on Poole and Van de Ven's concept of assemblage. From the foundation of Dooley's CAS, intersecting models are assembled to enhance understanding of military organisational change and explore vectors of change resistance. The next chapter seeks to further develop the CAS, examining the application of many theories and assemblages to military transformation. It aims to finalise an applied model to explore if the ADO is resistant to change and opportunities to overcome resistance, optimising future organisational change outcomes.

¹⁰⁶ Poole and Van de Ven, 'Theories of Organizational Change as Assemblages', 818.

Chapter 4 Military Organisational Change

This chapter leverages the literature analysing military transformation to test and further refine the CAS assemblage. There is no universally applied model for military organisational change, with any scholars using assemblages to support their exploration. It commences with accounts of Western military organisational change before exploring the literature available on discrete components of the ADO and tactical innovation.

Section 4.1 Other Militaries

The Revolution of Military Affairs (RMA) in the second inter-war period provides case studies to explore military organisational change in peacetime. Harvey Sapolsky et al. explore the US military response, exposing an unexpected lack of organisational change.¹⁰⁷ They consider Wilson's insights into innovation within bureaucracies, which highlights small, decentralised institutions are more likely to cultivate pioneers who generate ideas; however, this diversity leads to 'choice jurisdiction' hindering longer-term adoption. In contrast, organisations with more rigid hierarchies can often drive implementation.¹⁰⁸ As Sapolsky et al. notes, the US military, contained both and it was not clear how this hybridity behaved or could be optimised.¹⁰⁹

Instead, Sapolsky et al. assembled a composite theory leveraging the combined explanatory power of Stephen Rosen and Barry Posen's work, contributing that inter-service rivalry for status and budget can also motivate organisational change.¹¹⁰ Rosen outlines a gradual innovation model in militaries that requires a generational timescale, with change resulting only as proponents are promoted to positions of power.¹¹¹ This requires them to find protectors, experiment, and slowly climb the ladder until they can drive change. This resonates with the Berkana model, which requires pockets of innovation to coalesce into networks, an emergent system. To do so, pioneers must be protected, connected, and, in Rosen's view, promoted to achieve organisational change.

Posen emphasises the importance of senior civilian intervention driving significant doctrinal change to overcome military organisational resistance.¹¹² This perspective aligns with Zegart and Durant's analysis. J.P. Clarke further expands this idea, highlighting the simultaneous influence of a maverick internal reformer crucial to

¹⁰⁷ RMA during this period focused on the significant technological advancement in sensors, communication Networks, precision weapons and stealth. Harvey Sapolsky, Benjamin Friedman, and Brendan Green, *US Military Innovation Since the Cold War: Creation Without Destruction* (Routledge, 2009), 9, <https://www.taylorfrancis-com.ezproxy-b.deakin.edu.au/books/edit/10.4324/9780203878651/us-military-innovation-since-cold-war-harvey-sapolsky-benjamin-friedman-brendan-green>.

¹⁰⁸ James Q. Wilson, *Bureaucracy: What Government Agencies Do and Why They Do It* (Hachette UK, 2019).

¹⁰⁹ Sapolsky, Friedman, and Green, *US Military Innovation Since the Cold War*, 7.

¹¹⁰ Sapolsky, Friedman, and Green, 9.

¹¹¹ Stephen Peter Rosen, *Winning the Next War: Innovation and the Modern Military* (Cornell University Press, 1991), 251, <http://www.jstor.org.ezproxy-f.deakin.edu.au/stable/10.7591/j.ctv2n7k6j>.

¹¹² Barry Posen, *The Sources of Military Doctrine: France, Britain, and Germany Between the World Wars*, Cornell Studies in Security Affairs (Ithaca: Cornell University Press, 1984), 223, <https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,sso&db=e000xww&AN=843731&site=eds-live&custid=s3330841>.

assuring success.¹¹³ Posen's approach provides greater fidelity across the CAS organic and organism levels. The DSR and NDS represent this external intervention. The CAS offers a framework to assess its enduring impact and the existence and cultivation of Clarke's cross-boundary network of agents to drive organisational change.

Sapolsky et al. observe interservice rivalry can be a powerful motivator or barrier to change, highlighting through their case study the promise of Joint Operations enhancing cross-boundary interoperability and efficiency was only realised when it did not come at the cost of a single Service.¹¹⁴ This resonates with the Australian experience and is an ominous predicament for the ADF's pursuit of an integrated force. It illustrates the strength of tribes within militaries and the importance of understanding these networks at the CAS organism level.

Williamson Murray explores military organisational change in peace and wartime, highlighting the connection between the two; he argues innovation skills developed in peacetime, based on empirical evidence, enabled militaries to recognise actual wartime conditions, which was crucial to adaption.¹¹⁵ He examines organism level military architecture and processes challenging innovation and adaption, highlighting, '(t)he demand of discipline and rigid respect for one's superiors—on which cohesion in battle depends—are antithetical to the processes of adaptation, which require the willingness of subordinates to question revealed wisdom of their superiors.'¹¹⁶ Through his study of the interwar periods, he identifies trends across militaries to cultivate innovation.

Emphasising culture and learning, his trends enhance the CAS cognitive level, providing practical examples for cultivating Double and Triple-loop learning. He focuses on using empirical evidence to challenge mental models, cultivating critical examination across doctrine and concepts, and pragmatic, respectful analysis of adversaries to promote enhanced learning.¹¹⁷ John Nagl reinforces the importance of building an organisational learning culture and change acumen in peacetime to ensure adaptability in wartime.¹¹⁸ Murray also cautions against misusing history, re-writing, or selectively remembering the past to fit existing schema and resist change.¹¹⁹ Whilst not a comprehensive model, his examination of historical examples reveals trends helpful to understanding agents and the evolution of their schema. These insights provide key prompts to enhance the CAS through tangible military examples.

Whilst Murray takes an expansive view of the inter-war period, Andrew Krepinevich focuses on the US Army in Vietnam, examining its learning and innovation within the broader political environment. To explore the causes of the US Army's failure in Vietnam, Krepinevich examines their innovation in the 1950-60s. This period reinforced

¹¹³ JP Clark, 'Organizational Change and Adaptation in the US Army.Pdf', *US Army War College: Parameters*, no. 46 (1 September 2016): 24.

¹¹⁴ Sapolsky, Friedman, and Green, *US Military Innovation Since the Cold War*, 9.

¹¹⁵ As per section 1.3 adaption occurs in wartime and innovation in peacetime Murray, *Military Adaptation in War*, 5.

¹¹⁶ Murray, 3.

¹¹⁷ Williamson R. Murray and Allan R. Millett, eds., *Military Innovation in the Interwar Period* (Cambridge: Cambridge University Press, 1996), 312–22, <https://doi.org/10.1017/CBO9780511601019>.

¹¹⁸ John A. Nagl, 'Learning to Eat Soup with a Knife: British and American Army Counterinsurgency Learning during the Malayan Emergency and the Vietnam War', *World Affairs* 161, no. Issue 4 (15 March 1999): 193–98.

¹¹⁹ Murray and Millett, *Military Innovation in the Interwar Period*, 310–28.

a foundation of resistance contributing to adaption failure during the war.¹²⁰ The richness of this case study lies in its parallels to the ADO's current situation. The 'Army Concept' was entrenched when President Kennedy came to power and remained so, despite his efforts to shift Eisenhower's Massive Retaliation doctrine to a Flexible Response focus.¹²¹ Concurrently, Secretary of Defence Robert McNamara sought to institute the Planning Programming Budgeting System (PPBS) to enhance procurement efficiency with a strong focus on technical and managerial aspects.¹²² Krepinevich explores where attempts to drive change were avoided, overcome or ignored, highlighting the importance of agent schema, the CAS cognitive level and how they become impenetrable. The dual nature of innovation meant the Secretary of Defence's focus on the acquisition system diverted attention from the President's challenge, leaving the Army autonomous, and undermining the external direction Posen emphasises as critical.

Krepinevich builds on this analysis to explore his latest work on how disruptive innovation influences the trajectories of nations. He suggests to maintain the competitive edge, military organisations should prepare to respond effectively to an emerging military revolution.¹²³ By examining Christensen's concept of disruptive innovation, he draws parallels to the RMA. Unlike the private sector, he emphasises RMAs are characterised by multiple technologies; the combination of the machine gun, aeroplane, submarine and battleship transformed warfare at the end of the 19th Century.¹²⁴ Moreover, implementing this combination of technologies with new operational concepts - a change in thinking - proved most successful.¹²⁵ Integrating this analysis into the CAS refines Christensen and Adner's innovation concepts for the military context. Krepinevich reinforces the challenges and resistance identified by other scholars, including cultivating leaders who can navigate bureaucracy, foster deep learning, and provide a compelling vision and rationale for change.

While many scholars distinguish between military innovation and adaption, Theo Farrell, like Murray, highlights the interdependency, taking a longitudinal view. His widely referenced work focuses on three elements of change: adjustment, adaption, and innovation.¹²⁶ With Rynning and Terriff, he takes a longitudinal view of Army organisational change, which does not conclude at the boundary of war. Instead, operations enable testing, refinement, adaption and enhanced understanding of the evolving character of war.¹²⁷ Farrell et al. do not propose a single theory; instead, they assemble several, including Rosen, Posen, and Sapolsky, to examine transformation of the United States, France, and British Armies since the Cold War.¹²⁸ They draw four factors from these models: service interests (Sapolsky), senior leadership ideas (Posen), individuals (Rosen) and the impact of operations. Whilst no single factor has

¹²⁰ Andrew F. Krepinevich, *The Army and Vietnam*, Paperback ed., 1988, 260–63, <https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,sso&db=cat08417a&AN=do d.798654&site=eds-live&custid=s3330841>; Krepinevich, 35. and 260-3

¹²¹ Krepinevich, *The Army and Vietnam*, 27–28.

¹²² Krepinevich, 35.

¹²³ Andrew F. Krepinevich, *The Origins of Victory: How Disruptive Military Innovation Determines the Fates of Great Powers* (New Haven, Ct: Yale University Press, 2023), <https://research.ebsco.com/linkprocessor/plink?id=d97009d2-8f3b-3925-9e30-71252da8d489>.

¹²⁴ Andrew F. Krepinevich, 132.

¹²⁵ Andrew F. Krepinevich, 132.

¹²⁶ Francis Hoffman, *Mars Adapting: Military Change During War*, Transforming War (Annapolis, MD: Naval Institute Press, 2021), <https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,sso&db=e000xww&AN=270 8134&site=eds-live&custid=s3330841>.

¹²⁷ Farrell, Rynning, and Terriff, *Transforming Military Power since the Cold War*, 12–13.

¹²⁸ Farrell, Rynning, and Terriff, 248–92.

primacy, all influence military organisational change, reinforcing their value to an enhanced CAS. A common theme across case studies is the risk of technological fetishism, explored further in Chapter Five.¹²⁹

Additionally, Farrell et al. explore emulation and how militaries influence each other.¹³⁰ They found military cooperation and alliances significantly influence organisational change, though they were not decisive over the other factors in the countries studied.¹³¹ For the ADO, AUKUS and sub-imperial notions described by Clinton Fernandez may warrant further exploration as both a trigger for organisational change and how schema are shaped through this cultural phenomenon.¹³²

Mick Ryan exemplifies contemporary discussions of military transformation, positioning his work in today's strategic environment. Whilst rooted in the megatrends described by Dobbs et al., he emphasises humans continue to compete and fight with available tools. Warfare will use old and new technologies, some ancient and others highly sophisticated.¹³³ His analysis leverages models of open and disruptive innovation described in Chapter Three. A significant theme is the 'knowledge explosion,' an acceleration of the CAS cognitive level requiring exploitation. Humans' insatiable capacity to learn and share has expanded tremendously and, through technology, is on an exponential trajectory.¹³⁴ Notably, technology is not the complete solution. It is how people combine it with new ideas and organisations to cultivate 'Decision Advantage.'¹³⁵ His work reinforces the importance of a non-linear appreciation of organisational change, best modelled by the CAS, and the importance of deep learning enabling dynamic schema and system cultures celebrating creativity, encouraging debate, continually challenging mental models.

Examining the application of organisational change and intersecting theories to other military transformations reinforces the importance of a model that can appreciate complexity whilst providing explanatory power. There is a strong focus on cognitive elements, learning, leadership, and empowerment and how CAS organism elements like doctrine, SOPs, and structure enable or constrain organisational change. Any model should keep curiosity and a thirst for understanding central. As Ryan emphasises, quoting Strachan 'On War's strength, its very essence and the reason for its longevity is it remains a work in progress. Its author never stopped asking questions – not simply of his conclusions but also of the methods by which he reached them.'¹³⁶

Section 4.2 Australian Military

Literature on the ADO is limited, focusing on cultivating innovative individuals and

¹²⁹ Farrell, Rynning, and Terriff, 295.

¹³⁰ Farrell, Rynning, and Terriff, 292–93.

¹³¹ Farrell, Rynning, and Terriff, 294.

¹³² AUKUS stands for Australia, United Kingdom and the United States as described by the NDS. Sub-Imperial refers a model where Australia's strategic culture is that of a sub-imperial component of the US. Clinton Fernandes, *Sub-Imperial Power: Australia in the International Arena*. (Melbourne University Press, 2022), <https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,sso&db=cat08417a&AN=do1069338&site=eds-live&custid=s3330841>.

¹³³ Mick Ryan, *War Transformed: The Future of Twenty-First-Century Great Power Competition and Conflict* (Annapolis, Maryland: Naval Institute Press, 2022), 12, <https://research.ebsco.com/linkprocessor/plink?id=9c2ac6e9-24d2-38ce-a122-421565fb6d75>.

¹³⁴ Mick Ryan, 23.

¹³⁵ Mick Ryan, 29.

¹³⁶ Hew Strachan, 'Clausewitz's On War: A Biography / Hew Strachan.', 1 January 2007, 193, <https://research.ebsco.com/linkprocessor/plink?id=059f393d-2404-31b3-90cf-2397c0566b96>.

teams. Chris Field, James Brown, and Alex Neads et al. highlight individuals as key drivers of innovation, pinpointing organisational culture and intrinsic motivation as core barriers.¹³⁷

Brown discusses Army's innovation ability, highlighting culture and talent management as barriers.¹³⁸ While acknowledging the Adaptive Army initiative, he notes a lack of tangible action, incentivisation or fostering of learning, new ideas, and critical thinking.¹³⁹ Field also stresses the importance of the CAS cognitive level, encouraging Double and Triple-loop learning to foster innovation. He further emphasises creating an 'organisational climate that enables creativity and innovation'.¹⁴⁰ This aligns with Argyris' informed CAS cognitive level and Zweibelson's Triple-loop learning enhancement.

Brown discusses improved talent management, seeking to accelerate timeframes outlined by Rosen to position key agents in influential roles to drive change.¹⁴¹ Field reinforces this premise by discussing Clarke's concept of diffusion, describing a process akin to the Berkana model, where pioneers form networks and emergent systems. While his focus is on the pioneers, he acknowledges the need to cultivate the conditions for points of innovation to coalesce into organisational change.¹⁴²

Field further focuses on providing space for imagination, experimentation, and robust testing.¹⁴³ Scott Holmes explores this idea further, proposing a dual structure balancing preparedness with room for innovation and experimentation.¹⁴⁴ This provides organism level insight to enhance the CAS, structuring to enable innovation.

Brown and Field's analysis, while focused on tactical innovation, reinforces CAS cognitive aspects and complementary organism elements. However, their view is incomplete, focused only on early innovation and pioneer cultivation stages. While reinforcing enhancements to the CAS by other scholars, neither offers a holistic view of military organisational change.

Neads et al. take a broader perspective, examining the Army's digital future. They reinforce Dooley's punctuated equilibrium concept, highlighting how innovation causes the rupture needed for rapid organisational change and capability enhancement.¹⁴⁵ Their work centres on 'officer perceptions of the strengths and weaknesses of potential military innovations, and how these collectively shape professional understandings of the desirability of change'.¹⁴⁶ This resonates with the Iron Colonel phenomenon and provides ADO-specific enhancement to the CAS.

Leveraging Institutionalism, Neads et al. examine how institutions influence member

¹³⁷ James Brown, 'The Challenge of Innovation in the Australian Army', *Security Challenges* 7, no. 2 (2011): 16–17; Alex Neads, Theo Farrell, and David J. Galbreath, 'Evolving towards Military Innovation: AI and the Australian Army', *Journal of Strategic Studies*, n.d., 23–24, <https://doi.org/10.1080/01402390.2023.2200588>; Chris Field, 'Enabling Army Innovation', *Australian Army Journal* 13, no. 1 (1 June 2016): 68–69.

¹³⁸ Brown, 'The Challenge of Innovation in the Australian Army', 14.

¹³⁹ Brown, 15.

¹⁴⁰ Field, 'Enabling Army Innovation', 70.

¹⁴¹ Brown, 'The Challenge of Innovation in the Australian Army', 15–16.

¹⁴² Field, 'Enabling Army Innovation', 71.

¹⁴³ Field, 73–74.

¹⁴⁴ Holmes, 'Military Revolution'.

¹⁴⁵ The authors leverage Murrays definition of innovation s1.3. Neads, Farrell, and Galbreath, 'Evolving towards Military Innovation: AI and the Australian Army', 3.

¹⁴⁶ Neads, Farrell, and Galbreath, 5.

attitudes and behaviours, either facilitating or resisting change. Past organisational experiences influence individual schema evolution, as does the collective behaviour of a broad field of similar agents.¹⁴⁷ Their work finds Australian military officers' attitudes towards Human-Machine Teaming and AI integration into command, control and decision-making are heavily influenced by their past digitisation experiences. Supporters and opponents base their arguments on this experience, resulting in a consensus favouring gradual sustaining innovations over revolutionary change.¹⁴⁸ Neads et al. underscore the importance of understanding how past organisational change can enhance or constrain future efforts by influencing agent schema. Reinforcing the requirement for a longitudinal understanding beyond the current change being pursued.

They also explain how coalition partnerships can influence organisational change. Although Farrell et al. suggested this was not determinative, in this instance, it impacted the Australian approach to AI integration by reinforcing interoperability and cultural similarities.¹⁴⁹ Emphasising the CAS organism level should comprehensively explore cross-organisational networks, including external agents, capturing all potential influences on agent schema.

Michael Evan's exploration of the ADO's unique diarchal structure, its history and evolution provide crucial structural insights into the CAS organism level. The Diarchy is the joint administrative authority of the Secretary and the Chief of the Defence Force.¹⁵⁰ Evans' exploration of the ADO's civil-military context highlights the Diarchy's dysfunction - 'Broken Backbone,' risking the ADO and Australia's ability to navigate the current strategic environment.¹⁵¹ Based on the Huntington philosophy, the civil-military compact ensures subjective control of armed forces by elected civilian authorities but professional autonomy or objective control of military affairs by senior officers over members of the profession of arms. He notes many consider this rigid separation outdated, with most Western militaries favouring 'an equilibrium model based on integration, partnership and liberal democratic values.'¹⁵²

Evans argues this foundation persists, weakened by reviews that have diminished the Defence Minister's power, compared to the Secretary's, strengthening a powerful public service at the expense of the uniformed officials.¹⁵³ This imbalance focuses too heavily on civilian managerial solutions, with neither side genuinely understanding the other.

Further, as reinforced by Albert Palazzo, a strategic culture persists in investing too much independence and power in the Service Chiefs at the cost of the Joint Force.¹⁵⁴ This compounds a lack of integrated partnerships, compromising institutional unity and significantly impacting organisational change efforts. Evans and Palazzo highlight structural aspects and interservice primacy within the ADO, aligning with Sapolsky, Posen and Zegart's analysis of key barriers to organisational change in militaries. Evans and Palazzo's analysis provides nuanced ADO-specific structural insight into the CAS

¹⁴⁷ Neads, Farrell, and Galbreath, 6.

¹⁴⁸ Neads, Farrell, and Galbreath, 23.

¹⁴⁹ Neads, Farrell, and Galbreath, 23; Farrell, Rynning, and Terriff, *Transforming Military Power since the Cold War*, 292–93.

¹⁵⁰ Section 10, 'Defence Act', Cth § 10 (1903), https://www8.austlii.edu.au/cgi-bin/viewdoc/au/legis/cth/consol_act/da190356/s10.html.

¹⁵¹ Michael Evans, 'Diagnosing Dysfunction in Defence Management', *Quadrant* 66, no. 10 (1 October 2022): 21.

¹⁵² Evans, 22.

¹⁵³ Evans, 22–23.

¹⁵⁴ Evans, 22–23; Dr Albert Palazzo, 'Resetting the Australian Army: Negotiating the 2023 Defence Strategic Review', n.d.

organism levels.

The literature on military transformation reinforces the CAS assemblage as a rich model to grasp the nuances of change in military organisations. Viewing military transformation studies through the lens of the CAS assemblage enables further refinement, incorporating specific military insights enhancing all three levels. This chapter reinforces that no universally applied model for military organisational change exists, with scholars relying on assemblages to support their investigations. This reinforces the importance of a tailorable assemblage to account for the unique nature of the ADO. The exploration across Chapters One through Four is situated on the premise change is necessary. The next chapter explores the logic of military conservatism, balancing the narrative that the mere presence of change and innovation equates to positive organisational outcomes.

Chapter 5 The Logic of Military Conservatism

The premise of this thesis is how military organisational change can be improved. In today's strategic environment, H.G. Wells' sentiment continues to resonate: 'Adapt or perish, now as ever, is nature's inexorable imperative.'¹⁵⁵ However, there is a quiet voice of caution, a logic of military conservatism, often drowned out by the populist hype requiring exploration as part of any model of military organisational change. Few authors examine risks of military innovation, and the absence of such exploration implies a lack of innovation is detrimental to military capability. Kendrick Kuo's account of the British Army's innovation in armoured warfare during the interwar period and subsequent performance in the Desert War exemplifies not only his theory of harmful innovation but also a prevailing theme in the study of military innovation and organisational change - the presence of innovation and the pursuit of change equals effectiveness, rather than an objective focus on the outcome.

Kuo's exploration offers the opportunity to ensure the CAS incorporates mechanisms to identify where organic, organism, and cognitive elements designed to cultivate positive organisational change outcomes are in danger of producing perverse results. Kuo emphasises self-defeating innovation occurs when growing security commitments outweigh resourcing, thus incentivising gambling behaviour.¹⁵⁶ The NDS potentially drives this nexus, an ADO facing resource constraints and growing requirements, potentially resulting in harmful outcomes. This chapter will explore three pathologies: gambling, glorification of mavericks, and superficiality.

Elizabeth Kier exemplifies the popular narrative surrounding the British Army's inadequate innovation during the Battle of France and the subsequent Desert War. Conversely, Germany's victory in the Battle of France, enabled by the Blitzkrieg concept, is a celebrated exemplar of military innovation. She points to the barrier posed by 'conservative Army leaders suppressing a small group of prophetic tank enthusiasts.'¹⁵⁷ However, Kuo draws on historical revisions of Blitzkrieg to offer an alternate view - far from failing to innovate, British poor performance was a story of innovation gone too far.¹⁵⁸

Kuo and others contend Britain's interwar Army relied too heavily on the promise of armour. Influenced by radicalism and wishful thinking in a resourced-constrained environment. A new armoured manoeuvre concept resolved the workforce and funding challenges of the time. Liddell Hart and Fuller's new Army abandoned the combined arms concept, arguing that incorporating infantry would be 'tantamount to yoking a tractor to a draft horse'.¹⁵⁹ The British experience illuminates the compounding impact of resource constraints, wishful thinking, and despite experimental evidence, abandoning proven concepts in the hope of a radical new way of war.¹⁶⁰ After significant losses in the Desert War, undeniable evidence, the British were forced to adapt

¹⁵⁵ H. G. Wells, *Mind at the End of Its Tether* (San Francisco: Millet Books, 1974).

¹⁵⁶ Kendrick Kuo, 'Military Magic: The Promise and Peril of Military Innovation', 31 August 2021, 642.

¹⁵⁷ Elizabeth Kier, *Imagining War: French and British Military Doctrine Between the Wars* ([N.p.]: Princeton University Press, 2017), 120–21.

¹⁵⁸ This revisionist line of inquiry is known as the Blitzkrieg Myth. Kendrick Kuo, 'Dangerous Changes: When Military Innovation Harms Combat Effectiveness', *International Security* 47, no. 2 (1 October 2022): 62, https://doi.org/10.1162/isec_a_00446; Kuo, 'Military Magic: The Promise and Peril of Military Innovation', 68–70.

¹⁵⁹ Kuo, 'Dangerous Changes: When Military Innovation Harms Combat Effectiveness', 68–70.

¹⁶⁰ Kuo, 71–72.

unlearning armoured-only manoeuvre in favour of combined-arms approaches.¹⁶¹ The British gambled on an alternative, exhibiting behaviour inherent to Kuo's theory of harmful innovation. Exploring the CAS cognitive level reinforces the requirement for deeper Double and Triple-loop learning. Significantly, whilst doctrine and SOPs can constrain change, their abonnement must be supported by empirical evidence.

Kier's account of Liddell Hart and Fuller exemplifies the dangers of glorifying mavericks, change agents, a component of the CAS organism level. The CAS cognitive level emphasises requirements enabling innovative thought, disruptive thinking, and experimentation. However, it does not suggest militaries abandon assured preparedness. As Rumsfeld described: 'You go to war with the Army, you have,' and innovation should enable, not undermine combat effectiveness.¹⁶² The popular narrative on military innovation dismisses logical military conservatism as simply a component of the inherent resistance Murray describes in Chapter Four.¹⁶³ Most literature addresses resistance or caution as a negative barrier; anyone opposing the mavericks as stifling necessary creativity, as Zweibelson describes, 'inhibitors who cannot open their minds to the future.'¹⁶⁴ Military history is a powerful vehicle for shaping mental models enabling the current force; an unbalanced narrative obscures risk and can potentially drive a new generation towards harm.

Evans, who subscribes to the popular theory of failed British innovation in the face of the Blitzkrieg concept, shares Kuo's concern about mythology surrounding mavericks and radicals. In his view, too much faith was placed in Liddell Hart and Fuller as change agents, and they were ill-equipped to influence broader organisational dynamics necessary to assure practical innovation.¹⁶⁵ This resulting mythology sets an alarming precedent for future generations. It continues the theme of focusing on the presence of innovation or change as the end state and obscures potential risks of catastrophic failure. Rather than demonise conservatives, as Holmes describes, the CAS must balance the conservation of military preparedness while simultaneously cultivating new ideas and thinking.¹⁶⁶

The explosive acceleration of technology risks a superficial fascination with technology, a fetish, with genuine innovation giving way to a narrow focus on technology integration.¹⁶⁷ Perhaps the starkest example of technology fetish is the Israeli Defence Force. Lebanon in 2006 and, most recently, the Hamas-led action in October 2023 exposed weakness in their technology-led approach.¹⁶⁸ This is not unique to small armies; Farrell et al explores superficial innovation in the US Army, where a focus on technology risks comprehensive warfighting capability. The highly technical conventional force-on-force operations in the 1991 Gulf War yielded impressive results;

¹⁶¹ Kuo, 74–79.

¹⁶² *Disgruntled Soldier Complains to Rumsfeld*, 2015, <https://www.youtube.com/watch?v=t5uBgLTy6ec>.

¹⁶³ Elizabeth Kier, *Imagining War: French and British Military Doctrine Between the Wars*, 120; Murray, *Military Adaptation in War*, 3–5.

¹⁶⁴ Ben Zweibelson, 'Why Do Militaries Stifle New Ideas?', *Contemporary Issues in Air and Space Power* 2, no. 1 (19 February 2024): bp38138320, <https://doi.org/10.58930/bp38138320>.

¹⁶⁵ Michael Evans, 'Fabrizio's Choice: Organisational Change and the Revolution in Military Affairs Debate', n.d., 80.

¹⁶⁶ Holmes, 'Military Revolution'.

¹⁶⁷ The acceleration of technology is one of the four megatrends defining the strategic environment. Dobbs, Manyika, and Woetzel, *No Ordinary Disruption*.

¹⁶⁸ Franz-Stefan Gady, 'Israel's Military Tech Fetish Is a Failed Strategy', *Foreign Policy* (blog), 5 September 2024, <https://foreignpolicy.com/2023/10/26/israel-hamas-gaza-military-idf-technology-surveillance-fence-strategy-ground-war/>; Avi Kober, 'The Israel Defense Forces in the Second Lebanon War: Why the Poor Performance?', *Journal of Strategic Studies* 31, no. 1 (1 February 2008): 3–40, <https://doi.org/10.1080/01402390701785211>.

however, the transition to a war among the Balkans people exposed significant gaps.¹⁶⁹ The lack of focus on human-centric counter-insurgency operations similarly required rapid adaption in the Middle East, fundamentally challenging the promise of network-centric warfare.¹⁷⁰ Murray's organisational resistance presents a contributing factor potentially reinforcing harmful superficial innovation. As Zweibelson reinforces, the architecture, driving order and control, and challenges of predicting the changing character of war can lead to a 'fixation on the tactical and the technical, a search for new ways or means of achieving old things.'¹⁷¹ Pursuing comprehensive innovation whilst balancing risk against preparedness requires an environment that challenges the convergent order described by Murray but can equally balance preparedness. The CAS cognitive level, the ability to challenge and evolve entrenched mental models, is where the balance between innovation and conservatism is best achieved.

The narrative driving organisational change to keep pace with the strategic environment compounds a perspective that innovation dramatically enhances military effectiveness. The presence of innovation or pursuit of change has become synonymous with improved military effectiveness; any voice of caution is drowned out. When efficiency drives innovation without considering the consequences, outcomes can be compromised. As Galvin discusses, people naturally presume very large organisations are inherently too large, and efficiency can be achieved by becoming smaller. In an environment of performance driven by numbers, lowering them is always attractive, especially if there is potential for savings to reinvest in other priorities.¹⁷² Centralisation of assets and establishment of shared services are examples of saving of people, but consequently, time and priority are compromised; most have experienced this in the ICT or HR help desk construct.¹⁷³

This chapter exposes pathologies and contexts driving harmful innovation and organisational change. The ADO must be cautious of an emerging environment where security commitments outstrip military resources, potentially cultivating harmful behaviours. How militaries approach the future, the mental models, and the schema used to process information are well-informed by history. This requires a pragmatic and balanced account, which is not currently represented in military innovation and transformation studies. The Glorification of mavericks and their pre-eminence in organisational change obscures risk, reinforcing incomplete and unhelpful mental models for the next generation. The CAS organism and cognitive levels must incorporate military conservatism. Indeed, the CAS assemblage offers a means for deep understanding to identify best the change required.

¹⁶⁹ Farrell, Rynning, and Terriff, *Transforming Military Power since the Cold War*, 294–95.

¹⁷⁰ Farrell, Rynning, and Terriff, 294–95.

¹⁷¹ Zweibelson, 'Why Do Militaries Stifle New Ideas?', 2–4.

¹⁷² Galvin, 'Leading Change in Military Organizations: Primer for Senior Leaders', 7.

¹⁷³ Galvin, 7.

Chapter 6 Enhanced CAS and Next Steps

This ADO has been directed to change, simultaneously evolving warfighting capability whilst overhauling the machinery delivering capability. This is occurring in a dynamic strategic environment, cultivating a narrative that pursuing change and innovation are critical to success. To determine if ADO is postured to meet this challenge, this thesis has explored organisational change theories and intersecting academic inquiry to create a model of military organisation change. This is but the first step, setting a foundation for future research to answer the question, is the ADO resistant to change?

This final chapter will present the Enhanced Complex Adaptive System (eCAS), as illustrated in Figure 3. Structured in CAS' three levels, it outlines the assemblage of theories and studies, enhancing its explanatory power and applicability to the ADO.

Much of this thesis has been an exploration, a journey to understand organisational change and its application in a military context. This exploration operates on the premise that change is necessary. The previous chapter explores the logic of military conservatism, balancing the narrative that the presence innovation or pursuit of change guarantees success. The CAS offers a starting point to understand the organisation deeply, focus effort and appreciate risk to ensure any change achieves continual improvement and enhanced organisational fit rather than adherence to populist hype.

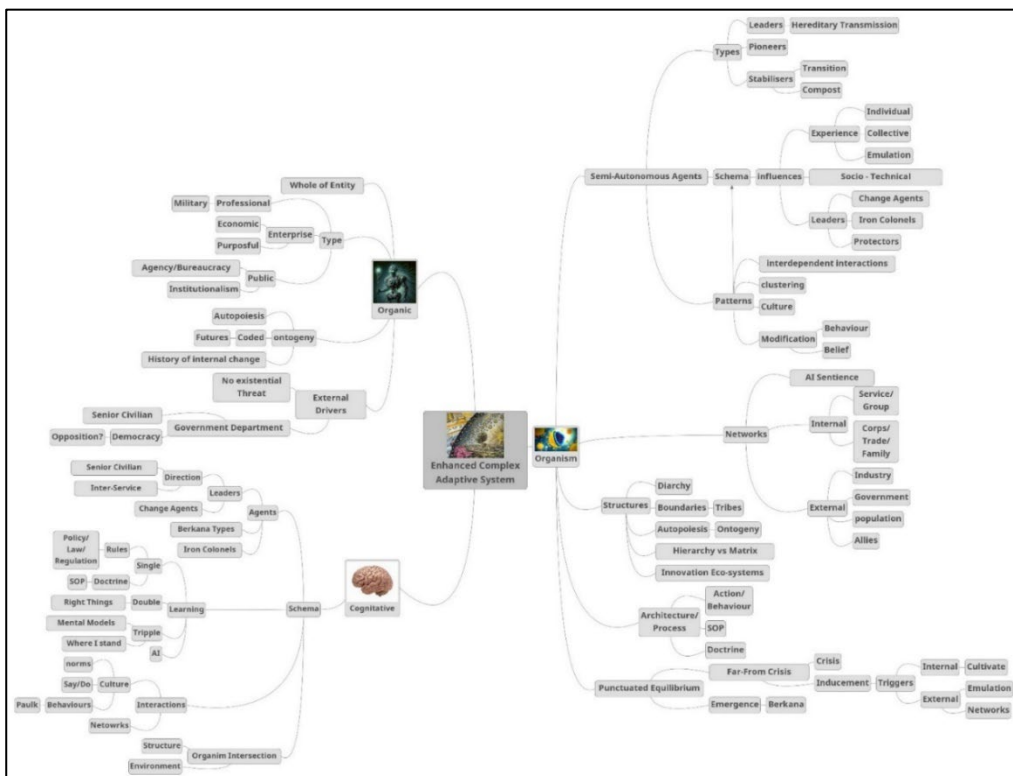


Figure 3 - Enhanced Complex Adaptive System

Section 6.1 Organic

At the whole of entity level, the eCAS is considered homogenous, responding to external fluctuations. This level of the model enables evaluation as a unified entity, maintaining

its holistic identity whilst containing all possible futures in its internal coding. This creates a practical boundary and a mental model of the entire ADO entity. A shared understanding of this boundary enables unbounded exploration of multiple internal coded futures, including challenging traditional internal boundaries, such as the diarchy, Service and Group tribes, potentially unlocking the promise of the integrated force. The ADO uniquely responds to change as an enterprise and a professional firm. This hybrid type influences both individual schema and collective culture from the bottom up and top down. Understanding Grissom's organisational type at the organic level distinguishes it from the private sector. Zegart and Durrant's analysis of public institutions provides insight into the unique nature of the military entity. As a public organisation, it will survive regardless of effective evolution. Identifying similar hybrids enables the exploration of historical precedents and their responses to organisational change.

The lack of existential threat (adversary) or market forces can lead to ambivalence or resistance to external environmental fluctuations in peacetime or interwar periods. The current strategic environment, marked by the fourth industrial revolution, is unprecedented, but is it sufficient to mobilise whole of ADO organisational change? Durant and Zegart highlight the need for external senior civilian intervention to overcome institutional bureaucratic resistance, a view supported by Posen, which is widely referenced in military transformation studies. Noting not all senior civilians are invested in the successful continual improvement of public entities, particularly the democratic opposition. Although the DSR and NDS represent such intervention, Palazzo notes this has previously proved inadequate.¹⁷⁴ Evans points out the challenge of the ADO Diarchy and the immaturity of Australian civil-military relations as compounding challenges.

Whilst external triggers can initiate change, artificially generating crises internally can drive change through recovery, impacting all levels of the CAS. While motivated to achieve positive outcomes, Morrison's approach to Army organisational change exemplifies crisis in a military context. A holistic view considering second and third-order impacts and enduring outcomes is essential; short-term gain may not realise the intended vision. The organic level assists in framing the military organisational change model, but as shown in Chapter Four, it is insufficient. The complexity of contemporary military organisation requires a deeper level of analysis.

Section 6.2 Organism

The CAS's organism level explores this complexity, the organisation's internal dynamics. The ecological influences at this level differentiate it from mechanistic planned approaches characterising early organisational change models. At the core of Dooley's CAS is the network of semi-autonomous agents, each with their schema interacting, producing pattern across the system. These interactions form cultures impacting individual and collective behaviour. Two key intersecting structural factors in the ADO must be considered at this level: the interservice tribes and the diarchy. Evans' consideration of the weakness in the Australian civilian-military relationship intersects with Sapolsky's consideration of interservice rivalry, providing a unique context enhancing the application of the eCAS to the ADO.

Sapolsky and Farrell et al. explore military structures, noting they are both hierarchical and matrixed networks. This provides opportunities to challenge structural barriers Murray et al. suggest constrain organisational change. Understanding the hybrid nature of the military organism uncovers vectors of resistance to be overcome. Holmes, Field,

¹⁷⁴ Palazzo, 'Resetting the Australian Army: Negotiating the 2023 Defence Strategic Review'.

Christensen, Adner, and Levinthal suggest structuring to enable the Berkana pioneers to innovate in cross-boundary ecosystems may unlock disruptive thought and creativity, often constrained in traditional hierarchical structures.

The eCAS is a network of interacting agents adapting based on experiences and system influences, characterised by non-linearity, self-organisation, and creation. Small changes at the right place and time can have exponential impact. The co-evolution of systems and technology is crucial, emphasising the interplay between networks (social structures), communication and collaboration (social process) and technological systems, illustrating their co-evolution in dynamic environments. For the ADO, this integrates Farrell and Evans' observations on the technology fetish paradigm, illuminating unhelpful behaviours unique to digital transformation and how the socio-technology concept can be leveraged to overcome them.

At the organism level, intersecting with networks and the socio-technology component, Singer's work interfaces with the strategic environment. Understanding AI and emerging sentience expands the network of agents construct. Immediately, machine learning can enhance decision-making and shape mental models in the cognitive space. Singer's insights further challenge the current mental model of what constitutes a network of semi-autonomous agents. The eCAS incorporating his work provides opportunities to explore how this intersects at all levels, potentially accelerating or constraining organisational change.

Understanding agent schema and how it can be evolved is fundamental to the eCAS cognitive level. However, as Murray and Zegart highlight, military architecture and processes can cultivate resistance to change. SOPs and doctrine, designed to enable cohesion and ordered, controlled military action in battle, can have a perverse effect in peacetime. When architecture and process assume moral/political importance instead of the outcome they were designed to achieve, resistance to change can result. Conversely, leveraging this phenomenon can ensure a balanced approach to change. Paluk's exploration of behaviour modification, without changing individual belief systems, further illustrates how collective influence can shift schema at the network level.

Not surprisingly, a consistent theme across military transformation studies is the crucial role of leaders as proponents of change. Posen's focus on senior civilian intervention, coupled with Clarke's internal mavericks, emphasises the importance of internal and external change leaders. Rosen's generational model highlights the importance of these critical agents achieving the correct position with power and influence to drive organisational change. However, in contrast, Wilson's analysis of public intuitions emphasises that, unlike private entities, leaders are constrained by their ability to independently change the system, challenging their ability to achieve change. Understanding the leadership landscape at the eCAS organism level enables cultivation and empowerment to ensure change outcomes.

The eCAS contains significant organism-level enhancement, improving its applicability to the military context. Ontogeny suggests all possible future change outcomes are already coded into the organisational entity. Understanding the current state enables predictive approaches to planning, strategy development, simulation, and testing and ultimately implementation. The inherent eCAS non-linearity challenges rigid approaches and checklists. Instead, it encourages multi-future analysis to track evolution, outcomes, and emerging resistance. It motivates strategies and plans enabling dynamic adjustment, focusing on outcomes rather than rigid adherence to a plan.

Section 6.3 Cognitive

The CAS cognitive level has significant synergies with the theory and models used to examine military transformation. Integrating military-specific exemplars enhances the eCAS' explanatory power, especially considering the nature of agents within military organisations. This level emphasises agents and their schema, the rules, knowledge, and experience used to navigate their environment. Schema are fundamental to processing information and decision-making, helping agents navigate novel scenarios. Agents adapt and evolve schema based on interactions with other agents, the environment and learning. Importantly, agent interaction guided by schemas coalesces into emergent patterns at the organism and organic level, which cannot be predicted by individual components. The cognitive level incorporates Argyris and Schön's learning models, with Zweibelson's work in the military context further enhancing.

Learning is critical to the evolution of agent schema. Cultivating learning and encouraging agents to challenge foundational mental models enables paradoxical thinking, prompting them to explore tensions between how others interpret the environmental reality rather than simply conform to linear decision-making. Paluk, Singer, Zegart, Nagl and Murray's exploration of how architecture and process at the organism level influence schema evolution intersect into this cognitive level. Their impact on learning can both cultivate and constrain change efforts. While Zegart's exploration of agency and bureaucracy intersects most heavily at the organic level of the CAS, her core questions to frame change help drive deeper learning, 'Are you doing enough different today to meet the challenges of the future?'¹⁷⁵ This type of learning encourages creative exploration and disruptive innovation.

The Berkana model identifies agent types. Whilst all possess unique individual schema, these agents' consistent response to organisational change can be leveraged. This baseline understanding, coupled with Johnson's parable, enables leaders to support individuals and teams more effectively. This may go as far as identifying pioneers, connecting them into networks and tailoring their management to accelerate change outcomes. Conversely, as Kalm highlights, the Iron Colonels represents a group cultivating organisational resistance and must be considered in the military context, requiring equally nuanced management.

Change leaders are detailed at the organism level, but all leaders influence schema, specifically learning. Brown and Field highlight leaders provide environments that constrain or cultivate the deep learning essential to schema evolution. They are vital to balancing military conservatism and innovation, nurturing creativity whilst maintaining warfighting capability. Leadership alone cannot assure or retard change but is a key contributor to eCAS requiring exploration across all levels.

The eCAS offers a model of military organisational change leveraging Dooley's CAS foundation. It leverages assemblage theory to enhance its explanatory power and brings together intersecting theories and studies of military transformation to support its application to the military environment. Whilst this thesis uses literature exploring change and innovation in discrete parts of the ADO, it cannot be extrapolated to assess change resistance. Instead, it offers a model to take forward into primary source engagement to more effectively understand the ADO and its approach to change.

Section 6.4 Next Steps

This exploratory thesis aimed to develop a model for military organisational change,

¹⁷⁵ Zegart, 'Agency Design and Evolution', 2010, 217.

enabling the ADO to ascertain whether it is genuinely resistant to change and thereby optimise future transformation efforts. In examining organisational change and intersecting theories, Dooley's CAS provided a robust foundation for understanding the intricate complexity of the contemporary military organisation. It offered tangible explanatory power to identify resistance and optimise organisational change outcomes. Integrating intersecting theories and studies of military transformation through the application of assemblage theory, the eCAS model was developed, enhancing both explanatory power and applicability to the ADO context.

Whilst literature specifically addressing ADO organisational change is limited, this thesis has drawn from studies of discrete components and tactical innovation to enhance the CAS across the cognitive and organism levels. However, simply extrapolating these findings is insufficient to assess the ADO's resistance to change.

This thesis lays the groundwork for examining contemporary ADO transformation programs through the eCAS model. Insight from comprehensive primary sources across the organisation is necessary to validate its explanatory power and ability to identify change resistance, ultimately providing a means to optimise future transformation efforts.

The author intends to apply this model to a contemporary organisational change initiative to validate its explanatory power and effectiveness in analysing and optimising organisational change. The Enterprise Reform Program (ERP) is realising the ADO's digital future, affecting the entire organisation. Its impact across all parts of the organisation and its problematic implementation makes it an excellent candidate for exploration.¹⁷⁶ The potential for comparative analysis of other militaries also exists, noting number of nations are undergoing simultaneous transformation using the same digital platform.¹⁷⁷ This represents an ideal nexus for further contribution to the study of contemporary military organisational change and providing tangible benefits to the continual improvement of the ADO.

The ADO faces a significant challenge ahead. As Kurt Lewin aptly said, 'If you want to truly understand something, try to change it.'¹⁷⁸ The eCAS model provides a means to truly understand how the ADO can meet the challenges ahead and if dinosaurs can be taught to surf?

¹⁷⁶ Eleanor Dickinson, 'Defence to Migrate 100,000 ADF Personnel to New HR Tool', *iTnews*, accessed 3 October 2024, <https://www.itnews.com.au/news/defence-to-migrate-100000-adf-personnel-to-new-hr-tool-611771>.

¹⁷⁷ Peter Selfridge, 'Modernizing Defense for the Digital Age', SAP News Center, 23 February 2024, <https://news.sap.com/2024/02/modernizing-defense-for-digital/>.

¹⁷⁸ Charles Tolam et al., *Problems of Theoretical Psychology* (Captus Press, 1996), 31.

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ADF
Australian Defence Force

Punched in the Face: Towards an Ontology of Strategic Surprise

Colonel Andrew Kirby



**This thesis is submitted in partial fulfilment of the requirements for the degree
Master of National Security and Strategy
In the Faculty of Arts and Education**

About the Author



Colonel Andrew Kirby assumed his current role as Director of the Australian Command and Staff Course (Part Time) after completing the 2024 Defence Strategic Studies Course (DSSC). He has previously served in a variety of strategic, joint, and command appointments. Privileged to have served over a decade in command roles, he most recently led domestic operations in Queensland as Deputy Commander Joint Task Group 629.3 (2021–22). He previously commanded the 9th Battalion, The Royal Queensland Regiment (2018–20), including two years forming a battlegroup within Army's 3rd Brigade. In his civilian career, he serves as Director of an independent strategic advisory firm. Holding multiple bachelor's and master's degrees in strategy, business,

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Abstract

This thesis explores the critical concept of strategic surprise, with particular regard for the challenge of implementing Australia's National Defence Strategy, which highlights the diminishing window for strategic warning. Similar concerns are echoed by the US and UK, emphasizing the growing risk of unforeseen events. While intelligence and policy efforts focus on anticipating specific threats, history and theory suggest that predictions will often be wrong, underscoring the inevitability of surprise. This thesis examines traditional theories of strategic surprise, integrates insights from cognitive science and psychology, and proposes a framework to classify surprise events across four dimensions: temporal, informational, schematic disruption, and strategic impact. By developing a clearer ontology of strategic surprise, this research aims to enhance preparedness planning, laying the groundwork for future research. As an exploratory thesis it lays an ontological foundation for a comprehensive typology and analysis to be developed in the Author's pending PhD studies on enhanced civil-military preparedness for surprise.

“Everybody has a plan until they get punched in the face”¹

Introduction

The dead were unloaded after dark. The wounded - evacuated at sea - were now in hospitals across Australia. Although the battered helicopter carrier had been able to limp into port beyond the media's glare, the sight of her scarred and listing hull would not shock a public who had witnessed the looping footage of her sister ship's final moments. The unforgettable images had displaced the financial collapse and energy grid failures that dominated the news cycle and had occupied the government's attention for weeks. In the months that followed the enormous explosion that claimed a thousand lives and marked the first day of the conflict, there would be outrage, resignations, even a royal commission, to ask: 'how did we not see this coming' and 'why were we not better prepared'? However, the questions that occupied the government on that day were: 'what happened?', 'what does it mean?', and 'what do we do now?'

This grim vignette offers two lessons for policymakers. First the self-evident observation that strategic surprise can have dire consequences. Since World War II, numerous devastating surprises, from the Cuban Missile Crisis; 9/11; and the recent invasion of Ukraine to name but a few; have not only inflicted enormous human and security costs they have changed the fate of nations. Strategic surprise is of critical interest to policy makers. The second is captured in Mike Tyson's pithy philosophy of pugilism 'everybody has a plan until they get punched in the face'. Strategic surprise represents the critical juncture where strategic plans collide with unforeseen events – the 'punch in the face' when plans confront the disruption and disorder of reality.

When Australia's National Defence Strategy (NDS) cautions a 'loss of warning time', with government cautioning 'Australia no longer has the luxury of a ten-year window of strategic warning time', it is describing the need to prepare for strategic surprise.² Similar sentiments are shared by the US National Defense Commission and British Government who also conclude that the risk of some unforeseen event is increasing.³ All three nations' peak security documents describe an urgent need to enhance preparedness and readiness. Much effort on the part of the intelligence community and policy makers already goes into predicting, in detail, what it is we are preparing for. But their predictions will most likely be wrong as Betts observed 'the only thing less probable

¹ Mike Tyson, quoted in "Everybody Has a Plan Until They Get Punched in the Mouth - How Did the Famous Mike Tyson Quote Originate?" *Sportskeeda*, accessed August 19, 2024,.

² Richard Marles, Minister for Defence. (2024, April 17). *Launch of the National Defence Strategy and Integrated Investment Program*; and Department of Defence. (2023). *National Defence: Defence Strategic Review 2023*, 24

³ The U.S. National Defense Strategy Commission describes the need to keep pace 'with a worsening situation' (see U.S. Congress, Senate Committee on Armed Services, Commission on the National Defense Strategy for the United States, *Providing for the Common Defense: The Assessment and Recommendations of the National Defense Strategy Commission*, 115th Congress., 2nd session., 2018, 7) and the British Integrated Review (see UK Government. *Integrated Review Refresh 2023: Responding to a More Contested and Volatile World*, March 13, 2023, 2).

than war itself is that it would start in the way we expect.⁴ Tyson's insight is that deliberate plans never fully prepare a nation for the experience of being surprised. It is almost inevitable that whatever we expected, will not transpire when, where and how we anticipate. We should expect to be surprised. But to prepare to survive the blow requires a clear understanding of what strategic surprise is.

This exploratory thesis addresses a divide between 'deliberate strategic planning' and dynamic 'strategy making' in government.⁵ The former is vital for building long-term capabilities and alliances; the latter acknowledges the need for contingency and adaptation in response to unpredictable technological, geopolitical, and environmental changes. The dissonance between them is a form of 'contingency theory' - organizations must balance adaptation to external environments with the internal integration of resources.⁶ Tyson's observation highlights how disruptive the transition between them can be, with strategic surprise acting as the fulcrum upon which they interact. National preparedness, therefore, requires an understanding of strategic surprise in order to define what we are preparing for. I found however, that while there is a large corpus of literature on *averting* surprise, there is a lacuna in the form of an ontology of the *experience* of surprise. This exploratory thesis approaches this gap in three stages.

First, it surveys traditional thinking about strategic surprise, examining four key themes: classical theories; case studies of major surprise events; orthodox scholarship; and revisionist approaches. To address the gaps that emerge, the thesis expands our current thinking about strategic surprise by integrating insights from fields such as cognitive science and psychology. Finally, it develops differentiating criteria to analyse surprise, focusing on four dimensions: temporal; informational; schematic; and the scale of impact before identifying priorities for future research.

Traditional thinking begins with 'the classics', from de Saxe, through Clausewitz, Mahan and Liddle-Hart to Cold War nuclear theorists. Most of them describe surprise as a characteristic of battle, what modern practitioners would describe as the tactical or operational level of war. While traditional scholarship recognises that surprise has a fundamentally temporal aspect, it is largely treated as a binary event with a *before* and *after*, but little attention to the in-between experience of surprise. Some authors, such as Clausewitz, Boyd and Luttwak, began to recognize there is a cognitive dimension to surprise offering an initial step towards an ontology.

After World War II, the study of strategic-level surprise gave rise to numerous case studies where authors like Wohlstetter and Lanir began to explore the role of information entropy in impeding prediction and preparation. By comparing different case studies of strategic surprise, it also becomes clear that the temporal domain is more nuanced than a simple binary of *before* and *after* surprise, offering a more textured understanding of

⁴ Richard K. Betts, *Surprise Attack: Lessons for Defense Planning* (Washington, D.C.: The Brookings Institution, 1982), p. 177.

⁵ Steven Jermy, *Strategy for Action: Using Force Wisely in the 21st Century* (London: 2011), 118-19.

⁶ Lawrence, P. R., & Lorsch, J. W. (1967). Differentiation and Integration in Complex Organizations. *Administrative Science Quarterly*, 12(1), 1-47. 4, 6

its unfolding.

Towards the end of the Cold War numerous scholars began to study strategic surprise as a phenomenon in its own right, cleaving to two schools: orthodox and revisionist. The former, advocated by Betts, Wirtz, Handel and many others, argues that surprise is an inherent feature of a stochastic international system. Rather than seeking the impossible task of preventing surprise, the orthodox view suggests improving our anticipation to navigate through it. Revisionists, beginning with Levite, instead argue that instances of strategic surprise inevitably result from intelligence failures or policy lapses. Although these schools enhance our understanding of the causes of surprise, through failures to foresee and prepare, they leave a gap around the dimensions of the experience of surprise.

The second chapter seeks to expand our thinking on surprise by integrating insights from other disciplines—particularly cognitive science and psychology. The former approaches surprise from two schools of thought: the probabilistic school, which shares traditional thinking's desire to avert; and the sense-making or 'cognitive evolutionary model', which directly addresses the experience of surprise. This latter school explores how novelty and unexpectedness disrupt established mental frameworks, 'schemas', offering a way to describe the dimensions of surprise. Psychology, meanwhile, identifies factors like arousal and valence that allow us to describe the scale and significance of surprise.

The final chapter integrates traditional approaches with insights from cognitive science and psychology to develop differentiating criteria (specifically *temporal*, *informational*, *schematic* and *impact*) that enable more precise description and classification of surprise events. Building on the classics and case studies, the *temporal* criterion adds depth by considering not only speed of onset but distinguishing between short- and long-duration surprise events, as well as whether they are persistent or punctuated. Expanding the use of *information theory*, particularly the concept of information entropy, allows insights into the quality of information *during* the event itself, assessing the signal's reliability and the level of distortion in communication channels. *Schematic disruption*, drawn from cognitive science, offers a framework and qualitative scale to measure how surprises disrupt mental models and organizational schemas. Finally, *impact* adapts psychological insights on arousal and valence to assess the magnitude of a surprise's strategic effect, helping to understand its broader influence on decision-making and strategy. This framework offers policymakers a clear language to describe and analyse strategic surprise, providing differentiating criteria that enhance preparedness planning to better anticipate, assess, and respond to a range of potential surprises.

Having a means to better describe and communicate surprise is an important foundation to enhancing our ability to plan and prepare to adapt, which is crucial to addressing the tension between strategic surprise and strategic plans at the core of this research. If we can describe different types of surprise, it follows that they may also require different types of preparation. This raises key questions: What is common across all surprises? What varies between different cases? And how can we optimize our responses? As an exploratory thesis this is only the beginning of an enhanced understanding of strategic

surprise. Answering these questions will require further research to create a typology, develop a theory and test its validity. But it is the necessary first step.

The Research Puzzle

The genesis of this thesis emerged from my experience rewriting the *Australian Strategy Framework* in 2017. While trying to describe how Australia undertook strategy it became apparent to me that various parts of Defence, and Government, inhabited two different universes. One was the prudential world of strategic plans, necessary for the development of sophisticated capabilities and the curation of long-term relationships, treaties and alliances. The other, the dynamic world of operations, contingency and adaptation in the face of technological, geopolitical and environmental turbulence – Clausewitz’s demand that ‘planning must maintain infinite flexibility’.⁷ I had encountered what Jermy described when he wrote, ‘a strategic-*planning* process is not the same as a strategy-making one’⁸.

The intellectual friction between these two worlds—one governed by order and predictability, the other by chaos and unpredictability—was palpable: one sought the clarity of a clockwork universe, the other contended with a ‘clockwork orange’.⁹ This tension is an example of contingency theory - organisations need to achieve both ‘differentiation (adapting to different external environments)’ and ‘integration (coordination of internal activities)’.¹⁰

Tyson’s observation in the title of this thesis leads us to surprise. The transition between these two worlds occurs at the point of the blow, where we encounter ‘discontinuity’, or strategic surprise.¹¹ To understand how to mediate and integrate these ‘two hemispheres of the ‘strategic brain requires an understanding of the manifestation of discontinuity – strategic surprise’.¹²

Consequently, the original intent of this thesis was to find ways to enhance preparedness using existing strategic surprise theories as a starting point. However, the available literature is heavily prognostic i.e. focussed on predicting or preventing unexpected events. On the one hand, this makes eminent sense, an ounce of prevention is worth a pound of cure, especially when the consequences of strategic surprise can be so dire. However, Professor John Arquilla helped shape the question at the heart of this thesis by suggesting that, if the scholarship is focussed on *averting* surprise, then there is a lacuna in describing the nature of *being* surprised.¹³ There is significant analysis on the causes of surprise, with scholarly debate on how to predict or prepare for surprise, and another corpus on adaptation after the instantiation of

⁷ Carl von Clausewitz, *On War*, book 1, chapter 3 (Princeton: Princeton University Press, 1984), 102

⁸ Jermy (2011), 118-19.

⁹ Although often attributed to Newton, he resiled from the metaphor ‘clockwork universe’ which actually originated with Bishop Nicole d’Oresme (1330-1382), see Adam Frank, *About Time: From Sun Dials to Quantum Clocks, How the Cosmos Shapes Our Lives* (Oxford: Oneworld Publications, 2012), 54.

¹⁰ Lawrence, P. R., & Lorsch, J. W. (1967). “Differentiation and Integration in Complex Organizations.” *Administrative Science Quarterly*, 12(1), 1-47. 4, 6

¹¹ Dimitrov, K. (2013). Edgar Schein’s model of organizational culture levels as a hologram. *Economic Studies*, 22(4), 3-36.

¹² Schein in Dimitrov, 6.

¹³ Conversation with author, 20 April 2024 discussing Arquilla’s work *Bitskrieg*.

surprise. But there is limited inquiry into the essence of *being* surprised, that in-between period, evoked by T.S. Eliot when he wrote:

*'Between the idea
And the reality
Between the motion
And the act
Falls the Shadow'*¹⁴

This thesis seeks to better inform our mental model of national preparedness, developing a way of thinking about the experience of surprise, offering consistent language to describe it, and criteria to diagnose it, in doing so casting light upon Eliot's shadow.

¹⁴ T.S. Eliot, 'The Hollow Men,' in *Collected Poems, 1909-1962*, New York: Harcourt Brace Jovanovich, 1963, 79-82.

Methodology

This exploratory thesis establishes an ontology of strategic surprise across three main components as a foundation for subsequent, PhD level, research.

First, by examining the current canon on strategic surprise through a narrative literature review addressing four thematic areas: classic works; case study approaches; orthodox; and revisionist schools of thought. This review synthesises existing knowledge and identifies gaps in understanding. Second, expanding our thinking about surprise by integrating relevant insights from an interdisciplinary literature exploration incorporating cognitive science, psychology, management science, and organisational behaviour. This approach aligns with calls for greater integration across disciplines in studying complex phenomena like strategic surprise¹⁵

The differentiating criteria for this typology were then developed through a process of literature review and synthesis, combining insights from multiple disciplines. These criteria represent a mix of quantitative and qualitative measures, reflecting the complex nature of strategic surprise, using Ragin's fuzzy set qualitative comparative analysis (fsQCA).¹⁶ Some criteria are more quantitative in nature, such as the temporal dimension, while others are more qualitative, such as the level of schematic disruption. This is a feature of fsQCA and allows for nuanced non-binary classifications. The criteria were iteratively refined through application to historical case studies to ensure relevance.¹⁷ By synthesizing existing literature, incorporating interdisciplinary perspectives, and applying fsQCA, this methodology seeks to develop a robust ontology that can inform future research and theory development.

¹⁵ Robert Jervis, 'The Logic of Images in International Relations,' in 'Remembering Robert Jervis,' Texas National Security Review, accessed October 4, 2024, <https://tnsr.org/roundtable/remembering-robert-jervis/>.

Richard Heuer Jr., 'Psychology of Intelligence Analysis' (Washington, D.C.: Center for the Study of Intelligence, 1999).

¹⁶ Ragin first proposed synthesising quantitative and qualitative methods (see chapter two for 'fuzzy set theory') in Charles **Ragin** *The Comparative Method: Moving Beyond Qualitative and Quantitative Strategies*. University of California Press, 1987 Chapter 2: 'The Set-Theoretic Method'. A more rigorous approach, which informs this thesis, is set out in chapter three of Charles Ragin *Fuzzy-Set Social Science*. Chicago: University of Chicago Press, 2000. Chapter 3, 'Methodological Innovations,' 45-67.

Goertz sets out the core principles that this thesis applies in Gary Goertz. 'Fuzzy Sets and Qualitative Comparative Analysis: A Review and Update.' *European Journal of Political Research* 60, no. 3 (2021): 564-581. P 565-567

¹⁷ This method of criteria development follows Fiss's recommendation for building better causal theories in organizational research using fuzzy set approaches see Fiss, P. C. "Building better causal theories: A fuzzy set approach to typologies in organization research." *Academy of Management Journal* 54, no. 2 (2011): 393-420.

Scope and Limitations

This study acknowledges several important considerations that are beyond its current scope and are recommended for future research. These include:

Strategic Level Focus: Surprise can manifest at various levels—tactical, operational, and strategic, there is a substantial sub-set of the literature in the field which is primarily concerned with tactical and operational aspects of surprise. This thesis is specifically concerned with the highest tier of surprise, where strategic and policy considerations intersect with civil-military decision-making processes.

Simplification of Decision-Making Dynamics: In order to build a tractable framework, this thesis deliberately avoids the complex organizational, structural, and political dynamics that influence decision-making. The myriad human factors, including insights from political science, organizational behaviour, and psychology, are acknowledged as critical for further development. An exceptional study, such as Goodwin's *Team of Rivals*, exemplifies the depth of understanding that can be achieved by exploring these factors, but this thesis is limited to analysing surprise within a single decision-making entity.¹⁸ Future research could expand this to include distinctions between different types of governance structures, e.g. states with collective decision-making processes may experience surprise differently than centralized regimes, such as dictatorships, due to fewer decision-makers and decreased dissent. Additionally, this thesis focuses on unilateral surprise, meaning the experience of a single nation state. However, future work is also needed to explore multilateral surprise, such as the differing experiences of allies, treaty partners, or coalition members during the same event. This would address how strategic surprise impacts multiple actors in different ways, further complicating decision-making and response.

Contemporary Cases: There are numerous contemporary, indeed ongoing, strategic surprise events available today including the war in Ukraine and the conflict sparked by the October 07 attacks in Southern Israel. However the scholarly literature and data to fully analyse these events are still emerging, making them both a priority for future research and a valuable opportunity to apply and further develop the ontology of strategic surprise.

¹⁸ Doris Goodwin, *Team of Rivals: The Political Genius of Abraham Lincoln* (New York: Simon & Schuster, 2005)

Chapter 1 Thinking about Surprise: A Review of the Literature

Surprise has long fascinated scholars of conflict, strategy, and politics, forming a foundational element in the study of statecraft and warfare since antiquity. This chapter explores the evolution of thinking about strategic surprise, revealing several trends through a narrative review of four aspects of the literature: classical works; case studies; and the orthodox and revisionist schools.

Traditional war and conflict studies, collectively forming 'the classics,' from the pre-enlightenment era to the early Cold War, primarily associate surprise with battles or campaigns, emphasizing its temporal nature. By treating surprise as an event with a clear *before* and *after* they offer limited insight into the experience itself and our ability to describe the dimensions of strategic surprise. This view reaches its apogee in nuclear strategic theory, where the entire course of war could unfold in minutes, allowing little depth to explore the experience of surprise. After World War II, large-scale strategic surprises led to the rise of analytic case studies, introducing key concepts like the role of information theory in creating surprise. However, these were predominantly forensic, asking how surprises could have been predicted or prevented. In the late Cold War, scholars like Betts began to think of surprise as a distinct phenomenon, leading to the development of the orthodox school. They argued that surprise is an inevitable outcome of a stochastic environment, seeking to understand how to reduce its impact by improving anticipation. However, orthodox theory triggered the rise of an opposing revisionist school, which argued that strategic surprises result from intelligence or policy failure. These approaches all offer significant insights into the sources, mechanisms, and failures that lead to surprise, improving our understanding of how it can be averted (or created) or at least mitigated. However, they leave gaps in our understanding of the experience of surprise as it unfolds *during* the event.

Classical theory

Historically, surprise was primarily understood in the context of campaigns and battles - the instruments of surprise after all, moved at the speed with which an army marched or a fleet sailed. Consequently, our earliest thinking about surprise was defined by its temporal aspects. Early modern writers, such as Machiavelli and De Saxe, typically framed surprise as a battlefield phenomenon, what modern practitioners would recognise as the operational level of war, seeking tactical advantage for strategic effect.¹⁹ This battlefield-focused view of surprise persisted through the 19th and into the 20th century. Jomini emphasized 'taking the enemy by surprise as a means to gain superiority,' while his contemporaries, drawing from Napoleon's campaigns, saw

¹⁹ Niccolò Machiavelli, *The Art of War*, trans. Christopher Lynch (Chicago: University of Chicago Press, 2003), 102. And Maurice de Saxe, *Reveries on the Art of War*, trans. Thomas R. Phillips (Mineola, NY: Dover Publications, 2007), 19. See also Pierre-Joseph de Bourcet in Jonathan Abel, *Guibert: Father of Napoleon's Grande Armée* (Norman: University of Oklahoma Press, 2016). 'The operational level of war is the level of command that connects tactical actions to strategic objectives by planning and conducting campaigns and major operations within a theatre of war or theatre of operations' see U.S. Joint Chiefs of Staff. "Joint Publication 3-0: Joint Operations." Washington, DC: U.S. Joint Chiefs of Staff, 2017.

surprise as a tactical manoeuvre—such as flanking an enemy to turn a battle and potentially influence the war.²⁰ This conception of surprise as a battle-tactic was echoed by strategists like Mahan, who argued that ‘the essence of strategy is to bring about the battle...by surprise,’ and Liddell-Hart, who stated that ‘surprise in battle is the master-key of war’.²¹

In the wake of the Second World War, both Western and Soviet military theorists continued to emphasise the role of surprise as a battle phenomenon through the prism of operational theory.²² Russian military doctrine described surprise as an effect which is generated and dissipated over time,²³ while the US military evinced a similar philosophy, proposing surprise could be calculated almost formulaically as a function of ‘time and risk’.²⁴ In all these instances, while surprise is fundamentally temporal—rooted in the superior speed of thought and action over an adversary—it remains conceptually limited. Theorists and practitioners alike tend to describe surprise as a discrete event with a clear *before* and *after*, focusing on the moment when it occurs and post-surprise effects. This approach overlooks the depth of the experience itself, including how surprise is processed cognitively and collectively in real-time. Treating surprise as a linear sequence risks reducing it to a two-dimensional concept, emphasising the build-up and aftermath but neglecting the nuances in how it impacts decision-making in the moment.

This paradigm of surprise reaches its apogee in early nuclear theory. Figures like Kahn, Kissinger and Schelling, envisioned the possibility of a ‘30-minute war’, vividly described by Kahn as an ‘orgiastic spasm of destruction’.²⁵ The sheer destructive power of thermonuclear weapons, combined with the ability to launch them with less than an hour’s warning, elevated surprise to a truly strategic scale. However, this presents a paradox. The concept of a ‘spasm war’ is inherently bound by time—its brevity defines it. This leaves little capacity for analysis of the shadow that falls between the exchange and the response. In nuclear theory, there is no state of being surprised, only immediate annihilation. The corollary is that prediction, prior planning and prevention were paramount since, once the surprise occurred, there would be no

²⁰ Antoine-Henri Jomini, *Treatise on Grand Military Operations: Or, A Critical and Military History of the Wars of Frederick the Great*, trans. Samuel B. Holabird (New York: D. Van Nostrand, 1865), 277.

²¹ Alfred Thayer Mahan, *The Influence of Sea Power upon History, 1660–1783* (Boston: Little, Brown and Company, 1890), p17 and B.H. Liddell Hart, *Strategy*, 2nd rev. ed. (New York, NY: Frederick A. Praeger Publishers, 1967), 357.

²² Richard E. Simpkin, *Race to the Swift: Thoughts on Twenty-First Century Warfare* (London: Brassey’s Defense Publishers, 1985), 182

²³ Donald C. Daniel and Katherine L. Herbig, eds., *Strategic Military Deception* (New York: Pergamon Press, 1982), 347

²⁴ US Department of the Army, *Field Manual 3-0: Operations*. (Washington, DC: Government Printing Office, 2008), 3-5.

²⁵ A version of this was quoted in Herman Kahn, *On Thermonuclear War* (Princeton, NJ: Princeton University Press, 1960), p651. For discussion of Schelling’s views see Reid B.C. Pauly, “The Psychology of Nuclear Brinkmanship,” *International Security* 47, no. 3 (Winter 2022/23): 9-49,

Paul Dibb essays Kissinger’s similar views in ‘Kissinger’s role in avoiding nuclear war, and the key part Australia played,’ *The Strategist*, Australian Strategic Policy Institute, December 4, 2023.

opportunity for adaptation or recovery.²⁶ The resultant 'reciprocal fear of surprise attack' saw an emphasis on warning,²⁷ readiness and prepared plans, reflected in the first-strike doctrine on both sides of the Cold War.²⁸

However, throughout the 20th and 21st centuries, even at the height of nuclear risk, a variety of strategic surprises would occur—none of them resembling a 'spasm war'. From the 1967 'Six-Day War', to the 1971 Indo-Pakistani War, and the 1973 Arab-Israeli War, surprise remained a recurring feature. Even in cases where nuclear weapons were involved, such as the Cuban Missile Crisis, there was a distinct passage of time during which the experience of surprise unfolded. During the 13 days of the crisis policymakers on both sides engaged in information gathering and sense-making - as Allison would come to suggest nearly 40 years later – a demonstration of the extended experience of surprise, even in nuclear contexts.²⁹

Among classical theorists, Clausewitz was one of the first to consider the cognitive aspects of surprise moving beyond a view of surprise as a mere battle-tactic, recognizing its psychological and cognitive dimensions. Clausewitz saw surprise as a phenomenon in its own right stating, 'surprise therefore becomes the means to gain superiority, but because of its psychological effect, it should also be considered as an independent element'.³⁰ His ideas were built on by theorists such as Fuller, who suggested 'the real target in war is the mind of the enemy commander, not the bodies of his troops.'³¹ The logical corollary of this notion was that surprise may not be homogenous, but may have different forms. Fuller began to consider that surprise may have variations in form, seeking to distinguish between 'moral' and 'material surprise'.³² In Fuller's thinking moral surprise refers to the psychological impact of unexpected actions or events on an enemy's mindset, morale, and decision-making processes. This form of surprise targets the mental and emotional state of the adversary, potentially causing confusion, fear, or paralysis in their command structure.³³ Material surprise, on the other hand, relates to the physical or tangible aspects of unexpected military actions creating a tactical advantage through unexpected deployment or application of military assets. Material surprise occurs in the realms of time and space, while moral surprise exists within the mind of the object. Several theorists developed this idea: Boyd distinguished between 'surprise' and 'shock'; while Luttwak reinforced this binary distinction, differentiating between 'routine' surprise on the battlefield and the kind that

²⁶ This paraphrases Pauly and McDermott's argument in Reid Pauly (2023), P11

²⁷ Robert Jervis, "Thomas C. Schelling: A Reminiscence," *War on the Rocks*, December 15, 2016, <https://warontherocks.com/2016/12/thomas-c-schelling-a-reminiscence/>.

²⁸ See Herman Kahn. "Thinking about the unthinkable." *Horizon Press*.(1962), 59 for western first strike dogma however as Hoffman argues 'The Russians came closest to building an automatic retaliation system'.

See David E. Hoffman, *The Dead Hand: The Untold Story of the Cold War Arms Race and Its Dangerous Legacy* (New York: Doubleday, 2009)

²⁹ Graham T. Allison and Philip Zelikow, *Essence of Decision: Explaining the Cuban Missile Crisis*, 2nd ed. (New York: Longman, 1999).

³⁰ Clausewitz, p198.

³¹ J.F.C. Fuller, *The Foundations of the Science of War* (London: Hutchinson & Co, 1926), p 121

³² Fuller (1926), 272-277

³³ Jeffrey O'Leary, *Surprise and Intelligence: Towards a Clearer Understanding* Air War College, Maxwell Air Force Base, 1994.

could 'render the victim unhinged.'³⁴ This binary thinking has, overtime, influenced western operational thought.³⁵ While this approach acknowledges the cognitive aspect of surprise, it doesn't provide a framework to assess its dimensions, degree, or impact.

The classics reveal that surprise has an inherently temporal aspect. Paradoxically, however, theorists often view it in a simplistic, two-dimensional way, as a clear-cut event with a distinct 'before' and 'after'—as if surprise simply happens. Yet, even in early thought, there was a nascent understanding of its cognitive dimension, gradually leading to the recognition that surprise can take different forms and be experienced in different ways.

Analytic Case Study

Following World War II, the scale, scope, and strategic impact of surprise led to specific cases being studied in their own right, rather than merely as features of battles or campaigns. Advances in technology, such as combustion engines, aviation, and nuclear weapons, fundamentally reshaped the dynamics of conflict and heightened the potential consequences of strategic surprise. Combat was no longer constrained by the speed of armies or fleets; it could now occur over vast distances with unprecedented destructive force. From the early 1960s onward, numerous case studies emerged, examining these new forms of strategic surprise.³⁶

In her landmark case study of the Japanese attack on Pearl Harbor, Wohlstetter introduced a crucial perspective: surprise is not only something inflicted on an adversary but also something experienced by one's own side.³⁷ This initiated a trend of case studies focused on exploring why strategic surprises occurred and how nations, along with their policy and intelligence apparatuses, failed to foresee, adequately deter, or prepare for such events. These studies sought explanatory factors in the shortcomings in intelligence processing, decision-making, and strategic planning that allowed surprises to happen despite available warnings or signals.

Importantly, Wohlstetter's analysis of Pearl Harbor introduced the role of information (what would later be understood as information entropy theory), particularly the idea of distinguishing the 'signal' from the 'noise'.³⁸ She highlighted the challenge of identifying

³⁴ John R. Boyd, *A Discourse on Winning and Losing*, ed. Dr. Grant T. Hammond (Maxwell AFB, AL: Air University Press, 2018), slide 30.

Edward Luttwak, *Strategy: The Logic of War and Peace* (Cambridge: Harvard University Press, 1987), p. 8.

³⁵ Charles B. Vandepeer, James L. Regens, and Matthew R.H. Uttley, "Surprise and Shock in Warfare: An Enduring Challenge," *The Strategy Bridge*, October 27, 2020,

³⁶ In the course of researching this thesis there are over half a dozen books alone whose main title is 'Surprise Attack' Richard K. Betts, *Surprise Attack: Lessons for Defense Planning* (Washington, D.C.: Brookings Institution, 1982); Ephraim Kam, *Surprise Attack: The Victim's Perspective* (Cambridge, MA: Harvard University Press, 1988); P. Darman, *Surprise Attack* (New York: Barnes & Noble Books, 2004); Larry Hancock, *Surprise Attack: From Pearl Harbor to 9/11 to Benghazi* (Berkeley, CA: Counterpoint, 2015); and Larry Hama, *Surprise Attack! Battle of Shiloh* (New York: Aladdin, 2006).

³⁷ Roberta Wohlstetter, *Pearl Harbor: Warning and Decision*. Stanford, CA: Stanford University Press, 1962.

³⁸ Wohlstetter seems never to have used the term 'signal through the noise' although it is often attributed to her, having famously introduced the concept of noise in intelligence. Informational

critical intelligence signals amidst overwhelming background information, a concept that has become central to understanding the complexities of anticipating strategic surprise. This concept was further developed by scholars like Allison and Lanir, however, much of their work, like their contemporaries, is forensic in nature, focused on understanding failures of foresight.³⁹ The emphasis tends to be on how information theory can help predict and anticipate surprise events, rather than on the role of information in understanding how surprise unfolds in real-time.

Many case studies in this era developed a nuanced understanding of the temporal dimensions of surprise. Comparing the short, sharp attack on Pearl Harbor with the prolonged 'penetrating attack' of the 1973 Arab-Israeli War, it becomes clear that surprise can take different forms.⁴⁰ Lanir's major study of the latter highlights how the ongoing, persistent nature of the attack shifted from 'situational (or material) surprise' to one of 'comprehension,' illustrating Fuller's distinction between 'material' and 'moral' surprise.⁴¹ This comparison underscores that surprise is not a uniform experience but can evolve over time, affecting both the physical and cognitive realms of decision-making. Wohlstetter herself would go on to note that different strategic surprises could have a rapid or slower onset and could even, absent an act of violence, would only be apparent retrospectively.⁴²

Case studies of strategic surprises in the 20th century offer insights into the anticipatory challenges of surprise, in particular how time and information can increase or decrease its likelihood. However, this approach has two key limitations. First, it tends to focus solely on successful surprises, neglecting Finegar's paradox, which suggests that successful intelligence (and by extension, policy) may have correctly anticipated and averted a potential surprise.⁴³ As a result, policymakers may mistakenly assume that the anticipated threat was never going to create a real surprise. Second, while individual events are studied in great depth, they often lack comparative context. For instance, how did Pearl Harbor differ from the 1971 India-Pakistan conflict or 1973 Arab-Israeli War? How did pre-event actions, inactions, and mental models shape the *experience* of surprise? The danger lies in applying lessons from one case study to another type of surprise.

Returning to the research puzzle, while the US intelligence and policy system was shaped by the lessons of Pearl Harbor, did these lessons prepare it for other forms of

entropy is widely credited to Claude Shannon who was among the first to quantify the unpredictability and disorder in a set of messages or signals, which provides the quantitative basis for Wohlstetter's observations about the difficulty of distinguishing crucial intelligence from background noise see Claude E. Shannon, "A Mathematical Theory of Communication," *The Bell System Technical Journal* 27, no. 3 (1948): 379-423

³⁹ Allison and Zelikow. (1999) and Zvi Lanir, *Fundamental Surprises* (Tel Aviv, Israel: Centre for Strategic Studies, 1983).

⁴⁰ Colonel Trevor N. DePuy, *Elusive Victory: The Arab Israeli Wars, 1947-1974* (New York, NY: Harper & Row, 1978), 596

⁴¹ Zvi Lanir (1983), 3

⁴² Roberta Wohlstetter, 'Cuba and Pearl Harbor: Hindsight and Foresight.' *Foreign Affairs* 43, no. 4 (1965): 691-707.

⁴³ See Thomas Finegar, *Reducing Uncertainty: Intelligence Analysis and National Security* (Stanford: Stanford University Press, 2011), 192. This description adapts a classic paradox of deterrence theory to the relationship between intelligence and political leadership.

surprise, or leave it optimised for a certain type of surprise? ⁴⁴ When Australia's NDS proposes a lack of warning time, what type of surprise are we preparing for and how should we think about different potential surprise types in those preparations? This raises the need for an ontology that accounts for multiple types of surprise, better equipping us for a range of potential scenarios.

The Orthodox School⁴⁵

Recognising surprise as a phenomenon worthy of study, Betts laid the foundation of what would come to be described as the orthodox school in the 1980s.⁴⁶ Broadly, this school suggests that, due to a stochastic external environment, the nature of conflict and of human contest, it is impossible to completely avert surprise. As Gray wrote 'uncertainty is not a flaw in our understanding; rather is it an essential feature'.⁴⁷ Betts highlights a key paradox: that accurate signals often exist before a failure but despite this, failures remain unavoidable. He develops Wohlstetter's work on the challenge of distinguishing critical signals from background noise by linking it to bureaucratic and organisational factors that form 'pathologies in processing warnings'.⁴⁸ While reform can improve intelligence analysis, Betts argues that the core issues are political and psychological, making them difficult to resolve through structural changes alone. He also notes that we tend to focus on high-profile failures, overlooking routine successes, and that analysts' preconceived notions can hinder accurate assessments. Schelling captured the essence of the orthodox view observing, 'one thing a person cannot do, no matter how rigorous his analysis or heroic his imagination, is to draw up a list of things that would surprise him'.⁴⁹

The orthodox school doesn't propose nihilism or despair; key authors such as Cancian, Dahl, and even Wohlstetter seek to learn lessons and identify surprise events as early

⁴⁴ See Chapter 2 of Erik J. Dahl, *Intelligence and Surprise Attack: Failure and Success from Pearl Harbor to 9/11 and Beyond* (Washington, DC: Georgetown University Press, 2013) for an exposition of how the US policy and intelligence community reorganised itself to be ready for another Pearl Harbour attack during and after World War Two. Dahl posits that many of the institutional measures introduced to prevent another Pearl Harbour contributed to the failure to foresee the 9/11 terror attacks.

⁴⁵ Orthodox school is used here to describe the school however it was an appellation first used by its critics and would not necessarily be used by leading theorists to describe themselves.

⁴⁶ Richard K. Betts, "Analysis, War, and Decision: Why Intelligence Failures Are Inevitable," *World Politics* 31, no. 1 (1978): 61-89.

⁴⁷ Colin Gray, "The Strategy Bridge: Theory for Practice," in *Strategy Matters: Essays in Honor of Colin S. Gray*, ed. Donovan C. Chau and Thomas G. Mahnken (Maxwell Air Force Base, AL: Air University Press, 2020), 25.

See also chapter 1 of Colin S. Gray, "Transformation and Strategic Surprise," Article, *Transformation & Strategic Surprise* (04//4/1/2005 2005) and Richard K. Betts, "Surprise Despite Warning: Why Sudden Attacks Succeed," Article, *Political Science Quarterly (Academy of Political Science)* 95, no. 4 (//Winter80-81 Winter80-81 1980),

⁴⁸ Richard K. Betts, "Surprise Despite Warning: Why Sudden Attacks Succeed," *Political Science Quarterly* 95, no. 4 (1980-1981): 551-572.

⁴⁹ Thomas C. Schelling, *The Role of War Games and Exercises, in Managing Nuclear Operations*, ed. Ashton B. Carter, John D. Steinbruner, and Charles A. Zraket (Washington, D.C.: Brookings Institution Press, 1987), 426-444, 478

as possible in an effort to prepare where possible and adapt where necessary.⁵⁰ Although surprise may be inevitable, orthodox theorists focus on aversion and anticipation by continuously adapting preparations up to the point of surprise, aiming to mitigate its impact rather than prevent it entirely. As Betts notes,

*Orthodox pessimism emerges from cases... which appear to reveal a prevalence of warning indicators prior to attack... While many sources of surprise lie in the attacker's skill in deception and operational innovation, orthodox studies emphasize the victim's mistakes—how interactions of organisation, psychology, and inherent ambiguity of information create pathologies in processing and reacting to warning indicators.*⁵¹

One important contribution of the orthodox school is the introduction of concepts from cognitive science, such as those by Wirtz who argues that cognitive limitations are the root cause of the problem of anticipation the orthodox school identifies.⁵² These include biases such as overconfidence, confirmation bias, and the tendency to rely on existing analytical frameworks, even when they are outdated or inadequate.⁵³ He concludes 'surprise is not a structural or systemic phenomenon – it is about human cognition (existing) in the mind of the victim.'⁵⁴ The emerging insights from cognitive science are explored further in Chapter Two of this thesis. Once again however, the majority of analysis focuses on pre-surprise cognitive limitations, not the impact of cognitive factors post-event.

When the NDS highlights a lack of warning time, what kind of surprise are we preparing for? The orthodox school highlights the importance of anticipating the unexpected, but it raises key questions about how decision-makers will respond when truly surprised. Tyson's insight, that deliberate plans often misalign with reality, suggests the need for frameworks that better capture how we might experience and interpret different types of surprise.

The Revisionist School⁵⁵

Levite was one of the first to challenge the orthodox perspective, suggesting that surprise was inevitably the product of *avoidable* failures within intelligence or policy-

⁵⁰ Mark F. Cancian, *Avoiding Coping with Surprise in Great Power Conflicts*, Center for Strategic and International Studies (CSIS) (2018).;

Erik Dahl, *Intelligence and Surprise Attack: Failure and Success from Pearl Harbor to 9/11 and Beyond* (2013); Roberta Wohlstetter, *Pearl Harbor : warning and decision* (Stanford, California: Stanford University Press, 1962).

⁵¹ Richard K. Betts, "Surprise, Scholasticism, and Strategy: Review of Ariel Levite's *Intelligence and Strategic Surprise*," *International Studies Quarterly* 33, no. 3 (1989): 330-331

⁵² Wirtz, James J. "Understanding Intelligence Failure: Warning, Response and Deterrence." *In Understanding Intelligence Failure: Warning, Response and Deterrence*, edited by James J. Wirtz. London: Routledge, 2017.

⁵³ Wirtz, James J. (2017) specifically Chapter 3

⁵⁴ James J. Wirtz, "The Intelligence Paradigm," *Intelligence and National Security* Vol. 4, No. 4 (October 1989), pp. 829-837. P 830

⁵⁵ 'Revisionist school' is used here to describe the school however it was an appellation first used by its critics and would not necessarily be used by leading theorists to describe themselves.

making apparatus.⁵⁶ This led to a prolonged, contentious academic debate which played out through the end of the Cold War and into the War on Terror. It was Levite who would coin the appellation 'orthodox school' to describe Betts and fellow thinkers. Betts would respond by labelling Levite and others who expressed similar views 'revisionists'.⁵⁷ The orthodox criticism of the revisionists is that they were utopian, seeking a world where strategic surprise could be averted. However, this is simplistic and reductionist, rather, proponents of such thinking, including Kent, Zegart and Johnson, propose that each case of strategic surprise was the result of one or more, specific and *avoidable* failures.⁵⁸ They would not argue that states could prevent *all* failures *all* the time, rather, that by learning from failure, states could do better next time. Most who might be described as revisionists, such as Knorr and Handel, would use the word 'mitigate', rather than 'avert' making the differences between the schools more philosophic rather than practical.⁵⁹

A key focus of the revisionist school is enhancing intelligence systems' ability to better warn of impending surprises, emphasizing the link between intelligence failures and organisational behaviour, particularly 'bureaucratic structures.'⁶⁰ Revisionists often refer to case studies like Pearl Harbor, the Cuban Missile Crisis, and the 1973 Arab-Israeli War, arguing that these surprises were preventable with better foresight and action.⁶¹ They aim to distinguish between the lead-up to different surprises, highlighting how improved processes could have mitigated or averted such events. But both orthodox and revisionist schools continue the tradition of studying the before-surprise experience.

This approach can be visualised in a bow-tie diagram such as at Figure 1.⁶² This tool, used to analyse risk scenarios, shows the causes leading to an

⁵⁶ Ariel Levite, "Intelligence and Strategic Surprises Revisited: A Response to Richard K. Betts's 'Surprise, Scholasticism, and Strategy'," *International Studies Quarterly* 33, no. 3 (1989).

⁵⁷ Richard K. Betts, 'Surprise, Scholasticism, and Strategy: A Review of Ariel Levite's Intelligence and Strategic Surprises,' *International Studies Quarterly* 33, no. 3 (September 1989): 329-343, P 330 and 333. See Levite's riposte in Ariel Levite, "Intelligence and Strategic Surprises Revisited: A Response to Richard K. Betts's 'Surprise, Scholasticism, and Strategy,'" *International Studies Quarterly* 33, no. 3 (September 1989): 345-349.

⁵⁸ Amy B. Zegart, "September 11 and the Adaptation Failure of U.S. Intelligence Agencies," *International Security* 29, no. 4 (2005); Loch Johnson, "Bricks and Mortar for a Theory of Intelligence*," *Comparative Strategy* 22, no. 1 (2003/01/01 2003).

Sherman Kent, *Strategic Intelligence for American World Policy* (Princeton: Princeton University Press, 1966).

⁵⁹ Knorr, Klaus, and Patrick Morgan, eds. *Strategic Military Surprise: Incentives and Opportunities*. New Brunswick, NJ: Transaction Books, 1983. For Handel's theories on intelligence failure refer to Michael Handel *Masters of War: Classical Strategic Thought*. London: Taylor & Francis, 2001, Ch 4.

⁶⁰ Robert Jervis, "Why Intelligence and Policymakers Clash," *Political Science Quarterly* 125, no. 2 (Summer 2010): 185.

⁶¹ For the role of organisational behaviour in intelligence failure see Wilensky's argument in, Harold L. Wilensky "The Professionalization of Everyone?" *American Journal of Sociology* 70, no. 2 (1964): 137-158.

⁶² One way of visualising them is to consider a bow tie diagrams are more formally known as Generalized Time Sequence Models (GTSM) and provide a framework to analyse surprise events, combining elements of fault tree and event tree analysis in a simplified, linear representation (Zahra Mohammadi, Mohsen Kiani, and Hamid Aghajan, "Spatiotemporal Signatures of Surprise Captured by Magnetoencephalography," *Frontiers in Systems Neuroscience* 16 (2022), 2). This model positions initiating mechanisms on the left side of a

event (left) and the consequences or responses that follow (right), with the surprise event represented at the centre, or 'knot'. Traditional approaches focus heavily on aversion by examining factors that lead to surprise, but they provide limited depth in exploring the experience of surprise, the shadow that Eliot described in *The Hollow men*.⁶³ To address the central question of the research puzzle—how surprise influences and transforms strategic plans into dynamic strategies—a richer understanding of surprise is essential. This requires moving beyond the simplistic 'before and after' framework and adding dimension to the 'shadow'. Cognitive scientists Moore and Schatz elucidate their field's perspective, stating 'surprises should not be taken as dichotomous on/off phenomena but rather should be considered as a variable' with depth and variety.⁶⁴ By deepening our understanding of surprise, we can better grasp how it unfolds, varies, and inflects strategic decisions in real time, ultimately shaping our preparation.

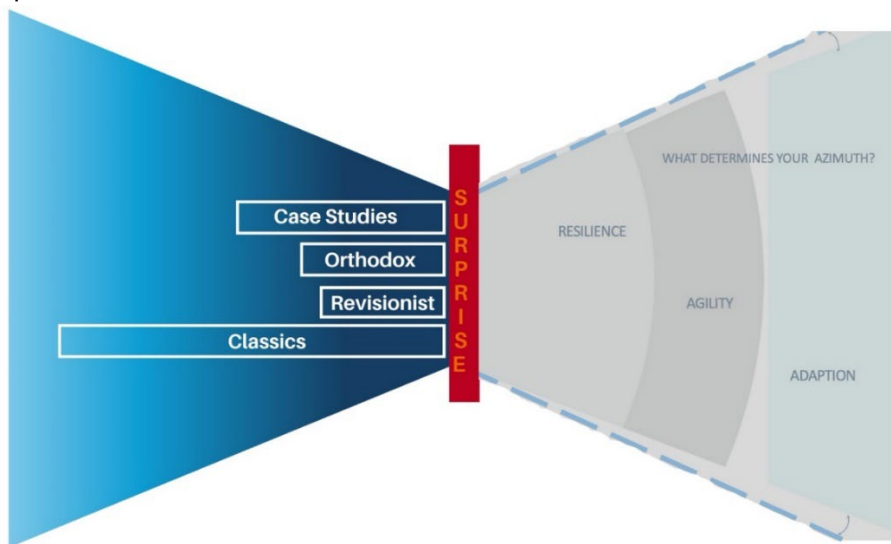


Figure 1 Traditional thinking about strategic surprise⁶⁵

central surprise event, with outcomes and consequences on the right, creating a time-based flow from causes to effects D. Viner, *Accident Analysis and Risk Control* (Melbourne: VRJ Delphi, 1991). Viner developed the original bow-tie model in earlier chemical sciences work in the 1960s)

⁶³ There is another corpus that deals with response and adaptation post-surprise which, for the sake of brevity, must sit outside this thesis.

⁶⁴ Don A. Moore and Derek Schatz, "Over precision Increases Subsequent Surprise," *PLOS ONE* 15, no. 7 (July 8, 2020):

⁶⁵ (NB – post-surprise scholarship on topics such as adaptation is expansive but beyond the scope of this thesis)

Chapter 2 Expanding Our Approaches to Surprise: Integrating Inter-Disciplinary Literature

The previous chapter explored how traditional approaches often present a two-dimensional view of the temporal aspects of surprise, focussing on aversion, but also introduce the role of information in causation along with the potential contribution of cognitive science. This chapter aims to address some of the identified gaps by incorporating insights from other disciplines—specifically cognitive science and psychology—which have examined surprise for over a century. Cognitive science contains two schools of thought: the probabilistic school, which aligns with traditional strategic surprise thinking; and the sense-making or ‘cognitive evolutionary’ school which directly addresses the experience of surprise. The latter explores how novelty and unexpectedness disrupt established mental frameworks (schemas) offering the potential to describe the dimensions of surprise. Psychology, meanwhile, identifies factors like arousal and valence that influence the impact of surprise. While these fields predominantly study individual-level surprise, they provide important frameworks which may be scaled and adapted to enhance our understanding of strategic surprise.

Cognitive science – why are some surprises so surprising?

Cognitive science approaches surprise through at least two prominent schools of thought: the probabilistic; and the cognitive or sense-making.⁶⁶ Unlike the tension between orthodox and revisionist schools in strategic studies, these are harmonious, differing in focus rather than intent. Indeed, cognitive sciences recognise that these two schools can build a more complete picture of surprise phenomena by describing both anticipation and actuation of surprise. The probabilistic approach emphasizes the role of uncertainty and probability in reasoning and decision-making, examining how individuals assess likelihood to make judgments.⁶⁷ This perspective builds an understanding how people anticipate surprise and seek to avert or prepare for it, and is finding renewed interest in the fields of computer science and Ai.⁶⁸ This school enhances insights of traditional approaches, notably the orthodox and revisionist schools, into prediction of discontinuities. This is likely why, when leading thinkers have sought to introduce insights from cognitive science, they have predominantly done so in relation to prediction and aversion.

Authors such as Wirtz, Finkel, Handel, and Knorr were some of the first to introduce cognitive science into the study of strategic surprise, drawing predominantly on the probabilistic school.⁶⁹ Finkel, for example explores how cognitive limitations can lead to

⁶⁶ Nick Chater and George Loewenstein, "The Under-Appreciated Drive for Sense-Making," *Journal of Economic Behavior & Organization* 126 (2016): 137-154,

⁶⁷ Pierre Baldi and Laurent Itti, "Of Bits and Wows: A Bayesian Theory of Surprise with Applications to Attention," *Neural Networks* 23, no. 5 (2010): 649-666.

⁶⁸ Brenden M. Lake, Ruslan Salakhutdinov, and Joshua B. Tenenbaum, "Human-Level Concept Learning through Probabilistic Program Induction," *Science* 350, no. 6266 (2015): 1332-1338

⁶⁹ Michael Handel, *Masters of War: Classical Strategic Thought* (London: Taylor & Francis, 2001);

Knorr, Klaus, and Patrick Morgan, eds. *Strategic Military Surprise: Incentives and Opportunities*. New Brunswick, NJ: Transaction Books, 1983; and James Wirtz (2017)

biases or 'blind spots' that hinder accurate predictions.⁷⁰ Wirtz and Handel further explore the role of faulty schema and assumptions in hampering prediction.⁷¹ This school makes an important contribution, providing explanatory tools for intelligence failures like Pearl Harbour that Wohlstetter identified (before the concept had a formal name), today they are understood courtesy of cognitive science as an example of 'mirror imaging bias'.⁷² Similarly, the failure of MacArthur and the United Nations Command to anticipate China's entry into the Korean War in 1950 is often cited as an example of bias, with US intelligence predictions skewed by 'optimism' and 'selective attention' biases.⁷³ Indeed the study of bias is a core element of western intelligence training models.⁷⁴

The unrealised contribution of cognitive science to an ontology of strategic surprise, however, is to be found in the cognitive, sense-making school. More formally described as the 'cognitive evolutionary model of surprise (CEMS)', it describes how surprise is experienced, focussing on how individuals interpret and create meaning, especially in ambiguous or unexpected situations.⁷⁵ This school explores the cognitive processes involved in recognizing, interpreting, and responding to novel or surprising information.⁷⁶

An important contribution from this school is the concept of schematic disruption which suggests that surprise occurs when incoming information conflicts with existing mental schemas, leading to 'cognitive dissonance'.⁷⁷ The CEMS proposes that surprise is the result of unexpected (schema-discrepant) events, and its intensity is determined by the degree of schema-discrepancy.⁷⁸ In other words, the degree to which an event is surprising, and the impact it has, is linked to how far outside our conceptions the event is.⁷⁹

Several theorists propose that schematic disruption is a product of novelty, either instead of, or in addition to, unexpectedness.⁸⁰ Unexpected events are defined as those

⁷⁰ Meir Finkel, *On Flexibility : Recovery From Technological and Doctrinal Surprise on the Battlefield* (Stanford, California: Stanford Security Studies, 2011). Meir Finkel, *Military Agility : Ensuring Rapid and Effective Transition From Peace to War*, AUSA Books - Foreign Military Studies, (Lexington, Kentucky: The University Press of Kentucky, 2020).

⁷¹ James Wirtz (2017)

⁷² Richards J. Heuer Jr., *Psychology of Intelligence Analysis* (Washington, D.C.: Center for the Study of Intelligence, 1999), 111-113

⁷³ Jonathan Corrado, "Biases Blind Us to the Risk of Chinese Military Intervention in Korea," Atlantic Council, August 16, 2023, <https://www.atlanticcouncil.org/in-depth-research-reports/issue-brief/biases-blind-us-to-the-risk-of-chinese-military-intervention-in-korea/>.

⁷⁴ See Martha Whitesmith, *Cognitive Bias in Intelligence Analysis* (Edinburgh: Edinburgh University Press, 2020); and also Erik J. Dahl, *Intelligence and Surprise Attack: Failure and Success from Pearl Harbor to 9/11 and Beyond* (Washington, DC: Georgetown University Press, 2013).

⁷⁵ The full title is often the 'Cognitive-Evolutionary Sensemaking model of surprise'. In the interest of brevity this thesis will refer to it as the cognitive or sense-making school

⁷⁶ Sensemaking as a function Gary Klein and Nader Jalaeian, "The Plausibility Transition Model for Sensemaking," *Semantic Scholar*, accessed October 5, 2024,

⁷⁷ Klein, 2024.

⁷⁸ Reisenzein, Rainer, Gernot Horstmann, and Achim Schützwohl. "The Cognitive-Evolutionary Model of Surprise: A Review of the Evidence." *Topics in Cognitive Science* 11, no. 1 (January 2019): 50-74

⁷⁹ Reisenzein, Horstmann, and Schützwohl. (2019): 50-74

⁸⁰ Karl Halvor Teigen and Gideon Keren, "Against Expectations: Surprising and Not Surprising

disconfirming expectations, while novel events are those not represented in a person's schema (mental model) for the current situation.⁸¹ The degree of novelty can be quantified as the dissimilarity of an event to relevant schemas.⁸² While unexpected events can be novel or familiar, evidence suggests that more novel events are usually more surprising.⁸³ Schematic disruption can be thought of as describing the difference between the unexpected and the unimaginable. This might cause us to ask how far from a pre-strategic surprise mental model were the events that unfolded? Was a Japanese attack on Pearl Harbour as divergent from the mental models of US political leaders as the terror attacks of 9/11? An aerial attack on Pearl Harbour was unexpected but not overly novel, an attack on the World Trade Centre using hijacked civilian airliners was both unexpected and extremely novel. The former may have been unexpected, but to most the latter was unimaginable - in the strict sense that Schelling had meant – they simply had not formed a part of policy makers' pre-attack mental model. Schematic disruption provides a clue that the experience of surprise becomes a vital consideration in preparedness, evident in comparing the reaction of decision-makers in the US and the USSR on their entry to World War Two.

The attack on Pearl Harbor, while clearly *unexpected* as evidenced in the inadequate preparations by the US, was not *unimaginable* for U.S. military planners. As early as 1924, U.S. war games had simulated a potential Japanese carrier-based air attack on Hawaii, indicating that such a scenario was within the conceptual framework of American military thinking.⁸⁴ While Pearl Harbour is a famous study in intelligence and policy failures *before* the attack, when the surprise occurred there is broad consensus that the US civil and military leadership reacted swiftly, calmly and rationally to the initial attack.⁸⁵ In contrast, the German invasion of Russia in 'Operation Barbarossa' was a complete departure from Stalin's mental model of the geopolitical situation.⁸⁶ Stalin had convinced himself that Hitler would not attack the Soviet Union while still at war with Britain, and he stubbornly dismissed multiple warnings of the impending invasion, including intelligence from his own spies.⁸⁷ For days after the event, in a paralysis that likely cost territory, thousands of Soviet lives and military advantage, Stalin famously

Events," *Cognition* 87, no. 1 (2003): 33-51.

⁸¹ Teigen and Keren (2003), 34

⁸² Andrew G. Barto, Marco Mirolli, and Gianluca Baldassarre, "Novelty or Surprise?" *Frontiers in Psychology* 4 (2013): 907.

⁸³ François Vachon, Robert W. Hughes, and Dylan M. Jones, "Broken Expectations: Violation of Expectancies, Not Novelty, Captures Auditory Attention," *Journal of Experimental Psychology: Learning, Memory, and Cognition* 38, no. 1 (2012): 164-177.

⁸⁴ Caesar Nafrada and Joseph Caddell, "'Never Thought They Could Pull Off Such an Attack': Prejudice and Pearl Harbor," *War on the Rocks*, December 7, 2021,

⁸⁵ See Butow for a detailed analysis of the executive and cabinet responses in the opening stages of Japan's war on the US in Robert J. Butow. "How Roosevelt Attacked Japan at Pearl Harbor." *Prologue Magazine* 28, no. 3 (Fall 1996). Accessed October 5, 2024. See also the last chapter of Gordon W. Prange, Donald M. Goldstein, and Katherine V. Dillon, *Pearl Harbor: The Verdict of History* (New York: McGraw-Hill, 1986).

⁸⁶ Gabriel Gorodetsky, *Grand Delusion: Stalin and the German Invasion of Russia* (New Haven: Yale University Press, 1999), viii.

⁸⁷ This argument is explored comprehensively in David E. Murphy, *What Stalin Knew: The Enigma of Barbarossa* (Yale University Press, 2005). His firm belief in the Molotov-Ribbentrop Pact's ability to prevent war with Germany; his misunderstanding of Hitler's strategic goals; and his fear of provoking Germany into war by taking defensive measures.

hid in his Dacha unable or unwilling to make a decision or provide direction.⁸⁸ What role did schematic disruption, and the pre-existing mental models, play in the very different reaction that Stalin displayed to his counterparts in Washington. While orthodox and revisionist writers have embraced the significance of cognitive science in *anticipating* surprise, there is a gap that the CEMS' schematic disruption may help address in how to better prepare for the *experience of* surprise.

Psychology – measuring impact: how big was the surprise

Psychology offers another potential dimension to our understanding of surprise by describing how and why some surprises are greater than others due to perception, researchers proposing 'the perception of surprise is a matter of impact'.⁸⁹ This perspective complements the CEMS discussed above. While the cognitive model speaks to the novelty of surprise through disruption to mental models, psychology's study of surprise addresses the scale of surprise. The CEMS helps understand the mechanisms by which surprise manifests, focusing on the discrepancy between expected and actual events. In contrast, the psychological impact literature provides a framework for measuring the intensity of the surprise experience. How, then, is impact measured? Psychologists have identified two primary dimensions for assessing the impact of surprise: arousal and valence.⁹⁰

Arousal refers to the degree of physiological and psychological activation experienced during a surprising event. High arousal surprises tend to be more memorable and impactful. In psychology arousal is usually studied through the physiological response triggered by surprising events, which can be influenced by personal proximity to the situation as well as the perceived intensity. Most typically this is measured along certain physiological markers as well as phenomenologically (i.e. self-reporting by the subject).⁹¹ The latter is difficult to scale, the former almost impossible, as noted by Cunha et al. 'a systematic and integrative typology of (large scale) surprises, however, is still missing.'⁹² But it may be possible to adapt arousal to the strategic scale in two ways. First, decision makers' personal proximity (either physically or direct personal connection with the events at the centre of surprise), and second the systemic impact.⁹³

Proximity considers how closely involved or affected the decision-maker is by the surprise event. The closer the proximity, the higher the potential for arousal and

⁸⁸ "Did Stalin Suffer a Nervous Breakdown After Germany Invaded?" *War History Online*, accessed October 2, 2024.

⁸⁹ Paul Shrivastava, "Crisis Theory/Practice: Towards a Sustainable Future," *Industrial & Environmental Crisis Quarterly* 7, no. 1 (March 1993): 23-42.

⁹⁰ Nico H. Frijda, "Surprise," in *The Oxford Companion to Emotion and the Affective Sciences*, ed. David Sander and Klaus R. Scherer (Oxford: Oxford University Press, 2009), 386-387.

⁹¹ D.E. Berlyne, *Conflict, Arousal, and Curiosity* (New York: McGraw-Hill, 1960).

Klaus R. Scherer, "Appraisal Considered as a Process of Multilevel Sequential Checking," in *Appraisal Processes in Emotion: Theory, Methods, Research*, ed. Klaus R. Scherer, Angela Schorr, and Tom Johnstone (New York: Oxford University Press, 2001), 92-120.

⁹² Cunha, Miguel Pina e, Stewart R. Clegg, and Ken Kamoche. "Surprises in Management and Organization: Concept, Sources and A Typology." *British Journal of Management* 17, no. 4 (2006): 317-329, 317.

⁹³ Nico H. Frijda, "Surprise," in *The Oxford Companion to Emotion and the Affective Sciences*, ed. David Sander and Klaus R. Scherer (Oxford: Oxford University Press, 2009), 386-387, 386

emotional engagement. Proximity can be 'physical, temporal, or psychological', and may influence the decision-maker's 'perception of urgency' and personal stake in the situation.⁹⁴ Research suggests decision-makers who are more proximate to a crisis event tend to exhibit higher levels of stress making intuitive rather than analytical decisions more likely, however to date this has not been adapted as a measure of the impact of surprise.⁹⁵

Perceived systemic impact, what we might describe as the intensity of the surprise, assesses the extent to which the surprise event affects the broader system or organization.⁹⁶ A higher degree of systemic impact implies more far-reaching consequences, potentially leading to greater arousal and perceived importance of the event. The relationship between strategic surprise and systemic impact is often characterized by amplification and cascading consequences. Strategic surprises can amplify systemic impacts, leading to more profound and far-reaching consequences than initially anticipated. A case made by Kasperson et al. in their seminal paper on 'social amplification', they argue that amplification occurs when 'events interact with social, and cultural processes in ways that can heighten or attenuate public perceptions of risk and related risk behaviour'.⁹⁷ The 9/11 terrorist attacks in 2001 serve as a prime example of strategic surprise with significant amplification effects. The attacks not only caused immediate devastation but also led to far-reaching consequences that amplified the initial impact. The amplification of the initial surprise attack resulted in transformative effects on international relations, military strategy, and societal norms that persisted for decades. This exemplifies 'cascading effects' - a surprise event in one area can trigger a chain reaction of impacts across multiple systems and stakeholders. Pescaroli defines 'cascading effects' of disasters, 'where an initial impact can trigger a sequence of events with progressive consequences over time, leading to non-linear impacts across different systems'.⁹⁸ Amplification and cascading non-linearity are proxy metrics for systemic impact. Therefore, the psychological concept of 'arousal' can be applied to strategic surprise through the twin lenses of decision makers' proximity; and the level of impact based on the degree of amplification and cascading consequence across the strategic system.

Valence refers to the emotional quality of a surprise, capturing whether the event is perceived as positive or negative and describes how much the surprising event aligns with or contradicts an individual's values, expectations, or desires.⁹⁹ Positive valence surprises, which align with values, may lead to quicker acceptance and integration of new information, increased motivation, and engagement. Negative valence surprises,

⁹⁴ Ingrid Bonn and Sharyn Rundle-Thiele, "Do or Die—Strategic Decision-Making Following a Shock Event," *Tourism Management* 29, no. 2 (2008): 387-396, 388.

⁹⁵ C. Smart and I. Vertinsky, "Designs for Crisis Decision Units," *Administrative Science Quarterly* 22, no. 4 (1977): 640-657.

⁹⁶ Marret K. Noordewier and Seger M. Breugelmans, "On the Valence of Surprise," *Cognition and Emotion* 27, no. 7 (2013): 1326-1334., 1327.

⁹⁷ R. E. Kasperson et al., "The Social Amplification of Risk: A Conceptual Framework," *Risk Analysis* 8, no. 2 (1988): 177-187.

⁹⁸ G. Pescaroli and D. Alexander, "A definition of cascading disasters and cascading effects: Going beyond the 'toppling dominos' metaphor," *Planet@Risk* 3, no. 1 (2015): 58-67.

⁹⁹ The impact of valence Mark T. Quinn and Mark T. Keane, "Factors Affecting 'Expectations of the Unexpected': A Computational Model of Surprise," *Cognitive Science* 47, no. 1 (2023),

which contradict values, often trigger denial or resistance, paralysis in decision-making, or lead to more cautious and defensive strategies. The fall of the Berlin Wall in 1989 offers an illustration of how valence can influence responses to strategic surprise. For East German authorities, this was a negative valence surprise that contradicted their values and expectations, consequently their initial response was characterized by confusion and paralysis in decision-making.¹⁰⁰ In contrast for West German authorities, and many citizens, it was a positive valence surprise, aligning with their hopes and leading to rapid acceptance and proactive engagement. 'While East German leaders hesitated and debated, West German Chancellor Helmut Kohl quickly grasped the historic opportunity, presenting a ...Plan for German Unity just weeks after the Wall's opening'¹⁰¹

Cognitive science and psychology's insights into the cognitive processes involved in responding to unexpected events complement traditional approaches to strategic surprise. Traditional approaches align with, and occasionally draw upon, the probabilistic school of cognitive science, with their focus on anticipation. The sense-making school with its CEMS, helps address this gap. Similarly, psychological concepts like arousal and valence are essential for informing strategic thinking, as they help to understand how emotional responses influence decision-making and adaptability at the highest levels of leadership. The relationship between the traditional schools, and those discussed in this chapter can be visualised on a revised bow-tie diagram (vide Figure 2). Traditional approaches, and the probabilistic school, seek to forecast and avert surprise – they are fundamentally *prognostic* in nature. But we also need to be able to *diagnose* different types of strategic surprise, as Ghandi suggested, 'A correct diagnosis is three-fourths the remedy'.¹⁰²

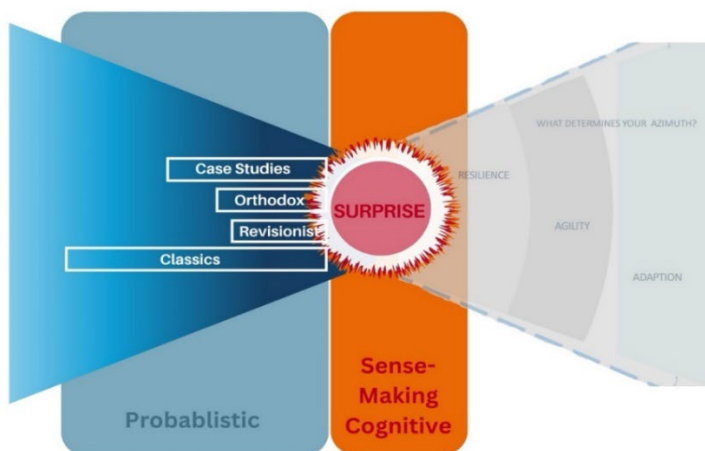


Figure 2 Bow-tie diagram indicating the relationship between cognitive science schools and traditional approaches

¹⁰⁰ M. E. Sarotte, *The Collapse: The Accidental Opening of the Berlin Wall* (New York: Basic Books, 2014)., p. 5.

¹⁰¹ J. Grix, *The Role of the Masses in the Collapse of the GDR* (London: Palgrave Macmillan, 2000). p. 143

¹⁰² Mahatma Gandhi, quoted in "Gandhi Quotes | Epigrams from Gandhiji," MKGandhi.org, accessed August 19, 2024, <https://www.mkgandhi.org/epigrams/d.php>.

Chapter 3 Qualifying Surprise: Developing Dimensions

Integrating traditional approaches explored in Chapter One, with insights from cognitive science and psychology in Chapter Two allows us to develop a richer understanding of surprise, directly addressing the research puzzle. To then develop an integrated ontology, however, requires a more precise description and classification of surprise events, which in turn necessitates differentiating criteria. These criteria serve multiple purposes: they allow for a more systematic analysis of surprise; facilitate comparison across different cases; and they provide a foundation for future research and theory development.¹⁰³ Of the four criteria detailed below (temporal, informational, schematic and systemic impact) some are more quantitative in nature, such as the temporal dimension while others are more qualitative, such as schematic disruption. This is a feature of fsQCA and allows for nuanced categorization beyond simple binary classifications throughout the four criteria.

The first criteria builds on the classics and insights from case studies to add depth to the temporal aspect of surprise by considering speed of onset as well as distinguishing between short- and long-duration surprise, and the persistence of the event. Second, expanding on the use of information theory in case studies, particularly the concept of information entropy, we consider the quality of information during the event itself, not just leading up to it. Two key dimensions are inferred: the quality of the signal (similar to the intelligence scale of reliability and authority) and the level of distortion in the communication channel.¹⁰⁴ Leveraging insights from cognitive science, schematic disruption incorporates a framework and qualitative scale to measure the extent to which surprises disrupt existing mental models and organizational schemas, and how this may affect responses. Finally adapting psychological insights on arousal (proximity and systemic intensity) and valence to the strategic environment, allows assessment of the magnitude of a surprise's effect at the strategic level. By exploring these four dimensions, we aim to develop a more robust framework for understanding, anticipating, and responding to strategic surprises in an increasingly complex global environment.

Temporal

Time is the most obvious and commonly discussed aspect of strategic surprise, being the easiest to observe and quantify. The temporal aspect however can be analysed in at least three sub-dimensions: speed of onset, persistence, and duration. Speed of onset refers to how quickly the surprise unfolds, while persistence distinguishes between surprises that endure and those that are brief or punctuated. Duration captures the overall timespan of the surprise's impact, from its initial occurrence to the point where a new equilibrium is reached.

¹⁰³ P. C. Fiss, "Building better causal theories: A fuzzy set approach to typologies in organization research," *Academy of Management Journal* 54, no. 2 (2011): 393-420, 394.

¹⁰⁴ "What is the Admiralty Scale?," SRM Asset Management, February 11, 2021,

Speed of onset

The speed of onset is a critical sub-dimension of strategic surprise, shaping how events unfold and are perceived. While revisionists assert that warnings are always present but are often overlooked due to cognitive or systemic failures, most revisionists concede that true 'bolt from the blue' surprises can still occur. Yet, many strategic surprises, while disruptive, often have a protracted onset, allowing the unexpected to gradually reveal itself over time suggesting that the speed of onset is an important discriminator.

Traditional approaches, in seeking to understand errors in intelligence and preparedness, would measure the speed of onset from the perpetrator's perspective, however, measuring onset from the victim's perspective, more accurately reflects the experience of surprise. This is apparent when comparing the aerial attacks on Pearl Harbor; the Israeli strike on Arab armies in 1967; and the 9/11 attacks. The Japanese fleet departed Japan on November 26, 1941, and attacked on December 7, providing an 11-day window from the first tangible action of the strategic surprise to its denouement.¹⁰⁵ The Israeli attack, occurring during a period of heightened tensions replete with false-alerts and continual military activity in each country, took just 185 minutes from activation to conclusion of the strike.¹⁰⁶ By contrast, Al-Qaeda transitioned from planning to a tangible execution phase as early as 1999 when 'the Hamburg cell' became involved and hijackers were selected seeing around 18-24 months of detectable activity preceding the attacks.¹⁰⁷ However, from the victim's perspective, from the first engagement (i.e. the moment somebody on the victims side had a tangible experience of the surprise was occurring) to the final at Pearl Harbour was precisely 185 minutes – the exact same duration as the surprise air attack that started the 1967 war.¹⁰⁸ On September 11, the gap between the first and second attacks was only 17 minutes.¹⁰⁹ The speed of onset, and how we measure it, can inform our perception of a strategic surprise and potentially reveal that seemingly dissimilar events may be more alike than expected, while seemingly similar events may differ in important ways.

Surprise can also unfold slowly, lacking the clear punctuation of rapid-onset events. For example, while the protests sparked by Mohammed Bouazizi's self-immolation in Tunisia in December 2010 initially caught observers off-guard, the full impact wasn't immediately apparent.¹¹⁰ Only as protests spread to Egypt and across the Arab world

¹⁰⁵ Richard B. Frank, *The Path to Pearl Harbor*, The National WWII Museum, accessed October 3, 2024.

¹⁰⁶ Michael B. Oren, "The Six-Day War," in *Six Days of War: June 1967 and the Making of the Modern Middle East* (New York: Oxford University Press, 2002), 170-171.

¹⁰⁷ National Commission on Terrorist Attacks upon the United States, *The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks Upon the United States* (Washington, DC: Government Printing Office, 2004), 7-8.

¹⁰⁸ The first action at Pearl Harbour was not the famous mistaken radar sighting at Opana Radar Site at 0702 hours, but an attack by USS Ward on a Japanese submarine at approximately 06:37 on the morning of December 7, 1941. Richard B. Frank, "The Path to Pearl Harbor," The National WWII Museum, accessed October 3, 2024.

¹⁰⁹ The 9/11 Commission Report (2004), 8.

¹¹⁰ A variety of scholars and journalists suggests that the west was: 'taking a case-by-case basis' (Jason Brownlee, Tarek Masoud, and Andrew Reynolds, "Theorizing the Arab Spring," in *The Arab Spring: Pathways of Repression and Reform* (Oxford: Oxford University Press, 2015)); and that Jasmine K. Gani, "From Discourse to Practice: Orientalism, Western Policy and the

did the magnitude of the 'Arab Spring' as a strategic surprise become clear. Unlike sudden events like Pearl Harbor or 9/11, where there was an evident transition from start point to the surprise, the Arab Spring's significance emerged gradually, illustrating how slow-onset surprises can present different challenges. Context matters, while 9/11 was a bolt from the blue, the 1967 Israeli strike came after months of heightened tensions, hostile actions, and false alerts. However, once the surprise crystallizes, the speed of onset becomes an important dimension in describing it.

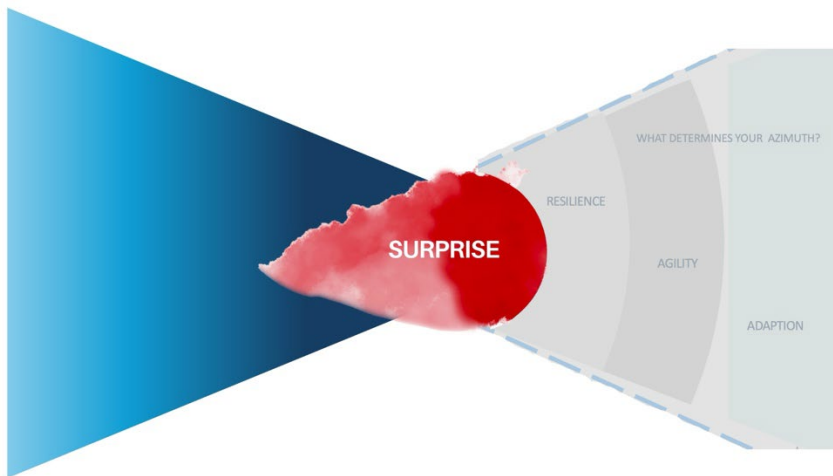


Figure 3 - Not all surprise has a rapid onset - creeping surprise can present distinct challenges

Duration and Persistence

Strategic surprises can be further distinguished by their duration and persistence, factors that significantly impact the experience of strategic surprise. This distinction is crucial because brief events often allow only for post-mortem sense-making, while longer, persistent surprises require both sense-making and action in real-time. For example, although 9/11 was traumatic it soon became apparent there were no follow up attacks demanding a further, immediate, response. In contrast, the French government faced urgent, concurrent demands for both decision-making and sense-making during the German invasions of 1940, just as the Israeli government did in 1973. In the case of Pearl Harbor, the punctuated nature of the attacks allowed political leaders some breathing room; the situation didn't demand an immediate response. However, in the cases of France and Israel, leaders faced calamitous consequences as enemy forces rapidly advanced toward their capitals, forcing immediate decisions under immense pressure. In the latter cases, leaders had to gather information, rebuild mental models, and gauge the impact while responding immediately to the unfolding crisis. As Gray has observed, the urgency of the situation and the presence of ongoing events to react to will significantly impact decision quality.¹¹¹ Brief, self-terminating, events allow for a more measured response and retrospective analysis before major actions are taken,

Arab Uprisings," *International Affairs* 98, no. 1 (January 2022): 45.); and 'the west, led by the US administration of Barack Obama, 'failed to see the Arab revolts coming,' From Hope to Agony, What's Left of the Arab Spring?" *The Economic Times*, December 13, 2020.

¹¹¹ Colin S. Gray, "The Implications of Strategic Surprise" in *Strategy and History: Essays on Theory and Practice* (Newport, RI: Naval War College Press, 2013).58

while extended and persistent events will often create pressure for immediate decisions in a fluid situation. This difference in duration and persistence thus plays a critical role in shaping the nature of the response, the quality of decision-making, and ultimately, the outcome of the strategic surprise.

In studying a number of (admittedly tactical) cases, Finkel concluded that a common feature of successful responses was how readily the policy establishment 'resolved pre-surprise debates'.¹¹² Might a rapid onset surprise, though traumatic, offer a 'clean break' between strategic plans and the subsequent response where the catalysing shock creates a clear imperative for change? Creeping surprises offer their own challenges as the gradual nature of change can make it difficult to identify a clear transition point and build consensus for a new approach. When the Australian NDS (and its allied equivalents) express concerns about a 'lack of strategic warning time,' it is crucial to question the temporal dimension of the surprise they anticipate. Are we preparing for rapid, bolt-from-the-blue surprises, or for longer, unfolding crises? Different types of surprises, distinguished by their temporal characteristics, may require distinct preparations and responses. Understanding these differences is important when considering how to prepare military and political leadership for strategic surprise.

Informational

Wohlstetter was perhaps the first major author to introduce the concept of noise in detecting impending surprise, primarily in the context of predicting or anticipating such events. However, noise is equally important once a surprise begins to unfold. To fully grasp the role of information entropy in strategic surprise, we must first consider Shannon's 'fundamental problem of communication,' which defines a data communication system as having three elements: 'a source of data, a communication channel, and a receiver'.¹¹³ The central challenge, according to Shannon, is not just transmitting data, but ensuring the receiver can accurately interpret the information based on the signal received through the channel. In the context of strategic surprise, two variables shape how events are understood in real time: the clarity of the signal and the level of noise or distortion in the channel, sharply contrasted in two surprise attacks on American soil - Pearl Harbor and 9/11.

Both the clarity and lack of distortion in the transmission of information during the initial attack on Pearl Harbor are noteworthy. Within 17 minutes of the first strike, Pearl Harbor's command issued a clear alert 'air raid on Pearl Harbor X this is not a drill'.¹¹⁴ This message was transmitted across the Pacific to Washington D.C. in minutes meaning key decision-makers, including the Secretary of the Navy and President Roosevelt, were briefed within two hours of the attack.¹¹⁵ The information source was both reliable and authoritative with messages transmitted by professional staff using pre-formatted, templated communications. They were clear, succinct, and informed by multiple data sources, including ship reports, ground observers, naval air stations, and various electronic means. Moreover, all the significant reporting *during* as well as after

¹¹² Finkel (2011), iii

¹¹³ Shannon, Claude E. "A Mathematical Theory of Communication." *The Bell System Technical Journal* 27, no. 3 (1948): 379-423, 380.

¹¹⁴ Prange et al. (1991), 539.

¹¹⁵ *ibid*

the attack was transmitted in highly structured and organised military reports, allowing it to be clearly understood and interpreted at the other end, leaving little doubt as to the relevant facts at hand. Admittedly, the information was incomplete – the exact number of aircraft took time to confirm, as did the battle damage sustained. However, information entropy was further reduced with the messages travelling through secure, uncontested military channels, including both low-frequency and high-frequency encrypted radio channels as well as submarine telegraph cables, ensuring low noise in the channel.¹¹⁶

The information quality and transmission during the 9/11 attacks stand in stark contrast. Unlike the clear, professional communications following the Pearl Harbor raid, the attacks were characterized by a lack of authoritative intelligence sources and an absence of systematic reporting.¹¹⁷ In the immediate aftermath of the first plane striking the World Trade Centre, there was no single, credible source providing a clear picture of events. Instead, information came from a multitude of uncoordinated channels, including civilian eyewitnesses, local law enforcement, and media reports.¹¹⁸ This lack of a centralized, authoritative source made it challenging for decision-makers to quickly assess the situation and respond effectively. This was exacerbated by the noise in the channel.

Television networks broadcast live footage of the unfolding events, but much of the initial reporting was speculative and often contradictory. The volume of 911 calls overwhelmed emergency response systems, with dispatchers struggling to manage the influx of information from panicked callers.¹¹⁹ These calls ranged from eyewitness accounts of the plane impacts to reports of people trapped in the towers, creating a chaotic information environment that was difficult to parse for actionable intelligence. Furthermore, the unprecedented nature of the attacks meant that there were no pre-formatted templates or established protocols for communicating this type of threat.¹²⁰ Unlike the military channels used in Pearl Harbor, the 9/11 communications relied heavily on civilian infrastructure, which quickly became overloaded with information that was often unconfirmed from sources of varying reliability, and sometimes appeared conflicting in nature. This made it extremely challenging for key decision-makers to quickly grasp the full scope and nature of the attacks, delaying effective response measures. The 9/11 Commission Report later highlighted these communication failures, noting the lack of information sharing between intelligence agencies and domestic law enforcement as a critical factor that contributed to the success of the attacks.

The NDS anticipates strategic surprise, but how well does it anticipate the effects of informational entropy? Modern preparedness must account for the informational

¹¹⁶ Prange et al (1991), 540.

¹¹⁷ Thomas H. Kean and Lee H. Hamilton, *Without Precedent: The Inside Story of the 9/11 Commission* (New York: Alfred A. Knopf, 2006).54-55.

¹¹⁸ *ibid*

¹¹⁹ The near collapse of the emergency communications systems was studied by McKinsey & Company, "Increasing FDNY's Preparedness" (New York: Fire Department of New York, 2002) refer pages 10-11 and also referenced in Police Executive Research Forum, "The Revolution in Emergency Communications" (Washington, DC: Police Executive Research Forum, 2017).

¹²⁰ Amy Zegart "September 11 and the Adaptation Failure of U.S. Intelligence Agencies." *International Security* 29, no. 4 (2005): 78-111., 78 and 80.

dimension of surprise, ensuring that leaders receive timely, clear, and reliable intelligence. In the information domain a critical question arises, how will decision-makers form a complete picture? Sense-making relies heavily on the quality and confidence of the information provided, which will determine how quickly and effectively leaders can respond to emerging threats. Modern preparedness must consider the role of information entropy in sense-making amid strategic surprise.

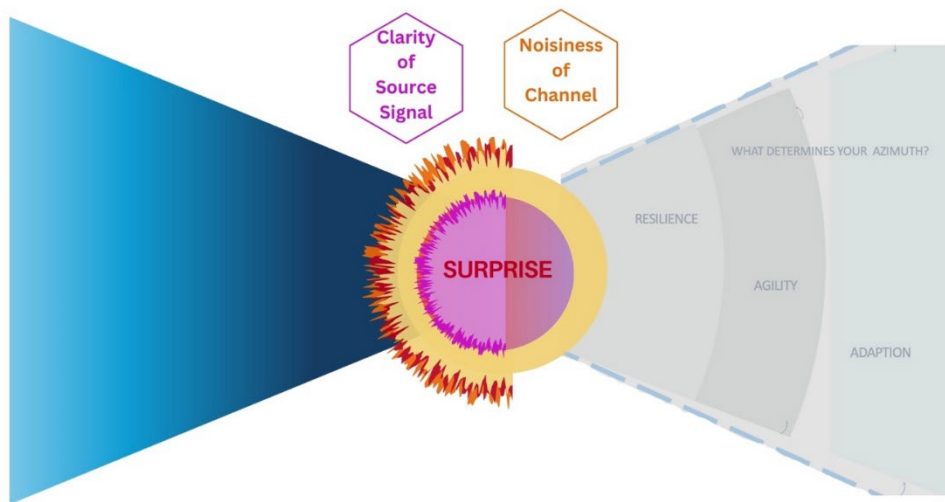


Figure 4 The experience of surprise can be influenced by the informational dimension which includes both the clarity of signal and the noisiness of the channel

Novelty and Schemata

Applying insights from cognitive science, particularly the importance of novelty, allows us to create a measure of surprise. Schematic disruption refers to the breakdown of established mental models in the face of unexpected events. The CEMS, emphasizes how greater cognitive demands lead to higher levels of surprise. Emerging literature suggests that the more explanations needed to make sense of a surprising event, the greater the level of surprise experienced.¹²¹ However, a gap exists in the literature regarding the application of schematic disruption to large-scale, organizational surprises. This thesis addresses this through two approaches: first, using interrogatives (what, where, when, who, how and why) to develop differentiating criteria; and second, employing a radar plot as a means to visualize and analyse surprise. Comparative scenario analysis is used to illustrate how these tools enhance understanding of surprise at an organizational level.

At the individual level, it's easier to ask a person to describe how novel a surprise event felt (phenomenology) compared to assessing this for an organization. The CEMS emphasizes that surprise is triggered by schema-discrepant events, with the intensity of surprise determined by the degree of discrepancy between the event and existing mental models.¹²² One approach to scaling the schematic disruption model is through

¹²¹ Mark T. Keane, "Why Some Surprises Are More Surprising Than Others: Surprise as a Metacognitive Sense of Explanatory Difficulty," *Cognition* 144 (November 2015): 53-62, 53

¹²² Meyer, Reizenzein, and Schützwohl,

estimated interrogatives, combining qualitative content analysis¹²³ —systematically coding and identifying themes—with Weick’s sense-making theory, which explores how people assign meaning to experiences of uncertainty or change.¹²⁴ This qualitative method doesn’t provide precise measurements but offers an assessment of high or low schematic impact. Developing a more formal metric for such assessments should be considered in future research. Using a ‘radar plot’ then allows us to visualize the surface area of schematic disruption. ‘Radar charts (vide Figure 5 A radar plot allows the visualisation of multiple variables, such as schema disruptors, and comparison between events for multivariate data visualization.’¹²⁵ By analysing the surface area of these plots, we can approximate the relative size of schematic disruption across two or more strategic surprises.¹²⁶

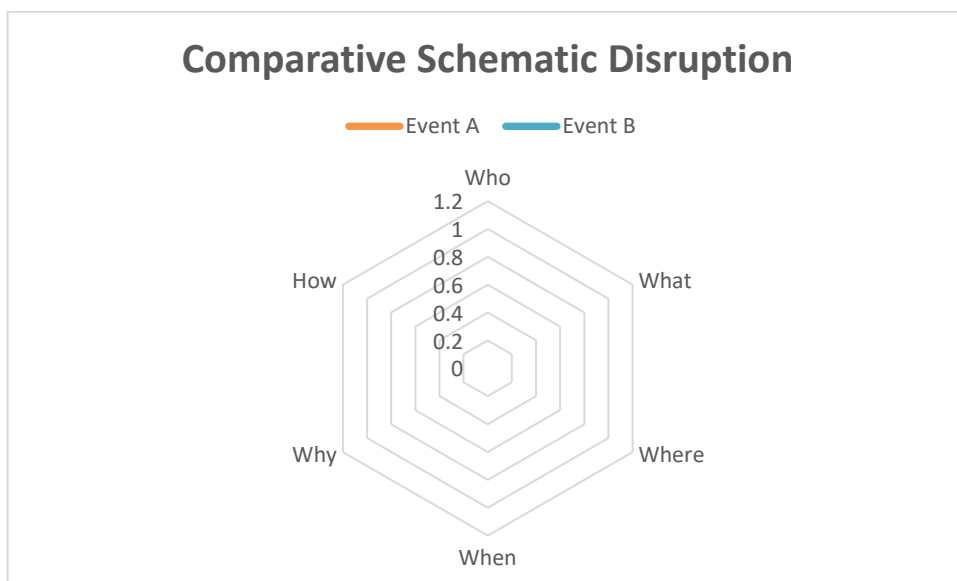


Figure 5 A radar plot allows the visualisation of multiple variables, such as schema disruptors, and comparison between events¹²⁷

The variation can be seen comparing Roosevelt (and his cabinet’s) schematic disruption with those of his successor 60 years later. In terms of ‘who’, the Japanese attack was not entirely surprising given the tensions between Japan and the US. However, the specific timing and scale were unexpected.¹²⁸ Similarly the ‘what’ and the ‘how, i.e. an aerial attack on the US Pacific Fleet using aircraft carriers operating at extended range,

¹²³ Margrit Schreier. *Qualitative Content Analysis in Practice*. London: SAGE Publications, 2012.

¹²⁴ Karl Weick *Sensemaking in Organizations* Thousand Oaks, CA: Sage Publications, 1995, iv-v

¹²⁵ Analyzing the Advantages of Using Radar Charts for Data Visualization," *International Journal of Research*, October 5, 2023,

¹²⁶ M. Joan Saary, "Radar plots: a useful way for presenting multivariate health care data," *Journal of Clinical Epidemiology* 60, no. 3 (2008): 311-317, 312.

¹²⁷ While this method provides a useful qualitative comparison, it is not a strictly quantitative metric.

¹²⁸ ‘U.S. civil and military intelligence had good information suggesting additional Japanese aggression throughout the summer and fall before the attack’ but ‘At the time, however, no reports specifically indicated an attack against Pearl Harbor.’ Gordon W. Prange, Donald M. Goldstein, and Katherine V. Dillon, *At Dawn We Slept: The Untold Story of Pearl Harbor*, 60th anniversary ed. (New York: Penguin Books, 2001) 12, 77.

were not entirely unforeseeable. While innovative, it occurred over a year after the British Royal Navy's successful carrier-based attack on the Italian fleet at Taranto in November 1940, an event that Roosevelt and his cabinet were familiar with.¹²⁹ Likewise 'when' had low schematic disruption coming in the second year of a global conflagration, with an expectation of potential conflict in the weeks leading up to Pearl Harbor.¹³⁰ This understanding in turn rested on the clear rationale for Japanese hostility, biting US economic sanctions and trade embargoes; and it was evident to both sides that the US Pacific Fleet was the most significant threat to Japan's expansionist plans in Southeast Asia. What was outside of existing planning and mental models, was the 'where'. US planners had anticipated possible attacks in the Philippines or Malay-peninsular, however, had discounted the possibility of Japanese fleet carriers being able to reach the Hawaiian Islands.

Compare this to the schematic disruption experienced by President George W. Bush and his cabinet on September 11, 2001 where almost all interrogatives were significantly outside of any existing mental schema. In terms of 'who', Al-Qaeda was a known entity, having previously attacked the World Trade Centre in 1993, however they were not seen as an imminent threat, and few anticipated such a large-scale attack from them on American soil.¹³¹ 'How' the attack had been conducted and 'what' means were used were also highly disruptive - coordinated hijackings of commercial airliners used as weapons against civilian and military targets was an unprecedented and transformative escalation in the nature of terrorism.¹³² Likewise, there was little anticipation of the timing, a seemingly random Autumn's day, during a period of relative peace for the US mainland. The suddenness of the attack shattered the perception of security that had existed since the end of the Cold War. Likewise, the rationale, the 'why' is still a subject of ongoing inquiry, though Bin Laden and Al-Qaeda cited opposition to US foreign policy and the American presence in the Middle East as primary motivations. And in terms of 'where' an attack on the continental United States, especially after the Cold War, was completely outside most policy makers' schema.¹³³

In this case, there was significant disruption across multiple dimensions, particularly the 'what' (unprecedented use of hijacked planes as weapons), 'when' (a sudden attack in peacetime), and 'where' (the US mainland, which was considered safe from such large-scale attacks). Unlike Pearl Harbor, where the main surprise was geographical, September 11 disrupted expectations in nearly every aspect, making it a much more comprehensive and multifaceted shock. The contrast between the two is illustrated on the radar plot in Figure 6.

¹²⁹ Ironically it was the US who had studied the British attack on Taranto, and contrary to opinions that the Japanese had also studied the raid, there is seemingly little evidence they did. Alan Zimm, "Taranto: The Raid, the Observer, and the Aftermath," *Naval War College Review* 65, no. 4 (2012): 110-125, 114.

¹³⁰ Frederic L. Borch and Daniel Martinez, "Kimmel, Short, and Pearl Harbor: The Final Report Revealed," *Naval History Magazine* 19, no. 5 (October 2005).

¹³¹ National Commission on Terrorist Attacks upon the United States. The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks

¹³² *ibid*

¹³³ Thomas H. Kean and Lee H. Hamilton, *Without Precedent: The Inside Story of the 9/11 Commission* (New York: Alfred A. Knopf, 2006).

Comparative Schematic Disruption

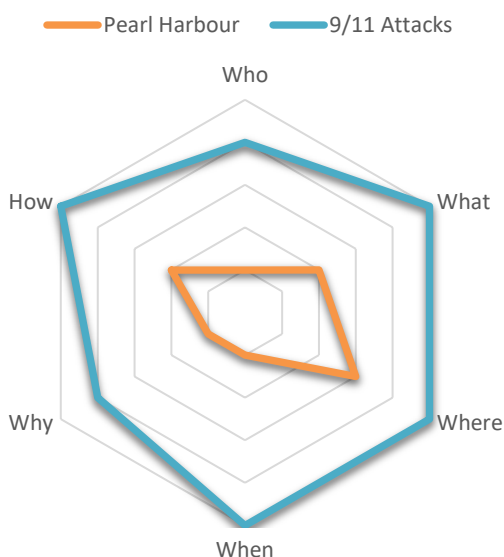


Figure 6 Radar Diagram Comparing Schematic Disruption of Pearl Harbour with September 11 Terror attacks

Schematic disruption is, perhaps one of the most challenging dimensions of surprise in the context of preparedness. To paraphrase Schelling: how do you prepare for what you cannot imagine? Cognitive surprise—instances where the response to any putative scenario is ‘they simply wouldn’t do that’—is a rich area for exploration, and understanding what makes states more capable of overcoming schematic disruption is critical. The lack of strategic warning is a significant challenge, but this is where developing a typology of surprise can assist strategic planners and policymakers. While we can’t predict the unimaginable, creating a typology based on key criteria allows us to forecast the ways we might be surprised. Although not exhaustive, such a framework can help identify relevant factors and improve preparedness, ensuring that at least some aspects of potential surprises have been considered in advance.

Equally important is examining how cognitive surprise interacts with other factors. For example, does a rapid speed of onset amplify the impact of schematic disruption? Or, if Finkel is correct that recovering from surprise requires the rapid resolution of pre-surprise debates, are there cases where a fast, persistent surprise forces resolution and definitive acclimation to a new reality? How does the informational dimension shape and influence this? Answering these research questions may enhance preparedness for strategic surprise.

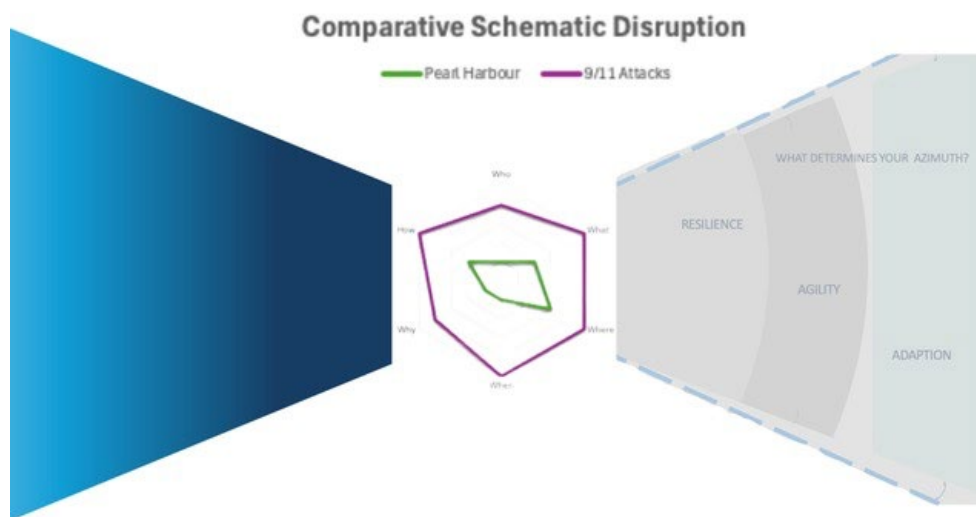


Figure 7 The level of schematic disruption can influence how surprise influences decision makers

Impact

Applying psychological insights into arousal and valence allows us to develop a fourth and final criterion for understanding strategic surprise: impact. Arousal refers to both the emotional and physiological response of decision-makers and the systemic impact, while valence captures the positive or negative emotional quality of that response. At the strategic level, the proximity of decision-makers to the event—whether physical or emotional—can significantly influence their arousal state, directly affecting their cognitive processes and decision-making capabilities.

The personal proximity of leaders to a surprise event is crucial, as individual 'windows of tolerance' for emotional arousal shape their ability to make effective decisions.¹³⁴ High arousal states, whether positive or negative, can lead to more impulsive or less reasoned responses. For example, during the Pearl Harbor attack, President Roosevelt was in the White House and received updates from his cabinet in real-time, allowing him to remain physically close to key decision-makers. His relatively stable proximity to the centre of power may have contributed to more measured responses.

In contrast, during the 9/11 attacks, President Bush was at an elementary school in Florida when the events unfolded. He was quickly removed from the scene and boarded Air Force One, creating a physical and emotional dislocation from his key advisors. Secretary of Defense Donald Rumsfeld was at the Pentagon, experiencing the attack firsthand and assisting first responders. The difference in physical proximity between Bush and Rumsfeld highlights the potential impact of location on decision-making in moments of strategic surprise. The emotional and physical dislocation of decision-making collectives is an area that warrants further analysis in understanding the role of arousal and proximity in shaping strategic responses to surprise events. Equally, much

¹³⁴ Elizabeth A. Stanley and Kelsey L. Larsen, "The Neurobiological Window of Tolerance: How Leaders' Self-Regulatory Capacity Shapes Strategic Decision-Making," *Frontiers in Psychology* 12 (2021),

has been discussed about how the events of September 11 influenced U.S. foreign policy, particularly the decision to invade Iraq in 2003—a decision in which Rumsfeld played a key role.¹³⁵ While it is speculative to link his (and Bush's) personal experiences directly to these decisions, a scaled model of arousal and valence raises important questions about the potential influence of such factors.

Proximity, whether physical or emotional, plays a significant role in shaping the decision-making process during a surprise event. For instance, while being physically remote on Air Force One, the emotional experience of separation can still have a profound impact. The physical dislocation of policy-making collectives is an area worthy of further analysis. Though it is beyond the scope of this thesis to fully explore, important questions arise about how these criteria—such as temporal factors and proximity—may combine. By examining case studies where proximity was high or low, we can assess the quality of decision-making during surprise events. What was the impact of proximity when combined with the temporal nature of the event? Or with schematic disruption? For example, could an event with low schematic disruption (i.e., an anticipated event that had been planned for) still lead to suboptimal outcomes if proximity heightened emotional arousal? Understanding these dynamics is key to improving strategic responses to surprise.

The systemic impact of surprise refers to the broader, state-wide arousal resulting from the amplification and cascading consequences of a surprise event, affecting multiple domains of state functioning and leading to significant disruption of normal operations. This concept captures how systemic arousal,¹³⁶ influenced by the scale of the event and the extent of schema disruption, interacts with individual decision-makers' emotional responses, collectively shaping national decision-making and resource allocation in times of strategic surprise.¹³⁷ Understanding this dynamic offers a critical framework for analysing state responses to unexpected crises and the broader implications for strategic planning.

The interaction between these two levels of arousal can significantly influence strategic decision-making in the face of surprise events. Personal arousal of key decision-makers may be amplified or moderated by the systemic intensity of the surprise, and vice versa. Understanding this dual-level arousal framework can provide insights into how states respond to strategic surprises and why certain decisions are made under such circumstances.

Arousal is positively correlated with valence - a surprise which fundamentally confronts our values system is likely to elicit a stronger response than one which is not so

¹³⁵ For the arguments linking the September 11 attacks and the decision to invade Iraq see Melvyn P. Leffler, *9/11 and Iraq: The Making of a Tragedy*, Brookings Institution, September 7, 2021. For an examination of the role that Rumsfeld, and others with personal proximity to the events of the attacks, played in the decision to go to war in 2003 see Joshua Rovner, "Why Did the United States Invade Iraq? The Debate at 20 Years," *Texas National Security Review* 6, no. 3 (Summer 2023)

¹³⁶ William Hutchison "A Systemic View of Surprise Attacks: Why It Matters," *Journal of Information Warfare* 22, no. 4, accessed October 6, 2024,

¹³⁷ Rainer Reisenzein, Wulf-Uwe Meyer, and Michael Niepel, "Surprise," in *Encyclopedia of Human Behavior*, 2nd ed., accessed October 6, 2024

discordant. The concept of valence in surprise is a subject of ongoing enquiry in emotion research. While some scholars argue that surprise is valence-neutral, others, such as Noordewier and Breugelmans, contend that surprise has inherent valence, stating that 'surprise is indeed valenced' and can be experienced as either positive or negative depending on the context. The unexpected Japanese attack on Pearl Harbor was, obviously, strongly negative for Americans, causing immediate shock, fear, and anger. There is, however, further research needed to quantify whether the galvanising effect outweighed the initial shock and emotion that it engendered. Returning to the example of the Fall of the Berlin Wall, those who had a positive view of events (i.e. the West German State) have been judged as better able to respond to the surprise than those who had the opposite valence.¹³⁸

To again consider the implications of the loss of warning foreshadowed in the NDS, it would seem a comprehensive framework is needed to better anticipate not just the types of surprises that may arise but also the systemic impacts they may trigger. This involves developing tools and processes to observe, anticipate, and mitigate the amplification and cascading consequences that often follow unexpected events. Additionally, thinking about how valence may shape not only decision makers, but the broader public, should be a part of prudent preparedness.

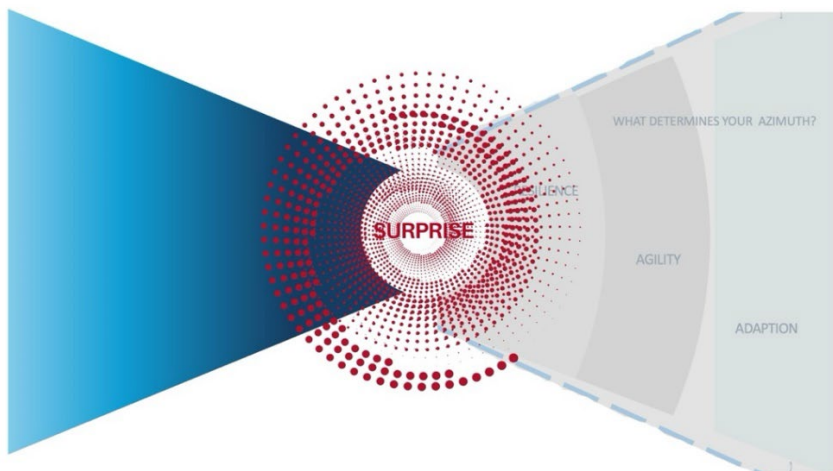


Figure 8 The impact of strategic surprise is shaped by the proximity of decision makers, the systemic impact and the valence of the event

¹³⁸ Grix (2000), p. 143

Conclusions and Future Research

Having examined traditional thinking on strategic surprise, including classical theories, case studies of major events, and both orthodox and revisionist approaches, this thesis identified key gaps—namely the two-dimensional treatment of surprise and the focus on pre-surprise aversion. To address these gaps, it integrated insights from cognitive science and psychology, broadening our understanding of how surprise unfolds. CEMS provided insights into novelty and schematic disruption, while psychology contributed to understanding systemic impact and valence. These insights informed the development of a framework for analysing surprise across four key dimensions: temporal, informational, schematic disruption, and impact.

Having integrated traditional thinking about surprise with new fields to create differentiating criteria, each criterion offers new insights into, and questions for, preparedness. It is also apparent that these criteria are only a first step in addressing important questions that arise, demanding a more comprehensive typological framework to account for multiple types of surprise, equipping us to respond to a range of scenarios. In doing so numerous questions remain to be explored.

Regarding the temporal dimension, a rapid onset surprise, though traumatic, may offer a 'clean break' between strategic plans and dynamic responses, creating a clear imperative for change. In contrast, creeping surprises pose their own challenges, as the gradual nature of change makes it difficult to identify a transition point and build consensus for a new approach. When the Australian NDS and its allied equivalents express concern about a 'lack of strategic warning time,' it is essential to consider the temporal characteristics of the surprise they anticipate. Are we preparing for rapid, bolt-from-the-blue events or for longer, unfolding crises? Each type demands distinct preparations and responses.

And how well have Australian and allied policy makers accounted for the effects of informational entropy? Preparedness must ensure that leaders receive clear, timely, and reliable intelligence, placing a demand on our preparedness framework to consider how decision-makers form a complete picture in the midst of surprise. Moreover, schematic disruption appears to be perhaps the most challenging dimension of surprise for preparedness. As Schelling's insight suggests, how do you prepare for what you cannot imagine? Understanding how states overcome schematic disruption is essential for future research - creating a typology of surprise may help planners foresee how we might be surprised, even if we cannot predict the exact event. A lack of strategic warning is a significant challenge, but, while we can't predict the unimaginable, creating a typology based on key criteria allows us to forecast the ways we might be surprised.

The systemic impact of a surprise also requires attention, such as the prosaic but important procedural aspects of decision-making – understanding potential personal and collective dislocation, as well as the personal, emotional, and physical relationships that may compromise decision-makers' objectivity. Finally, we need tools and processes to observe, anticipate, and mitigate the systemic impacts surprise may trigger, including amplification and cascading consequences. This includes considering how valence influences both decision-makers and the broader public should be part of prudent

preparedness planning.

Equally important is examining how these dimensions interact with each other. Does a rapid onset amplify the impact of schematic disruption, or clarify pre-surprise debates? And how might informational entropy accentuate or attenuate this dynamic? If strong information entropy worsens schematic disruption, are there certain circumstances, where a lack of information could reduce the cognitive load on decision-makers. While the criteria in this thesis move us closer to an ontology of strategic surprise, these questions suggest the need for a more comprehensive framework to provide meaningful and structured answers to these and other questions. This thesis seeks to provide policymakers with a clearer language to classify and prepare for different types of strategic surprise, offering a foundation for improved preparedness and response strategies. But it will need further research, the development of a typology of ideal types and fsQCA case study analysis as a foundation for essential research into national preparedness for strategic surprise.

The invasion of Ukraine in 2022, the attack on Israel in 2023, and potential flashpoints looming in 2025, are reminders that strategic surprise remains both relevant and seemingly inevitable. Intelligence and threat aversion are core responsibilities for any government, but we must also prepare for the inevitable shift from making predictions to diagnosing strategic surprises in real time. As Mike Tyson might say, we may have a plan, even a National Defence Strategy, but are we truly ready to be punched in the face?

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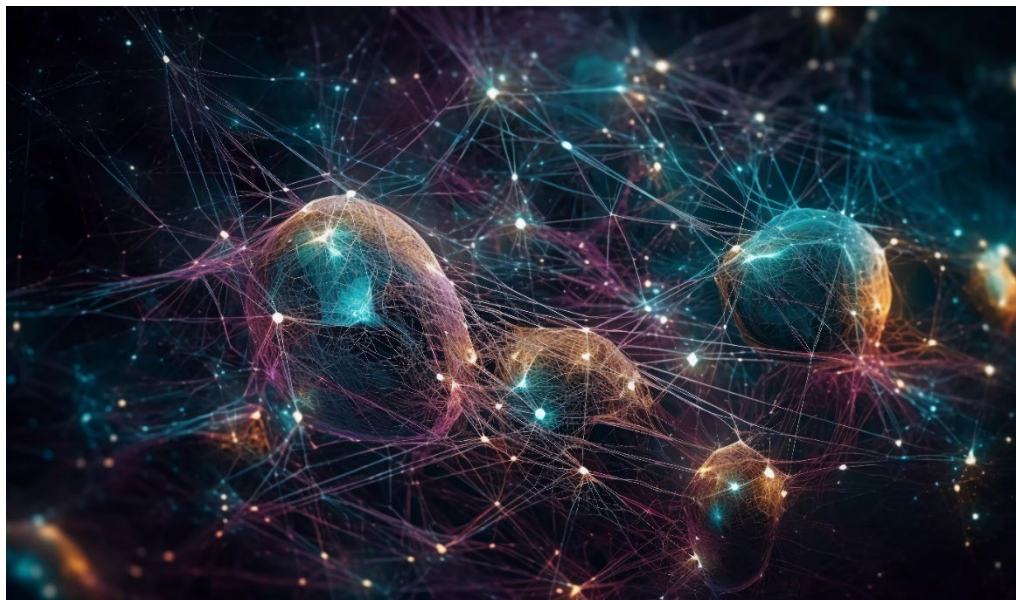
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Quantum Statecraft: A New Narrative for International Relations

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(Image courtesy of MDRakib. Available at www.vecteesy.com)

This thesis is submitted in partial fulfilment of the requirements for the
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About the Author



Sharryn is a civilian in the Department of Defence. She is also an Army reservist, and in 2025 is representing Army on continuous full-time service at the National Security College, the Australian National University. Prior, she held multiple roles in the Defence portfolio, principally in intelligence practice, intelligence capability, and strategic assessment. Sharryn holds a Master of National Security and Strategy (Leading International Policy), a Master of Military and Defence Studies, a Master of Intelligence Analysis, and a Graduate Diploma in Strategic Intelligence. She is a graduate of the Defence Department's Australian War College, the Australian Command and Staff College, and the ANU Asia-Pacific Centre for Security Studies. Sharryn's current research interests include the application of statecraft in strategy, intelligence tradecraft in practice, leadership in geo-strategic competition, and the

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For Imogen and Erin, my elegant additions to the material world.

Someone clever once said “to write is to bleed.”

Can confirm.

Summary

Classical theories of international relations (IR) inadequately address the intricacies of modern state-based behaviour, falling short in their attempt to explain and extrapolate possible outcomes due to their linearity, reliance on rigid frameworks, overemphasis on material power, and difficulties in adapting to complex, evolving scenarios.

A quantum statecraft narrative incorporates quantum principles for understanding and communicating IR, demonstrating better relevance to modern statecraft in-praxis. It emphasises the complexity, interconnected nature, and the potential for multiple simultaneous states in IR, and global statecraft’s probabilistic nature

Beginning with a review of available literature, this thesis considers the novel potential of a quantum statecraft narrative to offer a potent alternative to classical IR theories. It delivers a compelling analysis of quantum statecraft narrative’s utility before closing with a consideration of its value for the contemporary statecraft practitioner.

This quantum statecraft narrative offers a timely evaluation that incorporates material and ideational dimensions of quantum for IR. This new perspective, prosecuted via a ‘beginner-appropriate’ crash course in quantum lexicon aims to motivate and foster innovative problem-solving in the social sciences by encouraging creative thinking to transcend traditional barriers in IR.

Introduction

"No matter how thorough our observation of the present, the (unobserved) past, like the future, is infinite and exists only as a spectrum of possibilities."

Stephen Hawking

International Relations (IR) has a problem. In the high stakes of modern statecraft, where convolution and counterintuition are regular challenges, classical IR theories fall short in capturing the full complexity of our interconnected world. We have an international environment that is volatile, uncertain, complex, and ambiguous (VUCA).¹ It is a complex adaptive system,² where the factors that drive this state-of-affairs are not new: globalisation, the dissolution of a unipolar world, re-emergence of great power competition, and numerous regional conflicts. Powerful non-state and information actors benefit from nation-state boundaries where convenient, and companies such as Black-Rock or Microsoft function within, across, and beyond those same borders to garner global influence and wealth.

The current era is affected by five major factors relating to technology and its use that increase the IR system's complexity in ways that are unique, novel, and unexpected. These factors are the immense increase of nodes within the state-system, nodal connectivity, speed of information passage, velocity of decision effects, and the rate of technological change. In short, the world has never been as complex; and disassembling the system using classical IR theory to better understand it, or control it, seemingly leads to chaos.³ The combined effect of these issues is that classical IR theory is no longer keeping pace with the challenges it seeks to explain.

IR's rising VUCA has reduced classical IR theory's explanatory and predictive effects, and now falls short of contemporary statecraft practitioners' expectations. This thesis presents a new idea, so-named 'Quantum Statecraft.' Its aligned research question has three parts:

1. What is Quantum Statecraft?
2. What is its utility and value?
3. How is Quantum Statecraft best communicated to the statecraft practitioner?

This thesis advocates for adding a quantum philosophy broadly to social science, and specifically within the IR domain. It seeks to unify physical and social quantum ontologies to provide a novel lens to analyse human behaviour and societal issues. As national power dynamics and statecraft blur in our increasingly interconnected world, quantum offers a valuable narrative for Australian policymakers and statecraft practitioners that assists in replacing outdated and exclusive classically Newtonian language too focused on finite gains, adherence to established rules, risk reduction, and guaranteed outcomes.

The quantum statecraft narrative offers a fresh perspective on global interactions. It fosters creativity and responds effectively to the complex demands of modern

¹ Dave Snowden, "Strategy in the Context of Uncertainty," *Handbook of Business Strategy* 6, no. 1 (December 1, 2005): chap. VUCA, <https://doi.org/10.1108/08944310510556955>.

² David Snowden, "The New Simplicity: Context, Narrative and Content.," *Journal of Knowledge Management* 15, no. 10 (2002): 11–15.

³ Snowden, "Strategy in the Context of Uncertainty," chap. 3: Order versus Chaos.

statecraft.⁴ This approach addresses gaps between academic communities. It also equips statecraft practitioners with necessary contextual knowledge to engage with scientific advancements that will reshape statecraft in the 21st century.⁵ A shift from Newtonian toward quantum-thinking permits statecraft practitioners to explore more paths and possibilities across strategy development and operational practice. In turn, resilience is inferred by preparing practitioners for rapid change and greater unpredictability in decision-making. This approach encourages creativity and experimentation and explains infinite learning pathways rather than leading people to linear often flawed singular courses of action. Before progressing selected definitions that will assist are listed below:

Definitions

Quantum: a discrete quantity of energy (at the atomic level), proportional in magnitude to the frequency of radiation it represents.

Quantum Narrative: Rather than describe the technical quantum physics elements, a quantum narrative uses quantum concepts to explain and 'scale-up' the non-linear factors of complexity, connectivity, speed, velocity, and rate of change, in the modern macro, or physical world.

Wash out: Some argue the 'washing out' of quantum effects in the physical world renders it irrelevant to human interactions, and the humanities. A growing number of social scientists see value in retention of these technical explanations of quantum for the humanities to highlight how human perception is influenced by quantum scientific concepts, and better understand IR, statecraft and human decision making.

Statecraft: The managing of relations between States to the advantage of one's country.

Quantum thinking: The idea that one can hold multiple opposing thoughts and can optimally put thought into action.

Quantum Statecraft: The understanding and use of quantum theory to explain and accommodate the complex system of modern IR, and its use to support the management and practice of statecraft.

Key Arguments

The first argument is that a quantum statecraft narrative can ameliorate IR theory's reduced efficacy caused by the international environment's growing VUCA. It seeks to deliver three things: Firstly, understanding of the literature already available across this subject including those that support the idea and those critical of this approach. Secondly, it offers how a quantum statecraft narrative can be utilised to leverage, construct and analyse the activities of statecraft in contemporary IR. Finally, it encourages broadening of the IR practitioner's mindset to the value of quantum statecraft, as with this knowledge, comes enhanced resilience, adaptive capacity and

⁴ Andrei Khrennikov, "Classical and Quantum Mechanics on Information Spaces with Applications to Cognitive, Psychological, Social, and Anomalous Phenomena," *Foundations of Physics* 29 (April 4, 2000), <https://doi.org/10.1023/A:1018885632116>.

⁵ Dante K. Earle, "Quantum Principles," *Military Strategy Magazine* 8, no. 3 (Winter 2022): 29–34, <https://www.militarystrategymagazine.com/article/quantum-principles/>.

depth, no matter their political, military, social or diplomatic lens through which they practice statecraft.

This thesis will contribute to wider development and progress of statecraft-in-practice by examining the broader research then analysing its utility and value to IR and policy practitioners. Harnessing the principles of quantum theory will support better IR understanding and reshape the understanding of states and their interactions. If, as argued herein, there is room to develop, utilise and value quantum theory for statecraft's practice, it is prudent to begin with 'quantum' as a noun and give it a memorable story.

For most of its linguistic life quantum has meant 'something with quantity.' The word passed into physics in 1870, during the era of electricity, although 'quantum theory' was delivered into popular use by Max Planck. Albert Einstein followed him to explain measurable bits of energy as 'quanta.' The expression 'quantum leap' arrived in 1932 and became popular when the nuclear bomb in 1945. The influence of quantum's nuclear fission and the race to develop the nuclear bombs that ended World War II cannot be underestimated. This impact and its simplified versions saw it spread into popular culture, with Einstein and his ilk becoming the era's pop-icons. Soon after, the Oxford English Dictionary claims the first use of quantum to describe something *really* big in 1956, when 'the enormous multiplication of power was described as a quantum leap'⁶ describing the US-Soviet nuclear post-war capacity for destruction.⁷ By 1982, Webster's dictionary added 'any sudden and extensive change or advance, as in a program or policy' to its definition.⁸ It has been used by Antman,⁹ the television series (Quantum Leap: 1989) and Duracell to tout its modern battery power in 2014.

A quantum statecraft narrative offers new thinking to deliver a powerful understanding with greater congruence with the contemporary international environment. As we lean into Science, Technology, Engineering, and Mathematics (STEM) as the solution for our contemporary statecraft woes, this thesis provides the prospect for IR practitioners and leaders, to see beyond accepted classical IR explanations to explain more fully reality and better predict our future. It offers for the social sciences to reckon with the exclusive cult of STEM and robustly defend the humanities.

Finally, appreciating science does not require genius, it demands character and determination, attributes that statecraft practitioners possess. A little experimentation with this post-modern thesis can enable enhanced understanding, and interdisciplinary opportunities if the practitioner is open to non-linear post-Newtonian ideas that science offers.¹⁰

⁶ Henry W. Fowler and Jeremy Butterfield, *Fowler's Dictionary of Modern English Usage*, Fourth edition (Oxford: Oxford University Press, 2015).

⁷ Michael Burstein, "The Phrase 'Quantum Leap,'" n.d., <https://mabfan.livejournal.com/532115.html>.

⁸ Merrill Perlman, "The History of Using 'quantum' to Mean 'Really Big'," *Columbia Journalism Review*, no. Language Corner (August 4, 2014), [https://www.cjr.org/language_corner/language_corner_080514.php#:~:text=%E2%80%9CQuantum%E2%80%9D%20passed%20into%20physics%20in,Albert%20Einstein%2C%20the%20OE%20D%20says.](https://www.cjr.org/language_corner/language_corner_080514.php#:~:text=%E2%80%9CQuantum%E2%80%9D%20passed%20into%20physics%20in,Albert%20Einstein%2C%20the%20OE%20D%20says.;); Fowler and Butterfield, *Fowler's Dictionary of Modern English Usage*.

⁹ Chad Orzel, "What 'Ant-Man' Gets Wrong About The Real Quantum Realm," *Forbes.com*, 3 Aug 15, <https://www.forbes.com/sites/chadorzel/2015/08/03/the-rules-of-the-quantum-realm/>.

¹⁰ Greta Fowler Snyder and Andre Hui, "Complexity and Quantum in International Relations," in *Oxford Research Encyclopedia of International Studies*, by Greta Fowler Snyder and Andre Hui (Oxford University Press, 2023), 2, <https://doi.org/10.1093/acrefore/9780190846626.013.698>. Also, Snyder and Hui offer the label "post-Newtonian" refers to those scholars who continue to work with and in Western scientific frameworks and traditions, despite their critical orientation toward Western science's dominant (Newtonian) paradigm.

Methodology

The introduction described this thesis' research question, defined key terms, and outlined core arguments. This methodology highlights the gap between the realities of the modern statecraft, and the explanations offered by classical IR theories that no longer sufficiently explain IR's complexity. This thesis therefore is exploratory. It aims to reconnoitre the breadth of the humanities philosophical understanding of quantum theory, and to establish the post-modern term 'quantum statecraft' as an appropriate nexus that joins classical IR theory with quantum science to enhance the practice of contemporary statecraft.

The new aspect of this study is significant. It explores that quantum thinking in the humanities is not new, and to demonstrate that the use of quantum language, its lexicon and philosophies has value for the practitioners of statecraft, and that quantum statecraft is an excellent start point for those who manage STEM specialists. It also aspires to bridge the worlds of quantum scientific theory, and quantum philosophy, and to analyse the utility and value of this narrative for IR practitioners. This examination investigates the extent to which this initiative delivers a paradigm shift in strategic thinking. It also offers classically trained statecraft practitioners' preparedness for technological advancement, enhanced communication strategies and decision making. This new framework for complex system modelling supports a necessary engagement with the earlier five factors that describe modern IR's complexity.

The essay has three chapters:

Literature Review

This chapter portrays the building blocks of quantum physics, and its turn toward the humanities. It explains the importance of scientific history to the subject, before illuminating quantum theory in social science. This initial investigation leads to a discussion of quantum theory in IR, then covers dissenting views. To narrow the paper's focus, an investigation into a specific consideration of quantum in politics, the military, diplomacy and economics has been set aside. This maintains emphasis on the broader scholarship of quantum for IR and its practical use for wider statecraft.

The Utility of a Quantum Statecraft Narrative

Chapter two examines the utility of a quantum statecraft narrative. It seeks to address the complexities of global IR by using quantum concepts to accommodate the five scale factors of modern statecraft – system volume, nodal connectivity, speed of information delivery, velocity of decision effects and rate of technological change. This thesis argues that narratives derived from quantum theory assist in conceptualising and communicating the complexities of 21st Century IR. It recognises that IR is rarely linear or predictable. Instead, it acknowledges the intricate entanglement, and often chaotic interactions between states, non-state actors, and information between them, as being analogous to the behaviour of particles and waves in quantum mechanics.

The utility of the quantum statecraft narrative is derived from ten foundational principles that deliver a perspective of state-based interactions and encourages policymakers to be strategically adaptive. It emphasises that actions taken by one state can have far-reaching and non-linear effects on others, reflecting the increasing scaled-up and entangled nature of inter-and intra-state interactions. Quantum statecraft considers the impact of emerging technologies, such as artificial intelligence (AI) and quantum computing on statecraft, and why a broadly technical knowledge of quantum will

significantly benefit generalists (of the humanities), as they adopt leadership positions, and manage STEM in all areas of statecraft in praxis.

Put simply, this essay claims that leaving quantum to STEM specialists alone is a haphazard way to lead one's nation-state into a quantum age. The technology that will reshape state-interactions and decision-making will be improved vastly by integrating insights from quantum theory to provide a more comprehensive understanding of global affairs than the exhausted state-centric classical Newtonian IR can offer.¹¹

The Value of a Quantum Statecraft Narrative for the Practitioner

This chapter is a synthesis of study's main arguments to consider the value of a quantum statecraft narrative for the practitioner. It will outline the issues of education and training of quantum statecraft narrative. It will reinforce that a novel quantum statecraft narrative can help address unknowns, rather than assume they are 'categorically unknowable' and assist statecraft practitioners to interrogate IR problems through multiple lenses. The convergence envisaged through quantum statecraft narrative between IR and quantum principles, coupled with new technologies and knowledge, can reshape even revolutionise understanding of strategy, diplomacy, warfare, and economics all specialised areas through a deliberate quantum turn.

Summary

This thesis will conclude that a narrative of quantum theory for practicing statecraft will not just deliver more insightful analysts, it will transform how the fabric of IR is perceived. In a world where traditional models are increasingly strained, quantum-inspired thinking could be the competitive edge for navigating the complexities of 21st-century IR. This paper will now review the growing body of literature that captures scholarly thinking about quantum theory and IR.

¹¹ Danah Zohar, *Zero Distance: Management in the Quantum Age* (Singapore: Palgrave Macmillan, 2022), 19, <https://doi.org/10.1007/978-981-16-7849-3>.

Chapter 1 Literature Review

“The answer is to overturn all that was once believed reasonable and rational.”

Zhang Ruimin, CEO, Haier Group.¹²

Most dictionaries define quantum simply as ‘an amount’. However, its potential to illuminate the five phenomena, mentioned in the introduction, that have profoundly changed IR in ways that see classical theories struggling, is unique and unexpected. This infuses the term ‘quantum’ with gravitas and relevance. This thesis argues that there is a gap between classical IR theory and the contemporary experience of statecraft practitioners; and that it is possible to provide order from the current IR chaos by offering a narrative aligned with quantum theory that enriches contemporary IR discourse drawing from but without relying on the scientific principles of quantum physics itself.¹³

To begin the ordering, this chapter reviews literature that examines quantum theory, and its turn to the humanities. Firstly, it addresses the old and new schools of physics and provides an abridged explanation of the importance of scientific history to quantum statecraft for the practitioner, and why this storyline embeds so well with the practitioner.¹⁴ This review limits its scope to a consideration of quantum social science and IR; while there is literature stemming from the specialised areas of quantum theory in politics, diplomacy, warfare and economics, these require future treatment. Then, to demonstrate the utility and value of a quantum statecraft narrative this chapter will draw contextual similarities with gaming and complexity theory, and multi-methodology texts. Finally, it will examine opposition to quantum’s turn to the humanities.

The Importance of Scientific History to Quantum Statecraft

Short of war, overt aggression in the modern world is frowned upon across all levels of competition. In its place, passive aggression plays out across personal, business, collective group and nation-state competition. In the discourse of human interaction this phenomenon is comparatively new. The subtlety with which competition now occurs has seen a language vacuum emerge as society struggles to articulate this shift. In this vacuum, military language often provides a near enough-good enough solution for the dearth of appropriate diplomatic, political and economic language that can explain scaled up inter-and-intra state competition, and the aligned manoeuvring of statecraft.

¹⁵

In his work on the influence that scientific principles have on war, Antoine Bousquet offered four epochs.¹⁶ First was the 1600’s ‘Newtonian’ worldview as a clockwork mechanism composed of atomistic, fragmented parts governed by deterministic laws,

¹² Zohar, *Zero Distance*.

¹³ Anke Beger and Thomas H. Smith, eds., *How Metaphors Guide, Teach and Popularize Science*, Figurative Thought and Language (FTL) (Amsterdam: John Benjamins Publishing Company, 2020), <https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,sso&db=nlebk&AN=2411828&site=eds-live&custid=s3330841>.

¹⁴ David Hills, “Metaphor,” ed. Edward N. Zalta and Uri Nodelman, *The {Stanford} Encyclopedia of Philosophy*, Stanford Encyclopedia of Philosophy, Fall 2024, <https://plato.stanford.edu/cgi-bin/encyclopedia/archinfo.cgi?entry=metaphor>.

¹⁵ Zohar, *Zero Distance*.

¹⁶ James A. Robinson, “Newtonianism and the Constitution,” *Midwest Journal of Political Science* 1, no. 3/4 (1957): 252, <https://doi.org/10.2307/2109303>.

with materialism emerging as the dominant value. This represented the order, regularity and predictability that science sought to uncover in the workings of the universe. Second was the technology of the engine, with 19th Century became an epoch of unstable thermodynamics. The technically concentrated 20th Century delivered the epoch of cybernetics and network-centrism, after WWII, that reflected institutionalised bureaucracies and the emergence of computation.¹⁷ This was useful until network theory was progressively displaced as notions of predictability and control over systems required combining chaos and complexity for his final epoch of 'chaoplexity,' whereby the five factors raised earlier being increase in nodes, connectivity between the nodes, speed of occurrence, velocity of decision effect and the rate of technological change decisively upended everything in favour of non-linearity.¹⁸

While this description of Bousquet's 2022 book was written to describe the technoscientific epochs of warfare, there is an obvious link whereby this thesis introduces a fifth epoch, that of a quantum era, that neatly extends his ideas from a discussion of warfare to one around a globalised IR theory whereby perspective shifts.¹⁹ While Bousquet's theory focuses on the battlefield, Schubert et al argues that his reasoning could be extended to all forms of statecraft, including politics, diplomacy and economics.²⁰ Harding,²¹ Kavalski²² and Akrivoulis think similarly.²³ Further, McIntosh describes the entwining of technology and warfare as it extends beyond physical hardware. This idea he clearly describes as quantum entanglement and includes information warfare, where narratives, disinformation campaigns, and propaganda leverage technological platforms to shape public opinion and destabilise adversaries.²⁴ The rise of social media as a battlefield for influence and manipulation underscores the transformative impact of technology on all forms of statecraft.

Akrivoulis argues that the alignment of Newtonian thinking with the social sciences, particularly IR, has not kept up pace with the changes in science, and that a quantum turn is necessary to advance theory in IR.²⁵ His argument, supported by Rodgers earlier work, that IR's existing paradigm, heavily influenced by Newtonian science, views organisations as machines operating under predictable and stable laws.²⁶ In turn, this perspective fosters a mindset focused on efficiency and risk elimination. Through the

¹⁷ Antoine J. Bousquet, *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity*, 2nd edition (New York: Columbia University Press, 2022).

¹⁸ *Ibid.*, 27–32.

¹⁹ Allison Abbe, "Understanding the Adversary: Strategic Empathy and Perspective Taking in National Security," *The US Army War College Quarterly: Parameters* 53, no. 2 (May 19, 2023): 33, <https://doi.org/10.55540/0031-1723.3221>.

²⁰ Glendon Schubert, Hayward R. Alker, and Dina Zinnes, "The Evolution of Political Science: Paradigms of Physics, Biology, and Politics [with Commentaries]," *Politics and the Life Sciences* 1, no. 2 (1983): 97–124, <http://www.jstor.org.ezproxy-f.deakin.edu.au/stable/4235317>.

²¹ Sandra Harding, "Science Is 'Good to Think With,'" *Social Text* 46–47 (1996): 15–26.

²² Emilian Kavalski, "Waking IR Up from Its 'Deep Newtonian Slumber,'" *Millennium* 4, no. 1 (2012): 137–50, file:///Users/sharrynparker/Documents/University/Deakin%20University/Kavalski_Millennium2012.pdf.

²³ Dimitrios Efthymiou Akrivoulis, "The Ways of Stargazing: Newtonian Metaphoricity in American Foreign Policy," in *Political Language and Metaphor. Interpreting and Changing the World* (London: Routledge, 2008), 15–27.

²⁴ Chris McIntosh, "Writing Quantum Entanglement into International Relations: Temporality, Positionality, and the Ontology of War," *Millennium* 49, no. 1 (September 1, 2020): 162–74, <https://doi.org/10.1177/0305829820971688>.

²⁵ Dimitrios Efthymiou Akrivoulis, "The Quantum Politics Metaphor in International Relations: Revising 'American Newtonianism'" (2002).

²⁶ Hugh I. Rodgers, "Charles A. Beard, the 'New Physics,' and Historical Relativity," *The Historian* 30, no. 4 (1968): 560, <http://www.jstor.org.ezproxy-b.deakin.edu.au/stable/24440883>.

statecraft practitioners' lens, this leads to top-down management styles that prioritises and reward certainty. However, quantum physics emphasises uncertainty's creative potential. It suggesting that complex systems thrive when allowed to self-organise and engage in dialogue within their own environments, a point that Robinson²⁷ and Feyerabend in 1957,²⁸ Barad in 2005,²⁹ Kessler in 2007³⁰ and Armstrong et al in 2019³¹ all support. Barad's claim is that these systems are most effective at the 'edge of chaos', where instability fosters innovation.

Ideas such as Feyerabend's literary example are not new. John Randall published a particularly instructive book on the Science of Man in 1926 that discussed scientific ideals, and Newtonian and mechanistic thinking.³² A selected reading list, available at the end of each chapter is valuable to further study on the subject. It may be, then, as Australian scholar David Chalmers notes, that the Newtonian framework has led to isolationist thinking and unsustainable practices that no longer service the entirety of our social and IR experience.³³ Despite these significant challenges, many, including Flyvbjerg and Gunnell continue to approach these issues with a business-as-usual mindset.³⁴ As the quantum philosopher Danah Zohar surmises 'this is the only game we know.'³⁵ Noting the one hundred years of discussion that has passed since Randall's observations in 1926, it is broadly evident to contemporary practitioners that the interplay of 18th Century science with 21st Century statecraft is due a fundamental shift in thinking to meet the demands of the 21st century's global complexities.

Quantum's Humanities Turn

Despite the desire of many quantum physicists the broad, and popular culture-based use of the language of science without fully grasping its implications, often leads to its scientifically frustrating tautological use where terms that merely capture changing ideas without deeper understanding are often misused. However, while this frustration, as will be expressed in a later section, invites picking a side, theorists like Hone, in "Metaphor's for Diplomats," have proffered well considered ideas around why telling stories is important, and have concluded that science has a significant role in telling them.³⁶ Her

²⁷ Robinson, "Newtonianism and the Constitution," 254–56.

²⁸ P. K. Feyerabend, "An Attempt at a Realistic Interpretation of Experience," *Proceedings of the Aristotelian Society* 58 (1957): 150–53, <http://www.jstor.org.ezproxy-f.deakin.edu.au/stable/4544593>.

²⁹ Karen Barad, "Posthumanist Performativity: Toward an Understanding of How Matter Comes to Matter," *Signs: Journal of Women in Culture and Society* 28, no. 3 (March 2003): 801–31, <https://doi.org/10.1086/345321>.

³⁰ Oliver Kessler, "From Agents and Structures to Minds and Bodies: Of Supervenience, Quantum, and the Linguistic Turn," *Journal of International Relations and Development* 10, no. 3 (September 2007): 243–71, <https://doi.org/10.1057/palgrave.jird.1800131>.

³¹ Rachel Armstrong, Simone Ferracina, and Rolf Hughes, "Mind as Substance," in *Liquid Life, On Non-Linear Materiality* (Punctum Books, 2019), 206–9, <https://doi.org/10.2307/jj.2353974.59>.

³² John Herman Randall, *The Making of the Modern Mind: A Survey of the Intellectual Background of the Present Age*, 50th anniversary ed (New York: Columbia University Press, 1976), 253–82; 308–33; and 497–532.

³³ David J. Chalmers, "Why Isn't There More Progress in Philosophy?," *Philosophy* 90, no. 351 (2015): 3–31, <http://www.jstor.org.ezproxy-b.deakin.edu.au/stable/44015138>.

³⁴ Bent Flyvbjerg, *Making Social Science Matter: Why Social Inquiry Fails and How It Can Succeed Again* (Cambridge, UK: Cambridge University Press, 2001); John G. Gunnell, "Political Science on the Cusp: Recovering a Discipline's Past," *American Political Science Review* 99, no. 4 (2005): 597–609.

³⁵ Zohar, *Zero Distance*.

³⁶ Katarina Hone, "Metaphor for Diplomats," n.d., <https://www.diplomacy.edu/blog/metaphors-diplomats-philosophy-science/>.

counterparts Beger and Smith, in their book “How metaphors guide teach and popularise science” also present a sensible counterpoint to the purists, by focusing on how to integrate quantum principles into the practice of IR.³⁷ In their journal article on Generalised Quantum Theory, Walach and Stillfried explore how quantum scientific theory can enhance decision making, leadership, and policy development across the practice of statecraft.³⁸ Their research has demonstrated how non-specialists can utilise and value scientific theories.

Akrivoulis wrote in 2002, ‘if we consider how terms like ‘quantum entanglement’ might help us understand the intricate, instantaneous connections between global events, or how ‘superpositions’ could provide a framework for analysing complex diplomatic situations where multiple realities seem to coexist until a decision is made, or ‘uncertainty’ acknowledges the observer’s role in shaping outcomes, and recognises that distant events can be intimately connected’.³⁹ Understanding quantum principles then, delivers access to powerful metaphors and analytical tools for the social science theorists. This might prove to be especially important for any IR theorist attempting to tether the many IR theories, as Moon and Blackman describe.⁴⁰

In 2008, Akrivoulis’ further claimed ‘the potential of a quantum statecraft narrative is boundless’, becomes easier to accept⁴¹ the more broadly his ideas were considered by others. In 2015, Dellsen expressed IR could be perceived as a field of probabilities and potentials rather than a chessboard of unrelated pieces.⁴² Beyond 2015, Grinbaum follows this idea with a stronger claim of the narrative method’s power, claiming ‘quantum technologists ought to support the provocation of an aesthetic perception in the public commensurable with the mathematical beauty of a quantum as it is experienced by the physicist.’⁴³

One could easily stay within the specific quantum science lane to expand this reading list. A venture by Pothos and Busemeyer,⁴⁴ and Campagne⁴⁵ across the sciences to the realm of mathematical and other psychology provides an irresistible pull toward the concept of human cognition,⁴⁶ and irrationality, the most non-linear of complex ideas. Here, Ori and Rom Brafman consider examples of humanity’s propensity to irrationality,

³⁷ Beger and Smith, *How Metaphors Guide, Teach and Popularize Science*.

³⁸ Harald Walach and Nikolaus von Stillfried, “Generalised Quantum Theory: Basic Idea and General Intuition; A Background Story and Overview,” *Axiomathes* 21, no. 2 (2011): 185–209.

³⁹ Akrivoulis, “The Quantum Politics Metaphor in International Relations: Revising ‘American Newtonianism.’”

⁴⁰ Katie Moon and Deborah Blackman, “A Guide to Ontology, Epistemology and Philosophical Perspectives for Interdisciplinary Researchers.,” May 2, 2017, <https://i2insights.org/2017/05/02/philosophy-for-interdisciplinarity/>.

⁴¹ Akrivoulis, “The Ways of Stargazing: Newtonian Metaphoricity in American Foreign Policy.”

⁴² Finnur Dellsen, “Scientific Progress: Knowledge versus Understanding” (Studies in History and Philosophy of Science, 2015), <https://philpapers.org/archive/DELSPPK.pdf>.

⁴³ Alexei Grinbaum, “Narratives of Quantum Theory in the Age of Quantum Technologies,” *Ethics and Information Technology* 19, no. 4 (December 1, 2017): 295–306, <https://doi.org/10.1007/s10676-017-9424-6>.

⁴⁴ Emmanuel M. Pothos and Jerome R. Busemeyer, “Can Quantum Probability Provide a New Direction for Cognitive Modeling?,” *Behavioral and Brain Sciences* 36, no. 3 (2013): 255–74, <https://doi.org/10.1017/S0140525X12001525>.

⁴⁵ Daniel M. Campagne, “Quantum Physics and the Future of Psychology,” *The Journal of Mind and Behavior* 40, no. 3/4 (2019): 213–24, <https://www-jstor-org.ezproxy-b.deakin.edu.au/stable/26904002>.

⁴⁶ Jerome R. Busemeyer and Peter Bruza, *Quantum Models of Cognition and Decision* (Cambridge, UK: Cambridge University Press, 2012); Jerome R. Busemeyer, Zheng Wang, and James Townsend, “Quantum Dynamics of Human Decision-Making,” *Journal of Mathematical Psychology* 50, no. 3 (2006): 220–41.

particularly challenging to Newtonian linear thought in IR, in 2008's book 'Sway'.⁴⁷ This follows the extensive psychology works of Nobel laureate Daniel Kahneman,⁴⁸ and his academic partner Amos Tversky,⁴⁹ who adopted a mathematical psychology perspective in their experiments.⁵⁰

It is important to understand that while Brafman et al do not use quantum theory directly, the narrative of quantum goes a long way in describing the anomalies of individual and collective human nature that are not well supported by IR's comparatively linear paradigms. These influential paradigms of bounded rationality, and the utility of rational choice that IR's realism, libertarianism or constructivism deliver, as pointed out in Levy's and Shleifer's article's on Kahneman's contributions to interdisciplinary studies of decision, judgement and prospect theory.⁵¹ Rosenberg offered in 2017 that social science is biological science.⁵² If classical and neo-classical IR theories are based on human actor rationality, then more work is required to test these underlying assumptions. The Australian cognitive scientist David Chalmers is a proponent of this quantum turn,⁵³ as is Nobel laureate Roger Penrose if only because he offers that classical physics has not yet solved consciousness (an imperative issue for AI development).

Quantum Social Science

Quantum social science is an emerging interdisciplinary field that applies principles of quantum mechanics to understand social phenomena, decision making and human behaviour. Erskine et al contemplates the classical assumptions of social sciences by proposing that intentional phenomena, including psychological facts can be viewed as quantum processes.⁵⁴ This perspective is supported by the notion that cognitive biases, identified by Tversky and Kahneman,⁵⁵ can be better understood through quantum

⁴⁷ Ori Brafman and Rom Brafman, *Sway: The Irresistible Pull of Irrational Behavior* (New York: Doubleday, 2008).

⁴⁸ Despite never taking a course in economics, Kahneman was awarded the Nobel memorial prize in economics in 2002 for having integrated insights from psychological research into economic science, especially concerning human judgement and decision-making under uncertainty. A pioneer of behavioural economics, he upended the idea that financial decision are governed by logic.

⁴⁹ Amos Tversky and Daniel Kahneman, "Rational Choice and the Framing of Decisions," *The Journal of Business* 59, no. 4 (1986): S251–78, <http://www.jstor.org.ezproxy-b.deakin.edu.au/stable/2352759>.

⁵⁰ Michael Lewis, *The Undoing Project: A Friendship That Changed the World* (London: Penguin Books, 2017); Amos Tversky and Daniel Kahneman, "Judgment under Uncertainty: Heuristics and Biases," *Science* 185, no. 4157 (1974): 1124–31, <http://www.jstor.org.ezproxy-b.deakin.edu.au/stable/1738360>; Daniel Kahneman and Amos Tversky, "Prospect Theory: An Analysis of Decision under Risk," *Econometrica* 47, no. 2 (1979): 263–91, <https://doi.org/10.2307/1914185>.

⁵¹ Jack S. Levy, "Daniel Kahneman: Judgment, Decision, and Rationality," *PS: Political Science and Politics* 35, no. 2 (2002): 271–73, <http://www.jstor.org.ezproxy-b.deakin.edu.au/stable/1554738>; Andrei Shleifer, "Psychologists at the Gate: A Review of Daniel Kahneman's 'Thinking, Fast and Slow,'" *Journal of Economic Literature* 50, no. 4 (2012): 1080–91, <http://www.jstor.org.ezproxy-b.deakin.edu.au/stable/23644912>.

⁵² Alex Rosenberg, "Why Social Science Is Biological Science," *Journal for General Philosophy of Science* 48, no. 3 (September 1, 2017): 341–69, <https://doi.org/10.1007/s10838-017-9365-0>.

⁵³ Chalmers, "Why Isn't There More Progress in Philosophy?," 2015; Anthony Brueckner, "Chalmers's Conceivability Argument for Dualism," *Analysis* 61, no. 3 (2001): 187–93, <http://www.jstor.org.ezproxy-b.deakin.edu.au/stable/3329232>.

⁵⁴ Toni Erskine, Stefano Guzzini, and David A. Welch, "Alexander Wendt, Quantum Mind and Social Science: Unifying Physical and Social Ontology," *International Theory* 14, no. 1 (2022): 115–16, <https://doi.org/10.1017/S1752971921000038>.

⁵⁵ Tversky and Kahneman, "Judgment under Uncertainty: Heuristics and Biases."

decision theory.⁵⁶ Schubert et al 1983 work on the evolution of biology, physics and psychology established that neither quantum science, and the subsequent humanities-based quantum philosophies pertaining to such, are new. Its main theme aims to bridge the interdisciplinary divide between topics by proposing a novel analytical framework that offers deeper insights into the collective consciousness of international politics.⁵⁷

A key modern proponent for quantum social science, is Alexander Wendt. His book "Quantum Mind and Social Science" hypothesises that all intentional phenomena, including both psychological and social facts are macroscopic quantum mechanical processes.⁵⁸ Wendt's views are most challenging. They do, however, highlight the fact that the social sciences, including IR, have not systematically discussed the potential relevance of work conducted during the century old quantum revolution. According to Wendt, that has left social scientists today operating from an implicit and impoverished 19th Century world view that cannot accommodate important facts about human subjectivity. This position is supported by several others, such as Reyes-Galindo,⁵⁹ Busemeyer et al, who explicitly compare a classical model of human information processing with alternatives that draw on a quantum model.⁶⁰

Bagarello⁶¹ and James Der Derian⁶² who all seek an airing of the classical-quantum debate in a social science context.⁶³ All are advocates for the integration of quantum principles into social sciences, arguing that classical IR theorists have taken for granted the ontological and ideational properties of the structure of the States-system, and that such a shift can lead to more sophisticated analytical tools for navigating the unpredictable nature of global affairs.

If David Bohm's assertion that the world's problems stem from the siloed view of science and philosophy was true, then his next statement, that "the humanities needed to shift from Newtonian to quantum thinking" was a clear call to arms.⁶⁴ As Danah Zohar, the quantum philosopher states, this was one such example that examined an 'evolving quantum worldview presenting a universe that is dynamic, interconnected, and comprised of self-organising systems that explore the future through trial and error. In this quantum perspective, meaning, purpose and motivation supplant determinism and mechanistic laws as the driving principles of social organisations, shifting from fragmentations to holism and from certainty to uncertainty.'⁶⁵ This new framework emphasises potentiality and possibilities rather than fixed realities, moving away from

⁵⁶ Thomas Holtfort and Andreas Horsch, "Social Science Goes Quantum: Explaining Human Decision-Making, Cognitive Biases and Darwinian Selection from a Quantum Perspective," *Journal of Bioeconomics* 25, no. 2 (August 2023): 100, <https://doi.org/10.1007/s10818-023-09334-w>.

⁵⁷ Schubert, Alker, and Zinnes, "The Evolution of Political Science: Paradigms of Physics, Biology, and Politics [with Commentaries]."

⁵⁸ Alexander Wendt, ed., "Preface to a Quantum Social Science," in *Quantum Mind and Social Science: Unifying Physical and Social Ontology* (Cambridge: Cambridge University Press, 2015), 1–38, <https://doi.org/10.1017/CBO9781316005163.001>.

⁵⁹ Luis Reyes-Galindo, "The Sociology of Theoretical Physics" (2011).

⁶⁰ Busemeyer, Wang, and Townsend, "Quantum Dynamics of Human Decision-Making."

⁶¹ Fabio Bagarello, *Quantum Dynamics for Classical Systems: With Application for the Number Operator* (Hoboken, NJ: John Wiley, 2013).

⁶² James Der Derian, "From War 2.0 to Quantum War: The Superpositionality of Global Violence," *Australian Journal of International Affairs* 67, no. 5 (2013): 570–85.

⁶³ Jerome R. Busemeyer, "Introduction to Quantum Probability for Social and Behavioural Scientists," in *Qualitative Mathematics for the Social Sciences: Mathematical Models for Research on Cultural Dynamics* (London: Routledge, 2013), 75–103.

⁶⁴ David Bohm, *Quantum Theory* (Englewood Cliffs, NJ: Prentice Hall, 1951).

⁶⁵ Zohar, *Zero Distance*.

materialism. While finding it necessary to call this paradigm 'new' in 1996, Wallerstein et al also address 'rapid change, complexity, uncertainty, global interconnectivity, decentralisation, and heightened ethical expectations' as critical to ensuring best restructure for the social sciences.⁶⁶

The underlying assumption of social science is that social life and human decision-making are classical material phenomena.⁶⁷ In 2005, however, Wendt proposed that methodologies within quantum theory offer a transformative and novel way to consider human rationality, survival, identity, and societal relationships.⁶⁸ This directly challenged the underlying framework of classical, accepted social theories. He argued that



quantum theory be inserted into the social science debate to directly affect the development of AI and classical and neo-classical IR approaches. Purists in the physical and philosophical arenas of academia, including IR, argue that the distance between quantum science and the classical philosophies should remain. However, the persistent neglect of each other prevents a useful bridging of gaps necessary to advance the "application of quantum mechanical methods to topics in social sciences, which include economics, ecology and psychology."⁶⁹

If this holds, applying quantum methods in social science may shed light on mysteries surrounding human behaviour and cognition, leading to the development of significantly more advanced AI systems from the outset.⁷⁰ Byrne and Hall also explore quantum theory's links to enhanced collective consciousness.⁷¹ It argues that the consciousness gap between future AI capabilities and the human-like qualities it seeks to emulate is disconnected from science and philosophy. In a final showing for Quantum Social Science, Haven and Khrennikov are further examples of those writing on this issue who call for a re-evaluation of the foundational assumptions that have persisted since the 19th Century. They emphasise the value of critical thinking and theoretical exploration rather than empirical data collection, and that this precludes us from considering and

⁶⁶ Immanuel Wallerstein, Calestous Juma, and Evelyn F. Keller, *Open the Social Sciences: Report of the Gulbenkian Commission on the Restructuring of the Social Sciences* (Stanford, CA: Stanford University Press, 1996), <file:///Users/sharrynparker/Documents/University/Deakin%20University/TAS1998RevGulbenkian.pdf>.

⁶⁷ Kenneth N. Waltz, *Theory of International Politics*, Addison-Wesley Series in Political Science (Reading, Mass: Addison-Wesley Pub. Co, 1979), https://dl1.cuni.cz/pluginfile.php/486328/mod_resource/content/0/Kenneth%20N.%20Waltz%20Theory%20of%20International%20Politics%20Addison-Wesley%20series%20in%20political%20science%20%20%20%201979.pdf.

⁶⁸ Alexander Wendt, "Social Theory as Cartesian Science: An Auto-Critique from a Quantum Perspective," in *Constructivism and International Relations: Alexander Wendt and His Critics* (London: Routledge, 2006), 181–219.

⁶⁹ Jerome R. Busemeyer and Zheng Wang, "What Is Quantum Cognition, and How Is It Applied to Psychology?," *Current Directions in Psychological Science* 24, no. 3 (2015): 163–69; C. P. Snow, "The Two Cultures," *Leonardo* 23, no. 2/3 (1990): 169–73, <https://doi.org/10.2307/1578601>.

⁷⁰ Busemeyer and Bruza, *Quantum Models of Cognition and Decision*.

⁷¹ Alex Byrne and Ned Hall, "Chalmers on Consciousness and Quantum Mechanics," *Philosophy of Science* 66, no. 3 (1999): 370–90, <http://www.jstor.org.ezproxy-b.deakin.edu.au/stable/188592>.

assessing potential for structural and institutional change.⁷²

Quantum IR

This review now considers the growing number of scholars exploring the potential of quantum theory to provide new analytical tools and critical approaches for addressing IR's intractable probability problems. Importantly, the degradation of academia by its splitting the natural and social sciences is not new, as Matson recognised in his work "The Broken Image: Man, Science and Society" in 1964.⁷³ Nor is it of one nation alone that has broadcast a concern. A fortunate outcome of the globalised world is the cross pollination of quantum ideas, even to the antipodean global south, where the US-based privately owned Carnegie Foundation⁷⁴ has sponsored the work of USYDs Project Q (for Peace and Security in a Quantum Age) to advance knowledge of geopolitical and societal implications of quantum innovation.⁷⁵ This contextualises the Australian perspectives of a number of quantum IR proponents like the aforementioned Der Derian, Chalmers and highlights that the answers to a quantum statecraft in practice may come from nations less wedded to previously held 'old master' ideas, or Waters, who seeks to lay groundwork for it.⁷⁶ While some of these scholars' ideas challenge accepted majority views, and are challenging to understand initially, they telegraph connexions to gaming theory as delivered by the likes of Martinez-Martinez,⁷⁷ Arfi⁷⁸ and Eisert et al,⁷⁹ complexity theory as explained by Abbe,⁸⁰ and multimethodologies as exemplified by Mingers and Gill.⁸¹ Here, the challenge becomes drawing out themes of complexity that Newtonian IR models inadequately explain such as the rapid scaling of global complexity. It is to this end, that quantum's superposition, decoherence, entanglement and unpredictability illuminate these themes much better.

Beyond his book, IR's 'quantum turn' has been championed by Wendt. His work has been influential in establishing the foundations for a quantum approach to IR.⁸² Wendt's quantum monism, based on a panpsychist theory of mind, challenges the mind-body

⁷² Emmanuel Haven and Andrei Khrennikov, *Quantum Social Science* (Cambridge, UK: Cambridge University Press, 2013), chaps. 1; p 3–12.

⁷³ Floyd Matson, *The Broken Image: Man, Science and Society* (New York: Braziller, 1964), sec. Preface.

⁷⁴ Carnegie Foundation, "PROJECT Q: Peace and Security in a Quantum Age," 05 May 24, <https://projectqsydney.com/carnegie-corporation-of-new-york-announces-award-of-major-grant-to-the-centre-for-international-security-studies-at-the-university-of-sydney-for-project-q/>.

⁷⁵ Webpage, "PROJECT Q: Peace and Security in a Quantum Age," 05 May 24, <https://projectqsydney.com/>.

⁷⁶ Jayson Cydhaarth Waters, "Estranged/Entangled: The History, Theory, and Technology of Quantum Mechanics in International Relations" (PhD Thesis, Sydney, Australia, USYD, 2022), <https://hdl.handle.net/2123/29604>.

⁷⁷ Ismael Martínez-Martínez, "A Connection between Quantum Decision Theory and Quantum Games: The Hamiltonian of Strategic Interaction," *Journal of Mathematical Psychology* 58 (2014): 33–44.

⁷⁸ Badredine Arfi, "Resolving the Trust Predicament: A Quantum Game-Theoretic Approach," *Theory and Decision* 59, no. 2 (September 1, 2005): 130; and 132–33, <https://doi.org/10.1007/s11238-005-8632-4>.

⁷⁹ Jens Eisert, Martin Wilkens, and Maciej Lewenstein, "Quantum Games and Quantum Strategies," *Physical Review Letters* 83, no. 15 (1999): 3077–80, <file:///Users/sharrynparker/Documents/University/Deakin%20University/9806088.pdf>.

⁸⁰ Abbe, "Understanding the Adversary."

⁸¹ John Mingers and Anthony Gill, *Multimethodology: The Theory and Practice of Combining Management Science Methodologies* (Chichester New York (N. Y.) Weinheim... etc: J. Wiley, 1997), pts. 3; 241–290.

⁸² Alexander Wendt, "Why IR Scholars Should Care about Quantum Theory, Part II: Critics in the PITs," *International Theory* 14, no. 1 (March 2022): 193–209, <https://doi.org/10.1017/S1752971921000105>.

dualism.⁸³ It has radical implications for understanding the social and physical world as discussed by Brafman and Brafman in their book “Sway: The Irrational Pull of Irrational Behaviour.”⁸⁴ By engaging with quantum concepts like entanglement, Wendt suggests that people are never fully separable but are entangled elements of society. This has implications for how IR practitioners view the interconnectedness of global events and aligns with Barad’s theories around the agency of states and actors.⁸⁵ This approach encourages adoption of cognitively novel methods, shifting focus to relationality; and contrasts with classical IR theories that rely on Newtonian mechanics characterised by linear causality and predictability.

Finally, AI evolution, which currently resides within hard systems and computational development, is considered. Alongside it, also a hard science, sits quantum physics. However, AI also necessitates a deeper understanding of human cognition, which is more than computational. Moreover, the experience of cognition, including that of IR, is rooted in the humanities. In essence, Quantum IR, and its specialisations, leads wholeheartedly to the IR plays a pivotal role in comprehending the experience of cognition at the global level. As stated by Busemayer et al,⁸⁶ and McIntosh, developing AI without incorporating the humanities and social science observations of decision-making would be a grave oversight.⁸⁷ As Penrose aptly articulated, exploring whether there is a research pathway for quantum theory in social science may be beneficial.⁸⁸ Meyer’s entertaining Starship Enterprise deliberations, that equilibrium describes IRs balance of power, could be an example that propels philosophical and sociological thinking and enable quantum scientists to test quantum IR quantitatively.⁸⁹

By embracing quantum principles, IR practitioners can develop more sophisticated tools for modelling behaviour, such as those offered by Piotrowski and Giulianotti’s Quantum Game Theory⁹⁰ while Brannigan and Giulianotti consider a quantum approach to IR can help practitioners move beyond outdated Newtonian analogies and metaphors that have long dominated the field.⁹¹

While promising not to extend this paper to the subject of quantum economics or quantum politics, a small step toward Der Derian and Alexander Wendt paper on “a human science of world politics”,⁹² Herbert Simon’s Nobel prize for Economics by

⁸³ Alexander Wendt, “Flatland: Quantum Mind and the International Hologram,” in *New Systems Theories of World Politics* (Basingstoke, UK: Palgrave Macmillan, 2010), 279–310.

⁸⁴ Brafman and Brafman, *Sway*, 16–17.

⁸⁵ Karen Barad, “Posthumanist Performativity: Toward an Understanding of How Matter Comes to Matter,” *Signs, Gender and Science: New Issues*, 28, no. 3 (Spring 2003): 801–31, https://www-jstor-org.ezproxy-b.deakin.edu.au/stable/pdf/10.1086/345321.pdf?refreqid=fastly-default%3Ae6db4456d761e1c7e62fe081848d4855&ab_segments=&origin=&initiator=&acceptTC=1.

⁸⁶ Busemeyer, Wang, and Townsend, “Quantum Dynamics of Human Decision-Making.”

⁸⁷ McIntosh, “Writing Quantum Entanglement into International Relations: Temporality, Positionality, and the Ontology of War.”

⁸⁸ Roger Penrose, *Shadows of the Mind: A Search for the Missing Science of Consciousness* (Oxford ; New York: Oxford University Press, 1994); Roger Penrose, *The Emperor’s New Mind: Concerning Computers, Minds and the Laws of Physics* (Oxford: Oxford Univ. Press, 1999), Preface xxiii.

⁸⁹ Ibid.

⁹⁰ E. W. Piotrowski and J. Sladkowski, “An Invitation to Quantum Game Theory,” *International Journal of Theoretical Physics* 42, no. 5 (May 1, 2003): 1089–99, <https://doi.org/10.1023/A:1025443111388>.

⁹¹ Paul Michael Brannagan and Richard Giulianotti, “Unlocking the Whole of Soft Power: A Quantum International Relations Analysis,” *Journal of Political Power* 16, no. 3 (September 2, 2023): 301–21, <https://doi.org/10.1080/2158379X.2023.2270412>.

⁹² James Der Derian and Alexander Wendt, “Quantum International Relations: The Case for a New Human Science of World Politics,” in *Quantum International Relations: A Human Science*

demonstrating the limited capacity to digest information needed to make complex decisions,⁹³ and Maurice Allais⁹⁴ following proof of the breakdown of classical economic theory used to predict choice by acknowledging the links between economics, psychology, and the other social sciences all encourage the reader to lift the lid on the utility and value of quantum for IR. Overarchingly, while classical IR recognises its limitations, it has been slow in finding alternatives to challenge the status quo, with the following section demonstrating a steadfast effort to keep quantum contained to the natural sciences.

Embracing Inevitable Dissent

While quantum theory offers intriguing possibilities for rethinking IR, its application as pointed out by Snow, is contentious.⁹⁵ While Kavalski called for the waking of IR from its deep Newtonian slumber in 2012,⁹⁶ as far back as 1927 the divisive William Munro called for an academic alignment to “get rid of intellectual insincerities concerning the nature of sovereignty, the general will, natural rights, and the freedom of the individual” to discover “the true purposes and policies which should direct human action in matters of government.”⁹⁷ This request, to combine the talents of science and philosophy was a rare demand for the natural and social sciences to come together, with most scientists then including Nobel laureates Born and Heisenberg opposing a marriage of academia to progress the collective understanding of cognition and consciousness through physics and its philosophy.⁹⁸

Frustratingly for science, the social science realm begins with the assumption that the mind and body are separate. The aligned assumption that the mind is not subject to physics laws is, therefore, open to a never-ending cycle of hypotheses that IR theorists are willing to debate but can never resolve. However, the third emerging hypothesis of quantum decision theory has started to investigate the premise of deniability.⁹⁹

Wendt's ideas are critiqued by Rasmus Jaksland, who contends that the arguments for quantum relevance in social science lack sound epistemic foundations.¹⁰⁰ Daniel Little also evaluates Wendt's claims, particularly emphasising the limitations of quantum effects in current biology and quantum consciousness.¹⁰¹ Friedrich V. Kratochwil

for *World Politics*, ed. James Der Derian and Alexander Wendt (Oxford University Press, 2022), 0, <https://doi.org/10.1093/oso/9780197568200.003.0001>.

⁹³ Herbert A. Simon, “Theories of Decision-Making in Economics and Behavioral Science,” *The American Economic Review* 49, no. 3 (1959): 253–83, <http://www.jstor.org.ezproxy-b.deakin.edu.au/stable/1809901>.

⁹⁴ Maurice Allais, “An Outline of My Main Contributions to Economic Science,” *The American Economic Review* 87, no. 6 (1997): 1–12, <http://www.jstor.org.ezproxy-b.deakin.edu.au/stable/2951290>.

⁹⁵ Snow, “The Two Cultures,” 169–71.

⁹⁶ Kavalski, “Waking IR Up from Its ‘Deep Newtonian Slumber,’” 138.

⁹⁷ William Bennett Munro, “Physics and Politics. An Old Analogy Revisited,” *American Political Science Review* 22, no. 1 (1928): 1–11.

⁹⁸ Werner Heisenberg, *Physics & Philosophy: The Revolution in Modern Science*, 1st Harper Perennial Modern Classics ed, Harper Perennial Modern Classics (New York: HarperPerennial, 2007), chap. 5.

⁹⁹ David J. Chalmers, “Why Isn’t There More Progress in Philosophy?,” *Philosophy* 90, no. 351 (2015): 15–21, <http://www.jstor.org.ezproxy-b.deakin.edu.au/stable/44015138>.

¹⁰⁰ Rasmus Jaksland, “Distinguishing Two (Unsound) Arguments for Quantum Social Science,” *European Journal for Philosophy of Science* 13, no. 3 (July 29, 2023): 34, <https://doi.org/10.1007/s13194-023-00540-x>.

¹⁰¹ Daniel Little, “Entangling the Social: Comments on Alexander Wendt, *Quantum Mind and Social Science*,” *Journal for the Theory of Social Behaviour* 48, no. 2 (June 2018): 167–76, <https://doi.org/10.1111/jtsb.12165>.

question Wendt's interpretations and the implications of quantum theory for social science, arguing that Wendt's claims do not adequately address the complexities of social phenomena.¹⁰²

While Karen Barad emphasises the significance of quantum metaphysics, and advocates for a broader epistemic relevance of quantum mechanics social contexts, she too is challenged by Jaksland that quantum effects are minimal. Additionally, Emmanuel Haven and Andrei Khrennikov's work on quantum social science is challenged by Vogel who questions their approach and the compatibility of quantum theory with social science methodologies.¹⁰³

Tegmark,¹⁰⁴ and Donald¹⁰⁵ argue more broadly that quantum mechanics deals with inanimate particles and cannot be applied to human and social phenomena. They contend that attempts to 'quantise' IR often result in 'mere' metaphors not substantive theories, lacking scientific rigour and practical relevance. This is like other interdisciplinary approaches that borrow concepts from different fields, such as economics in IR, where models are adapted to fit social phenomena. While not entirely discounting the quantum social sciences and IR theories, in their considerations of the quarrels between the natural and social sciences Oren,¹⁰⁶ Pothos and Bussemeyer,¹⁰⁷ and Cohen all agree quantum IR faces scepticism due to the challenges of scaling quantum concepts to human and social systems.¹⁰⁸

Suffice to say, there are several treatments of using quantum theory for the social sciences and IR. At one end, Harre¹⁰⁹ gently criticises Feyerabend's position (by 1975 his post-modern work 'Against Method' was published);¹¹⁰ while in the middle, Kagan merely works to separate the academic cultures.¹¹¹ Tegmark¹¹² is joined in his

¹⁰² Friedrich Kratochwil, "The Strange Fate of the Morphed 'Rump Materialism': A Comment on the Vagaries of Social Science as Seen through Alexander Wendt's Quantum Mind and Social Science," *International Theory* 14, no. 1 (2022): 169–82, <https://doi.org/10.1017/S1752971921000075>.

¹⁰³ Manuel Vogel, "Quantum Social Science, by Emmanuel Haven and Andrei Khrennikov," *Contemporary Physics* 56, no. 1 (January 2, 2015): 94–94, <https://doi.org/10.1080/00107514.2014.962095>.

¹⁰⁴ Max Tegmark, "Parallel Universes," *Scientific American* 288, no. 5 (2003): 40–51: pp48, <http://www.jstor.org.ezproxy-b.deakin.edu.au/stable/26060282>.

¹⁰⁵ Matthew J. Donald, "We Are Not Walking Wave Functions. A Response to 'Quantum Mind and Social Science' by Alexander Wendt," *Journal for the Theory of Social Behaviour* 48, no. 2 (June 2018): 157–61, <https://doi.org/10.1111/jtsb.12162>.

¹⁰⁶ Ido Oren, "Can Political Science Emulate the Natural Sciences? The Problem of Self-Disconfirming Analysis," *Polity* 38, no. 1 (2006): 72–100, <http://www.jstor.org.ezproxy-f.deakin.edu.au/stable/3877091>.

¹⁰⁷ Pothos and Bussemeyer, "Can Quantum Probability Provide a New Direction for Cognitive Modeling?"

¹⁰⁸ I. Bernhard Cohen, ed., *The Natural Sciences and the Social Sciences: Some Critical and Historical Perspectives*, Boston Studies in the Philosophy of Science 150 (Dordrecht: Kluwer Academic Publ, 1994).

¹⁰⁹ Rom Harré, "Notes on P. K. Feyerabend's Criticism of Positivism," *British Journal for the Philosophy of Science* 10, no. 37 (1959): 43–48.

¹¹⁰ Paul Feyerabend, *Against Method: Outline of an Anarchistic Theory of Knowledge* (London: Atlantic Highlands: NLB ; Humanities Press, 1975); John Mingers and Anthony Gill, *Multimethodology: The Theory and Practice of Combining Management Science Methodologies* (Chichester New York (N. Y.) Weinheim... etc: J. Wiley, 1997), 300–305.

¹¹¹ Jerome Kagan, *The Three Cultures: Natural Sciences, Social Sciences, and the Humanities in the 21st Century* (Cambridge, UK: Cambridge University Press, 2009).

¹¹² Max Tegmark, "Why the Brain Is Probably Not a Quantum Computer," *Information Sciences* 128, no. 3–4 (October 2000): 155–79, [https://doi.org/10.1016/S0020-0255\(00\)00051-7](https://doi.org/10.1016/S0020-0255(00)00051-7).

unadorned denunciation of quantum theory for the humanities by Brueckner,¹¹³ Sokal,¹¹⁴ Sokal and Bricmont,¹¹⁵ Stone,¹¹⁶ and Waldner,¹¹⁷ all of whom adopt particularly critical positions.

Despite these strong negative responses quantum methods for social science and IR deserve a systematic and academically sound treatment, especially as classical and neo-classical IR scholars like Arfi.¹¹⁸ Indeed, Gross and Levitt acknowledge that their ontological and epistemological foundations remain unproven.¹¹⁹ Notwithstanding the academic criticisms, these issues align with broader social sciences trends that seek to incorporate complexity and non-linearity into theoretical frameworks, such as system, complexity and game theory. If Bacciagaluppi and Valentini¹²⁰ captured sciences struggle with itself in 1927, that science will also struggle with the humanities philosophical intrusion into quantum should be anticipated.

In Summary

This literature review outlined an exploratory approach to studying quantum science narratives for application to IR, particularly to statecraft. This review addressed the lack of discourse on the intersection of quantum theory and IR for the purpose of statecraft. The potential power of a quantum statecraft narrative lies in its ability to challenge outdated assumptions and offer innovative frameworks for enhancing understanding complex global interactions.

By adopting a quantum statecraft narrative, IR practitioners can enhance their analytical capabilities and foster a more inclusive and adaptive approach to statecraft and policymaking. This narrative empowers them to embrace uncertainty and complexity leading to more effective strategies for addressing the pressing challenges of an interconnected world. This thesis will prime the reader for quantum's incorporation into 21st-century IR theory.

¹¹³ Brueckner, "Chalmers's Conceivability Argument for Dualism," 192.

¹¹⁴ Alan D. Sokal, "Transgressing the Boundaries: Toward a Transformative Hermeneutics of Quantum Gravity," *Social Text* 46–47 (1996): 217–52.

¹¹⁵ Alan D. Sokal and Jean Bricmont, *Fashionable Nonsense: Postmodern Intellectuals' Abuse of Science* (New York: Picador, 1998).

¹¹⁶ Lynden Stone, "Doubting Conventional Reality," *Leonardo* 51, no. 1 (2018): 5–10, <https://www-jstor-org.ezproxy-b.deakin.edu.au/stable/26808533>.

¹¹⁷ David Waldner, "Schrödinger's Cat and the Dog That Didn't Bark: Why Quantum Mechanics Is (Probably) Irrelevant to the Social Sciences," *Critical Review* 29, no. 2 (April 3, 2017): 199–233, <https://doi.org/10.1080/08913811.2017.1323431>.

¹¹⁸ Badredine Arfi, "Challenges to a Quantum-Theoretic Social Theory," *Millennium: Journal of International Studies* 47, no. 1 (September 2018): 99–113, <https://doi.org/10.1177/0305829818781691>.

¹¹⁹ Paul R. Gross and Norman Levitt, *Higher Superstition: The Academic Left and Its Quarrels with Science* (Baltimore: Johns Hopkins University Press, 1994).

¹²⁰ Guido Bacciagaluppi and Antony Valentini, eds., *Quantum Theory at the Crossroads: Reconsidering the 1927 Solvay Conference; [with a Complete Translation of the Original Proceedings]*, 1. paperback ed (Conseil de Physique, Cambridge: Cambridge Univ. Press, 2013), https://books-google-com-au.ezproxy-b.deakin.edu.au/books?id=EAPX3JfQAglC&pg=PR7&source=gbs_selected_pages&cad=1#v=onepage&q&f=false.

Chapter 2 The Utility of a Quantum Statecraft Narrative

“UTILITY: A state of being useful, or beneficial.”

*Macquarie Dictionary*¹²¹

Quantum statecraft draws inspiration from quantum mechanics and quantum field theory to frame state behaviours and interactions in a new and holistic light. Quantum statecraft releases state behaviour from the traditional boundaries of classical IR theory, with its three major schools of IR theory - realism, liberalism and constructivism. While this essay bounds its considerations, there is room to test quantum ideas across any IR classical theories, or neo-theories as described by Blackman and Moon.¹²² Integrating a quantum statecraft theory into the classical IR schools of thought offer several significant improvements by addressing classical IR theory limitations and expanding perspectives for those educated in classical IR.

This chapter considers non-linear dynamics as it pertains to 21st Century statecraft and considers it within the context of rapid technology innovation and a holistic approach to its practice. Three issues will be brought together to illuminate the utility of quantum statecraft in practice. First is an epistemological revision of the classical world views and discuss the issues of translation for bringing quantum mechanics to bear for IR theory and practice.¹²³ Second is IR's classical pedagogy in which most practitioners are trained. This leads to the third argument for the added value of quantum for statecraft, before finishing with why this translation is valuable.¹²⁴

Limits of Classical Learning and Western Pedagogy

Wendt believes that quantum theory has been needlessly constrained by classical social science theory. He argues powerfully that human consciousness and therefore decision-making are impervious to classical IR theories and models; and claims that the assumption of the classical basis of social science is wrong. Wendt argues there is growing empirical evidence stemming from quantum decision theory and quantum cognition literature that quantum models deliver better perspectives on social life, including statecraft, than the classical models. This argument extends to mathematical theories of psychology by Tversky and Kahneman, who evince that human actions are not deterministic.¹²⁵ While they do not raise the argument for quantum modelling for human behaviour directly, Wendt argues that this behavioural evidence of human indeterminism in decision making and actions challenges classical models, and that human beings are not quantum-like, instead, they are quantum beings, and that this plays out in ontology.¹²⁶

¹²¹ Susan Butler, ed., *Macquarie Concise Dictionary*, 5th edition (Sydney: Macquarie Dictionary Publishers, 2009), 1389.

¹²² Moon and Blackman, “A Guide to Ontology, Epistemology and Philosophical Perspectives for Interdisciplinary Researchers.”

¹²³ Akrivoulis, “The Quantum Politics Metaphor in International Relations: Revising ‘American Newtonianism.’”

¹²⁴ James Der Derian and Stuart Rollo, “‘Quantum 3.0’: What Will It Mean for War, Peace, and World Order?,” *Global Perspectives* 5, no. 1 (February 28, 2024): 93888, <https://doi.org/10.1525/gp.2024.93888>.

¹²⁵ Tversky and Kahneman, “Rational Choice and the Framing of Decisions.”

¹²⁶ Butler, *Macquarie Concise Dictionary*, 878. Ontology: The branch of metaphysics that investigates the nature of being.

Wendt's above view is challenged by classical IR theorists and physicists. It is particularly perplexing for physicists, who counter with the idea that quantum theory *washes out* at the macro level or human, real-world level. Other physicists prefer to adopt a 'shut-up-and-calculate' view, rather than engage across disciplines to discuss the metaphysics¹²⁷ as presented by Wendt, Lewis¹²⁸ and Becker.¹²⁹ Other key supporters of quantum IR like Der Derian,¹³⁰ Chalmers, and Waters rework earlier ideas to make them more viable to classical IR thinkers. Collectively, they begin to set up quantum theory across the IR realm, by considering four issues that require reasoned interdisciplinary logic.

If quantum social science is true, these quantum humanities theorists ask for the acceptance that the Western teaching of people as classical beings has been implicit for over three centuries, through statistics and rational choice IR theory, and matches the Newtonian world view. If the classical world view is taught intergenerationally, and from first principles, it limits the ability to think inventively and reduces the potential to consider the human actions, and therefore the actions of collective human (nation-state) actions, beyond this classical world view.

Possessing a quantum IR world view, one should consider the subjectivity of each classical theory. An example is to observe IR's realism in comparison to other classical views of liberalism and constructivism. The 'them or us' politicising of classical IR (are you a realist, or a liberalist?), leads to the development of nation-state great power theory. This convergence in epistemic and technical theory deftly explains the lived experience of quantum during the 20th Century. The progress of quantum theory has never been smooth. From Planck's discovery of the 'constant' in 1905, later developed by Bohr, and Einstein separately, then debated through the 1920s lead to the establishment of the Copenhagen school of quantum physics, and the repudiation of Newtonian physics.¹³¹ While WWII elevated the popularity of quantum's new conventions, the development of the nuclear bomb, also ended international collaboration across quantum scientific discovery. Ongoing competitive quantum science through the Cold War and information age saw quantum weaponised and monetised with capital made available to certain schools that matched the views of political-state sponsors. This set the scene for a tenacious status quo defence in both the natural sciences, and classical IR theories whereby:¹³²

- a. Realism emphasises the competitive and anarchic nature of the international system, where states act primarily in their interest and power dynamics dominate interactions.
- b. Liberalism focuses on cooperation, institutions, and the potential for progress in international affairs, emphasising how states and non-state actors can work together to achieve mutual benefits and address global challenges.

¹²⁷ Metaphysics, a branch of philosophy that explores the fundamental nature of reality, existence, and the universe

¹²⁸ Peter J. Lewis, *Quantum Ontology: A Guide to the Metaphysics of Quantum Mechanics* (New York, NY: Oxford University Press, 2016).

¹²⁹ Theodore Lewis Becker, ed., *Quantum Politics: Applying Quantum Theory to Political Phenomena* (New York: Praeger, 1991).

¹³⁰ James Der Derian, "Quantum Diplomacy, German-US Relations and the Psychogeography of Berlin," *The Hague Journal of Diplomacy* 6, no. 3–4 (2011): 373–92.

¹³¹ Jenny Edkins, "Security, Cosmology, Copenhagen¹," *Contemporary Politics* 9, no. 4 (December 1, 2003): 361–70, <https://doi.org/10.1080/1356977032000172863>.

¹³² "Political Realism In IR," Plato Stanford, October 9, 2023,

<https://plato.stanford.edu/entries/realism-intl-relations/>.

c. Constructivism has several key parallels with quantum world view. It emphasises the role of ideas, beliefs, norms, and identities in shaping state behaviour and the international system; in turn provides a better accommodation of the complexity discussed previously, while still sitting squarely in the classical, linear camp. Even this classical theory has its detractors and lends itself an understanding of quantum statecraft's battle for relevance and legitimacy.

A Vivid IR Explanation

The above provides an initial consideration as to why quantum is required across IR. Put simply, social science starts with folk psychology and rational choice whereas physicists discuss the physical world. Neither consider the human mind, and this is a problem given the creation of AI. Wendt claims everything in the mind, or consciousness, is quantum science, not a part of a classical machinery (the traditional view of humans). He specifically claims there is zero evidence that humans are classical machines, however we continue to teach social science and IR, and conduct statecraft, through a classical lens. Without a hint of irony, Wendt also says that the most necessary audience to win over – those who practice IR and statecraft in all forms - will also be the toughest to convince due to their history, pedagogy, and classical learning.

As Earle discusses, through a quantum lens, we can begin some of the translation issues.¹³³ To understand that like quanta, the science of the smallest to largest magnitudes of energy, IR can perceive of scale from the atomic to astro-level, and bio-to geo-political level. This is relevant in 21st Century statecraft's use of the military and how the military conceives itself, for example the Australian Defence enterprise has recently added cyber and space domains to the traditional (Newtonian, material and classical) domains of land, air and maritime. While this is one example, and only one avenue through which statecraft is practiced, we can begin to understand how to ask questions affecting future statecraft in practice. If quantum statecraft starts widening the aperture of its practitioners, eventually there will be a change in the burden of proof. If evidence of quantum like behaviour in people increases then the burden of proof will shift to the classists who will have to justify their orthodoxy of rational choice theory, and why people, as 'classical machines', behave quantumly.

Translating Ten Quantum Statecraft Ideas

Quantum theory is vast. It relates everything to atomic existence of particles, electrons, and waves. Ten quantum principles will be defined and then outlined as to how they can apply to statecraft. These principles will be considered against the five major factors of complexity in the practice of statecraft: increase of IR system nodes, their connectivity, speed of information passage, velocity of decision effects, and the rate of technological change, to deliver an initial utility of quantum statecraft:

1. Superposition¹³⁴

Definition (in physics): The ability of a quantum system, such as an electron, particle or wave, to be in multiple states at the same time – until it is measured.¹³⁵

¹³³ Earle, "Quantum Principles."

¹³⁴ "TechTarget: What Is?," October 2021,

<https://www.techtarget.com/whatis/definition/superposition>.

¹³⁵ Newtonian, or classical physics, expects an electron to have a well-defined position and velocity at any given moment, this concept has very real-world applications in quantum computing to perform complex calculations at speeds classical computers can't match; in cryptography, it is used to create secure communication channels. A paradox of existence, superposition is exemplified by the 'Schrodinger's Cat' thought experiment whereby a

Utility in Quantum Statecraft: Superposition supports the development and management of complex systems modelling. This provides for depth in strategic flexibility, and for subsequent actions and outcomes. It is crucial to decision-making by shaping how practitioners interpret and respond to complex international scenarios, where various outcomes coexist until decisions are made. Just as quantum systems can exist in multiple potential states simultaneously and only ‘collapse’ into a single state upon measurement, statecraft is fluid, with multiple potential outcomes influenced by states’ interactions and perceptions. This understanding creates cause for analysis across the specific elements of statecraft, forcing the consideration of alternate futures, rather than single courses of action committed to and planned for.¹³⁶ States might manoeuvre through various strategic options, only collapsing into a specific strategy when circumstances require. This can be metaphorically related to the idea that states may hold multiple potential strategies or objectives at the same time. In comparison, realism, which focuses specifically on power and security, can be adapted toward quantum as states continuously evaluate and shift their strategies based on evolving power dynamics and threats. Superposition therefore can deliver agency and empowers choice. In its quantum statecraft paradigm, it considers social constructs, societal norms and social change as it pertains to societal identity.

Superposition is an expression of reality of the macro-environment that accommodates for the human mind being insufficiently understood. Thus, it prepares policymakers and practitioners of statecraft for many possible futures, and develops their adaptiveness earlier, and more broadly. Therefore, surprise is also reduced, as is discomfort at unexpected departures from linear decisions or movement. In turn, themes of miscalculation, oversight, or even blunders can be circumvented earlier, and statecraft can manage destabilising actions more adroitly. Quantum statecraft **enhances understanding of complex dynamics through improved analytical tools** for understanding complex and fluid dynamics such as the interplay between multiple potential outcomes and the interconnectedness of global actors.¹³⁷ This supports statecraft practitioners analysing and interpreting complex scenarios where traditional models fall short. Further, the superposition principle assists in conceptualising multiple potential statecraft-outcomes simultaneously, enabling more nuanced strategic planning. Finally, it enhances communication strategies for explaining complex international situations to policy makers and the public, potentially improving strategic communication.

2. Decoherence

Definition: Quantum decoherence is the process where a complex object interacts with its surroundings, causing a disappearance of certain quantum properties, leading to a loss of quantum coherence.¹³⁸

Utility: The changing nature of international norms and identities is analogous to decoherence, where new beliefs and practices emerge becoming dominant as they interact with existing norms and social structures. Understanding decoherence offers IR

hypothetical cat in a box may be considered both dead and alive simultaneously because its fate is linked to a random event that may, or may not, occur. And

¹³⁶ Brian Nichiporuk, *Alternative Futures and Army Force Planning: Implications for the Future Force Era ; Prepared for the United States Army* (Santa Monica/Cal: RAND Corp, 2005), chaps. 3 and 4.

¹³⁷ Alexander Wendt, *Quantum Mind and Social Science: Unifying Physical and Social Ontology* (Cambridge, United Kingdom; New York: Cambridge University Press, 2015), 258–59.

¹³⁸ “Decoherence,” The Information Philosopher, accessed October 5, 2024,

<https://www.informationphilosopher.com/quantum/decoherence/>.

practitioners perspectives for navigating the increasingly complex and interconnected global landscape, potentially leading to innovative statecraft. This process illustrates how social change, and the development of new norms can shift state behaviour and the international system, reflecting that IR are dynamic and shaped by evolving social constructs, as per Heyes 2024.¹³⁹

3. Multiple realities

Definition: The 'Many Worlds' interpretation (MWI) of quantum mechanics asserts the universal wave function is objectively real, and that there is no wave function collapse. This implies that all possible outcomes of quantum measurement are physically realised in some world or universe.¹⁴⁰

Utility: Just as a quantum system's state is determined upon measurement, the international system's configuration can be shaped by its actors' collective perceptions and social constructions, highlighting the fluid and subjective nature of IR. Transference of the multiple reality idea - that international realities are not fixed but can exist in multiple, coexisting states based on the social constructions, identities, and beliefs of its actors - argues that IR are fluidity and evolving, shaped by changing norms, identities, and interactions. The international system is seen as dynamic not static. In quantum statecraft, narratives are not merely stories; they embody the interplay of multiple possibilities. By recognising the agency inherent in narratives, practitioners can better understand their role in shaping diplomatic realities. This awareness can empower them to make more informed decisions, considering the immediate consequences and the broader narrative context.

4. Entanglement

Definition: Quantum entanglement involves the interconnection of particles such that they become linked such that the state of one particle instantaneously affects the state of another, regardless of distance or what lies between them.¹⁴¹

Utility: Applying this to IR highlights how actions in one region or by one state can have immediate often unforeseen effects elsewhere.¹⁴² This underscores the importance of understanding global interconnectedness and the ripple effects¹⁴³ of decisions. Quantum entanglement emphasises deep interconnectedness and mutual influence among states, regardless of distance or formal alliances. As Zanotti claims, this can enhance classical IR theories by illustrating how states' actions are interconnected in more complex ways than suggested by traditional theories.¹⁴⁴ As realism often focuses

¹³⁹ Cecilia Heyes, "Rethinking Norm Psychology," *Perspectives on Psychological Science* 19, no. 1 (January 2024): 12–38, <https://doi.org/10.1177/17456916221112075>.

¹⁴⁰ Lev Vaidman, "Many Worlds Interpretation of Quantum Mechanics," *Stanford Encyclopaedia of Philosophy*, August 5, 2021, <https://plato.stanford.edu/entries/qm-manyworlds/>.

¹⁴¹ Andreas Muller, "What Is Quantum Entanglement? A Physicist Explains the Science of Einstein's 'Spooky Action at a Distance,'" *The Conversation*, October 7, 2022, <https://theconversation.com/what-is-quantum-entanglement-a-physicist-explains-the-science-of-einsteins-spooky-action-at-a-distance-191927>.

¹⁴² The 2022 Nobel Prize in physics recognised physicists Alain Aspect, John Clauser and Anton Zeilinger who made groundbreaking contributions in understanding the mysterious natural phenomena of quantum entanglement, that Einstein called 'spooky action at a distance.'

¹⁴³ Ripple effect: Another useful quantum term, not explained in this article.

¹⁴⁴ Laura Zanotti, *Ontological Entanglements, Agency and Ethics in International Relations: Exploring the Crossroads.*, 2018, chap. 2; Alyssa Ney and David Z. Albert, eds., *The Wave Function: Essays on the Metaphysics of Quantum Mechanics* (Oxford: Oxford Univ. Press, 2013), 52–57.

on power politics and competition, often prioritising material power and security, it potentially overlooks the role of ideational and perceptual factors.

This can be related to how states are connected through complex power relationships and alliances. Just as entangled particles affect each other instantaneously, states in an anarchic international system can have their power and security directly affected by the actions of other states. This interconnectedness implies that states must constantly be



aware of the broader power dynamics and influence of other states, as actions in one region or by one actor can have immediate and unexpected repercussions elsewhere. Similarly, liberalism emphasises cooperation through institutions. While liberalism focuses on institutional cooperation, it potentially overlooks the role of ideational and perceptual factors that address how interconnectedness influences state behaviour beyond formal institutions.

The study of entanglement can extend traditional theories that struggle with complex rapidly evolving scenarios where simple power calculations, or institutional frameworks may not fully capture the dynamics in play.¹⁴⁵ States' influence each other's behaviour through social and normative interactions. Quantum entanglement reflects this interconnectedness, where particles can affect each other instantaneously regardless of distance. Similarly, constructivism views international actors as deeply interconnected, where changes or actions by one actor can influence others through shared norms and values.¹⁴⁶ Incorporating this approach highlights the importance of observation, perception, and ideas in shaping reality. This can enhance classical IR theories by integrating a more comprehensive view that includes the impact of ideational factors and social constructs in statecraft. Quantum concepts like entanglement could inspire novel ways of thinking about interconnectedness in global politics, potentially leading to innovative approaches in conflict resolution or peacebuilding.

5. Uncertainty

Definition: Heisenberg's 'uncertainty principle' is a fundamental mathematical principle whereby the position and speed of a particle cannot be accurately known.¹⁴⁷ It describes a trade-off between complementary properties of a wave, like speed and position.¹⁴⁸

¹⁴⁵ To which the extended war between the Ukraine and Russia fails to explain the Ukraine's failure to fold against the sheer power differential, and numbers, of Russia.

¹⁴⁶ A statecraft idea evidenced by China's initiatives to influence and transfer their stability norms into the United Nations, thereby challenging the West's perspective and hold on the international rules-based order.

¹⁴⁷ The uncertainty principle affects any object with wave-like properties as described by measuring ripples in a pond. For speed, one monitors the passage of peaks and troughs, but the less we can say about the wave's position. Conversely to know the position of a ripple peak, we would have to observe the peak itself and would lose information about the wave's speed.

¹⁴⁸ "What Is the Uncertainty Principle and Why is it Important?," Caltech Science Exchange, accessed October 6, 2024, <https://scienceexchange.caltech.edu/topics/quantum-science-explained/uncertainty-principle>.

Utility: Quantum statecraft acknowledges IR's inherent uncertainty and unpredictability. By embracing the uncertainty concept practitioners can develop strategies to manage and navigate uncertainty more effectively.¹⁴⁹ This is crucial for those educated in Newtonian and classical models of IR whose leadership inclines towards likely courses of action, centres of gravity, material power, or economic policies, which all narrow options and solutionise pre-emptively. This can undermine developing sound strategy and statecraft. The uncertainty principle offers the statecraft practitioner greater comfort with ambiguity and understanding of uncertainty. This can enhance and inform decision-making across issues of risk and its management; and Kavalski says "where uncertainty is regarded and accepted as an intrinsic quality of nature and not as a result of imperfect knowledge."¹⁵⁰ This can improve anticipation and mitigate risks and uncertainties. The quantum-inspired uncertainty model could offer more accurate probabilistic assessments of geopolitical risks and opportunities, helping practitioners navigate IR's VUCA. Put simply, the quantum statecraft narrative can improve the handling of uncertainty in statecraft by preparing for wider potential scenarios rather than focusing on deterministic outcomes.¹⁵¹ In line with other described quantum physics definitions in this chapter, a deeper understanding of uncertainty might provide a paradigm shift in strategic thinking.¹⁵² A quantum statecraft narrative could encourage IR practitioners to move beyond binary thinking (e.g.: allies versus adversary) toward more nuanced, multidimensional understandings of relationships. A well-constructed quantum statecraft narrative mindful of uncertainty will highlight key themes and priorities, helping decision makers identify the critical factors influencing and guiding strategic choices. This focus enables practitioners to navigate IR's complexities with greater confidence.

6. Indeterminacy

Definition: Quantum indeterminacy is the apparent necessary incompleteness of a physical system and is a key characteristic of quantum physics.¹⁵³

Utility: While the classical IR theories describe deterministic outcomes and probability, the quantum indeterminacy accepts that quantum theory is indeterminate, and therefore all activities are open to change. In turn this means a practitioner of quantum statecraft dispenses with the notion of determinism, which opens the door for free will. The role of free will is a multifaceted topic that various philosophers and physicists have explored. Quantum explanations – initially used to describe issues at the sub-atomic level, also raise interesting perspectives at the material and macro-level. These can be random international actions that are unexpected, and seemingly, neither linear nor logical. Put simply, quantum indeterminacy challenges traditional notions of cause and effect positing the need for a more nuanced understanding of agency and free will.

A quantum statecraft narrative embraces multiple possible outcomes and futures. This aligns with free will, where agents make choices. This view contributes to more sophisticated decision-making models that better account for the probabilistic nature of outcomes and the observer's part in shaping events. However, the implications for free will are not straightforward. Indeterminacy might prompt new discussions about the ethical implications of international or domestic actions, considering their potential effects across multiple realities or outcomes, and prompt deeper ethical reflections on

¹⁴⁹ Snowden, "Strategy in the Context of Uncertainty," chap. 3.

¹⁵⁰ Kavalski, "Waking IR Up from Its 'Deep Newtonian Slumber,'" 142.

¹⁵¹ Becker, *Quantum Politics*.

¹⁵² Theodore L. Becker et al., *The Future of Teledemocracy* (Westport, Conn. London: Praeger, 2000).

¹⁵³ Karl R. Popper, "Indeterminism in Quantum Physics and in Classical Physics. Part I," *The British Journal for the Philosophy of Science* 1, no. 2 (1950): 117–33, <http://www.jstor.org.ezproxy-b.deakin.edu.au/stable/685807>.

statecraft's possible consequences. This contrasts classical theories that often oversimplify ethical dilemmas.¹⁵⁴ A quantum statecraft lens on ethical dimensions of decision-making can lead to more thoughtful and responsible policy outcomes.

7. Wave-Particle Duality

Definition: Wave-particle duality is a cornerstone of quantum physics. Here quantum entities exhibit particle or wave properties according to the experimental circumstances and highlight the inability of the Newtonian concepts such as particle or wave to describe how quantum objects behave.¹⁵⁵

Utility: Quantum objects exhibit both particle-like and wave-like properties. Similarly, states might need to navigate between different roles or strategies—sometimes acting as fixed, predictable entities and other times adapting fluidly to changing circumstances. This aspect of statecraft suggests a need for greater flexibility and adaptability. While realism tends to focus on fixed power structures and competition, liberalism emphasises institutional stability and cooperation. A quantum perspective acknowledges that states can adjust their strategies based on evolving perceptions and interactions, offering a more fluid view of statecraft and policy that encourages adaptive strategies, which complement and refine those derived from classical approaches. Wave-particle duality provides a conceptual framework for assessing new information and adjusting decisions accordingly. In turn, this assists in flexible approaches to global challenges. Just as particles can exhibit different properties based on observation, IR actors can adopt various approaches—cooperative, multilateral, or institutionally driven—depending on context and the nature of the challenge. Understanding wave-particle duality embraces that quantum statecraft is dynamic, and that cooperation has different forms and evolves over time, much like the dual nature of quantum entities.

8. Observer Effect

Definition: The effect whereby watching, observers affect the observed reality.¹⁵⁶

Utility: The observer effect in quantum mechanics emphasises how perceptions and interactions influence outcomes. By integrating ideational factors—such as norms, values, and perceptions—into strategy, the non-material dimensions of statecraft can be better addressed to enhance effectiveness. Quantum statecraft promotes and fosters a holistic analysis of statecraft, integrating both material and ideational factors into a given perspective. This comprehensive approach can help statecraft strategies address the full spectrum of influences shaping global dynamics, leading to more balanced and effective policies. This might translate to the idea that military actions, or political or diplomatic negotiations can be influenced by perceptions and interactions, and that the presence of an observer (or mediator) can alter the dynamics of international engagements. The quantum observer effect suggests that observation influences outcomes, which can leverage perceptual dynamics as explained by Myers and Meneses.¹⁵⁷ In negotiations, this can help practitioners more deeply appreciate how

¹⁵⁴ Zanotti, *Ontological Entanglements, Agency and Ethics in International Relations: Exploring the Crossroads.*, chap. 7.

¹⁵⁵ Tim Davis, "Explainer: What Is Wave-Particle Duality," *The Conversation*, July 27, 2012, <https://theconversation.com/explainer-what-is-wave-particle-duality-7414>.

¹⁵⁶ Venkatesh Vaidyathan, "What Is the Observer Effect in Quantum Mechanics?," *Science ABC*, October 19, 2023, https://www.scienceabc.com/pure-sciences/observer-effect-quantum-mechanics.html#google_vignette.

¹⁵⁷ James Myers and Mariana Meneses, "The Observer Effect: Why Do Our Measurements Change Quantum Outcomes?," *The Quantum Record*, May 8, 2024,

their presence, statements, and actions shape the perceptions and behaviours of other actors, leading to more effective engagement.¹⁵⁸

In quantum mechanics, particularly the observer effect, highlights that a quantum system is not fixed but depends on observation and measurement. The outcome can change based on how the system, in the statecraft any given international dynamic, is observed. This reflects that reality is not objective but subjectively influenced by the act of observation. States and actors' perception, therefore, interpret and respond to the world based on these socially constructed realities, including those prevailing social constructions and ideas.

9. Quantum Tunnelling

Definition: Quantum tunnelling describes a particle's ability to pass through energy barriers, which are insurmountable in classical physics.¹⁵⁹

Utility: Quantum tunnelling characterises innovation, creativity and problem solving in statecraft. It epitomises how states or leaders might find unconventional solutions or breakthroughs in diplomacy and IR, transcending traditional barriers and constraints. It can inspire creative problem-solving approaches by encouraging practitioners to think beyond traditional frameworks. This can lead to innovative solutions for complex global issues. Importantly, for those practicing statecraft, quantum tunnelling directly links to quantum sensor technology too.¹⁶⁰ While this concept yet to affect broad public security debates, its future highlights the need to ensure that significant and assumed 'near-invulnerable' national submarine investments are survivable, and not endangered by advances in quantum tunnelling technologies.¹⁶¹

10. Coherence

Definition: Quantum coherence describes the ability of a quantum mechanical system to stably maintain its quantum mechanical states and generate interference patterns. In a coherent state, quantum states are precisely defined and exhibit regular and predictable behaviour.¹⁶²

Utility: By framing events and decisions within this structured narrative, statecraft practitioners can better understand their actions' implications and the interconnectedness of global events. For a system of state-held beliefs, the beliefs that constitute the system must 'cohere'. This coherence is taken to involve the components of logical consistency, explanatory, relations, and various non explanatory relations. Coherence creates a sense of agency and empowers practitioners by illustrating how

<https://thequantumrecord.com/quantum-computing/observer-effect-why-do-measurements-change-quantum-outcomes/>.

¹⁵⁸ Interference is another quantum effect related to the observer effect not discussed in this paper. Deciphering, and protection of information transfer are two real world issues that these quantum concepts relate to.

¹⁵⁹ Katrina Kramer, "Explainer: What Is Quantum Tunnelling?," Quantum Chemistry, Royal Society of Chemistry: Chemistry World, July 30, 2020, <https://www.chemistryworld.com/news/explainer-what-is-quantum-tunnelling/4012210.article>.

¹⁶⁰ T. Albrecht, "Electrochemical Tunnelling Sensors and Their Potential Applications," *Nature Communications* 3, no. 1 (May 8, 2012): 829, <https://doi.org/10.1038/ncomms1791>.

¹⁶¹ Katarzyna Kubiak, "Quantum Technology and Submarine Near-Invulnerability," Global Security Policy Brief (European Leadership Network, December 2020), <https://europeanleadershipnetwork.org/wp-content/uploads/2020/12/Quantum-report.pdf>.

¹⁶² Margaret Rouse, "Quantum Coherence," Techopaedia, September 25, 2019, <https://www.techopaedia.com/definition/34025/quantum-coherence>.

their decisions can shape future outcomes. This agency is essential in quantum statecraft, where the interplay of choices can lead to various potential realities and dynamic approaches to policy formulation. This coherence also enhances communication among stakeholders, ensuring that all parties share a common understanding of a situation. This is crucial in diplomacy and politics, where misinterpretations may cause conflict, miscalculation or missed opportunities.

Summary

A quantum statecraft world view encourages a more comprehensive, nuanced, flexible, and interconnected understanding of IR. It promotes a recognition of uncertainty and complexity, urging policymakers to embrace adaptability and innovative thinking in addressing global challenges. By addressing uncertainty, emphasising interconnectedness, and integrating non-material factors, a quantum statecraft narrative offers tools to refine and enhance the insights provided by traditional theories, leading to a richer and more adaptable framework for analysing and understanding global affairs. While constructivism and quantum statecraft both emphasise the importance of perception, interconnectedness, and the fluidity of reality, constructivism's basis is that humans are classical machines, whereas quantum accepts that humans are not deterministic. This distinguishes the perspectives. Quantum statecraft counters the emphasis on a centre of gravity, or a single way forward for a national strategy.

These ten quantum concepts capture the fluidity and probabilistic nature of statecraft in the 21st Century. This collaborative narrative can inform more comprehensive strategies that account for multiple perspectives and potential futures. Quantum statecraft can inspire more flexible and adaptive strategies and can scale for rapidly changing global dynamics.

Chapter 3 The Value of a Quantum Statecraft Narrative

“VALUE: The regard to which something is worth.”

*Macquarie Dictionary*¹⁶³

Collectively, this analysis considers the relevance of a quantum statecraft narrative and assesses how these narratives can foster and illustrate the application of quantum principles in statecraft. It aims to further understanding, utility, and value of a quantum statecraft narrative to transform IR decision making and leadership and the practice of statecraft. It commences highlighting the integration of quantum statecraft narrative into policymaking.

The previous section considered its ‘utility’. This section focuses on its ‘value,’ and begins considering how a quantum statecraft narrative supports those facing a VUCA environment stemming from rapid new technology delivery, before demonstrating how quantum lexicon addresses Western statecraft’s weaknesses. It then addresses what leadership through quantum statecraft might look like, and how its practice might be advanced.

Value 1: Rapid New Technology Delivery

As quantum technologies advance, IR practitioners versed in quantum concepts will be better prepared to understand these technologies and their geopolitical implications.¹⁶⁴ As technology continues to evolve, a quantum paradigm will increasingly pervade IR.¹⁶⁵ Understanding and navigating this dynamic relationship between technology and users requires a comprehensive understanding of technological trends, strategic foresight, and a commitment to fostering the dual purpose of the natural and social sciences. IR’s future will undoubtedly be shaped by how societies navigate the opportunities and challenges presented by technological advancement.¹⁶⁶ A quantum statecraft narrative delivers the opportunity to prepare not just STEM practitioners but provide sense-making and align leadership and practitioners from across the social science domains, particularly those invested in hard technologies, such as the military.¹⁶⁷

Value 2: Demonstrating how a Quantum Narrative Addresses Western Strategy Weaknesses

While quantum mechanics has reshaped our understanding of the universe, the philosophical implications have taken longer to influence the physical and social sciences, which remain rooted in Newtonian physics. Newton’s framework, focusing on larger-than-sub-atomic phenomena, offers precise scientific results. In contrast, quantum mechanics introduces potentiality, suggesting multiple outcomes exist simultaneously, leading to a fundamental shift in how reality and its inherent

¹⁶³ Butler, *Macquarie Concise Dictionary*, 1892.

¹⁶⁴ Mauritz Kop, “Quantum ELSPI: Ethical, Legal, Social and Policy Implications of Quantum Technology,” *Digital Society (Springer Nature)*, Transatlantic Technology Law Forum, July 28, 2021, <https://law.stanford.edu/publications/quantum-elspi-ethical-legal-social-and-policy-implications-of-quantum-technology/>.

¹⁶⁵ Zohar, *Zero Distance*, 25–25.

¹⁶⁶ Vivek Wadhwa and Mauritz Kop, “Why Quantum Computing Is Even More Dangerous than Artificial Intelligence,” *Foreign Policy*, Stanford Center for Responsible Quantum Technology, August 21, 2022, para. 4, <https://law.stanford.edu/publications/why-quantum-computing-is-even-more-dangerous-than-artificial-intelligence/>.

¹⁶⁷ Ron Immink, *Sense-Making* (Cork: Oak Tree Press, 2018).

uncertainties is perceived. There is an argument that failures of strategy in Western IR often stems from several key factors, like rigid frameworks, an over-reliance on traditional models, and difficulties in adapting to complex and evolving scenarios. These weaknesses can be explained by normative theories:

Rigid traditional strategic-thinking models: Western strategy often relies on established models and frameworks that may not account for the complexity and fluidity of the global landscape.¹⁶⁸ This rigidity can lead to inadequate responses to emerging challenges or unforeseen developments.

Overemphasis on material power in power dynamics: Western strategies often overly focus on material power and military strength, neglecting ideational factors, such as norms, beliefs, and identities, in shaping IR.

Underestimating complexity and uncertainty in complex systems: The international system with its many actors is highly complex, uncertain and interconnected. Western strategies often struggle to adapt to this leading to ineffective, mistimed or counterproductive outcomes.

Static approaches in diplomacy and inflexibility in policy: Inflexible approaches to diplomacy and policy can hinder the ability to respond effectively to changing circumstances and evolving geopolitical dynamics.

Value 3: Leadership Qualities in a Quantum Age

The juxtaposition between Newtonian and quantum leadership is stark.¹⁶⁹ The education and experience of many current 'Newtonian leaders' focus on finite gains, adhering to established rules and seeking guaranteed outcomes.¹⁷⁰ Historically, the development of Newtonian leadership favoured simplistic and complicated environments, engineering, and aligned linear solutions.¹⁷¹ This is despite for example the popular Cynefin framework illuminating that leaders more often operate in complex and chaotic environments that require non-linear solutions.¹⁷²

A quantum leader then, embraces infinite gamesmanship, and a persistent exploration of multiple paths and possibilities. This better prepares them for rapid change and unpredictability across myriad challenges, rather than reverting to planning around simplified and often singular courses, which is particularly true of military tactical training. A quantum approach to leadership, and an adjustment to tactical training encourages creativity and experimentation, viewing mistakes as natural end states of multiple possible realities rather than as abject failures of analysis and planning. Zohar describes twelve principles of quantum leadership¹⁷³ as:

¹⁶⁸ Claudia Aradau, "Security That Matters: Critical Infrastructure and Objects of Protection," *Security Dialogue* 41, no. 5 (2010): 509–10, <https://www.jstor.org/stable/26301166>.

¹⁶⁹ Earle, "Quantum Principles."

¹⁷⁰ Kavalski, "Waking IR Up from Its 'Deep Newtonian Slumber.'"

¹⁷¹ Danah Zohar, *The Quantum Leader: A Revolution in Business Thinking and Practice* (Amherst, New York: Prometheus Books, 2016), chap. 1.

¹⁷² Snowden, "Strategy in the Context of Uncertainty," chap. 9.

¹⁷³ Zohar, *The Quantum Leader*, chap. 4.

¹⁵⁴  The Australian War College – Shedden Papers

1	Self-awareness	7	Ability to Reframe
2	Vision and value led	8	Asking fundamental questions
3	Spontaneity	9	Celebrate diversity
4	Holism	10	Positive use of adversary
5	Field-independence	11	Compassion
6	Humility	12	Sense of vocation (or purpose)

These provide a baseline for praxis; necessary as contemporary leaders face ongoing technological upheaval and an urgent need for creative restructuring. For statecraft-focussed departments, who provide through-life train and/or educate their people toward professionalised proficiencies and standards, determining the pertinent elements of quantum leadership might be appropriate at foundational-through-to-expert levels.

Further, a cautious and deliberate introduction and systematic but rapid uptake for those already in more senior positions (especially if Newtonian parallels have been a hallmark of success within the organisation). This will also show the necessary nature of a quantum statecraft narrative by explaining that the existing paradigm - heavily influenced by Newtonian classical views of both history, science and IR like Bousquet, and Akrivoulis, who offers a detailed analysis of Newtonian analogy of US foreign policy from the Cold War explaining organisations as machines operating under predictable and stable laws with cause and effect.¹⁷⁴

Further, there is likely to be a recognition especially among those with an academic IR background that leadership that fosters focused 'efficiency and risk elimination' mindset, often leads to top-down management styles that prioritise and incentivise certainty, despite modern statecraft's complex and chaotic environments. Crafting a quantum statecraft narrative emphasises the creative potential of uncertainty.¹⁷⁵ It suggests that complex systems thrive when permitted to self-organise and engage in dialogue within their environments. These systems are most effective at the 'edge of chaos', where instability fosters innovation most suited to the modern, VUCA statecraft environment.¹⁷⁶

Future consideration should interrogate the broader audience of IR professionals to quantitatively assess the awareness and acceptance of quantum principles in statecraft. This data will help identify trends and correlations between quantum thinking and effective decision-making. Careful placement of training and education can align to de-risking operational practices already in play. The benefits of early introduction, consistent and repetitive nature of exposure, understanding, and knowledge of quantum principles, and their usefulness for junior through to senior leadership. By leading with these practices and tools the practitioner will become more comfortable with VUCA at

¹⁷⁴ Antoine J. Bousquet, *The Scientific Way of Warfare: Order and Chaos on the Battlefields of Modernity*, 2nd edition (New York: Columbia University Press, 2022); Dimitrios Efthymiou Akrivoulis, "The Ways of Stargazing: Newtonian Metaphoricity in American Foreign Policy," in *Political Language and Metaphor. Interpreting and Changing the World* (London: Routledge, 2008), 15–27.

¹⁷⁵ Zohar, *Zero Distance*, 24–25.

¹⁷⁶ *Ibid.*, 25.

the strategic level and by dint more effective.¹⁷⁷

Value 4: Advancing Quantum Statecraft in Practice

A quantum statecraft narrative can enhance IR by transcending the limitations of classical schools of IR theory through a dynamic framework. Dator offers that the horse



and buggy, once novel and splendid, is now obsolete in an environment that envisioned and built jets that required runways.¹⁷⁸ Unlike traditional narratives that often rely on linear, deterministic models, a quantum narrative embraces complexity and uncertainty, reflecting the nature of global interactions. This approach fosters deeper engagement with global events' interconnectedness, encouraging IR professionals to think beyond the binary of ally and adversary. Ultimately, a quantum statecraft narrative enriches analytical capabilities and empowers practitioners to navigate IR with greater insight and creativity, making it an essential statecraft tool.¹⁷⁹

Ultimately, STEM researchers and practitioners hold the zeitgeist, they will develop and deliver the science that allows IR practitioners to undertake statecraft through a quantum lens. If they are to succeed in building trust in their work, then STEM must connect with the practitioners of statecraft. This can be achieved by provoking a perception in IR circles that equals the thrill of quantum science as experienced by the physicist.¹⁸⁰

The power of a quantum statecraft narrative lies in its capacity to bring this specialisation's knowledge and language to a wider audience. In response, the social scientists are responsible to use the narrative wisely. Einstein said quantum is incomplete.¹⁸¹ So too, IR theorists should accept that classical theories are also incomplete. As interest in using a quantum statecraft narrative and lexicon grows, ensuring responsible engagement involves establishing a solid foundation to integrate this new approach effectively and ethically.

To develop a robust framework for quantum statecraft in IR, clear definitions and concepts are required that connect quantum principles with IR theory. This interdisciplinary approach requires consistent and accurate use of terminology within the IR context, ensuring a well explained narrative that bridges quantum physics and the modern global statecraft, some of which is offered by Tsao and Laslo.¹⁸² Promoting

¹⁷⁷ Ron Immink, "Quantum Leadership Is the New Paradigm," 2024 2021, <https://www.ronimmink.com/quantum-leadership/>.

¹⁷⁸ James A. Dator, "Civil Society and Governance Reform," in *Fairness, Globalization, and Public Institutions: East Asia and Beyond* (Honolulu: University of Hawaii Press, 2006), 200–204.

¹⁷⁹ Brannagan and Giulianotti, "Unlocking the Whole of Soft Power: A Quantum International Relations Analysis," 316–18.

¹⁸⁰ Der Derian and Wendt, "Quantum International Relations: The Case for a New Human Science of World Politics," chap. 1.

¹⁸¹ Christopher Norris, *Quantum Theory and the Flight from Realism: Philosophical Responses to Quantum Mechanics*, Critical Realism Interventions (London: Routledge, 2000), 8.

¹⁸² Frederick Chavalit Tsao and Christopher Laszlo, *Quantum Leadership: New Consciousness in Business* (Stanford, California: Stanford Business Books, an imprint of Stanford University Press, 2019).

scholarly research and dialogue is crucial for advancing quantum statecraft. As argued by Dey, this includes supporting theoretical work, empirical studies and case analyses that test and refine quantum analogies for IR. Facilitating collaboration between quantum physicists, IR scholars, and statecraft practitioners will ensure the sound application of quantum concepts to international affairs.

Developing training programs and educational workshops for policy makers, diplomats and scholars, and within professional military education systems is essential to familiarise them with quantum statecraft concepts and their implications for statecraft theory and practice. Scholars like Akrivoulis contribute ideas on how to do so including revising American Newtonianism.¹⁸³ Another example is the observer effect in IR-action in the journal article by Tribe, which discusses “each legal decision restructures the law itself.” It explains how the law is inevitably embroiled in the dialectical process whereby society is constantly recreating itself. Tribe draws on quantum physics metaphors to rethink constitutional jurisprudence and the work of the US Supreme Court. He suggests viewing legal events as interconnected and to consider the interdependency between an observation and that which is being observed.¹⁸⁴

Incorporating these ideas into academic curricula for IR and related fields will prepare future professionals to employ quantum thinking. The collaboration between physics and philosophy departments at institutions like MIT and Harvard demonstrates the growing acceptance of interdisciplinary approaches. Following this, the creation of ethical standards and guidelines for the use of quantum statecraft concepts in policy making and diplomacy is necessary to address potential risk, biases and unintended consequences.¹⁸⁵ Ensuring diverse perspectives in the development and application of these theories will reduce narrow applications or biased interpretations.

Sharing insights and developments through conferences, publications and public forums will shape discourse and guide responsible use of quantum statecraft concepts. Fostering public understanding by communicating implications and benefits to a broader audience, including policymakers, will ensure informed engagement. The regular evaluation of the impact of quantum statecraft concepts in IR is crucial. Assessing their contribution to understanding and addressing global issues will allow refinement, as per Geok and Shaari.¹⁸⁶ Establishing feedback mechanism from practitioners and scholars will continuously improve the application and integration of quantum statecraft in IR theory and practice.

In Summary

By taking these steps, stakeholders can ensure that the integration of quantum statecraft into IR is done thoughtfully, responsibly, and effectively, leveraging the new perspectives it offers while mitigating potential risks and challenges. The allure of a quantum theory for statecraft lies in its ability to capture IR's inherent complexity and uncertainty. Current practitioners, steeped in classical IR approaches, will find

¹⁸³ Akrivoulis, “The Quantum Politics Metaphor in International Relations: Revising ‘American Newtonianism.’”

¹⁸⁴ Tribe, “The Curvature of Constitutional Space: What Lawyers Can Learn from Modern Physics.”

¹⁸⁵ Zanotti, *Ontological Entanglements, Agency and Ethics in International Relations: Exploring the Crossroads.*, chaps. 6 and 7.

¹⁸⁶ Soh Wan Geok and Amiruddin Shaari, “Show Up and Be Seen: A Study Towards Quantum Leadership in Quantum Era,” *PalArch's Journal of Archaeology of Egypt/Egyptology* 17, no. 4 (2020): 420–22, file:///Users/sharrynparker/Downloads/731-Article%20Text-1393-1-10-20201129.pdf.

quantum's perspective intriguing and challenging. By embracing quantum principles such as superpositions and entanglement, they can gain a richer understanding of the possibilities and interconnectedness that shape global events rather than perceive of recipient states being flat, homogenous shells ready to implant into.¹⁸⁷ This insight will empower people to make more informed, adaptive decisions, and navigate the unpredictable diplomatic environment with greater agility.

The quantum statecraft narrative offers a seductive alternative to traditional linear thinking, by providing a stimulating pathway that demands the capacity to embrace uncertainty in large global ecosystems and encourages exploration and experimentation. It removes the desire to deliver a single, committed decision that either wins or loses the game, but allows the practice of crafting and cocreation of strategies, foreseeing or being better prepared to make necessary change, and adjusting decisions in response to changing circumstances. This fostering agile decision making, and necessary strengthening of stewards of technology for the 21st century.¹⁸⁸

To close this section, learning about quantum statecraft offers IR practitioners advanced analytical tools, enhanced strategic flexibility, and a deeper understanding of complex and interconnected dynamics. By integrating these quantum concepts into their practice, practitioners can better navigate uncertainty, improve diplomacy, and develop innovative solutions to global challenges. A quantum statecraft narrative can improve Western strategies by promoting flexibility, embracing complexity, recognising interconnectedness, integrating ideational factors, fostering innovation, enhancing risk management, and encouraging holistic analysis. By incorporating these principles, Western strategists can develop more adaptive, nuanced, and effective strategies to addressing the challenges of the modern international landscape aligned with Sambursky's framework that demonstrates a stoic reinforcement of philosophical concepts with scientific ideas.¹⁸⁹

¹⁸⁷ Zanotti, *Ontological Entanglements, Agency and Ethics in International Relations: Exploring the Crossroads.*, chap. Introduction.

¹⁸⁸ "The Quantum Leader: A revolution in Business thinking and practice." Quantum leadership: "Quantum organisations are complex adaptive systems. Danah Zohar (Twelve Principles of Quantum Leadership (Springer books Chap 0, pages 137-146).

¹⁸⁹ Samuel Sambursky, "Physics of the Stoics," in *Physics of the Stoics* (Princeton University Press, 1959), vii–x; 166, <http://www.jstor.org/stable/j.ctt7zv3sr.3>.

Conclusion

While the topic of quantum theory is vast and can be turned to consider almost any element of the humanities, for this exploratory thesis the term 'quantum statecraft' refers to the application of principles from quantum mechanics to the practice of IR and statecraft. Its narrative, woven throughout delivers a historical context for how current statecraft practitioners arrived at this point. In considering this thesis' central research question of quantum statecraft's definition, and its utility and value, it addressed the complexity inherent in the practice of modern statecraft by using quantum concepts of non-linearity, superposition, entanglement, uncertainty, indeterminacy and the observer effect to offer insight to the power of a quantum consideration for the 21st Century.

As a new term, introduced to align with ideas expressed by Wendt, Der Derian, Zohar and many others, this thesis seeks to extend quantum ideas for the social sciences, and to draw these theories of quantum for IR toward a useful practice for the practitioner of statecraft. For them, these thoughts offer a refreshed ability to capture the complex and interconnected nature of global IR in ways that classical IR models fail to satisfactorily communicate. For the quantum statecraft beginner, quantum mechanics challenges intuition with principles like superposition and entanglement. This paper endeavours to close the gap between the physical sciences and their social science counterparts, and to provide a start point through its key arguments for interdisciplinary engagement and ongoing studies of metaphysics will defy traditional simplistic IR explanations, leading toward greater comfort with multi-dimensional and unpredictable state, non-state, and global interactions.

By no means is the chronicle over. It cannot be, as the nexus between quantum physics and the humanities continues to search for answers across the physical, and atomic universe. If Einstein said quantum is not complete, then any person interested in developing the capacity of our statecraft practitioners should accept his reasoning. Wendt referenced something similar about the broad schools of social science. This addition has aimed to raise the utility and value of a post-modern quantum statecraft narrative and practice for 21st century challenging traditional IR theories key assumptions such as mechanism, determinism and materialism.

While contemporary IR theories seek to address complex human engagements from the perspective of classical power considerations, newer versions of neo-realism and neo-constructivist theories work harder to consider cognitive psychology's implications for decision-making. However, they still do so through the lens of these activities rather than through the lens of the human actors themselves. Quantum methods support advancing statecraft beyond the classical theories' limits.

This space supports the growing hypothesis that quantum theory across the elements of IR allows the space to update the classical world view with the teachings of quantum physics to better understand human behaviour, and the collective social interactions between nation-states. While the bow of quantum statecraft remains untied, quantum utility in the specialised subjects of warfare, diplomacy, politics and economics remain unexplored in this thesis they are offered as a potential next step to draw out specific value for these specialists in practice. Any or each of them might start with Zohr's quantum leadership principles. Similarly, those involved in intelligence analysis and tradecrafts might seek to investigate more deeply the value of quantum economics, from which there is already significant published works from Allais, Simon and others that connect economics to the biological, and chemical sciences and draws ever closer to the base-line theories from quantum science.

After introducing the breadth of quantum theory across the scientific and philosophical divide, we can now discuss whether those ideas presented across the philosophical domain are sufficiently strong enough to support a quantum statecraft narrative. In addressing the central research question, this enquiry considered why a quantum narrative, as opposed to another, is a valid development on classical IR, and what ways could the incorporation of quantum principles improve geopolitical discourse. It also endeavoured to demonstrate a theoretical integration of the two topics, and to show how knowledge of quantum theory will enhance and augment classical IR theories for improved strategy.

This thesis's conclusion is that the quantum statecraft narrative offers practitioners a powerful lens for understanding and navigating the complex world. By embracing quantum principles, practitioners can develop more sophisticated tools for modelling behaviour, challenge outdated assumptions, and gain a deeper appreciation for the interconnectedness and uncertainty that characterises global events. As quantum statecraft evolves, it holds great promise for providing innovative solutions to the pressing challenges facing statecraft practitioners.

To close, employing a quantum for IR offers a powerful framework for understanding and navigating statecraft's complexities and its specialities of politics, economics, diplomacy, and conflict and competition. Embracing quantum concepts can better capture the nuanced interactions, unexpected outcomes, and intricate dynamics that shape and shape-shift in the increasingly interconnected world. A quantum statecraft narrative challenges us to think beyond traditional classical IR paradigms and fosters a more holistic approach to addressing the trials and opportunities of the 21st-century global landscape.

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The Royal New Zealand Navy: An Agile or Fragile Navy for a Large Maritime Nation

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Image courtesy of the New Zealand Defence Force

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Master of National Security and Strategy**

About the Author



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Ehara taku toa i te toa takitahi, engari kē he toa takitini

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This final *whakatauki* is an appropriate reflection on the value of the educational and research journey I have undertaken, which translates as, 'the forest belongs to the bird who feasts on the miro berry, but the world belongs to the bird who feasts on knowledge.'

Summary

The Royal New Zealand Navy has frequently demonstrated it is responsive to local and regional emergencies, yet it is suffering high levels of staff attrition that has forced the sale of ships, missions to conclude early, and seen other ships tied up indefinitely. As the New Zealand Government embarks on its first major Defence Policy review since the Defence Strategic Policy Statement 2018, this paper seeks to understand the extent to which the Royal New Zealand Navy is structured to meet Government policy objectives. It identifies New Zealand's national interests before examining how these interests have influenced defence policy and force structure.

The performance and availability of RNZN capabilities are critically analysed through the navy's annual reports to the government before implications for the future are considered. This thesis reveals that the adoption of a liberal internationalist approach to foreign policy has seen national security interests viewed as a product of multilateralism and economic interdependence rather than derived from military power. A balanced force structure has generated a fleet suitable for a wide range of operations in the low-threat Pacific environment where non-traditional security challenges dominate. However, the utility of the resulting broad yet shallow suite of capabilities is challenged by the government's desire to retain the pretence of a high-end combat capability. The benefits of maintaining this capability are not worth the attendant drain on limited resources. This thesis suggests that a longer-term and more innovative view is required in approaching force design. This approach must build resilience into the RNZN, beginning by reimagining how the navy, as an instrument of national power, contributes to regional security.

Chapter 1: Framing the Problem

On 15 January 2022, in the small Pacific Kingdom of Tonga, without warning, the Hunga Tonga-Ha'apai undersea volcano erupted with a 15-megaton blast sending debris nearly 60 kilometres into the atmosphere. The blast disrupted satellite communications and generated tsunamis across the Pacific.¹ Within hours of the eruption, the New Zealand Government responded through diplomatic networks and mobilised its Defence Force (NZDF) for this critical disaster relief mission. Aerial surveillance and Air transport assets were first over the scene, followed days later by a third of the Royal New Zealand Navy's (RNZN) fleet with specialist Army Engineers, utility and surveillance helicopters, hydrographic survey and undersea construction capabilities, and the all-important relief supplies embarked for the local population. After days on station producing and distributing fresh water across the Tongan island group and resupplying the growing multi-national naval flotilla from the United States of America (US), Australia, and the United Kingdom (UK), the refuelling ship *HMNZS Aotearoa* detached and sailed for Antarctica to resupply McMurdo Station ahead of the coming winter.² In this instance, the NZDF delivered a critical component of the Government's national instruments to support Tonga, principally enabled through RNZN capabilities. It demonstrated significant agility by responding quickly to a complex and uncertain environment, operating as part of a combined joint force, before seamlessly pivoting towards other tasks in equal but different, extreme and remote locations.

In contrast to this dynamic military response, the NZDF has also attracted negative media attention regarding high staff attrition, raising concerns that it could be unable to respond to a simultaneous range of contingencies in the region.³ Reinforcing these concerns in response to reports that a third of the Navy's fleet was tied up indefinitely due to staff shortages, the Chief of Navy confirmed he had only 90% of his ideal staffing levels.⁴ This statement suggests an underlying fragility in the Navy system, especially since this situation is not new. In 2013 media reports showed that RNZN ships were also unable to operate due to high staff attrition, with the RNZN having to rely on Royal Australian Navy sailors to help crew the fleet.⁵ This dichotomy between agility in times of crisis and periods of force inaction forces us to examine the extent to which the RNZN, as an instrument of national power, is structured to meet the Government's policy objectives.

The structure and roles of naval forces among Western nations have been subject to much debate since the demise of the Soviet Navy. Standing military forces are typically expensive to acquire and maintain, with costs escalating rapidly as complexity and

¹ Charles Choi, "1st Mega-Tsunami on Record since Antiquity Was Triggered by Tonga Volcanic Eruption," *livescience.com*, April 28, 2023, <https://www.livescience.com/planet-earth/tsunami/1st-mega-tsunami-on-record-since-antiquity-was-triggered-by-tonga-volcanic-eruption>.

² "2023 Briefing to Incoming Minister of Defence" (Wellington, New Zealand: Ministry of Defence, February 2023), 17, <https://www.beehive.govt.nz/sites/default/files/2023-03/BIM%20-%20Minister%20of%20Defence.pdf>.

³ Sarah Hall, "Defence Force Funding," *North & South Magazine* (blog), February 11, 2023, <https://northandsouth.co.nz/2023/02/11/new-zealand-defence-force/>.

⁴ Nick Lee-Frampton, "A Third of New Zealand's Navy Ships Are Docked over Lack of Crew," *Defense News*, December 9, 2022, <https://www.defensenews.com/naval/2022/12/09/a-third-of-new-zealands-navy-ships-are-docked-over-lack-of-crew/>.

⁵ "Cobbers Keep Navy Afloat - New Zealand News," *NZ Herald*, 2013, <https://www.nzherald.co.nz/nz/cobbers-keep-navy-afloat/SNWYJOBYHE4UUUWS4GNS76FVNI/>.

capabilities increase. However, governments can rarely justify high military expenditure against competing domestic priorities without a specific military threat. This scenario played out in 1991, resulting in the term 'peace dividend' being coined to describe the reallocation of Cold War military funding in many Western nations. In the case of naval forces, the notion of 'sea blindness' often compounds the reluctance of governments to invest in maritime capabilities through their inability to recognise or understand maritime security issues, which is brought about by either ignorance or a lack of resources to address the issues.⁶ These two factors (the peace dividend and sea blindness) quickly challenge the premise of any investment decision: the ability to fuse an organisation's purpose with a problem that needs solving. Designing and investing in solutions becomes less precise in the absence of either of these factors, hence the apt cliché, 'a solution looking for a problem.'⁷ New Zealand's former Prime Minister Helen Clark has often been cited for her comments in 2001, describing the Pacific region as an 'incredibly benign strategic environment',⁸ and although this language has moderated over time, a theme that remains common across strategic assessments still recognises that New Zealand faces no direct military threat.⁹

In this thesis, I will demonstrate that shifts in successive New Zealand government foreign and defence policies, along with corresponding changes to military doctrine, have fundamentally impacted the requirements for and design of the RNZN's fleet. The lack of a concrete threat has resulted in a broad but shallow suite of military maritime capabilities, with the resulting navy organisation being highly vulnerable to shocks. I will frame this argument by exploring the evolution of Western naval forces since the early 1990s and identify themes that help explain the RNZN's developmental pathway. I will then examine New Zealand's history and geography to contextualise how successive Governments view the nation's interests and explain how these have shaped foreign and security policies before exploring how these policies have been translated into the military ecosystem to produce the naval force structure of today. Finally, I will examine the extent to which the RNZN is structured to meet the Government's policy objectives before identifying areas of further potential research.



Image courtesy of New Zealand Defence Force

Two research methods aid in developing these arguments, discourse and empirical analysis. Primary and secondary sources of publicly available information form the basis of this research, underpinned by three focus areas. These focus areas include examining what the Government's national interests are, understanding the expected role of the Navy in achieving those interests and, finally, the crux of this research, assessing the extent to which the Navy is structured to meet those interests.

⁶ "Sea Blindness," Maritime Security Forum, February 5, 2023, <https://www.forumulsecuritatiimaritime.ro/sea-blindness/>.

⁷ Stephanie Burns, "Solution Looking For A Problem," Forbes, May 28, 2019, <https://www.forbes.com/sites/stephanieburns/2019/05/28/solution-looking-for-a-problem/>.

⁸ M. L. Cavanaugh, "New Zealand's Dangerous Strategic Apathy in an Uncertain Age," The Strategist, February 11, 2020,

<https://www.aspistrategist.org.au/new-zealands-dangerous-strategic-apathy-in-an-uncertain-age/>.

⁹ "Defence Assessment" (Wellington, New Zealand: Ministry of Defence, December 2021), 22, <https://www.defence.govt.nz/assets/publication/file/Defence-Assessment-2021.pdf>.

Discourse analysis is the primary method for examining New Zealand's national interests and the expected roles of the Navy. This method analyses text and the spoken word to derive meaning. While several approaches exist within the discipline, common principles exist across all approaches. These include the premise that communication is fundamental to human relationships, social action, or the construct of realities, is performed through discourse; and the interpretation of discourse is contextual to historical, social and cultural norms. The result of discourse analysis is groups of themes or illustrative points about a subject that presents a version of reality to the reader.¹⁰ Sources relevant to this research include policy statements, official speeches, strategic assessments, departmental strategic plans, doctrine, and relevant academic literature. A combination of discourse and empirical analysis methods form the basis for considering the final focus area, the extent to which the Navy is structured to meet the national interests. In contrast to discourse analysis which includes elements of subjectivity, empirical analysis focuses on the observation and measurement of actual events. Annual Departmental performance reports to the Government will provide the primary source for empirical research, supported by the discourse of professional journal articles, media releases, and relevant academic literature.

¹⁰ Sally Wiggins, *An Introduction to Discourse Analysis* (SAGE Publications Ltd., 2017), <https://doi.org/10.4135/9781473964709>.

Chapter 2: Evolving Maritime Strategies post-Cold War

The evolution of maritime strategy offered by Buddy Suseto et al. provides an important point of reference in their observation of a turning point in modern naval forces with the demise of the Soviet threat at the end of the Cold War. Suseto et al. observe, in the case of the US, that policymakers almost immediately reduced the size of the US fleet but ‘...without a corresponding reduction of the nation’s overseas obligation’.¹¹ This change was similarly observed by Jeremy Stöhs when analysing the impact of geostrategic events on European naval power. He observes that changing threat perceptions arising from several events, including the end of the Cold War, changed the balance of military investment away from the costly naval forces required for sea control towards less expensive patrol and force projection capabilities.¹² Stöhs argues that this geostrategic shift also changed the narrow focus of many navies from direct conflict to engaging in a broader range of activities, including non-traditional security matters, diplomacy, humanitarian aid, and disaster relief.¹³ Two themes quickly emerge — the desire for US and European countries to capitalise on the post-Cold War peace dividend and the reshaping of naval forces to find purpose, including pivoting towards new and non-traditional security threats. Stöhs goes on to argue that since the decline in investment, many navies have performed well in low-end operations in mostly permissive environments but with great power competition reemerging, many European powers have lost the ability to maintain order at sea through traditional concepts of deterrence and sea control.¹⁴

The decisions of US and European policymakers were similarly observed in New Zealand, as Derek Quigley demonstrated in his examination of New Zealand’s Defence Policy Framework Statement of June 2000. Due to the changing strategic environment, the policy framework envisaged the need for a land force supported by naval and air forces working as part of a collective security arrangement for peace support rather than peace enforcement. As a result, small countries, such as New Zealand, would not be expected to maintain a full range of military capabilities. He further reflected that it would not be in New Zealand’s interests to invest in capabilities that could not maintain operational standards.¹⁵ This assessment is an important observation in policy development. The NZDF’s *Future Joint Operating Concept 2040*, issued 20 years later, draws similar conclusions, albeit for different reasons. The Concept recognises that in the absence of a direct military threat, military forces are involved in a broader range of non-traditional security roles and argues that without a unifying military problem, it risks expending effort, ‘...too thin to achieve good outcomes, and force design may be mismatched to what needs doing.’¹⁶ João Correia reinforces this argument while examining capability-based planning systems, warning that the more ambiguous the concept, the more subjective the solutions derived from the capability planning process become, and suggests there is a greater likelihood that militaries will be ill-prepared for the future.¹⁷ In practical terms, Correia identifies that military planners are more likely to

¹¹ Buddy Suseto, Zarina Othman, and Farizal Mohd Razalli, “Assessing the Evolution of Maritime Strategy in the Asia Pacific,” *Jurnal Ilmu Sosial Dan Ilmu Politik* 23, no. 2 (December 26, 2019): 90, <https://doi.org/10.22146/jsp.41709>.

¹² Jeremy Stöhs, “Into the Abyss?: European Naval Power in the Post–Cold War Era,” 2018, 16, 18, 21.

¹³ Stöhs, 10.

¹⁴ Stöhs, “Into the Abyss?: European Naval Power in the Post–Cold War Era.”

¹⁵ Hon Derek Quigley, “The Evolution of New Zealand Defence Policy” 2, no. 3 (2006): 55–56.

¹⁶ Rhys Jones, *Future Joint Operating Concept 2035* (Wellington, New Zealand: New Zealand Defence Force, 2012), 24–26.

¹⁷ João Correia, “Military Capabilities and the Strategic Planning Conundrum,” *Security and*

bias their plans and advice towards capabilities they are familiar with when presented with vague concepts or scenarios. Furthermore, and of particular relevance to New Zealand, Correia observes a fundamental difference in capability planning imperatives between great and small powers. He observes that small powers who regularly interact with great powers, primarily through alliances or collective security arrangements, often fall into the trap of viewing the world through a great power lens and act as great powers themselves. Small nations then struggle to deliver capabilities and have a tendency, at least at the political level, to communicate capabilities that do not exist.¹⁸

The RNZN's *Maritime Doctrine* provides valuable insights for considering the link between current Government policy objectives and the expectations of its Navy. The doctrine prescribes three tenets underpinning the delivery of maritime capabilities, of which combined, joint and integrated approaches to warfighting are deemed critical to operational success within all-of-government responses to security events.¹⁹ Conventional wisdom dictates that high-end warfighting capabilities are the foundation for enabling joint and multi-agency operations, regardless of the demand or likelihood of using these skills. It infers that a wide range of capabilities must be maintained as the demand for maritime capabilities grows across the many branches of Government. This is reflected in Steven Paget's analysis of the RNZN soon after the release of the *Defence White Paper 2016*.²⁰ In his assessment of the size and capability of the fleet against its suitability to undertake expected tasks and its ability to integrate with close partners, Paget concluded that the RNZN is effective in filling a wide range of tasks. However, it is stretched, and expectations of the Navy are misaligned with the shape of the fleet. This conclusion is similar to that reached by Stöhs regarding European navies and illustrates the risks reflected in the NZDF's *Future Joint Operating Concept 2040* and the work undertaken by Correia. Andrew Watts has considered the RNZN's challenges in maintaining naval capability into the future. While the purpose of his article is to discuss strategies for addressing the future needs of the Navy, his opening remarks imply some criticism of the current shape of the fleet. He claims, '...many would argue it [the fleet] is already diverse beyond the point of sustainability',²¹ which reinforces Correia's observations regarding small nations' capability development traps. Media reports of staff shortages impacting fleet availability also support this view.²²

Reviewing policy documents, assessments, and academic analysis reveals common themes concerning the challenges of maintaining naval forces relevant to this argument. With the desire to capitalise on the post-Cold War peace dividend and no unified peer or near-peer naval threat, many Western nations needed to reevaluate the requirement to invest in capital-intensive naval capabilities. The search for new problems saw an orientation towards low-level, out-of-area operations, mainly in permissive environments and bent towards a wide range of non-traditional security issues. The appropriate capabilities required to respond to the range of possible traditional and non-traditional security contingencies have grown to meet the increasingly complex joint and inter-agency operating concepts and the growing demands of successive governments. Despite the NZDF recognising force design and capability planning risks, great power biases influence military thinking, especially role conception, which can create an

Defence Quarterly 24, no. 2 (June 28, 2019): 2, <https://doi.org/10.35467/sdq/108667>.

¹⁸ Correia, 38–39.

¹⁹ Correia, 26.

²⁰ Steven Paget, "The 'Best Small Nation Navy in the World'? The Twenty-First Century Royal New Zealand Navy," *Australian Journal of Maritime & Ocean Affairs* 8, no. 3 (July 2, 2016): 230–56, <https://doi.org/10.1080/18366503.2016.1217385>.

²¹ Andrew Watts, "Designing the Next Fleet," *The Professional Journal of the Royal New Zealand Navy* 1, no. 1 (December 2020): 25.

²² "Cobbers Keep Navy Afloat - New Zealand News"; Lee-Frampton, "A Third of New Zealand's Navy Ships Are Docked over Lack of Crew."

environment where government policy objectives do not translate well to force design.



Chapter 3: What is in the National Interest?

Geographically, New Zealand is a large remote Polynesian island nation in the South West Pacific, with its nearest neighbour over 1,000km away. It has a small economy when compared to other developed nations, which is largely fuelled by agricultural exports.²³ As a constitutional monarchy with a parliamentary government, elections in New Zealand are held every three years through a mixed-member proportional (MMP) electoral system. This system makes it unlikely that a single Party will govern alone.²⁴ David McCraw's analysis of the two dominant parties' policies demonstrates that historically the National Party has tended towards a more realist approach to foreign policy, emphasising the need to maintain relationships with great power allies for security and economic well-being, while the Labour Party has been reformist and demonstrates a strong commitment to internationalist ideas.²⁵ Since 1976 major Parties have governed in six to nine-year cycles, each supported by one or more minor Parties since the introduction of MMP.²⁶

When considering New Zealand in its South Pacific neighbourhood, it is reasonable to see it as a middle power, second only in national power to Australia when assessed against Lowy Institute's Asia Power Index.²⁷ However, in the context of the wider Indo-Pacific Region, it is appropriate to consider New Zealand's foreign policy from the perspective of a small state. Characteristics generally inherent in foreign policy among such states include limited policy objectives and low engagement in world affairs, but with a strong focus on trade and a heavy reliance on international institutions, and policy issues tend to have a strong moral or ethical basis.²⁸ In 1980 New Zealand's prime minister, Robert Muldoon, perhaps overplayed these characteristics when he famously quipped, 'Our foreign policy is trade. We are not interested in other foreign policy matters to any great extent...'.²⁹ However, by the early 2000s, New Zealand's foreign policy was heavily influenced by Helen Clark's Labour Government. Her nine-year tenure as Prime Minister provided the opportunity to significantly reorient New Zealand's foreign policy towards the Party's liberal internationalist ideology.³⁰ Despite a return to a conservative government in 2008, New Zealand's foreign policy settings remained arguably largely unchanged.³¹

²³ "New Zealand | Britannica," June 30, 2023, <https://www.britannica.com/place/New-Zealand>.

²⁴ "How Government Works," New Zealand Government, May 17, 2023, <https://www.govt.nz/browse/engaging-with-government/government-in-new-zealand/>.

²⁵ David McCraw, "New Zealand's Foreign Policy Under National and Labour Governments: Variations on the 'Small State' Theme?," *Pacific Affairs* 67, no. 1 (1994): 24–25, <https://doi.org/10.2307/2760117>.

²⁶ "Governments in New Zealand since 1856 - New Zealand Parliament," July 18, 2023, <https://www.parliament.nz/en/visit-and-learn/mps-and-parliaments-1854-onwards/governments-in-new-zealand-since-1856/>.

²⁷ Lowy Institute, "New Zealand - Lowy Institute Asia Power Index," Lowy Institute Asia Power Index 2023, accessed September 18, 2023, <https://power.lowyinstitute.org/countries/new-zealand/>.

²⁸ McCraw, "New Zealand's Foreign Policy Under National and Labour Governments," 7–8.

²⁹ McCraw, 14.

³⁰ David McCraw, "New Zealand Foreign Policy under the Clark Government: High Tide of Liberal Internationalism?," *Pacific Affairs* 78, no. 2 (July 1, 2005): 234, <https://doi.org/10.5509/2005782217>.

³¹ Ken Ross, "John Key's Global Diplomacy," *New Zealand International Review* 42, no. 3 (June 2017): 23. Donald E. Nuechterlein, "National Interests and Foreign Policy: A Conceptual Framework for Analysis and Decision-Making," *British Journal of International Studies* 2, no. 3 (October 1976): 246–47, <https://doi.org/10.1017/S0260210500116729>.

Government officials frequently use the term national interest to convey the importance of an issue. But, their statements are often vague and lack a causal explanation between the issue and the 'national interest'. It, therefore, becomes difficult to define what interests are. Donald Nuechterlein offers a simple definition of the national interest as '...the perceived needs and desires of one sovereign state in relation to other foreign states comprising the external environment.'³² He argues that four basic national interests form the foundation of a State's foreign policy.

These concern the security of the State and its people, enhancing the economic well-being of the State in relation to others, the importance of maintaining international order in political and economic systems, and an ideological component reflecting the values of the State.³³ This argument bares out in New Zealand's case, where the briefing to the incoming Minister of Foreign Affairs and Trade, Nanaia Mahuta, in 2020 describes the role of the Minister and her department as '...protect enduring national interests...', before describing these as the international rules-based order, a security environment that keeps New Zealanders safe, international connections that enables prosperity, and global action in sustainability issues.³⁴ The Foreign Minister's inaugural speech to the Diplomatic Corp in February 2021 reinforced these interests with two important additions, the first being to include '...promoting regional stability...' to the security interest.³⁵ The second was to include references to indigenous peoples in the concept of New Zealand's national interests. In the 20-minute speech, the Minister referred to trade and prosperity 28 times and indigenous populations 10 times, ahead of climate change, which she mentioned seven times. This is an interesting observation in that the Prime Minister at the time campaigned on climate change action in her 2017 election victory,³⁶ and is illustrative of Nuechterlein's argument that, although there are foundational interests, the priority afforded to these are influenced by leaders' 'intensity of interest'.³⁷ Security, as a national interest, was mentioned but four times during Mahuta's address, and only regarding the importance of maintaining relationships with Australia and the US, but most significantly, partnerships and relationships were mentioned 48 times.

The tone and emphasis of Mahuta's discourse support the assertions made by Small State Theorists that small-state foreign policy will strongly emphasise trade and place a heavy reliance on institutions and multilateralism. The low intensity of interest in security reflects New Zealand's Defence Policy, where successive White Papers have largely dismissed the threat of direct military attack,³⁸ and Strategic Assessments have placed greater emphasis on risks arising from the cyber-domain and non-traditional security challenges.³⁹ Still, it is worthy of analysing Mahuta's speech in June 2023 concerning '...New Zealand's Place in a Troubled World...', where the focus of this discourse is firmly on the risks of geostrategic competition.⁴⁰ In a similar length speech to that

³² Donald E. Nuechterlein, "National Interests and Foreign Policy: A Conceptual Framework for Analysis and Decision-Making," *British Journal of International Studies* 2, no. 3 (October 1976): 246–47, <https://doi.org/10.1017/S0260210500116729>.

³³ Nuechterlein, 248.

³⁴ "2023 Briefing to Incoming Minister of Defence," 33.

³⁵ Nanaia Mahuta, "Inaugural Foreign Policy Speech to Diplomatic Corps," The Beehive, February 4, 2021, <https://www.beehive.govt.nz/speech/inaugural-foreign-policy-speech-diplomatic-corps>.

³⁶ *Our Nuclear Free Moment*, 2017, <https://www.youtube.com/watch?v=gQW2MB3XiXI>.

³⁷ Nuechterlein, "National Interests and Foreign Policy," 248–49.

³⁸ *Defence White Paper, 2016* (Wellington, New Zealand: Ministry of Defence, 2016), 19.

³⁹ *Defence Strategic Policy Statement* (Wellington, New Zealand: Ministry of Defence, 2018), 26.

⁴⁰ Nanaia Mahuta, "Aotearoa New Zealand's Place in a Troubled World: Partnership and Partnering to Deliver International Solutions," The Beehive, June 6, 2023,

previously cited, keywords carry a similar weighting with matters concerning relationships, partnerships, and multilateralism dominating the narrative. These are followed by economic, trade and prosperity keywords, with issues of human rights, climate change, and security rating less than a dozen mentions each. However, Mahuta's emphasis on maintaining an independent foreign policy differs greatly from her previous speech. She emphasises that the current environment does not require binary choices — perhaps a veiled rejection of George W. Bush's 'either you are with us, or you are with the terrorists' ultimatum⁴¹ — and claims that a shared value system is not a prerequisite for constructive engagement. The Prime Minister's foreign policy speech to the New Zealand Institute of International Affairs on 7 July 2023 reinforces the importance of maintaining principled independence, and in keeping with his National Party predecessor 43 years earlier, Prime Minister Chris Hipkins fell back on the importance of trade, stating, 'In foreign policy terms, it means making sure that we have greater economic resilience across our trade markets...'. Hipkins continued to stress the importance of relationships, arguing that '...relationships [are] key to our economic prosperity, [and] enhancing our national security...',⁴² a logic that is in keeping with the long-held internationalist view that a country cannot become more secure by making others less secure — the antithesis of the security dilemma.⁴³

The term 'national interest' can be an overused cliché amongst government officials and is rarely explicitly defined in policy. Yet national interests and values are critical in shaping foreign policy. New Zealand's national interests are communicated through political discourse. A closer analysis of recent speeches by senior politicians demonstrates that matters concerning international relationships, multilateralism, and economic prosperity are of high importance to New Zealand's national interest. Issues concerning climate change and security remain relevant but of lesser importance. New Zealand's sovereignty is not addressed directly as a national interest; however, it may be inferred by emphasising the importance of principled independence in international engagements and decision-making. The breadth of national interests is rapidly growing, and Hipkins acknowledges New Zealand cannot be passive, stating, '...we may be small, but we are not bystanders...New Zealand has a role to play, and a contribution to make in shaping the international environment...',⁴⁴ while Mahuta's balancing statement warns, '...our capacity to engage can, at times, face real constraints...'.⁴⁵ The division of responsibility across Government agencies for protecting these national interests is defined in policies and departmental objectives. For example, the Ministry of Foreign Affairs and Trade has seven goals, including leading New Zealand's international action to protect the security and safety of New Zealanders,⁴⁶ while NZDF's objectives encompass community environmental well-being and resilience, securing the national lines of communication, contributing to maintaining the rules-based order and promoting strong international networks.⁴⁷ The scope of these expectations grows when paired with ten all-encompassing roles, including defending, protecting, contributing and supporting New Zealand, its allies and partners geographically ranging from Antarctica across the Pacific to Asia and, more broadly, internationally. Finally, there is an enduring

<https://www.beehive.govt.nz/speech/aotearoa-new-zealands-place-troubled-world-partnership-and-par-tnering-deliver-international>.

⁴¹ George W Bush, "President Declares 'Freedom at War with Fear,'" September 20, 2001, <https://georgewbush-whitehouse.archives.gov/news/releases/2001/09/20010920-8.html>.

⁴² Chris Hipkins, "Prime Minister's Foreign Policy Speech to NZIIA," The Beehive, July 7, 2023, <https://www.beehive.govt.nz/speech/prime-ministers-foreign-policy-speech-nziiia>.

⁴³ McCraw, "New Zealand Foreign Policy under the Clark Government," 228.

⁴⁴ Hipkins, "Prime Minister's Foreign Policy Speech to NZIIA."

⁴⁵ Mahuta, "Aotearoa New Zealand's Place in a Troubled World."

⁴⁶ "MFAT Strategic Intentions 2021-2025" (Wellington, New Zealand: Ministry of Foreign Affairs and Trade, 2021), 15.

⁴⁷ *Defence Strategic Policy Statement*, 6.

need to be prepared to respond.⁴⁸ These expectations present challenges for all Government agencies. Changing levels in the 'intensity of interest' of political leaders on matters of national interest will likely increase in a world characterised by increasing complexity and uncertainty. Government agencies that enable and deliver the effects of national power must be agile, capable, and equipped to respond to changing demand signals. However, reinforcing Mahuta's warning that '...Aotearoa cannot be "Everything Everywhere All At Once"...' ⁴⁹ will require political leaders to compromise and accept trade-offs, sometimes at the expense of other national interests.

⁴⁸ "Defence Assessment," 29.

⁴⁹ Mahuta, "Aotearoa New Zealand's Place in a Troubled World."

Chapter 4: The Changing Shape of the Navy

Having established that security is one of four basic and enduring national interests, the previous Chapter showed how security strategies can vary greatly between political parties, as does the intensity of political leaders' interests when prioritising resources towards promoting and protecting national interests. This Chapter examines how Government security policies have been translated into the military eco-system, focusing on two defining periods in New Zealand's history: the 1985 Nuclear Free legislation and the 2000 institutional reforms of the NZDF. These political decisions have fundamentally impacted New Zealand's long-standing approach toward assuring its security interests and are instrumental in producing the naval force structure of today. It is useful to start this examination with Peter Mayall's analysis of New Zealand geopolitics. Mayall uses Halford Mackinder's influential framework to examine New Zealand's security relationships, which he defines in three distinct phases: dependence, collective security and independent security. While this Chapter focuses mostly on the independent security phase, it is helpful to briefly examine the previous two phases as sources of influence on contemporary security thinking.

As a fledgling British colony, New Zealand's early security dependence was never in doubt. Through the 19th and much of the 20th centuries, New Zealand was part of the imperial defence network, a series of commercial and strategic relationships between Britain and its colonies, which assured both parties' security and economic interests.⁵⁰ To demonstrate its commitment to Britain, New Zealand raised 6,500 volunteers to fight in the Boer War 1899-1902, a pattern repeated during the successive World Wars.⁵¹ Underpinning this arrangement was an assumption that both Britain and New Zealand's security interests were aligned and an expectation that Britain was a committed partner in the relationship.⁵²

In the immediate aftermath of World War II, New Zealand's engagement in the Asian region continued to be guided by British foreign policies, with New Zealand forming part of the British Commonwealth Occupation Force of Japan from 1946-1949,⁵³ and the Malaya Emergency 1949-1960.⁵⁴ It soon became evident that the security interests of New Zealand and Britain were less aligned than previously imagined, and Britain's ability to act as a security guarantor, especially after the fall of Singapore during World War II, was in doubt.⁵⁵ The Korean War allowed New Zealand to pursue a more reliable security partner. As a founding member of the United Nations, New Zealand entered the Korean War deploying six of the RNZN's Loch Class frigates over three years to this conflict.⁵⁶ This early commitment to the Korean War was rewarded in gaining the US as

⁵⁰ David Killingray, "Imperial Defence," in *The Oxford History of the British Empire: Volume V: Historiography*, ed. Robin Winks and Wm. Roger Louis (Oxford University Press, 1999), 342, <https://doi.org/10.1093/acprof:oso/9780198205661.003.0022>.

⁵¹ "South African War 1899-1902," accessed July 9, 2023, <https://nzhistory.govt.nz/war/south-african-boer-war/introduction>.

⁵² Peter Mayell, "Beyond the 'Outer Crescent': The Mackinder Century in New Zealand Geopolitics," *The Geographical Journal* 170, no. 4 (December 2004): 371, <https://doi.org/10.1111/j.0016-7398.2004.00138.x>.

⁵³ "Main Body of Jayforce Lands in Japan," accessed July 31, 2023, <https://nzhistory.govt.nz/jayforce-arrives-in-japan>.

⁵⁴ "NZ and the Malayan Emergency," accessed July 9, 2023, <https://nzhistory.govt.nz/war/the-malayan-emergency>.

⁵⁵ Mayell, "Beyond the 'Outer Crescent,'" 371.

⁵⁶ "New Zealand in the Korean War," accessed July 9, 2023, <https://nzhistory.govt.nz/war/korean-war>.

a security guarantor with the ANZUS Alliance Treaty being signed in 1951.⁵⁷ Yet despite New Zealand shifting its great power alliance, New Zealand Prime Ministers continued to espouse the strong parent-child relationship with Britain, firstly during the Suez Crisis in 1956 when Sydney Holland said, 'New Zealand goes and stands where the mother country goes and stands', and reaffirmed as late as 1984 when Robert Muldoon claimed '...in times of trouble we stand with our mother country' concerning the Falklands War.⁵⁸

This new dependency on the US would soon become a politically contentious matter among the New Zealand public. The security relationship was a major factor in New Zealand supporting the unpopular Vietnam War, along with the desire to develop closer economic relations with Australia as Britain sought membership in the European Economic Community,⁵⁹ and at a similar time, the Government was becoming increasingly aware of the risks of atmospheric contamination from nuclear testing in the Pacific.⁶⁰ Public opposition to this testing grew throughout the 1970s, driven by community-based campaigning and education initiatives raising the awareness of risks surrounding nuclear technology.⁶¹ In 1984 the New Zealand public voted for a Labour Government, which paved the way for New Zealand to become a nuclear-free State, and in February 1985, the *USS Buchanan* was denied entry to New Zealand based on the US Government's refusal to confirm whether the conventional destroyer was carrying nuclear weapons.⁶² In response, the US cut all military ties, essentially expelling New Zealand from the ANZUS Alliance. For many across Australia and New Zealand, the Anzacs and Gallipoli are significant national memories that are credited with both countries' developing sense of national identity.⁶³ I would, however, argue that the outcome of the *USS Buchanan* affair, although less glamorous, was the defining political event in New Zealand's history where the country truly demonstrated principled independence in its foreign policy,⁶⁴ and marked the transition away from nearly 200 years of security dependence on Great Powers.

For New Zealand's navy, this transition to independence began earlier, at least on paper, with the formal establishment of the Royal New Zealand Navy in October 1941. While this signalled greater autonomy for the Navy and relations with the US strengthened in the post-war years, the RNZN was still very much influenced by the Royal Navy, with Britain remaining the source of supply for major combatants until the 1980s, providing officers and sailors to crew the fleet when necessary, and training New Zealand officers.⁶⁵ After World War II, the fleet comprised a core of two cruisers and six

⁵⁷ Mayell, "Beyond the 'Outer Crescent,'" 371.

⁵⁸ Mayell, 371.

⁵⁹ David McCraw, "Reluctant Ally: New Zealand's Entry into the Vietnam War," *New Zealand Journal of History* 15, no. 1 (April 1981): 49–50.

⁶⁰ Rebecca Priestley, "Ernest Marsden's Nuclear New Zealand: From Nuclear Reactors to Nuclear Disarmament," *Journal & Proceedings of the Royal Society of New South Wales* 139 (2006): 32.

⁶¹ Pinar Temocin, "From Protest to Politics: The Effectiveness of Civil Society in Shaping the Nuclear-Free Policy in Aotearoa New Zealand" 13 (2021): 185–86.

⁶² Wade Huntley, "The Kiwi That Roared: Nuclear-free New Zealand in a Nuclear-armed World," *The Nonproliferation Review* 4, no. 1 (December 1996): 1, <https://doi.org/10.1080/10736709608436649>.

⁶³ "The Significance of the Gallipoli Peninsula," text, Australia, accessed July 10, 2023, https://www.apf.gov.au/parliamentary_business/committees/senate/finance_and_public_administration/Completed_inquiries/2004-07/gallipoli/report/d01b.

⁶⁴ Amy L. Catalinac, "Why New Zealand Took Itself out of ANZUS: Observing 'Opposition for Autonomy' in Asymmetric Alliances," *Foreign Policy Analysis* 6, no. 4 (September 22, 2010): 330–31, <https://doi.org/10.1111/j.1743-8594.2010.00115.x>; Quigley, "The Evolution of New Zealand Defence Policy," 42.

⁶⁵ Kelly Ana Morey, *Service from the Sea: New Zealand Naval History Told through the*

frigates.⁶⁶ It would retain this surface combatant focus, modernizing towards an anti-submarine warfare (ASW) fleet of frigates from the 1960s to meet the demands of the Cold War.⁶⁷ By 1990 the RNZN comprised 15 ships, including a squadron of four Leander Class frigates, an underway replenishment ship, a hydrographic and research flotilla of four ships, two dive tenders, one of which primarily acted in a training capacity, and a four-ship patrol force crewed by Volunteer Reserve operating from New Zealand's main port centres. The fleet was primarily designed for maritime interdiction and sea control operations supporting the Cold War deterrence strategy.⁶⁸ The frigate squadron, supported by a replenishment ship, had the endurance to meet national and collective security obligations across the Pacific and Southeast Asia. The survey flotilla fulfilled national requirements for domestic and regional hydrographic cartography and oceanographic research, while the Volunteer Reserve controlled shipping, harbour defence, and mine countermeasures. From this point, a slow evolution in force structure began.

New Zealand's exile from the ANZUS Alliance and newfound independence forced the Government to adopt a more independent, self-reliant defence policy in the 1987 Defence White Paper. The first test of the Government's new independent policy stance arose immediately with the need to replace the Navy's ageing Leander Class frigates. Australia presented a proposal to build future combatants, and in 1988 the Government agreed to purchase two ships, later designated the Anzac Class. The debate over whether New Zealand should purchase up to four ships to provide a direct replacement for the existing fleet continued for the next decade before a newly elected Labour Government would confirm only two ships would be purchased.⁶⁹ Seeking to capitalise on the peace dividend, successive National Governments sought to curb spending on defence. The 1991 Defence Review assessed the shape of the NZDF was broadly appropriate for the tasks expected; however, over the next seven years, Defence experienced a 19% reduction in funding.⁷⁰ The 1997 Defence White Paper similarly confirmed Defence capabilities but argued the number of ships comprising the combat force was discretionary. It reduced the frigate fleet from four to three ships to balance the tension between desirability and affordability.⁷¹ This period of fiscal austerity shaped the fleet's ageing hydrographic flotilla. The principal survey ship *Monowai*, two inshore survey craft *Takapu* and *Tarapunga*, and the research ship *Tui* were decommissioned and replaced by a single ex-US Navy ship, *Resolution*. Contributing to this decision was restructuring the Department of Survey and Land Information in 1996 to form Land Information New Zealand, which saw accountability for delivering hydrographic services transferred to this new entity. The RNZN remained a contracted survey data provider until 2012, but when the memorandum of understanding expired, the remaining hydrographic vessel, *Resolution*, retired from service.⁷²

Collections of the Royal New Zealand Navy Museum = Ngā Mahi Nō Te Moana (Auckland, N.Z.: Viking, 2008), 166–203.

⁶⁶ John Martin, *Maritime Doctrine*, First Edition (Auckland, New Zealand: New Zealand Defence Force, Te Ope Kaatua o Aotearoa, 2019), 14.

⁶⁷ Michael Wynd, "Small Steps from Empire to Independence: The Royal New Zealand Navy, 1910-2010," *The Northern Mariner / Le Marin Du Nord* 24, no. 3 & 4 (October 31, 2014): 119, <https://doi.org/10.25071/2561-5467.276>.

⁶⁸ Paul G. Buchanan, "Lilliputian in Fluid Times: New Zealand Foreign Policy After the Cold War," *Political Science Quarterly* 125, no. 2 (June 1, 2010): 269, <https://doi.org/10.1002/j.1538-165X.2010.tb00675.x>.

⁶⁹ Wynd, "Small Steps from Empire to Independence," 119–20.

⁷⁰ Quigley, "The Evolution of New Zealand Defence Policy," 48–49.

⁷¹ Quigley, 50.

⁷² Rhys Jones, "Annual Report 2012" (Wellington, New Zealand: New Zealand Defence Force, August 15, 2012), 48.

The next major shift in New Zealand's Defence policy came with Helen Clark's Labour Government election in 1999. The Defence Beyond 2000 inquiry was particularly influential in generating reform and strongly guided by the liberal internationalist ideals espoused by the Party. The report concluded there was no plausible threat to New Zealand's sea lines of communication, and the NZDF should prioritise land forces supported by sea and air transport and patrol forces.⁷³ The report successfully argued against the logic of further investing in maritime combat capabilities in the absence of a specific threat, and land forces would represent 'a more conspicuous assertion of our identity...because of their closer involvement with the populations than naval or air combat units...'.⁷⁴ The Review advocated for incorporating the NZDF into the wider government strategic planning apparatus, recognising that a whole-of-government approach led by preventive diplomacy better reflected the nation's means.⁷⁵ This report initiated the Maritime Patrol Review, which further promoted multi-agency engagement and led to Project Protector, which would deliver a new suite of capabilities for the RNZN, including a sea lift ship, two long-range patrol vessels and a fleet of four smaller inshore patrol vessels.⁷⁶ In 2001 the Prime Minister announced a restructure of the NZDF, including a joint approach to operations to improve coordination between the three Services.⁷⁷ These significant reforms signalled a shift to a more integrated whole-of-government approach to national security and codified the links between policy, priorities and funding.

The National Party's return to Government in 2009 resulted in the first Defence White Paper in over a decade, which espoused the continued importance of national security, the international rules-based order, strong networks and a strong global economy.⁷⁸ The Paper predicted the tasks for the NZDF would remain largely unchanged from the previous 25 years; however, it did signal a likely increase in demand for the NZDF, pointing to rising fragility in the Pacific as a source.⁷⁹ The White Paper was a status-quo paper focused more on the affordability of maintaining capabilities in the shadow of the global financial crisis (2007-2009). It asserted that the cost of maintaining high-end combat capabilities was beyond New Zealand's means,⁸⁰ and expected \$100M to be freed up through organisational reform, with a further \$250M-\$300M to be realised annually from 'value for money' initiatives for front-line forces.⁸¹ In keeping with the previous Government's approach to Defence, the Paper emphasised the need for mutually reinforcing capabilities delivered through joint operations that were responsive to whole-of-government needs.⁸² The only change signalled for the RNZN in this paper was the replacement of the survey ship and dive tender by a single vessel.⁸³ But more importantly, in the wake of this White Paper, the NZDF embraced joint operations by releasing the NZDF's *Future Joint Operating Concept 2035*. This concept envisaged the

⁷³ Dr David Dickens, "Inquiry into Defence Beyond 2000: An Independent Review of the Foreign Affairs, Defence & Trade Parliamentary Select Committee's Interim Report," Working Paper, n.d., 6.

⁷⁴ Dickens, 8.

⁷⁵ Quigley, "The Evolution of New Zealand Defence Policy," 51.

⁷⁶ "Multi-Role Vessel and Patrol Vessels (Project Protector)," Office of the Auditor-General New Zealand, accessed May 24, 2023, <https://oag.parliament.nz/2008/defence/appendix/appendix2.htm>;

Quigley, "The Evolution of New Zealand Defence Policy," 56.

⁷⁷ "Maritime Patrol Review" (Wellington, New Zealand: Department of Prime Minister and Cabinet, February 2001), 41.

⁷⁸ Defence White Paper 2010 (Wellington, N.Z.: Ministry of Defence, 2010), 9.

⁷⁹ Defence White Paper 2010, 11.

⁸⁰ Defence White Paper 2010, 42.

⁸¹ *Defence White Paper 2010*, 13.

⁸² *Defence White Paper 2010*, 46.

⁸³ *Defence White Paper 2010*, 50.

development of a joint task force based on an amphibious capability.⁸⁴ It did not require significant capital investment. Rather the concept used amphibious operations as a means of forcing the single Services to operate in a more integrated way. The *Defence White Paper 2016* introduced only one new element for the RNZN to consider (Antarctica), which some frustrated Australian commentators described as New Zealand's 'Look South' policy.⁸⁵ The White Paper emphasised the growing importance of Antarctica and signalled the replacement of the aging fleet replenishment ship *Endeavour*, with a new ice-capable logistic support ship, along with a long-range southern ocean patrol vessel.⁸⁶

Today, the RNZN maintains a fleet of nine surface ships, augmented by small watercraft and shore-based operational units. Two Anzac Class frigates, *Te Kaha* and *Te Mana* deliver the Navy's combat capability, each fitted with modern weapons and sensor systems and augmented with the RNZAF's Kaman Super Seaprite SH-2G(I) helicopter. Patrol capabilities are delivered through *Otago* and *Wellington* Protector Class long-range offshore patrol vessels (capable of embarking helicopters), and two Lake Class patrol vessels, *Taupo* and *Hawea*, for domestic and inter-Agency tasks. *Canterbury* provides specialist sealift capability, which can deliver logistics over the shore in austere environments using the ship's landing craft or embarked helicopters, including the NH-90 medium-lift utility helicopters. *Aotearoa* provides at-sea replenishment and is capable of operating in Antarctic waters. The shore-based Unit *Matataua* provides diving, salvage, and hydrographic survey capabilities delivered most effectively through the specialist ship *Manawanui*, although not exclusively.⁸⁷ This fleet is balanced to meet the range of tasks the Government requires, ranging from Antarctica to the equator and responding to low-threat non-traditional security events, through to operating with coalition forces engaged in higher-intensity operations. The component capabilities deliver a versatile amphibious capability appropriate for the Pacific.



Image courtesy of the New Zealand Defence Force

The release of New Zealand's first comprehensive maritime security strategy in 2020 illustrates how successive Governments have responded to the more demanding geopolitical environment and increased frequency of non-traditional security events.⁸⁸ The strategy assigns roles and responsibilities to departments across a matrix spanning three delivery functions of policy/strategy, intelligence and operations, against 20 areas of interest or threats. The NZDF is assigned a lead role in only three of the 60 potential areas of responsibility and supports a further 33 areas.⁸⁹ Consistent with military approaches to operations, the strategy is structured to deliver effects comprising understanding, engaging, preventing and responding to threats — collectively,

⁸⁴ Jones, *Future Joint Operating Concept 2035*, 47–51.

⁸⁵ Peter Jennings, "New Zealand's Defence White Paper: Look South," *The Strategist*, June 9, 2016, <https://www.aspistrategist.org.au/new-zealands-defence-white-paper-look-south/>.

⁸⁶ *Defence White Paper 2010*, 52.

⁸⁷ "Ships & Watercraft," accessed July 10, 2023, <https://www.nzdf.mil.nz/navy/our-equipment/ships-and-watercraft/>.

⁸⁸ "Maritime Security Strategy" (National Maritime Coordination Centre (New Zealand), December 2020), 1–3, https://www.transport.govt.nz/assets/Uploads/Report/MSS_V6_U.pdf.

⁸⁹ "Maritime Security Strategy," 39.

emphasising deterrence.⁹⁰ Comparing this concept to Australia's Defence Security Review, which emphasises a hard military approach to deterrence by denial,⁹¹ it is clear both countries focus on different threats. New Zealand's approach emphasises gathering evidence of illegal activity to seek prosecution through international legal mechanisms or diplomatic solutions. The Strategy highlights that Agencies need the right tools to deliver the required effects. Capabilities need to be available at short notice for tasking, be able to cope with the maritime environment and carry out enforcement operations, but also balanced so the proper response is engaged appropriately for the situation.⁹² Most notably, the NZDF is not the lead agency in delivering New Zealand's maritime security strategy but is an essential operational enabler.

New Zealand's national interests have mostly remained unchanged, and similarly, since the end of the Cold War, New Zealand's strategic appreciation has varied little. However, the method in which New Zealand approaches its security requirements has evolved from a realist-centred dependence on a Great Power security guarantor to a liberal-internationalist view of self-reliance in partnership. New Zealand's newfound independence in 1985 provided greater autonomy to shape and scale its Defence Force to meet the nation's interests. It offered greater licence to pursue its own security agenda, resulting in a force that meets New Zealand's national security interests while being mindful of the need to contribute to collective security arrangements meaningfully. New Zealand's geographic location means the RNZN has always been a blue water expeditionary war-fighting service,⁹³ but affordability has been a key driver in shaping security capabilities. The more balanced approach to security from the 2000s, emphasising joint and inter-agency cooperation, has seen the RNZN's core capabilities shift from a single Service emphasis on sea control to joint force projection based on an amphibious core. The challenge for the RNZN is that, despite reducing the number of platforms, the range of capabilities required to deliver this effect increases. At the same time, the emphasis on inter-agency cooperation has seen the demands from those Agencies increase significantly.

⁹⁰ "Maritime Security Strategy," 23.

⁹¹ "National Defence - Defence Strategic Review" (Canberra, Australia: Australian Government, 2023), 19, <https://www.defence.gov.au/about/reviews-inquiries/defence-strategic-review>.

⁹² "Maritime Security Strategy," 24.

⁹³ Martin, *Maritime Doctrine*, 27.

Chapter 5: Perfectly Formed or a Hot Mess?

The previous Chapter demonstrated how New Zealand's defence strategy has evolved from great power dependency towards self-reliance in partnership, emphasising a whole-of-government approach to maritime security. With this change, the RNZN's parallel journey has gone from a sea control force towards a more balanced Navy with blue-water force projection capabilities, following the pattern of many European nations that Stöhs observed after the Cold War. This Chapter examines the extent to which the RNZN, as an instrument of national power, is structured to meet the Government's policy objectives. The roles the Navy is expected to perform are defined more fully, and examined from two perspectives — that of force structure (the ships it possesses) and the NZDF's operating model (how the force is used). The NZDF's formal reporting to the Government provides the evidence for this analysis. I acknowledge these reports tend to accentuate the positive, as does community engagement literature produced by the organisation.

This bias is balanced through media reporting and think-tank assessments, which tend to be more critical, emphasising vulnerabilities or system failures. These sources do have a tendency to be issues-focused, or limited in scope such as assessing the qualities of particular systems and platforms, without considering the integrated capabilities across the NZDF that generate military effects. However, together, these sources provide a balanced evidential basis from which to conduct the assessment. Government objectives and expectations are defined at the NZDF level and broadly grouped into roles associated with community, national, and global environments. These roles and objectives are wide-ranging, beginning with defending New Zealand's sovereignty and territory and protecting critical lines of communication. These broaden to encompass peace and security objectives across the South Pacific (including leading initiatives when and where necessary), making a credible contribution to the Asia-Pacific region and contributing to international peace and security and the international rules-based order. Added to these significant obligations is the need to contribute to national and community well-being, support other Agencies in the Southern Ocean and Antarctica, and work with other Agencies to understand New Zealand's strategic environment. Finally, there is the need to be prepared to respond to sudden shifts in the strategic environment.⁹⁴ These expansive requirements are translated in the RNZN's Maritime Doctrine through interrelated and interdependent roles encompassing safety and assistance, constabulary, diplomacy, and combat both at and from the sea.⁹⁵ All of this is underpinned by 16 functional capabilities necessary to undertake and deliver these roles.⁹⁶ Annual reporting to the Government describes how the RNZN has fulfilled these roles.

The following examples illustrate the range of activities undertaken by the navy, beginning with the newest maritime capability in Antarctica. The RNZN's newest ship *Aotearoa* supported the Antarctic mission resupplying fuel in 2022,⁹⁷ and a year prior hydrographic surveyors from *Matataua* deployed to support the Scott Base redevelopment project.⁹⁸ At the other end of the spectrum, supporting international

⁹⁴ *Defence Strategic Policy Statement*, 8.

⁹⁵ Martin, *Maritime Doctrine*, 83.

⁹⁶ Martin, 85–104.

⁹⁷ Kevin Short, "Annual Report 2022" (Wellington, New Zealand: New Zealand Defence Force, June 30, 2022), 50, <https://www.nzdf.mil.nz/assets/Uploads/DocumentLibrary/22-0341-NZDF-Annual-Report-2022-WEB.PDF>.

⁹⁸ Kevin Short, "Annual Report 2021" (Wellington, New Zealand: New Zealand Defence Force, June 30, 2021), 56.

peace and security, the RNZN commanded maritime security operations in the Arabian Gulf during 2021.⁹⁹ The navy engaged with partners to enhance interoperability, with *Te Kaha* and *Matataua* attending Exercise RIMPAC 2019,¹⁰⁰ and *Manawanui* participating in 2021 during the height of the COVID-19 pandemic.¹⁰¹ Regionally, the Lake Class inshore patrol vessel *Hawea* deployed for six months to support Fiji's maritime and fisheries security during 2017.¹⁰² Support to the Pacific continues with *Taupo* conducting a similar mission to Samoa in 2023.¹⁰³ The RNZN responded as part of a joint task force to significant national and regional emergencies, including the Hunga Tonga-Ha'apai volcanic eruption described in the introduction and the Kaikoura Earthquake 2017. In the latter case, *Te Kaha* commanded an international maritime response, comprising US, Canadian and Australian ships working alongside *Canterbury* and *Wellington*.¹⁰⁴ Articles in the RNZN's official magazine attest to the wide range of missions the RNZN fulfils, including supporting Agency tasks at Raoul Island and the sub-Antarctic Islands, Pacific fisheries patrols and cultural exchanges with both Fijian and US military partners.¹⁰⁵

These individual stories demonstrate the breadth of RNZN activities that meet wider national interests. However, these 'snapshots' are merely feel-good public relations stories, rather than being robust critical assessments of the Navy's operational capabilities or capacity. Scholarly assessments are more sobering. Steven Paget's analysis of the RNZN in 2016 concluded that while it was effective in filling a wide range of tasks, it was over-stretched, and expectations were misaligned with the shape of the fleet.¹⁰⁶

Similarly, the NZDF's Concepts warn that as militaries become involved in a broader range of non-traditional security roles, they risk expending effort, '...too thin to achieve good outcomes, and force design may be mismatched to what needs doing.'¹⁰⁷ Between 1990-2023, the fleet shrank from 15 ships required to perform a limited range of naval tasks to nine ships, while still being required to operate across a wide spectrum of joint and inter-Agency operations. In other words, the RNZN of 2023 represents a trade-off in capability depth for breadth. The impact of this is evident when analysed across Annual Reports, with Figure 1 demonstrating significant capability gaps over time, that are generally linked to platform replacement programmes or major capability upgrades.

⁹⁹ "CTF 150: Maritime Security," *Combined Maritime Forces (CMF)* (blog), September 17, 2010, <https://combinedmaritimeforces.com/ctf-150-maritime-security/>.

¹⁰⁰ Kevin Short, "Annual Report 2019" (Wellington, New Zealand: New Zealand Defence Force, June 30, 2019), 74–75.

¹⁰¹ Short, "Annual Report 2021," 64.

¹⁰² Audrey Young, "NZ Navy Sends Hawea to Fiji for Six Months," *NZ Herald*, April 6, 2017, <https://www.nzherald.co.nz/nz/nz-navy-to-send-hawea-patrol-vessel-to-fiji-for-six-months-to-help-patrol-fisheries/OCM6U3ONB2Y5LCELFYJO6WA3KA/>.

¹⁰³ "NZ Navy Ship Completes Maritime Patrol in Samoa to Help Protect Fisheries," accessed July 13, 2023, <https://www.nzdf.mil.nz/media-centre/news/nz-navy-ship-completes-maritime-patrol-in-samoa-to-help-protect-fisheries/>.

¹⁰⁴ Tim Keating, "Annual Report 2017" (Wellington, New Zealand: New Zealand Defence Force, June 30, 2017), 12, 35.

¹⁰⁵ *Navy Today*, 242 (Wellington, New Zealand: Defence Public Affairs, 2020).

¹⁰⁶ Paget, "The 'Best Small Nation Navy in the World'?", 249–50.

¹⁰⁷ Jones, *Future Joint Operating Concept 2035*, 24–26.

¹⁹⁶  The Australian War College – Shedden Papers

Reporting Period	Naval Combat		Projection & Sustainment			Shipping Control	Patrol
	Warfare	Security	Sea Lift	Replenish	Littoral		
2010	✓	✓	●	✓	●	No reporting	●
2011	✓	✓	●	●	✓		✓
2012	✓	✓	✓	✓	✓		●
2013	✓	✓	●	✓	✓		●
2014	●	●	✓	✗	✓		●
2015	✓	✓	✓	✗	✓	✓	No reporting
2016	✓	✓	✓	✓	✓	✓	
2017	✓	✓	✓	✓	●	✓	
2018	●	●	✓	✗	●	✓	✓
2019	●	●	✓	✗	●	✓	●
2020	✗	✗	✓	✗	●	✓	✓
2021	✗	✗	✓	✓	✓	✓	●
2022	●	●	✓	✓	✓	✓	●
✓ Fully met (>90%) ● Partially met (<90%) ✗ No capability (0%)							

Figure 1: RNZN Output Delivery 2010-2022¹⁰⁸

The most evident is the lack of combat force for two years (2020-2021) due to the frigate system upgrades,¹⁰⁹ while patrol capabilities frequently suffer due to shortages of skilled staff who are prioritised towards operating higher-value platforms. It must be noted that a reported result of ‘fully met’ does not mean a capability is available for the full reporting period, in this case, a financial year.

Rather it indicates that the capability was available for the period planned. While all ships possess common capabilities, each Class has unique attributes or specialist functions. The naval combat and patrol outputs (domestic and regional) benefit from having two platforms that offer some redundancy. The specialist capabilities inherent in the remaining ships are unique to single platforms. Thus, if *Canterbury* is undergoing major maintenance, whether planned or not, the RNZN has no practical sea lift or amphibious capability of scale.

This is further illustrated by the availability of each ship. Until 2014, RNZN outputs were reported to the Government by the number of days ships were available for tasks (mission available) and the days ships spent at sea. This ceased being reported publicly in 2015, but data between 2010-2014 provides a useful insight into the fleet’s actual availability, as illustrated in Figure 2.

¹⁰⁸ Data extracted from Defence Annual Reports (GR.55) 2010-2022.

¹⁰⁹ “New Zealand Navy Frigate to Leave Canada Years after Upgrade Began,” RNZ, May 17, 2022, <https://www.rnz.co.nz/news/national/467270/new-zealand-navy-frigate-to-leave-canada-years-after-up-grade-began>.

<i>Ships in Class</i>	<i>Availability</i>	<i>Sea Days</i>	<i>Days Deployed</i>
One	≈50%	≈30%	94-123 days deployed
Two	≈100%	≈60%	200-230 days deployed
Four	≈200%	≈100%	361 days deployed

Figure 2: Ship Availability and Utilisation Rates per Annum^{110]}

While individual ship utilisation can be highly variable and the source data is dated, it is representative of the normal operating tempo of the RNZN over five years. The data demonstrates a single ship will typically be mission available for six months of the annual cycle and, although available, will only be tasked for four months of the year, spending between 94-123 days at sea. Where two ships exist within a Class, the Government is more assured the capabilities derived from the platforms are available all year, while planned tasking between the two platforms will amount to seven months of operations. Against the total Fleet however, this would suggest that three ships are available for tasking or re-tasking if already employed, at any one time, and therefore it is plausible that media reporting of ‘A third of the fleet tied up’, although true, may simply be remarking upon the Fleet’s normal operating availability.¹¹¹

The core issue is the erosion of fleet size in general, as financial efficiencies have been sought by successive Governments. Indeed, the NZDF has reported sustainability issues to the Government stating, ‘...the two frigate paradigm does not provide enough reliable training capacity to sustain critical training capabilities. Significant deficiencies in trained and experienced personnel exist across the Naval Combat Force and wider Naval System...’¹¹² A practical example of this deficiency was highlighted in Ben Felton’s blog in Naval News where he reported the anticipation surrounding *Te Mana*’s scheduled surface-to-air missile firing in Australia in late 2023. Notably, it is the first missile firing to be conducted in 11 years.¹¹³

The current Fleet comprises six Classes across the nine ships, and with plans to acquire a Southern Ocean Patrol Vessel and an additional logistics ship with a docking capability, this issue compounds further.¹¹⁴ Efficiencies can be gained through commonality across a fleet of vessels or even a Class of ship used by a number of countries. These efficiencies are often couched in terms of lower costs delivered through construction, reduced training overheads, and improved material costs through achieving better economies of scale.¹¹⁵ Indeed, this was the concept underpinning the Anzac Class, and some equipment commonality across Project Protector (*Canterbury*, *Wellington*, *Otago*, *Taupo* and *Hawea*). However, New Zealand’s frigate systems upgrade adopted a different through-life development path to Australia, so the

¹¹⁰ Data extracted from Defence Annual Reports (GR.55) 2010-2014.

¹¹¹ Lee-Frampton, “A Third of New Zealand’s Navy Ships Are Docked over Lack of Crew.”

¹¹² Kevin Short, “Annual Report 2018” (Wellington, New Zealand: New Zealand Defence Force, June 30, 2018), 59.

¹¹³ Ben Felton, “New Zealand Frigate Arrives in Australia for Rare Missile Firing,” *Naval News* (blog), July 28, 2023, <https://www.navalnews.com/naval-news/2023/07/new-zealand-frigate-arrives-in-australia-for-rare-missile-firing/>.

¹¹⁴ “New Zealand Government Defence Capability Plan 2019” (Wellington, New Zealand: Ministry of Defence, June 2019), 13–14, <https://www.defence.govt.nz/assets/Uploads/03acb8c6aa/Defence-Capability-Plan-2019.pdf>.

¹¹⁵ Michael J Corl, Michael Kokkolaras, and Michael G Parsons, “Platform-Based Design of a Family of Ships Considering Both Performance and Savings,” August 28, 2007, 4, 11.

commonality between national variants is minimal. This pattern of growing diversification remains evident in the more recent acquisition of a dive and hydrographic vessel. A key risk highlighted to the Ministers of Finance and Defence concerned challenges around acquiring and maintaining qualified people to operate the ship's unique dynamic positioning system.¹¹⁶ Figure 3 illustrates the ratio between the number of ships comprising the RNZN fleet and the number of Classes, projected against current acquisition plans to 2030.

A higher ratio represents less commonality, which is arguably less efficient and less resilient. This observation lends credibility to Andrew Watts reflecting criticism of the current shape of the fleet when he stated, '...many would argue it is already diverse beyond the point of sustainability'.¹¹⁷

Classes of Ship in Service and Ship:Class Ratio

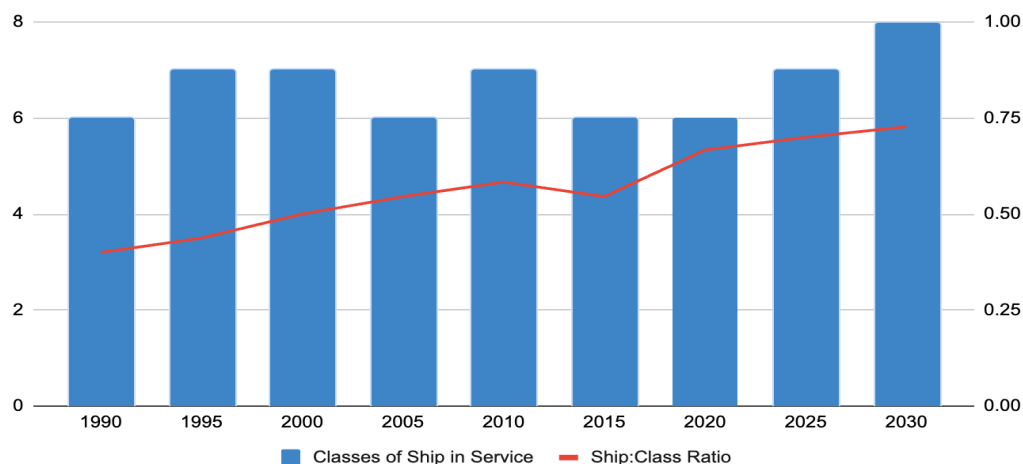


Figure 3: Classes of Ship in Service and Ship:Class Ratio

Diversity across the fleet is relevant when considering staffing, often cited as a critical vulnerability and the subject of more intense media reporting. This phenomenon is not new with the Chief of Navy reporting a 20% shortfall in technical staff in 1973 when recruiting challenges resulted in dissatisfaction among more experienced engineers who were required to stay at sea longer.¹¹⁸ In 1978, the frigate *Taranaki* was tied up due to these critical staff shortages.¹¹⁹ A decade later, the RNZN was trying to recruit retired officers and sailors from Australia and Britain in the face of strong commercial sector competition for skilled staff that drove attrition up to 23%.¹²⁰ Soon after, two patrol craft were tied up due to a shortage of skilled bridge staff.¹²¹ This pattern repeated in 2012 in the aftermath of the Defence Transformation Programme, resulting in two Lake

¹¹⁶ Helene Quilter and Kevin Short, "Report to the Ministers of Finance and Defence: New Zealand Defence Force: Approval to Commit to Contractor for the Dive and Hydrographic Vessel" (Ministry of Defence, December 2018), 4, <https://www.defence.govt.nz/assets/Uploads/5e0a78f961/2018-Dive-and-Hydrographic-Vessel.pdf>.

¹¹⁷ Watts, "Designing the Next Fleet," 25.

¹¹⁸ "Navy Critically Short of Men," *Press*, September 4, 1973, CXIII edition.

¹¹⁹ Norman L. Dodd, "New Zealand's Defence Problems," *The RUSI Journal* 123, no. 2 (June 1978): 52, <https://doi.org/10.1080/03071847809422896>.

¹²⁰ Dave Wilson, "Navy Woos Back Retired Officers," *Press*, March 27, 1988.

¹²¹ "Naval Staff Shortages Tie up Patrol Craft," *Press*, April 13, 1988.

Class inshore patrol vessels being tied before eventually being sold.¹²² And in 2022, the Chief of Defence Force reaffirmed challenges with staffing, citing a 16.5% attrition rate contributed to a third of the Navy's fleet being tied up indefinitely.¹²³ At the same time, *Wellington* returned from Pacific fisheries patrols a month early to help manage this attrition.¹²⁴ People are a critical component in delivering Navy capabilities. Still, issues in training new staff may be compounded by the high overhead associated with the diverse range of ships and roles the Navy is expected to undertake, resulting in a longer recovery time.

Some of these challenges are mitigated by changes to how the NZDF operates. With the Government's restructuring of the NZDF to operate in a more integrated way, the funding and activity reporting system also changed, being formally codified into the NZDF's output framework in 2015.¹²⁵ This change resulted in the Chief of Navy no longer having responsibility for executing naval operations but only retaining accountability for preparing naval capabilities for joint operations within prescribed periods of notice. The logistic ship *Canterbury*, for example, has particular utility during the Pacific's high-risk weather season, so the navy focuses on *Canterbury's* mission readiness for this period. Operational execution is vested in the Commander Joint Forces New Zealand, with mission-ready forces assigned from the Services.¹²⁶ This is explained in the Report by the Expert Review Group, which highlights the 'Could we? Should we? Will we?' process.¹²⁷ The Commander Joint Forces New Zealand has considerable flexibility in developing a range of options with the force elements available (what could we do?). A more politically nuanced view considers and advises on wider implications of each option (what should we do?), before the Government provides direction on and authorises using military forces (what we will do?). Designing military responses is seldom contingent on organic NZDF capabilities alone.¹²⁸ Options may range from delaying action as specialist force elements become mission-ready, seeking support from other government agencies, allies and partner nations, or seeking commercial solutions for specific capabilities or additional capacity. While operational domains such as 'the maritime domain' mostly remain the purview of the Navy,¹²⁹ the increased emphasis on joint operations has resulted in an increasing number of joint functions being realised, such as intelligence and information. Commanders can combine similar functions from across the Services to achieve the mission, with this matrix approach spanning domains and functions, offering greater flexibility in accessing and applying specific capabilities.¹³⁰ There remains a suite of conventional solutions for domain-specific problems recorded in doctrine. However, this joint

¹²² Nicholas Jones, "Govt Likely to Sell Idle Navy Ships," NZ Herald, April 15, 2016, <https://www.nzherald.co.nz/nz/govt-likely-to-sell-idle-navy-ships/IDBSMOKRVSCBEQDHN6MAOOI2 E/>; "Sale of Former Royal New Zealand Navy Vessels Provides \$26 Million Boost to Local Economy," April 6, 2023, <https://www.nzdf.mil.nz/media-centre/news/sale-of-former-royal-new-zealand-navy-vessels-provides-26-million-boost-to-local-economy/>.

¹²³ Lee-Frampton, "A Third of New Zealand's Navy Ships Are Docked over Lack of Crew."

¹²⁴ "Third of NZ Navy Ships Idle as Defence Force Staff Leave," RNZ, December 8, 2022, <https://www.rnz.co.nz/news/national/480354/third-of-nz-navy-ships-idle-as-defence-force-staff-leave>.

¹²⁵ Tim Keating, "Annual Report 2015" (Wellington, New Zealand: New Zealand Defence Force, June 30, 2015), 45.

¹²⁶ Kevin Short, *Command and Control*, 3rd ed., vol. 00.1, NZDDP (Wellington, New Zealand: New Zealand Defence Force, 2022), 16.

¹²⁷ Lyn Provost, "Report of the Expert Review Group" (Wellington, New Zealand, November 2021), 28–30.

¹²⁸ Kevin Short, *Campaigns and Operations*, 3rd ed., vol. 3.0, NZDDP (Wellington, New Zealand: New Zealand Defence Force, 2022), 23.

¹²⁹ Short, 3.0:26.

¹³⁰ Short, 3.0:29.

approach allows more innovative solutions to be explored than may otherwise be derived from traditional single-Service models. As a result, Government objectives are less likely to fail based on the availability of a single asset. The effectiveness of this approach at an NZDF-wide level is reflected in annual agency satisfaction ratings, which have been reported annually since 2014. Notably, since data was collected in a comprehensive form, the number of agencies has risen from just seven to 22, reflecting the increased demands being placed on the NZDF, yet with annual satisfaction ratings generally 80% or greater.

As an instrument of national power, it is evident that the Navy is structured to meet Government objectives, as reflected in the annual agency feedback. The range of operations conducted is diverse and often planned far in advance. Still, the RNZN has also demonstrated agility in responding to crises as part of a joint task force when necessary. It is equipped to deliver against expectations, but this versatility is only paper-thin. The concentration of capabilities — such as sea lift, underway replenishment, and to a lesser extent, littoral operations — into single assets means that the navy's ability to perform such core duties is too exposed to the vagaries of maintenance and training schedules, equipment reliability and an increasingly transient and diverse workforce. The fact that the RNZN has had only partial or no combat capability for the last five years and no underway replenishment capability for a similar period illustrates these vulnerabilities. While current capability plans intend to increase the depth of sea lift and Southern Ocean patrol, this will likely generate greater demands on an already stretched workforce. A considerable portion of the RNZN activities support other government agencies. This is evident both in the Maritime Security Strategy, where the NZDF supports 33 of the 60 work areas and the increase in agencies the NZDF sees as key customers. The Defence Annual Report 2012 introduces the NZDF as, '...the only agency that maintains disciplined forces available at short notice and that operates largescale and integrated fleets of vehicles, ships, and aircraft.'¹³¹ With the Government's stated desire to incorporate the NZDF into the wider strategic security architecture in 2000 and the more deliberate emphasis on joint and inter-agency operations from 2010, this demand is unsurprising in the absence of a direct military threat.

¹³¹ Jones, "Annual Report 2012," 9.

Chapter 6: Investing in Resilience

In 2013, the NZDF formally engaged with industry seeking information to support the replacement of the Navy's ageing diver tender vessel. Despite eventually acquiring and modifying an existing commercial vessel, the operational release of the new ship was not planned until 2022, nine years after the programme was initiated.¹³² This example illustrates a challenge in delivering maritime capability: a relatively simple off-the-shelf asset procurement spanned three different Governments. Procurement is a lengthy process, spanning multiple political cycles and with limited ability to adapt to evolving geopolitical environments. This challenge is succinctly described by the Chief of Defence Force, arguing that 'successive governments have had "too short a timeframe" on defence issues, focusing on wins they can score within three-year terms....we've got to look 10, 20, 30 years ahead'.¹³³

In addition to this short-term focus, there is also a need to critically challenge long-standing assumptions about the force structure, for example, the need to operate at the high end of the maritime warfare spectrum. It is worth considering the opportunity cost of maintaining the ability to respond at this level and, more fundamentally, asking whether this capability aligns with the Government's security philosophy. Pre-2015 Defence Reporting to Government offers insight into the cost of each maritime function. Output Expense 2 Naval Combat Force is described as 'The provision of *HMNZ Ships Te Kaha* and *Te Mana* prepared to conduct maritime operations...'.¹³⁴ The RNZN's Maritime Doctrine provides a fuller description of what the naval combat force functions include.¹³⁵ And the cost of maintaining this capability is expensive. Figure 4 shows the per diem cost is notably higher for the naval combat force than for other functions, averaging \$1.1M per mission available day over five years, as opposed to the Patrol force, which was less than 10% of that cost. Similarly, if every ship in Service in 2023 were put to sea with a full crew, the combat force would account for over 50% of the demand on people. This analysis is conducted purely to illustrate the resource burden of different capabilities, and, albeit in a superficial sense, this suggests the opportunity cost of an additional frigate may be as high as the sum of all other naval capabilities combined.

¹³² Andrew Bridgeman, "Major Projects Report 2021" (Wellington, New Zealand: New Zealand Ministry of Defence, December 9, 2021), 37–43, <https://www.defence.govt.nz/assets/publication/file/Defence-Major-Projects-Report-2021.pdf>.

¹³³ Hall, "Defence Force Funding."

¹³⁴ Rhys Jones, "Annual Report 2013" (Wellington, New Zealand: New Zealand Defence Force, August 28, 2013), 57.

¹³⁵ Martin, *Maritime Doctrine*, 106.

Cost per Mission Available Day by Output Class

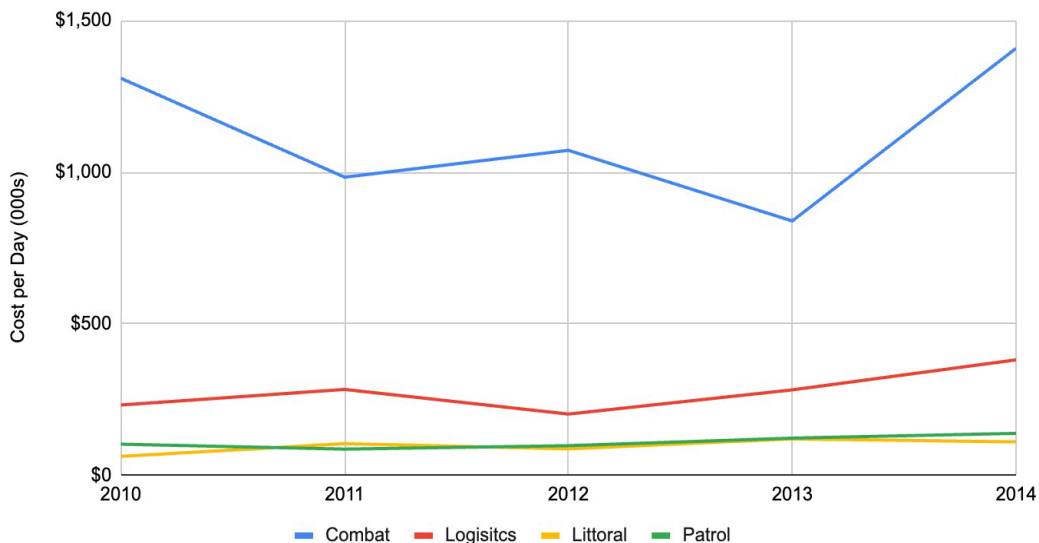


Figure 4: Cost per Mission Available Day by Output Class¹³⁶

Given the evidence of significant capability gaps, the training challenges identified in sustaining a two-frigate combat force, and the relative costs against other naval capabilities, the current investment or approach to maintaining a combat force is questionable. Even the expectations of naval practitioners in doctrine writing differ from what Government officials use. The capability of the Anzac Class frigate, for example, is described in the Navy's Doctrine as '...allow[ing] them to operate in medium to high threat situations...',¹³⁷ whereas the Ministry of Defence describes the frigate systems upgrade as offering '...confidence in low to medium-threat environments...'.¹³⁸ On paper, this appears a minor difference - at best a typographical error or an oversight in preparing a business case. Depending on the threat definitions in use, this difference could be significant, or even a subtle erosion of capability, and the manifestation of the Government's reluctance to invest in maintaining a high-end maritime warfighting capability. The fragility of the combat force described in this analysis supports João Correia's observation that small powers that interact with great powers fall into the trap of viewing the world through a great power lens and struggle to deliver capabilities. Further justification for reinstating the combat capability of the Anzac Class rests in 'providing a physical demonstration of New Zealand's commitment to regional and global security.'¹³⁹ This raises the question of whether a nation's interest in preserving global security translates to a need for global military reach.

Since New Zealand adopted an independent foreign policy, a pattern has emerged of successive governments reforming and then refining the force structures that enable the NZDF to meet its objectives. These have included investment decisions regarding capabilities, how the organisation operates internally, and how well it integrates with the wider government security architecture. Underlying national interests have not changed. However, the Nation has developed its unique security philosophy, arguably influenced by geographic isolation and the absence of direct military threats. This philosophy embraces the liberal internationalist view that security is a product of maintaining

¹³⁶ Data extracted from Defence Annual Reports (GR.55) 2010-2014.

¹³⁷ Martin, *Maritime Doctrine*, 106.

¹³⁸ Bridgeman, "Major Projects Report 2021," 25.

¹³⁹ Bridgeman, 25.

positive international relationships and economic interdependence rather than derived from protectionist policies and strong military forces. This is borne out in the discourse of senior political leaders who focus on multilateralism, and economic prosperity, underscored by New Zealand retaining its principled independence. This evolution has seen New Zealand's approach to conflict shift from needing to prove its allegiance to a great power security guarantor by committing troops to war to an approach that focuses on conflict management and post-conflict reconstruction legitimised through the United Nations.¹⁴⁰ These factors have strongly influenced the shape of New Zealand's military, but the lower priority that successive Governments have placed on military power as a tool for assuring traditional national security has seen these forces atrophy over time. The RNZN is designed to deliver a wide range of capabilities appropriate for the region — a blue continent with low military threat and an increasing frequency of non-traditional security issues or, in other words, the most likely scenario. It is not designed for the most dangerous scenario. From a capability perspective, the RNZN has the makings of an agile force through its balanced force structure, but from a resource perspective, it is unduly weighted towards a modern combat capability offering little more than a pretence at delivering the high-end warfighting capability expected by great powers. This has resulted in a fragile navy with too few ships that would have difficulty in managing multiple concurrent challenges.¹⁴¹ Even the Chief of Defence Force has conceded the NZDF would struggle to maintain a peacekeeping presence in the Pacific Region.¹⁴²

The NZDF is not new to organisational reforms that challenge underlying military traditions and assumptions. Indeed, one of the tenets that guide the employment of the Navy rests with encouraging 'commanders to seize the initiative and gain an advantage by adopting unorthodox or imaginative courses of action as opportunities arise.'¹⁴³ How could the RNZN reimagine New Zealand's contribution to regional security, beginning with the premise of New Zealand's role in maintaining the international rules-based order? China's destabilising behaviours in the Region have been the subject of significant scrutiny in recent times. The influence of China has been recognised in New Zealand's Defence Policy and Strategy Statement 2023,¹⁴⁴ although not in the same alarmist terms described by many media and think-tank commentators. New Zealand's relationship with China is significant, and future cooperation will be essential in addressing future challenges, yet there is no denying increasing strategic competition across the Indo-Pacific Region. During the release of New Zealand's first National Security Strategy, Minister of Defence Hon Andrew Little stated, '...we do not live in a benign strategic environment'.¹⁴⁵ The environment described in the strategy is complex, but strategic competition is only one of the dozen threat vectors identified. Transboundary challenges of violent extremism, terrorism, malicious cyber and disinformation, alongside a range of non-traditional security threats permeate the region. However, along with previous strategic assessments, a direct military attack on

¹⁴⁰ Mayell, "Beyond the 'Outer Crescent,'" 375.

¹⁴¹ Lucy Craymer, "New Zealand Navy Idles Ships as Labour Crisis Hits," 7 Dec 22, <https://www.reuters.com/world/asia-pacific/new-zealand-navy-idles-ships-labour-crisis-hits-2022-12-07/>.

¹⁴² Hall, "Defence Force Funding."

¹⁴³ Martin, *Maritime Doctrine*, 29.

¹⁴⁴ "Defence Policy and Strategy Statement" (Wellington, New Zealand: New Zealand Government, 2023), 14, <https://www.defence.govt.nz/assets/publication/file/23-0195-Defence-Policy-and-Strategy-Statement-WEB.PDF#page=14>.

¹⁴⁵ Andrew Little, "Speech to Announcement of Roadmap for Future of Defence and National Security Released," The Beehive, August 4, 2023, <https://www.beehive.govt.nz/release/speech-roadmap-for-future-of-defence-and-national-security-released>.

New Zealand is not one of them, and the impact of climate change is considered the greatest threat to the livelihoods and security of the Pacific people.¹⁴⁶ With New Zealand's dominant European heritage and membership of the Five Eyes community, it is easy for the small nation to interpret the world through the lens adopted by its traditional security partners. But this is also changing, especially with Hon Nanaia Mahuta's attempt to introduce more of an indigenous worldview to New Zealand's diplomatic toolkit and declare the Pacific region as central to New Zealand's national interests.¹⁴⁷ This does not mean New Zealand is blind to the challenges and implications of greater Chinese assertiveness in the region. Still, New Zealand's response to these challenges can be the point of difference, arguably led by New Zealand's soft power in the region.

Do these changing circumstances test or confirm the underlying assumptions for maintaining New Zealand's naval combat capability? Defence planners could mount a sound argument for continuing to invest in high-end maritime combat capabilities with global, or at least wider Indo-Pacific reach if overt Chinese military aggressiveness tops the list of security concerns. A return to a Cold War 'focused force', tailored to address a specific threat may enhance the effectiveness of a small nation's maritime capabilities in a particular mission area while offering much-needed depth to a coalition force, such as during the Cold War. However, it may also limit versatility in other types of operations. This is not the case. New Zealand's prime area of interest is the Pacific, and non-traditional security threats persist as the ever-present danger.



New Zealand's current approach to force design combines different types of ships that provide different capabilities to achieve a range of operational objectives. It is essential for preserving versatility and responding to various threats. However, as demonstrated, small navies face challenges maintaining a critical mass when specialist capabilities are vested in single ships. Lessons from the current force offer some factors to consider, with the first question being the degree to which New Zealand can afford to

maintain a balanced force through its traditional ship replacement programme. Replacing the Anzac Class with like-for-like platforms will cost between \$2.4bn-\$3.2bn for two European FREMM¹⁴⁸ or UK Type 26¹⁴⁹ platforms. Either of these options will anchor the challenges of resourcing the Navy's existing combat capability until the 2060s. The Royal Navy's Maritime Modularity Concept may offer alternative approaches that maximise the benefits of common low-cost platforms, with a suite of plug-and-play modules offering a range of mission profiles suited to the region and avoid the long-term

¹⁴⁶ "Secure Together: New Zealand's National Security Strategy 2023-2028" (Wellington, New Zealand: New Zealand Government, August 2023), 12, https://www.dpmc.govt.nz/sites/default/files/2023-08/New%20Zealand%27s%20National%20Security%20Strategy_Secure%20Together_FINAL_0.pdf#page=12.

¹⁴⁷ Nanaia Mahuta, "Why the Pacific Way Matters for Regional Security," The Beehive, May 3, 2023, <https://www.beehive.govt.nz/speech/why-pacific-way-matters-regional-security>.

¹⁴⁸ "FREMM Multipurpose Frigate," in *Wikipedia*, September 27, 2023, https://en.wikipedia.org/w/index.php?title=FREMM_multipurpose_frigate&oldid=1177378489.

¹⁴⁹ "Type 26 Frigate," in *Wikipedia*, August 16, 2023, https://en.wikipedia.org/w/index.php?title=Type_26_frigate&oldid=1170650207.

capability gaps experienced with the Anzac Class systems upgrade.¹⁵⁰

For the RNZN to be an effective instrument of national power, it needs to address its vulnerabilities. This is not just people; rather, it lacks the depth of capability across the force to be resilient in the face of shocks, whether from global supply chain collapse or attractive market conditions that lure trained sailors away. Andrew Watts argues that emerging concepts and technologies offer new ways of operating, including leveraging remote and autonomous solutions, embracing open computing architecture, and the concepts of modularity across common platforms. He further argues that the design of the future fleet must be based on a unified view of operational requirements and how these can best be delivered in the contemporary environment rather than just replacing ships.¹⁵¹ But, attitudes towards the RNZN's role in maintaining peace and stability beyond New Zealand's region may also need to be re-examined. In 2013 the Centre for International Maritime Security posed a simple question on their bulletin board, 'What advice would you give to a smaller nation on the maritime investments it should pursue, and why?'. Responses were wide and varied from junior Naval Officers to academics. Professor John Homles of the US Navy War College offered, 'There's a premium on thinking and acting strategically when you have only meagre resources to tap ...[small nations] have to think and invest smart...[and] design their fleets as creatively as possible'.¹⁵² New Zealand is a developed and innovative nation with an entrepreneurial spirit that has access to a wide range of commercial and defence concepts and technology solutions. The underlying question is whether traditionally conservative naval practitioners when advising the Government, can deviate from the conceptions of the past to deliver effects in a way that does not include the multi-billion-dollar investment of high-end surface combatants. New Zealand's current foreign policy and national security environment may suggest divesting naval combat capability in favour of building depth to the low-threat force projection capabilities suitable for responding to regional non-traditional security threats is the most prudent course of action.

¹⁵⁰ "Maritime Modularity Concept" (London: Ministry of Defence, February 2, 2023), <https://www.gov.uk/government/publications/maritime-operating-concept-maropc/introduction-to-the-royal-navy-maritime-modularity-concept>.

¹⁵¹ Watts, "Designing the Next Fleet," 24.

¹⁵² "MFP 8: The Future of Small-Nation Maritime Forces | Center for International Maritime Security," January 22, 2013, <https://cimsec.org/mfp-8-the-future-of-small-nation-maritime-forces/>.

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