APPLIED THINKING FOR INTELLIGENCE ANALYSIS

A guide for practitioners

CHARLES VANDEPEER

Disclaimer

This publication is presented by the Department of Defence for the purpose of disseminating information for the benefit of the public. The Department of Defence does not guarantee and accepts no legal liability whatsoever arising from or connected to the accuracy, reliability, currency or completeness of any material contained in this publication.

The content and views expressed in this publication are the author's own, and are not in any way endorsed by or reflect the views of the Department of Defence. The Department of Defence recommends that you exercise your own skill and care with respect to the use of this publication and carefully evaluate the accuracy, currency, completeness and relevance of the content for your own purposes.

This publication is not a substitute for independent professional advice and you should obtain any appropriate professional advice relevant to your particular circumstances.

Release

This document is approved for public release. Portions of this document may be quoted or reproduced without permission, provided a standard source credit is included.

National Library of Australia Cataloguing-in-Publication entry

Creator:	Vandepeer, Charles, author.
Title:	Applied thinking for intelligence analysis : a guide for practitioners / Charles B. Vandepeer.
ISBN:	9781925062045 (paperback)
Subjects:	Military intelligence. Critical thinking.
Dewey Number:	355.3432

Published by:
Air Power Development Centre, Department of Defence
PO Box 7932, CANBERRA ACT 2610, AUSTRALIA
Telephone: + 61 2 6128 7041 | **Facsimile**: +61 2 6128 7053
E-mail: airpower@defence.gov.au
Website: www.airforce.gov.au/airpower

THE AIR POWER DEVELOPMENT CENTRE

The Air Power Development Centre (APDC) was established by the Royal Australian Air Force in August 1989 at the direction of the then Chief of the Air Staff. Originally known as the Air Power Studies Centre, it was renamed the Aerospace Centre in 2000 and then became the Air Power Development Centre in 2004.

Its function is to promote a greater understanding of the proper application of air and space power within the Australian Defence Force and in the wider community. This is being achieved through a variety of methods, including development and revision of indigenous doctrine, the incorporation of that doctrine into all levels of RAAF training, and increasing the level of air and space power awareness across the broadest possible spectrum.

Over the years the APDC has evolved into an agency that provides subject matter expertise for air and space power education, and has a well-developed publication program. The Office of Air Force History (formerly known as the RAAF Historical Section) was amalgamated with the APDC in 1997.

Comment on this publication or inquiry on any other air power–related topic is welcome and should be forwarded to:

The Director
Air Power Development Centre
PO Box 7932
CANBERRA BC ACT 2610
AUSTRALIA

Telephone: + 61 2 6128 7051
Facsimile: + 61 2 6128 7053
Email: airpower@defence.gov.au
Website: www.airforce.gov.au/airpower

ABOUT THE AUTHOR

Squadron Leader Charles Vandepeer is a Reserve Intelligence Officer with the Royal Australian Air Force, having previously served in the Permanent Air Force. Charles has been posted to No 82 Wing, Officer Training School, No 92 Wing, No 87 Squadron, and Information Warfare Wing, serving in a number of positions including: Squadron Intelligence Officer, Instructor, Flight Commander, and Executive Officer. Squadron Leader Vandepeer gained operational experience in South-East Asia and deployments to the Middle East as part of Operation CATALYST (P-3 Detachment) and Operation SLIPPER (A2 Combined Air Operations Centre). During 2012, he was part of Project ARGO and in 2013 was appointed as the Training and Development Officer for the Air Force's newly established Air Intelligence Training Flight.

In his civilian career, Charles is an operations research scientist, specialising in methodologies and concepts for analysis and decision-making. Charles is a Visiting Research Fellow at the University of Adelaide, where he completed his PhD into concepts of threat within intelligence analysis. He has also been involved in course development and lecturing on strategy and critical thinking at the undergraduate and postgraduate level.

ACKNOWLEDGEMENTS

Many people have been involved in helping to get this book from an idea to reality. I would like to thank the efforts of those who supported this project from the outset, in particular Squadron Leader Andrew H, Wing Commander Colin C and Squadron Leader Stephanie S. Without each of you, this book simply could not have happened. I would also like to thank the consistent support and encouragement from Bruce Vandepeer and David Olney, who were instrumental as sounding-boards during the development of the book. The practical feedback and suggestions from Group Captain Trotman-Dickenson also helped to ensure the success of this endeavour.

I would like to thank the many people involved in reviewing the draft and providing invaluable critique, comments and suggestions. I deliberately sought feedback from a diverse range of people from numerous fields including former and current intelligence personnel, academics, operations research scientists and police analysts. I am indebted to the feedback from Dr Dirk Maclean, Colonel Michael

Burgess, Dr Coen Van Antwerpen, M Rainbow, T Marshall, Aleem Hossain, Dr Wayne Hobbs and Digby Howis. Also to Squadron Leader Gary B, Jeff Corkill, Wing Commander Ian Gibson, Associate Professor Hank Prunckun, Flight Lieutenant Bronwyn R, Flight Lieutenant Adam G, John K, Dr K Ward, D Kernot and Dr Patrick Walsh for their comments and suggestions.

My appreciation goes to Mario for the graphics and images contained and the Australian War Memorial for their kind permission to use the historical photographs in this book. I would like to recognise the staff at the Air Power Development Centre, including Group Captain Peter Wood, Sandra Finney, Wing Commander Keith Brent, Graeme Smith and Adam Braakman for their efforts in editing and publishing this text.

Thanks also to the Defence Intelligence and Security Centre at Chicksands (United Kingdom), particularly the staff at the Air Intelligence Wing, who so graciously gave their advice and insights on training junior intelligence analysts. I hope that this book goes some way towards repaying your time and efforts.

I would also like to acknowledge the Air Intelligence Training Flight staff involved in implementing and supporting this critical thinking training for junior analysts, including Flight Lieutenant Christie Y, Warrant Officer Nick B, Flight Sergeant Paul G, Sergeant Jo-Anne I, Corporal Jacob G and Corporal Michael S.

To the analysts whom I have had the privilege of training and working alongside, and those yet to come, I wish you every success in the problems and challenges that you will face. I hope that what is contained in this book goes some small way in giving you the confidence and skills to overcome whatever lies ahead.

Sapientia Omnia Vincit

FOREWORD

As a specialisation, intelligence is going through a remarkable period of development and adjustment reflecting the dynamic changes in the world politically and technologically. Whole new operating environments such as the cyber domain are rapidly opening up, while the threats and opportunities for intelligence in the physical domain become more shadowy and nebulous. For those of us in the military, new levels of intelligence integration into advanced and semi-autonomic weapons systems will be required in just a few years time to support the future data-fused battlespace. However, no matter the environmental changes or the complexities of the systems, the fundamentals of intelligence analysis remain and will endure.

Charles Vandepeer is somewhat unique in the Australian context in that he has had three careers: as an active duty Air Force intelligence officer, as a civilian research scientist, and more latterly as an academic specialising in intelligence analysis. I cannot think of someone more qualified to pull together the many strands of what constitutes effective intelligence analysis and synthesise them into a coherent package.

In *Applied Thinking for Intelligence Analysis: A Guide for Practitioners*, Charles has produced a book aimed at the practical level and designed to empower the intelligence analyst with concepts and tools to achieve a tangible result. A book focused on applied thinking is long overdue and with this volume Charles fills the void for a 'ready reckoner' on intelligence analysis. Although principally written to support introductory training for junior analysts, this easily accessed and immensely readable book is a singular resource for intelligence professionals both young and old, and for that matter anyone with an interest in improving their analytical techniques.

Charles takes the reader on a logical journey through the conceptual foundations of effective modern intelligence analysis in the early chapters, and introduces and discusses the real-world problems and constraints that will confront any analyst. For those of us with some experience in the intelligence business, the dangers of failing to identify the specific audience and the specific requirements, wasting precious time and resources and delivering a weak analytical product, will resonate. In his chapters 'Problems', 'Time and Research' and 'Knowledge, Information and Evidence', Charles examines the key factors underpinning the intelligence analysis process and provides thoughtful, practical advice on how to situate, structure and deliver that analysis.

Intelligence analysts, especially in more senior positions, will be expected by a commander to provide advice, and if necessary, to 'make a call'. Predictive analysis is the holy grail of any analyst and possibly the hardest thing to successfully achieve. In the chapters 'Expertise, Prediction and Surprise' and 'Complexity, Uncertainty and Assumptions', the reader will be exposed to concepts and examples to assist them in achieving this task. As noted by Charles in this section of the book, I advise any analyst to be cognisant of the dangers of slipping into the comfort of retrodictive analysis (explaining in glorious detail past events) rather than actual predictive intelligence analysis—we are all wise after the fact!

As intelligence analysts, even in an increasingly technical world, we must try to understand the human condition—including our own. We remain the product of our background, our socialisation, and our individual mindset—all of which colours our perceptions. The resultant cognitive biases can adversely shape intelligence analysis and are described by Charles with practical examples in the chapter 'Mindsets, Biases and Arguments'. An appreciation of these potential pitfalls is a vital consideration for any analyst. Combined with aspects of deferred judgement and the means of reviewing analysis contained in the chapter 'Unfinished Intelligence', it is a very pertinent summative to this book.

Understanding the true nature of the operational environment, our adversaries and effectively enabling our systems and our commanders is the fundamental role of intelligence, and it relies on having great intelligence analysts. This important book provides some key tools to develop and sustain those great analysts—I wish it had existed when I was starting out.

Richard Trotman-Dickenson, AM
Group Captain
Officer Commanding Information Warfare Wing
Royal Australian Air Force
June 2014

ABBREVIATIONS AND ACRONYMS

APDC	Air Power Development Centre
HUMINT	human intelligence
NATO	North Atlantic Treaty Organization
NGT	Nominal Group Technique
RAAF	Royal Australian Air Force

CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1
INTRODUCTION

This book was designed as a reference text to support introductory training on critical thinking and analytic techniques given to intelligence analysts entering the Royal Australian Air Force (RAAF). That said, the knowledge and methods described are practical and applicable to a broad range of intelligence problems, and relevant to analysts whether we are operating individually or as part of a team. The aim is to introduce junior analysts to knowledge and concepts that might otherwise take years to acquire.

Though this book presumes a degree of familiarity with the subject of intelligence, the principles of analysis described here can be applied more generally. Indeed, most of the concepts, methods and techniques discussed are not specific to the field of intelligence analysis. As intelligence analysis deals with problems across multiple domains, this text draws on research from a broad range of relevant areas including operations research, psychology, sociology, behavioural economics, mathematics, philosophy and political science.

The book provides a basic grounding in how we as analysts think, the types of problems we encounter, and some of the challenges and limitations we face. In addition, the text introduces analysts to some basic techniques and methods designed to help in making our analytical judgements more considered, robust and transparent and help in dealing with uncertainty. As a result, this text provides a basic grounding in decision-making and judgement relevant to intelligence analysis. It is this ability to make well-reasoned and supported judgements that is critical for analysts to develop. Which leads us to the title of this book, *Applied Thinking for Intelligence Analysis*.

What do I mean by *applied thinking*? Applied thinking is reasoning about a specific problem designed to produce a tangible outcome. This tangible outcome is an

analytical judgement, which can be in the form of a decision, a brief or a formal report. This book then is designed to be a combination of theory and practice, encouraging us to think deliberately about the analysis we are doing.

CHAPTER 2
SITUATING INTELLIGENCE ANALYSIS

Importance of intelligence

Intelligence is important. That is certainly the perception evident in the formalisation and significant growth of intelligence agencies since World War II. Governments around the world have established entirely new agencies and departments in response to actual or perceived threats from state and non-state actors. Each year, governments spend billions of dollars on intelligence agencies, reflecting a belief that intelligence is important to national security. The presumption is that intelligence identifies and prevents threats, informs important decisions, and helps users of intelligence better understand uncertain and changing situations.

Expectations of intelligence

Governments, policymakers, military commanders and the public all have expectations of what intelligence is, what agencies and analysts do, and what intelligence can provide. There is now a greater public awareness and expectation of what intelligence agencies can and should provide.[1] This has come about for a number of reasons. One reason is a result of the collective shock experienced by the public at actually witnessing the images of mass-casualty attacks and their aftermath (for example, New York and Washington, Bali, Madrid, London and Boston). When intelligence is thought to have failed the public's expectations of what intelligence should deliver become apparent; namely: to be accurate, identify threats, prevent surprise, and protect the nation and its citizens. Government's

1 Ormand, Sir David, 2009, *The National Security Strategy: Implications for the UK intelligence community*, Institute for Public Policy Research, Discussion Paper, London, February, p 5.

own actions have also increased public awareness and expectations of intelligence through the use of intelligence analysis to inform and shape public perceptions of threats at a national and international level.[2] Recent disclosures of intelligence material have also raised debate over the role of intelligence agencies and government use of information, a debate that is likely to continue for as long as intelligence agencies exist.

What people want intelligence analysts to deliver is based on what they *think* about intelligence, which can be based on positive or negative experiences and accurate or inaccurate perceptions. So before we consider what military commanders, operators or even other analysts *want* from intelligence, we need to think about what these people understand by intelligence and what they *expect* that intelligence can deliver. Each person, commander and analyst will have their own expectations about what intelligence can and cannot do. Some military commanders will have realistic expectations that analysts can provide support to operations, detailed tactical information and assessments on threat, and judgements on likely or plausible enemy actions. Other military commanders might have more unrealistic expectations, like analysts being able to predict the future, give absolute certainty of what an enemy will do, or provide assurance of mission success. Still others might think intelligence is a waste of time, preferring instead to rely solely on their own judgements about a situation.

This book will assist analysts in developing an understanding of what intelligence can and cannot do. It is important that we as analysts have a foundational understanding of what is and what is not possible, as our own understanding shapes the decisions and judgements that we make on a daily basis. So what do practitioners and researchers within the field think intelligence analysts should provide? For a consideration, refer to the table of quotes on page 6.

Why is intelligence analysis difficult?

Despite differences in what people expect intelligence analysts to do, one area where there is general agreement is that intelligence analysis is difficult. Researchers who looked at what makes intelligence analysis difficult identified nine cognitive challenges that analysts face (Figure 2.1):

---

2 Andrew, Christopher, 2004, 'Intelligence, international relations and "under-theorisation"', *Intelligence and National Security*, vol 19, no 2, Summer, p 170. The US Government's public release of significant extracts and judgements from National Intelligence Estimates is one example.

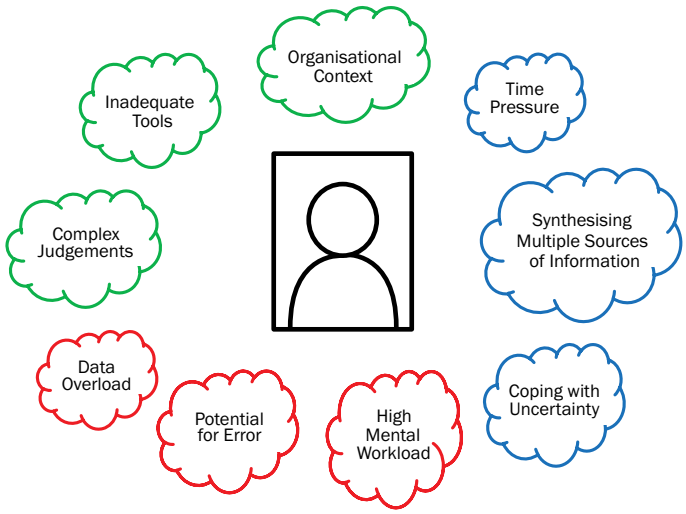


Figure 2.1: Cognitive challenges facing analysts[3]

Intelligence analysis is not easy. An analyst making a lot of assumptions and considering only a small subset of information might think that intelligence analysis is easy. However, for analysts to arrive at considered and robust analytical judgements about a situation or issue, while also understanding the limitations of their own judgement, is no easy task. Even with all the available information and analytical rigour brought to a problem, sometimes things do get missed. Analysts are not infallible and our understanding of situations is seldom comprehensive. In saying that intelligence analysis is difficult, it is clearly not impossible and is ultimately a valuable and important resource for decision-makers.

As a rule, intelligence analysts will have more time to analyse a specific situation than do consumers of intelligence. As analysts, we should be able to spend longer, research more thoroughly and think more critically about the various aspects of the specific problem at hand. To decision-makers short on time, this is invaluable. So regardless of the limitations on what intelligence analysts can or cannot achieve, we should be able to arrive at a more detailed understanding of the problem and a more considered judgement than others are able to.

3 Hutchins, Susan G, Pirolli, Peter L & Card, Stuart K, 2007, 'What makes intelligence analysis difficult?: a cognitive task analysis', in Hoffman, Robert R (ed), *Expertise Out of Context*, Lawrence Erlbaum Associates, New York, NY, pp 298–304.

Expectations of Intelligence Analysts from Intelligence Literature

The following quotes, not necessarily all in agreement, provide a useful overview of common expectations of intelligence analysts (author's emphasis in bold):

'The job of an analyst is to **make sense of a complicated mass of information**—to understand and **explain the current situation**, to reconstruct the past that led to it, and to use it as the basis of **predictions for the future**. To do so requires many types of **sophisticated reasoning skills**.'[a]

'Intelligence analysts are charged with the responsibility of **making sense of the complex and uncertain environment** in which decision makers operate.'[b]

Providing meaning to events, as Martin Petersen argues '… intelligence analysis starts when we stop reporting on events and start explaining them'.[c]

Others have argued that there are two primary goals of an intelligence analyst: '[t]o **reduce uncertainties** for the users of intelligence' and '[t]o **maximize the use of scarce resources**'. These two goals increase the control that the users of intelligence have over a threatening situation.[d]

According to Jack Davis, intelligence analysis exists to **assist decision-makers in making sound decisions**. In a statement applicable beyond the US context, Davis argues that '[t]he central task of intelligence analysis is to help US officials—policymakers, war fighters, negotiators, law enforcers—**deal more effectively with substantive uncertainty**, and especially to **provide timely warning of military attacks and other threats** to US national security interests'.[e]

Thomas Fingar argues that intelligence analysis is useful only as much as it is '**timely, targeted, and trusted** by those who receive it', arguing that 'getting it completely right is often less important than **providing useful information and insights to the right people at the right time**'.[f]

---

a Spellman, Barbara A, 2011, 'Individual reasoning', in Fischhoff, Baruch & Chauvin, Cherie (eds), *Intelligence Analysis: Behavioral and Social Scientific Foundations*, The National Academies Press, Washington, DC, p 117.

b Quiggin, Thomas, 2007, *Seeing the Invisible: National Security Intelligence in an Uncertain Age*, World Scientific Publishing, Singapore, pp 97–98.

c Petersen, Martin, 2011, *'What I learned in 40 Years of doing intelligence analysis for US foreign policymakers'*, Studies in Intelligence, vol 55, no 1, March, p 19.

d Thompson, JR, Hopf-Weichel, R & Geiselman, RE, 1984, *The Cognitive Bases of Intelligence Analysis*, U S Army, Research Institute for the Behavioral and Social Sciences, Alexandria, VA, January, p 4-1.

e Davis, Jack, 2002, *Improving CIA Analytic Performance: Strategic Warning*, Sherman Kent Center for Intelligence Analysis Occasional Papers: Volume 1, Number 1, September.

f Fingar, Thomas, 2011, 'Analysis in the U.S. intelligence community: missions, masters, and methods', in Fischhoff, Baruch & Chauvin, Cherie (eds), *Intelligence Analysis: Behavioral and Social Scientific Foundations*, The National Academies Press, Washington, DC, p 4.

A working definition of intelligence

> *At the core of intelligence is the challenge of analysis.*
>
> Loch Johnson

This book presumes a level of familiarity with intelligence and intelligence analysis. While in-depth considerations of definitions of intelligence already exist, intelligence as a field of research remains a maturing one. The field still lacks an accepted definition of what *intelligence* actually is, with widespread agreement on a single definition probably being unachievable. However, all that is required for this book is to provide a working definition of intelligence.

Intelligence can be broadly thought of as the product resulting from the processing of information concerning foreign nations, hostile or potentially hostile forces or elements, or areas of actual or potential operations. The term is also applied to the activity which results in the product and to the organisations engaged in such activity[4]. This book focuses on the analysis part of intelligence, specifically on the challenges faced by the intelligence analyst. Certainly, analysis itself is seen as foundational (and the intelligence analyst as central) to any concept of intelligence:

> Why would intelligence agencies collect mountains of data if not to make sense of it and provide policymakers with their best judgements as to its meaning and implications? There is simply no point in collecting data to sit idle, untouched, and unanalyzed forever. Analysis, therefore, is central to the mission of any intelligence community.[5]

Amongst practitioners, it is generally accepted that there is a difference between *information* and *intelligence.* For this book, information is thought of as unanalysed data with intelligence being information that has been analysed. This means that the analyst's role is the crucial distinction between *information* and *intelligence*. Therefore, it is intelligence as the *analysis of information* and *analysed information* that is the focus of this book.[6]

---

4 Royal Australian Air Force, Australian Air Publication 1000–D—*The Air Power Manual*, Sixth Edition, Air Power Development Centre, Canberra, 2013, p.223.

5 Lefebvre, Stephane, 2004, 'A look at intelligence analysis', *International Journal of Intelligence and CounterIntelligence*, vol 17, no 2, p 235.

6 For those familiar with the 'intelligence cycle' (planning, collection, processing, analysis and production, and dissemination), this book can be argued as primarily focusing on the analysis and production step. However, the concept of an 'intelligence cycle' is not without criticism, in particular that the model provides an inaccurate representation of the intelligence process. For a useful critique refer to Johnston, Dr Rob, 2005, *Analytic Culture in the U.S. Intelligence Community: An Ethnographic Study*, The Center for the Study of Intelligence, Washington, DC, Chapter 4.

By more narrowly defining intelligence as *analysed information*, we avoid becoming unnecessarily hampered by the notion of secrecy. That information might be classified, covertly obtained, or sensitive does not change the fact that it is still information. While the concept of secrecy will remain linked with intelligence, this is based on how information is collected and the nature of the information itself. This issue of secrecy does not relate to our understanding of human perception and cognition. By narrowing in on the analysis of information, we are able to draw upon a significant body of research that helps us better understand how we interpret information and make judgements.

Intelligence analysis as decision-making

There is a great deal of discussion about intelligence analysts supporting decision-makers. What is less often recognised is that intelligence analysis is *itself* a form of decision-making. Intelligence analysis is a continual process of forming judgements (ie making decisions) based on available information while dealing with inherent uncertainty. It is this analysis of information, and the judgements and assessments that analysts make, that represents the decision-making process of intelligence analysis. Consequently, intelligence analysis is *part of* the decision-making process and the judgements that analysts make influence the quality of other people's decisions. This is evident in the way that intelligence has shifted to a more central role and less a 'subordinate' one:

> Intelligence has now become an integral element of both the policy and military operational processes … Increasingly-integrated military operations, in which intelligence directly drives operations, and command centers in which intelligence personnel are fully integrated, are tangible evidence of such changes. As a result, it is important that intelligence appreciate not only the centrality of its role, but also the increased obligations and responsibilities that such a role brings.[7]

This emphasis on increased obligations puts the responsibility on intelligence analysts to understand the basis of their own decisions, judgements and assessments.

---

7 Cooper, Jeffrey R, 2005, *Curing Analytic Pathologies: Pathways to Improved Intelligence Analysis*, Center for the Study of Intelligence, Washington, DC, pp 14–15.

CHAPTER 3
PROBLEMS

Intelligence analysts deal with problems on a daily basis. These problems can be seen in the myriad of questions that analysts are asked. Familiar questions include variations of some of the following:

- What is the threat from X?
- Can I rely on this information?
- What will Y do next?
- What just happened?
- Why did it happen?
- Where will the next attack occur?
- If we did this, what will the enemy do?
- Where is the enemy?
- What are X's military capabilities?
- What are X's intentions?

These intelligence problems are *knowledge problems*—they are problems that we currently do not have the knowledge to answer, even though the information to provide this knowledge may already be on hand. Given the centrality of problems to intelligence analysis, what exactly is a *problem*?

A problem has two critical attributes: it is an unknown entity in some context; and finding or solving this unknown has a value.[1] In this chapter, we will consider a number of aspects of problems, specifically:

- the context of the problem
- defining the problem
- different types of problems

When we think back to the questions that intelligence analysts are asked, they can easily be defined as problems because: the answer is currently unknown, and the question is considered important to answer. If military commanders already had the answer to the question, then they would not ask an analyst for an answer (it would not be a problem). It is worth highlighting that the problem and the question are not necessarily the same thing. As analysts, we first have to determine exactly what the problem is; taking the question that has been asked as our cue. For example, 'What is the threat to X?' is a question, but the problem driving it might be quite different, namely: 'Do we go or not go on this mission?' 'Is the risk level too high?' 'Is this the right mission at all?' We will now look at the context, definition and types of problems in turn.

Context

What do we mean by *context*? Effectively, the context is the broader meaning, the surrounding issues that give us an understanding of why the question was asked. Addressing any problem relies on a broader understanding of the context of the problem. The less we know about the context of the problem, the more difficult it is to understand what is actually required and whether or not the analysis we deliver actually meets a military commander's needs. Some useful initial questions to help us understand the context of the problem include those shown in Figure 3.1:

1 Jonassen, David H, 2004, *Learning to Solve Problems: An Instructional Design Guide*, Pfeiffer, San Francisco, CA, p 3.

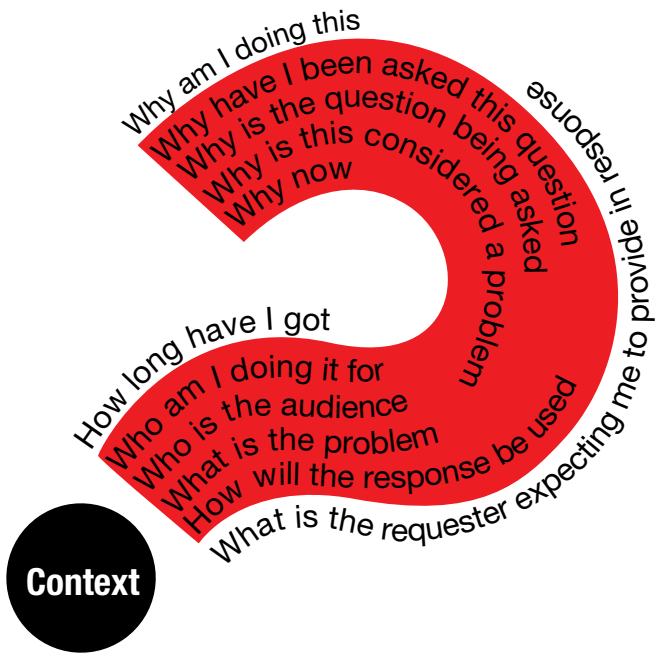


Figure 3.1: Questions to help understand the context of a problem

Understanding the context of the problem also includes knowing what the response will be used for. The more generic the understanding of how analysis will be used (ie 'to aid decision-making') the less useful the analysis, because it will be similarly generic. A good relationship with the people asking the questions is key, but unfortunately not always achievable. Poor communication between a requestor and an analyst risks misunderstanding the problem, wasting resources and delivering irrelevant analysis. This is why expectations, context and the audience are all important when understanding and defining the problem itself. As one experienced analyst argued, weak analytical products are a result of analysts failing to identify a specific audience and specific question that they need addressed.[2] So, wherever possible, analysts need to get an understanding of the *who*, *what* and *why* of those requesting the analysis and the problem at hand.

2 Petersen, Martin, 2011, 'What I learned in 40 years of doing intelligence analysis for US foreign policymakers', *Studies in Intelligence*, vol 55, no 1, March, p 17.

Defining the Problem

The importance of defining the problem is repeated in numerous intelligence (and general analysis) publications. Despite this, in practice there is a tendency for analysts to jump straight into research and analysis without first having actually thought through the problem. As Dietrich Dörner observes:

> The motto 'first things first' may well explain why, when confronted with a task, we immediately begin planning our actions and gathering information instead of formulating our goals in concrete terms, balancing contradictory partial ones, and prioritizing them. We've got a problem, so let's get to it and not waste a lot of time developing clarity about it.[3]

One reason that people go straight to coming up with solutions, even before understanding the problem, is because of time pressures. By developing an understanding of the actual problem saves time and effort by ensuring that we are researching and analysing the right problem.[4] Further, given that intelligence analysts are often working in teams, defining the problem ensures that everyone is working towards addressing the same problem. Ultimately, the aim of problem definition is to come up with a specific question that can be addressed.

It is worth observing that not everyone jumps into a task before defining the problem. Research suggests that experts go about solving problems differently than novices by spending more time at the beginning of a task thinking about the problem itself compared with novices who attempt to immediately find a solution.[5] The key point is starting with an accurate understanding of the problem because how we define a problem impacts on how we research, analyse and report on the problem. Consequently, we are considering:

- What is the actual problem?
- What needs to be understood to address the problem?
- How do we go about addressing the problem?

Let us take a non-military example. A company decides that it needs to identify the most cost-effective means for recruiting staff. Taking the problem at face value,

---

3 Dörner, Dietrich, 1989, *The Logic of Failure: Recognizing and Avoiding Error in Complex Situations*, Perseus Books, Cambridge, MA, p 186.

4 Jones, Morgan D, 1998, *The Thinker's Toolkit: 14 Powerful Techniques for Problem Solving*, Three Rivers Press, New York, NY, p 63.

5 Johnston, Dr Rob, 2005, *Analytic Culture in the U.S. Intelligence Community: An Ethnographic Study*, The Center for the Study of Intelligence, Washington, DC, p 64.

the approach would be identifying a range of recruiting strategies and selecting the cheapest. However, this may not actually address the real problem in relation to staffing. One approach for getting to the actual problem is the *5 Whys* approach, that is asking 'Why' five times, in order to get to the root cause of the problem.[6] If we applied this to the company's desire for cost-effective recruitment, it would look something like this:

1. Why do we need to identify the most cost-effective means for recruiting staff? *Because we currently are spending a lot of money on recruiting new staff.*
2. Why are we spending a lot of money on recruiting new staff? *Because we are having to replace a lot of our staff.*
3. Why are we are having to replace a lot of our staff? *Because a lot of staff are leaving the company.*
4. Why are a lot of people leaving the company? *Because they are unhappy with the management and leadership.*
5. Why are people unhappy with the management and leadership? *Because nobody knows what is going on, how decisions are being made, and ultimately if the company has a future.*

The point of the exercise is to identify the root cause and get to the *actual* problem. In this case, we can see that what starts out as a recruitment problem is actually a retention problem and, ultimately, a communication issue for the leadership and management.

Another way of better understanding a problem is to restate it in a number of ways before choosing the statement that best captures the problem.[7] The benefit of a more specific question is that we can better focus our research and it makes it easier to determine what is relevant and what is not. For example, the problem 'What are the health risks to people travelling overseas?' is enormously broad, lacks definition and specifics. In contrast, 'What are the health risks for people travelling to country X?' provides a much more specific and bounded question. With the problem defined, analysts can then identify relevant questions that they will need to

6 Taiichi Ohno, 1988, *Toyota Production System: Beyond Large-Scale Production,* Productivity Press, Portland, OR, pp 17–18.

7 Jones, *The Thinker's Toolkit: 14 Powerful Techniques for Problem Solving*, Chapter 3.

answer to provide an assessment of the problem.[8] For the problem above, a list of questions might include those shown in Figure 3.2:

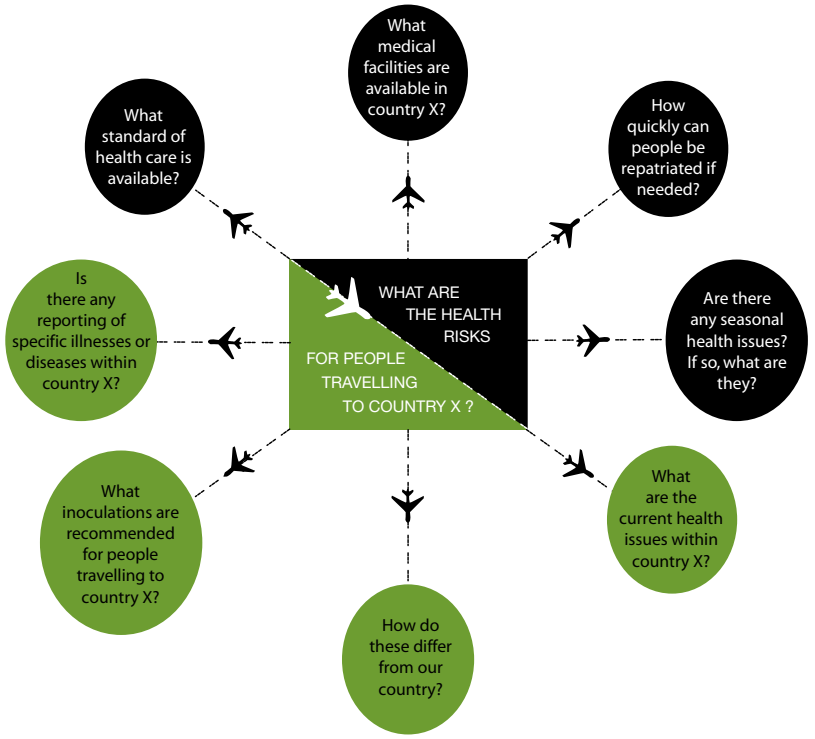


Figure 3.2: Relevant questions for identifying health risks

Defining the problem and developing a list of relevant questions that need to be answered saves us time by:

- focusing the analysis (report, brief)
- telling us what we need to be looking for
- helping to identify gaps and requirements
- speeding up research and stopping indiscriminate research because we know what we are looking for[9]

8 Petersen, Martin, 1985, 'Managing/teaching new analysts', *Studies in Intelligence*, vol 30, Fall, p 6, viewed 4 September 2014, <http://www.nationalsecuritylaw.org/files/received/CIA/Petersen-Managing_Teaching_New_Analysts.pdf>.

9 ibid.

Problem Types

Instinctively we know that not all problems are alike. Some problems we can confidently answer, while for others we can only provide informed guesses or estimates; some problems are solvable while others are not. We must acknowledge this at the outset, because the way we understand the problem affects the way we conceptualise and research it and the type of answer that we provide. If we think that a problem has a neat, single solution then we will approach it looking for the correct answer. In contrast, if we think that a problem is complex and constantly changing, then this too will frame the kind of response that we provide. By deliberately considering the nature of the problem confronting us we can then appreciate what is and what is not possible.

One of the critical factors influencing the nature of a problem is time; namely, *when* is the problem set. Is the problem one that has happened in the past and we are trying to understand something that *has* happened? Is the problem set in the present and we are trying to understand what *is* happening? Alternatively, is the problem set in the future and we are trying to understand what *will* happen? A useful approach is to think about this in terms of your own life. You might be most confident about describing what you have done in the past and what you are doing right now, but less confident in speculating on what you are going to be doing in the future. Why? Because the future has not yet happened. In saying that, our level of uncertainty about the future depends on how far out we are looking. For example, you might be fairly confident that you know what you will be doing tomorrow, but very unsure about what you will be doing one year from now.

Now apply this to military operations. We can assess, with some confidence, what an adversary has done in the past; we know that it has happened. Similarly, we can assess what that adversary is doing right now, based on observing their behaviour. However, in assessing what the adversary will do in the future we would have the least confidence in our judgement, simply because it has not happened. Again, our uncertainty about an adversary's future actions is based on how far ahead we are looking. We might be relatively confident about the adversary's behaviour tomorrow, but far less confident of what they will be doing in a week, a month or a year from now.

Having considered problems in terms of *when* they are set, let us look a little more closely at the nature of the problems themselves. Problems also differ in terms of the actual content—what is it that we are trying to solve? For example, 'what does 2+2 equal?' is a problem, as is 'what is the enemy going to do?' The first problem is mathematical; the second is about people's future behaviours. Both are problems

but the two are very different in subject matter and the method of answering them. In intelligence analysis, we can expect to get all manner of problems, some that have a single solution, some with multiple possible solutions, and others that we can only provide estimates or conjectures. Neil Browne and Stuart Keeley point out that arriving at definitive answers to questions very much depends on the subject matter, and contrast questions about our physical environment with questions about our social environment. They note that we are more likely to arrive at definitive answers when dealing with the physical environment because it is more dependable and predictable than the social world. In contrast, '[t]he causes of human behaviour are so complex that we frequently cannot do much more than form intelligent guesses about why or when certain behaviour will occur.'[10]

Where does this leave us as analysts? Much of the time intelligence problems tend to be people problems. To be more specific, many intelligence problems are *future-based people problems*. Therefore, assessing what an adversary *will* do is difficult, both because it is set in the future and because it is based on human behaviour. When we are referring to future *behaviour* there are multiple plausible scenarios of what could happen.

This leads us to how people describe different types of problems. Within Operations Research, there is a commonly referred to delineation of problem types into puzzles, problems and messes (Figure 3.3).[11]

10 Browne, M Neil & Keeley, Stuart M, 2007, *Asking the Right Questions: A Guide to Critical Thinking*, Eighth Edition, Pearson Prentice Hall, Upper Saddle River, NJ, p 7.

11 This delineation is described by Michael Pidd, who attributes the concepts to Russell Ackoff's ideas. Pidd, Michael, 2004, *Tools for Thinking: Modelling in Management Science*, Second Edition, Wiley, Chichester, pp 58–62.

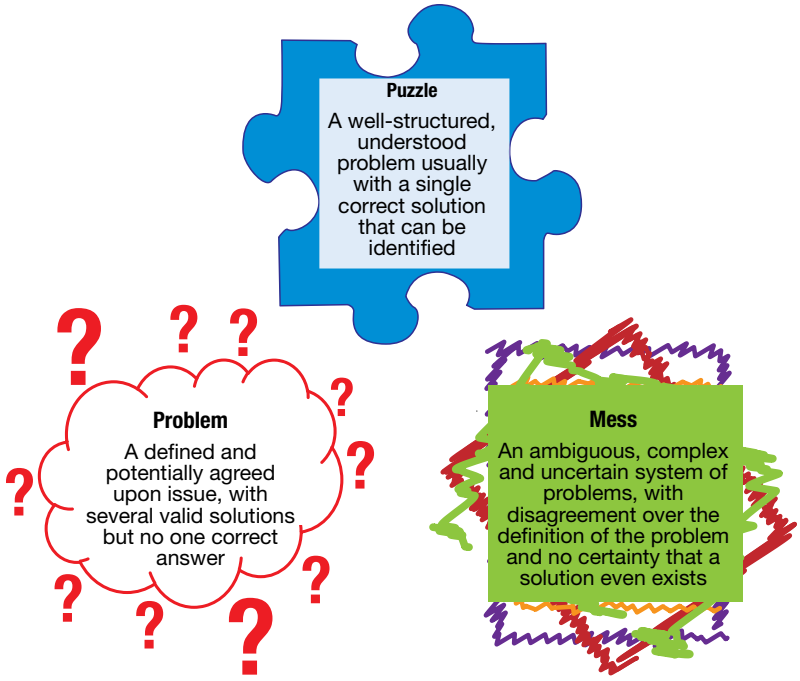


Figure 3.3: Delineation of problems into puzzles, problems and messes[12]

While this might be accepted within Operations Research, as intelligence analysts we are often working across numerous fields and disciplines, meaning that we will come across different terms for describing problems. Increasingly terms like 'puzzles', 'mysteries' and 'wicked problems' are used by decision-makers, operators and analysts to describe problems they are dealing with. However, people use these terms without necessarily knowing where they have come from or conforming to an agreed definition. Given the difference in terms for describing problem types, the approach here is simply to display different descriptions of each problem along a loose spectrum of solvable to unsolvable (Table 3.1). The point is that terms used to describe problems are useful but not definitive.

12 ibid.

	'Solvable'		'Unsolvable'
NATO	Puzzles	Problems	Wicked Problems
Treverton	Secrets	Mysteries	Complexities
Ackoff	Puzzles	Problems	Messes
Jones	Simplistic Deterministic Random		Indeterminate

Table 3.1: Brief typology of commonly used terms for describing problems

While some problems are solvable, others are not. Some problems are so complex with innumerable interacting parts (such as, 'What will country X look like after the withdrawal of peacekeeping forces?'). These types of problems require a consideration of the likelihood of a variety of plausible futures, rather than a single 'solution'. As we find out more about situations, even ones set in the past, we can find that our understanding changes significantly and what we once thought was resolved needs to be reconsidered. Consequently, there are times when even 'solved' problems need to be revisited in the light of new information.

Even when analysts do adopt the same terms to describe problems, we will not necessarily agree on the type of problem that we are addressing. Consequently, we might find ourselves working on a problem we believe to be unsolvable alongside someone who believes that the problem is solvable. In this instance, it is worth clarifying which aspects of the problem each of us believe to be solvable and which we believe to be unsolvable. The terms used to describe problems are important in communication amongst analysts and consumers of intelligence; they are useful when they help to achieve a shared appreciation and avoid potential misunderstandings.

CHAPTER 4
TIME AND RESEARCH

Analysts' severe time constraints cannot be overestimated.

Puvathingal & Hantula[1]

Time

Time is a critical factor for intelligence analysts. Time pressure is a constant theme throughout intelligence literature, with analysts consistently identifying time as one of the greatest constraints of the job.[2] Whether given minutes, hours, days or weeks, analysts are required to deliver assessments; we will have a time limit within which to deliver a required analytical output. Unfortunately, these pressures are unlikely to go away. Indeed, with more information becoming available more quickly, people expect faster decisions 'without the time allowed in the past for thoughtful reflection'.[3] Rather than simply repeating that time constraints are an issue, this chapter suggests some approaches that can assist us in making better use of the limited time available. The point is to recognise that time pressures are going to be a significant issue and that we can factor this into planning and preparation.

Intelligence analysis is used to support decisions, actions and responses to events. Consequently, decision-makers will (naturally) seek to maximise the time they have to make a decision, squeezing the time available for considered analysis. It is worth

---

1 Puvathingal, Bess J & Hantula, Donald A, 2012, 'Revisiting the psychology of intelligence analysis: from rational actors to adaptive thinkers', *American Psychologist*, vol 67, no 3, April.

2 For example, refer to Johnston, Dr Rob, 2005, *Analytic Culture in the U.S. Intelligence Community: An Ethnographic Study*, The Center for the Study of Intelligence, Washington, DC, p 13.

3 Klein, Gary, 1998, *Sources of Power: How People Make Decisions*, MIT Press, Cambridge, MA, p 279.

highlighting that decisions are often a rolling series rather than a one-off; yet, the observation stands—decision-makers want to have all the information available as early as possible in the hope of making the most informed and best decisions. At least some of the issue of decreased response time appears to be people wanting responses faster, rather than a genuine requirement for faster responses. Some people will have unrealistic expectations about how long it takes to analyse information and form a meaningful and considered judgement. In contrast, critical situations do exist where there is a genuine need for rapid decisions, particularly when the information is time sensitive (for example, person X will be in this location in three hours).

Time pressures increase the risks of mistakes, confirmatory thinking,[4] cognitive bias,[5] and seizing on the first piece of relevant information an analyst finds.[6] Time pressures also decrease analysts' use of what they perceive to be lengthy analytic techniques[7] and self-conscious critical thinking approaches.[8] In addition to increasing mistakes, the amount of available time influences:

- the breadth and depth of the research
- the type of product/report/brief we can provide (including the quality and length)
- to whom we can speak
- whether or not we can submit requests for information from other areas, or simply go with what is already available
- what sources and resources we can use
- who and how many people are available to work on the problem

As analysts, we face a dilemma; less time means less depth of analysis, less information that we can get across, and more chance of mistakes and inaccuracies.

---

4 Hastie, Reid, 2011, 'Group processes in intelligence analysis', in Fischhoff, Baruch & Chauvin, Cherie (eds), *Intelligence Analysis: Behavioral and Social Scientific Foundations*, The National Academies Press, Washington, DC, p 179.

5 Johnston, *Analytic Culture in the U.S. Intelligence Community*, p 21.

6 Hall, Wayne Michael & Citrenbaum, Gary, 2010, *Intelligence Analysis: How to Think in Complex Environments*, Praeger Security International, Santa Barbara, CA, p 111.

7 Puvathingal & Hantula, 'Revisiting the psychology of intelligence analysis: from rational actors to adaptive thinkers', p 207.

8 Moore, David T, 2007, *Critical Thinking and Intelligence Analysis*, Occasional Paper Number Fourteen, National Defense Intelligence College, Washington, DC, p 66.

Even so, analysis is often expected to be delivered in limited time frames for it to be deemed to be useful.

Given the significant impact of time pressures, it is worth clarifying whether the time lines are externally set or self-imposed. Organisations and individuals can develop a habit of setting unnecessarily short time frames, which do not reflect the actual time lines set by those requiring the analysis. As a result, valuable time that could have been invested in research and review can be wasted with reports often sitting unread for days. Useful indicators of this are deadlines that are 'close of business' (ie will not be read until the next morning, at the earliest) or 'the end of the week' (ie will not be read until Monday, at the earliest). So just asking the valuable question, 'When is the analysis *actually* required?', can provide valuable additional hours or days to produce a more robust, detailed and considered product.

Research

What do I mean by *research*? Simply identifying and collating relevant information relating to a specific problem. For intelligence analysts, *when* to stop researching is defined by the deadlines we have been given. This is in contrast to many other fields where research only stops once the problem is resolved. The reason that many analysts fail to meet deadlines is that they spend too long researching before attempting to finalise their formal report or brief. For many problems, however, the research phase could go on endlessly. We can always go deeper, review more sources, follow more leads, and consider more angles. Therefore, time limits become invaluable in putting a clear limit on the research, analysis and write-up. So far, this chapter has only focused on the negative aspects of time pressures. A positive aspect of time pressure is that time limits give analysts a boundary in which to work. The rest of this chapter deals with the issue of how we can make the best use of the time that we do have.

Be Prepared

Taking the motto of the Scouts, the first guidance on dealing with time pressures is simply to *Be Prepared*. To paraphrase one agency, the short notice requests placed on intelligence analysts require them to be able to rapidly determine what

they know on a subject and be able to respond quickly to difficult questions.[9] How does this work in practice? This works by knowing our area, our systems and our resources, and having an idea of what is happening in the areas on which decision-makers are likely to be focusing.

As an example, if we are supporting a specific aircraft, we should understand how the aircraft operates, what are the upcoming deployments or exercises, and what particular information is of relevance to the aircraft and aircrew. Even if we have not been looking at exactly the topic that comes up, by being proactive we will already have developed knowledge that will be useful and help to determine what questions and information gaps are likely to need to be addressed.

Backcasting

Beyond being prepared, there are also useful planning tools that help us to identify what we need to do and when we need to do it. One approach is *backcasting*, a technique originally used in large-scale planning projects. In backcasting we start with a desired future end state and work backwards to identify all the tasks that need to be completed to get from where we are today to where we want to be. The point is to start with the end in mind and work backwards.[10]

For instance, today we might be standing in front of a vacant block of land that is for sale. Our desired future end state is moving into our brand new house that we have built on that land. Using backcasting, we would start with moving into our completed house and think back to where we are today, standing in front of the vacant block. We then identify all the things that need to happen to make that future a reality (Figure 4.1).

9 Office of the Director of National Intelligence, 2008, *Analytic Transformation: Unleashing the Potential of a Community of Analysts*, Office of the Director of National Intelligence, Washington, DC, September, pp 4–5.

10 Backcasting is also a useful technique to apply when thinking about an adversary, and the steps and actions that they would need to achieve an end state or outcome.

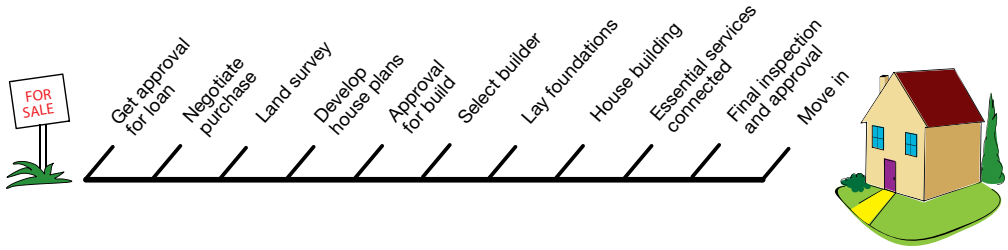


Figure 4.1: Indicative backcast for buying land and building a house

Of course, the reason that we got onto backcasting is that we are considering how we can best deal with time pressures. As analysts, we are usually provided with a time line, so we can add this into the backcast, knowing that the desired end state (finished report) already has a specified deadline. For example, as an analyst, let us say that our team is required to deliver a written threat assessment in five days to support a short notice deployment. Using backcasting, we have a tool that we can use to identify what we need to do between now and five days' time to get the report completed. Figure 4.2 provides an indicative example.

As discussed earlier, given the enormous amount of information likely to be unearthed, it can be quite difficult to stop researching and start writing up. Using backcasting, we can identify a time when we need to stop researching; and then we need to stick to it.

The aim of using backcasting is to reduce (we cannot entirely remove) mistakes attributed to time pressures by having a plan. When working in a team it also provides a visual tool with tasks and timings to which everyone can refer. Of course, plans and schedules can be overly optimistic, which leads us to the planning fallacy.

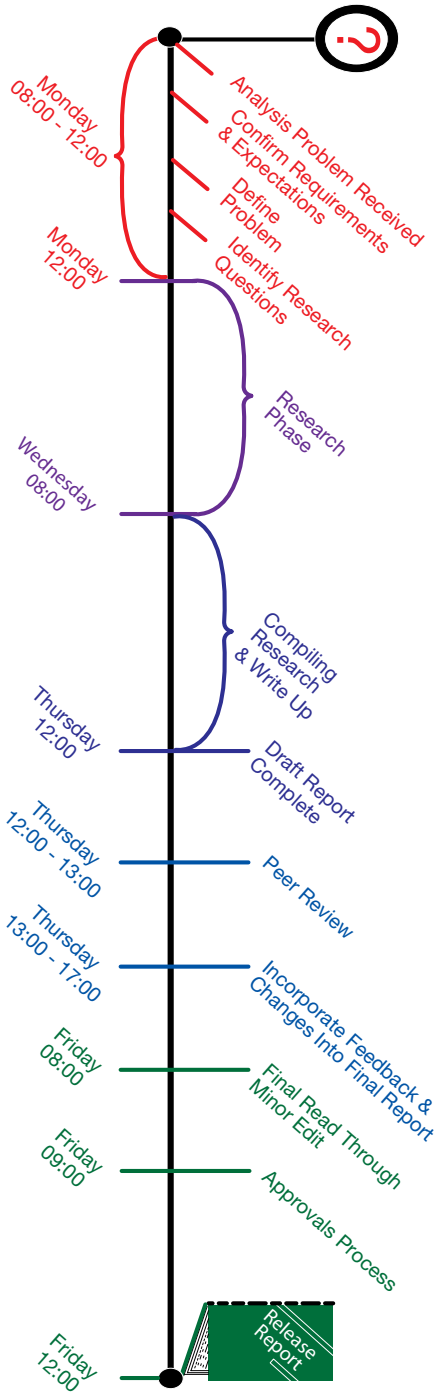


Figure 4.2: Indicative backcast for delivery of a formal report

The Planning Fallacy

Given that analysis involves delivering an analytic product within a time frame, it is worth touching on what is described as the *planning fallacy*. The term describes plans and forecasts which are overly optimistic and unrealistically close to being best-case scenarios.[11] A good example of the planning fallacy, and to continue our backcasting analogy from earlier, is the often overly optimistic timings and budgets of people building their first home. It appears fair to assume that this optimism bias and planning fallacy do exist within the context of intelligence analysis, particularly in the research phase of analytical tasks. Even where deadlines are met, it is often the case that the original scope or depth of research failed to be completed.

Reference class forecasting is one approach to attempt to overcome the planning fallacy and achieve a realistic time frame of how long a particular project will take. The three steps are as follows:

- Identify similar projects (relevant reference class)
- Get statistics for these similar projects (how long they took, how much they cost, what resources they used)
- Compare our project with the reference class to identify the most likely outcome[12]

The argument is that reference class forecasting removes the emotional attachment to our projects and helps overcome issues such as optimism bias by using hard data from already completed projects, rather than overly optimistic views of our own uncompleted project.[13] Adapting reference class forecasting to intelligence analysis could look something like the following:

- Identify similar completed products or reports that have already been produced
- How long did they take to produce? How many people worked on them? How much was able to be researched? What was the quality of the product?

---

11 For a discussion, refer to Kahneman, Daniel, 2011, *Thinking, Fast and Slow*, Penguin Books, London, pp 249–251.

12 Flyvbjerg, Bent, 2006, 'From Nobel Prize to project management: getting risks right', *Project Management Journal*, vol 37, no 3, August, p 8.

13 ibid, p 9.

- What is the most likely outcome for this product based on other similar products? This includes time, resources and quality.

Developing accurate judgements on how much research and analysis can be undertaken within a specific time frame will be an ongoing and iterative process. Not everyone is the same; each of us differs in how long it takes us to complete a task. Therefore, when working individually or in teams, we need to find out what works for us personally as well as understand what works for our team members. By doing this, we can be better organised and give ourselves the best chance of meeting our time lines.

CHAPTER 5
KNOWLEDGE, INFORMATION AND EVIDENCE

Despite the proliferation of information, we are all still seeking that elusive element – knowledge.

Weiss & Wright[1]

Knowledge

What is knowledge? It is a question that philosophers have considered over thousands of years (the technical term is *epistemology*). Like it or not, analysts are in the 'knowledge' business. Intelligence deals with knowledge and the types of problems being addressed are knowledge problems. So we need a working concept of knowledge. That is, we need a basic understanding of what we know and how we know it, what we do not know, and even what is knowable and what is not.

There are a number of ways that we can gain knowledge, including through personal experience, education or training and by research. Personal experience is based on what we learn from our own individual circumstances and the situations to which we are exposed. In contrast, education and training is based on learning from others; with research based on what is reported by others and also what we discover. Within intelligence, experiential learning of an event is rare, as we tend to be dislocated from the *object* of analysis. As analysts, we will usually only have indirect experiences of an opponent, situation or event. Instead, experiential learning tends to relate to how analysts do their job, such as putting together a report, delivering a brief, learning a new computer program, or using a new analytic technique.

---

1 Weiss, Arthur & Wright, Sheila, 2006, 'Dealing with the unknown: a holistic approach to marketing and competitive intelligence', *Competitive Intelligence Magazine*, vol 9, no 5, September–October, p 15.

A popular approach is to divide knowledge into three types:

- *Knowledge about something* (knowing that): facts, propositions, theories (eg how many days in a year, the chemical formula for water, who is the Prime Minister of Australia, the theory of relativity, what are the capabilities of an armed force)
- *Knowing how to do something*: a skill or task (eg use a computer, ride a bike, send an email, read a book)
- *Knowing by acquaintance*: somebody or something we have personally experienced (eg our best friend, eating chillies, the smell of a rose)[2]

How does this apply to us as analysts? Analytical products are principally *knowledge about something;* for example, knowledge of the specific characteristics and nature of a threatening group or organisation. The doing of analysis is more about *knowing how to do something*; for example, how to write a threat assessment. Finally, *knowing by acquaintance* could relate to knowing the people with whom we are working. So we have identified some types of knowledge and ways we can attain it, but what actually is knowledge?

A common method has been to take Plato's concept of knowledge as *justified true belief*. This leads on to a number of questions, including: *What is true? What is justification? What is belief?* The definition is not without criticism, as justified belief can turn out to be incorrect.[3] However, as the debate over defining knowledge has gone on for thousands of years (and remains ongoing), defining knowledge as justified true belief provides a useful working model. The issue then is what beliefs we determine to be true and how do we justify the conclusions we reach.

If we accept the argument that for something to be known it must be true and knowable, we can rule out future events being *knowable* because they have not yet happened.[4] When it comes to the future, the argument that 'an intelligence estimate is a conjecture' is useful.[5] A conjecture can be defined as a judgement or statement believed to be true but not yet proven. When assessing the likelihood and nature of future events, behaviours or situations, we are making a conjecture.

---

2 Baggini, Julian & Fosl, Peter S, 2010, *The Philosopher's Toolkit: A Compendium of Philosophical Concepts and Methods*, Second Edition, Wiley Blackwell, Chichester, p 167.

3 For the most famous refer to Gettier, Edmund L, 1963, 'Is justified true belief knowledge?', *Analysis*, vol 23, no 6, June, pp 121–123.

4 Kahneman, Daniel, 2011, *Thinking, Fast and Slow*, Penguin Books, London, p 201.

5 Ben-Israel, Isaac, 1989, 'Philosophy and methodology of intelligence: the logic of estimate process', *Intelligence and National Security*, vol 4, no 4, p 667.

We cannot know, we can only speculate and justify this speculation based on information that is available now.

When dealing with the past, we can be presenting knowledge. The event, behaviour or situation has happened and we hold our understanding to be a true belief, justified by the information detailing its occurrence. That is not to say that in dealing with a previous event that we cannot be wrong. Clearly, this is not correct; a person can have an incorrect understanding of the past. Additionally, our knowledge of the past is not fixed, but changes as we are exposed to new information.[6] Similarly, with events, behaviours and situations that we believe are occurring in the present, we argue that our understanding is a true belief, justified by the information that these things are currently happening. Again, as with what happened in the past, we can be mistaken in our interpretation of what is happening in the present. Which leads us to the following summary of knowledge:

- We can know what happened in the past (though our knowledge of it can be correct, incorrect or partial)
- We can know what is happening now (though our knowledge of it can be correct, incorrect or partial)
- We cannot know what will happen in the future, we can only make conjectures

Graphically we can display this as:

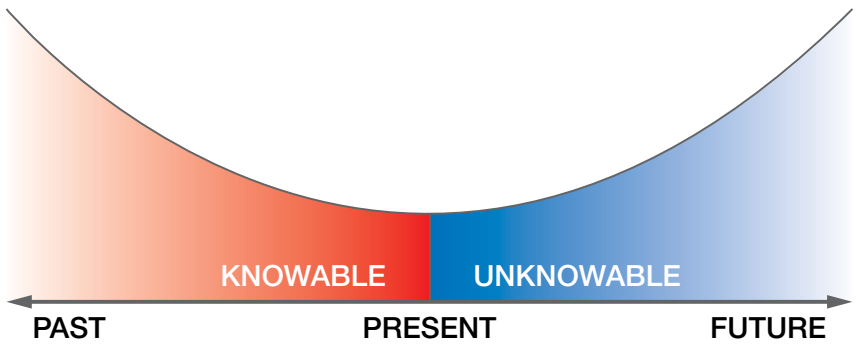


Figure 5.1: Knowable and unknowable based on time

6 Thompson, JR, Hopf-Weichel, R & Geiselman, RE, 1984, *The Cognitive Bases of Intelligence Analysis*, US Army, Research Institute for the Behavioral and Social Sciences, Alexandria, VA, January, p 3-7.

Matthew Herbert provides a useful set of principles in discussing Colin Powell's reported guidance to the US Director of National Intelligence, Mike McConnell. Powell is said to have advised McConnell that:

> As an intelligence officer, your responsibility is to tell me what you know. Tell me what you don't know. Then you're allowed to tell me what you think. But you always keep those three separated.[7]

Taking Powell's statement, Herbert argues that the best analysts can hope to achieve is to channel the flood of information into facts, judgements and pertinent unknowns.[8] Visually, we can display this guidance as follows (Figure 5.2):

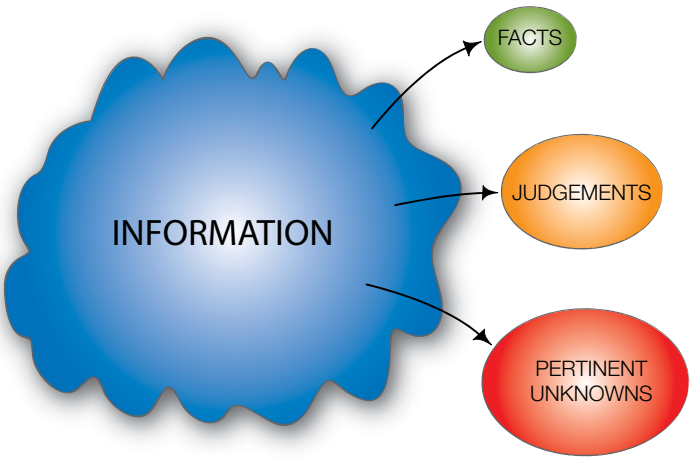


Figure 5.2: Information into facts, judgements and pertinent unknowns

To bring this together:

- **Facts** (justified true beliefs) are things we know (past or present)
- **Judgements** are our conjectures on what has, is or will happen (but are currently unproven)

---

7 Quoted in Weiner, Tim, 2007, 'Pssst: some hope for spycraft', *The New York Times*, 9 December, viewed 4 September 2014, <http://www.nytimes.com/2007/12/09/weekinreview/09weiner.html?pagewanted=all&_r=0>.

8 Herbert, Matthew, 2006, 'The intelligence analyst as epistemologist', *International Journal of Intelligence and CounterIntelligence*, vol 19, no 4, p 680.

- **Pertinent unknowns** are questions that we identify as being relevant to the specific problem (based on the past, present or future) that we currently cannot answer

To put this into a military example:

- **Fact**: A military force has been observed training in a certain way
- **Judgement**: In a conflict, the military force will fight in accordance with the way they have previously trained
- **Pertinent unknowns**: How would their troops actually behave in combat? Who will the commander be? How will the commander's actions influence the troops? How would that force react to our own tactics? In a conflict, who will win?

Tacit and Explicit Knowledge

An additional differentiation in knowledge that is important for us to be aware of is that of *tacit knowledge* and *explicit knowledge.* Tacit knowledge is the internal workings of the mind that enable us to think, act and do. Explicit knowledge is knowledge that can be externalised and communicated to others (eg in a conversation, in written reports, etc).

Most tacit knowledge cannot be made into explicit knowledge. In some fields, tacit knowledge does not need to be made explicit; it is enough that a person knows and acts based on their internal thought processes. However, attempting to make as much of our tacit knowledge into explicit knowledge is important as an analyst. Why? Because analysis is not an end in itself, analysis informs other people's decisions. As analysts, we need to ensure that others are able to understand: the conclusions that we have reached, how we got there, and what we disregarded (and why). Even in the most time critical situations, we need to be able to say what we think and explain why. It is not simply enough for us to know, we must be able to communicate the basis for our knowledge if we are to be listened to and be seen as credible.

Non-knowledge

> *What we know is a drop. What we don't know is an ocean.*
>
> Sir Isaac Newton[9]

There is much, much more that we *do not* know than we do know. Once we recognise this, it helps to bring proportion and humility to our efforts. It is also a liberating thought. The idea that what we do not know far outweighs what we do know applies to everyone, no matter what some may claim. As analysts, identifying what we do not know is often as critical as identifying what we do. Given the vast amount of information available, pointing out that we do not know something probably highlights the limits of the organisation's knowledge on a particular subject. This, in itself, can be invaluable.

There are a number of aspects to this concept of non-knowledge or *what we don't know*. It is worth highlighting Donald Rumsfeld's oft-quoted concept of knowledge, given its frequent use. Though Rumsfeld's concept came in for some ridicule at the time, it had already been in use in engineering and project management for decades previously. Further, the approach continues to appear in both the analytical and academic fields (often with some form of alteration) suggesting that it provides a useful approach for thinking about what we know and what we do not know. An amended version of this concept is displayed graphically in Figure 5.3:

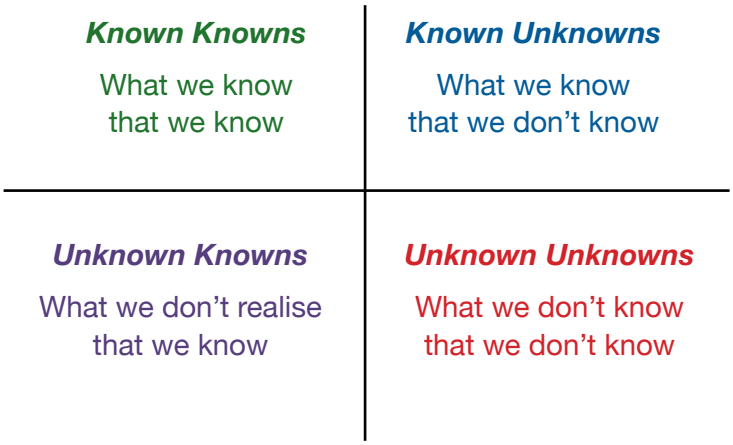


Figure 5.3: Aspects of knowledge and non-knowledge

9 This quote has long been attributed to Sir Isaac Newton.

Perhaps this approach is most useful simply as a means of acknowledging that we can identify different types of knowledge and non-knowledge, and that there is a great deal that we do not know. Another way of thinking about knowledge and non-knowledge is adapting the Johari window for intelligence analysis.[10] The Johari window was developed in the 1950s as a model for considering interpersonal relationships. The Johari window is useful for visualising knowledge as a contrast between what we know compared with what others know (Figure 5.4).[11]

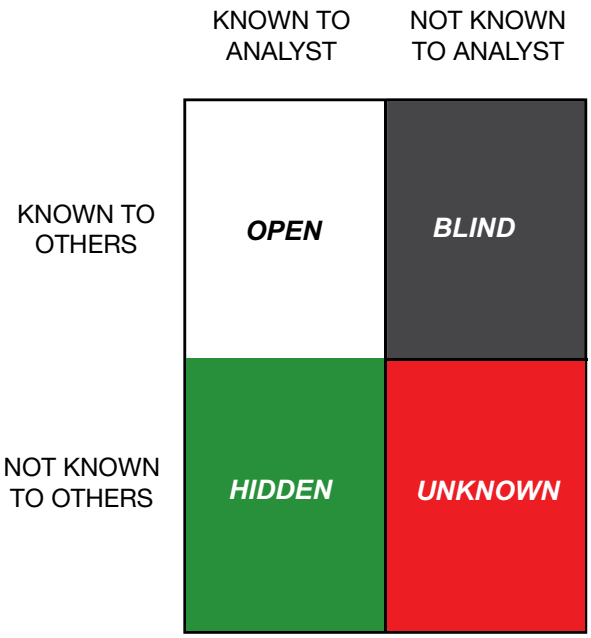


Figure 5.4: Adapted version of the Johari window

The more we read and observe, the more we are increasing our knowledge and becoming aware of new questions to ask and pursue. Even so, the more we learn, the greater our appreciation of just how much more we do not know. The point to

10 This idea has been advocated by Sheila Wright and David Pickton: see Wright, Sheila & Pickton, David, 1998, *Improved Competitive Strategy through Value Added Competitive Intelligence*, Proceedings of the Third Annual European Conference, Society of Competitive Intelligence Professionals, Berlin; and Weiss &Wright, 'Dealing with the unknown: a holistic approach to marketing and competitive intelligence', pp 15–20.

11 Luft, Joseph & Ingham, Harrington, 1970, 'The Johari window, a graphic model of interpersonal awareness', in Luft, Joseph, *Group Processes: An Introduction to Group Dynamics*, Second Edition, Mayfield Publishing, Palo Alto, CA.

take away is not one of despair but one of humility; we *are* gaining more knowledge even as we gain a greater appreciation of our limitations.

Reasoning

Through reasoning we make judgements, arrive at knowledge, and justify why we believe what we believe. There are different types of reasoning that people use, which directly affect the confidence that we can have in the judgements that we reach. It is worth being aware of these to understand the thinking behind these judgements and the strengths and weaknesses of the approaches.

Deductive Reasoning

In deductive reasoning, the conclusion logically follows from the premise. If the premises are true then the conclusion must be true. A commonly used syllogistic example is:

- Socrates is a man (Premise)
- All men are mortal (Premise)
- Therefore, Socrates is mortal (Conclusion)

Most of the time, deductive reasoning involves applying a general rule to specific examples. Deduction is about crawling slowly towards conclusions, not jumping to them.[12] Deductive reasoning tells us what we already know but have not necessarily deliberately considered. Given that intelligence largely deals with people-based problems, it is important to emphasise that deduction is not about determining future behaviour; one cannot deduce future behaviour based on previous behaviour because it has not yet happened. Deduction, therefore, is useful in clarifying what we know.

Inductive reasoning

In inductive reasoning, the conclusions do not necessarily follow from the premises, though there is some evidence that they should. An example of how inductive reasoning works is:

- The first bird I see flies. (Premise)

12 Baggini & Fosl, *The Philosopher's Toolkit: A Compendium of Philosophical Concepts and Methods*, p 7.

- The second bird I see flies (Premise)
- Therefore, all birds fly (Conclusion)

Inductive reasoning is going out on a limb, which may or may not support the weight of our conclusions. Analogies, rules of thumb and typical examples are all types of inductive reasoning.[13] Generally, inductive reasoning takes a specific example and attempts to develop a general rule. This is more applicable for intelligence problems. For example, when we use previous behaviour as an assessment of future behaviour or when we use a previous mission as the basis for a judgement about a future mission. Nevertheless, just because we have seen something before, it does not necessarily follow that it applies in all similar cases.

Abductive Reasoning

Abductive reasoning is the most likely or plausible explanation in light of the facts based on the available evidence. It is the conclusion that best fits the information available to us at the time. Medical diagnoses provide a useful example of abductive reasoning. Doctors make a diagnosis of the most likely ailment based on the symptoms being displayed in a patient. These can be life and death decisions, made within very tight time frames, where there might not be the time for a search for additional information. Again, abductive reasoning is a useful tool so long as one recognises that abductive reasoning can be right or wrong.

Intuition

What about 'gut feel', when we make a judgement based on our intuition? An often-quoted definition of intuition provides a useful guide on when and when not to trust our instincts. It has been argued that intuition is simply recognition: '[t]he situation has provided a cue; this cue has given the expert access to information stored in memory, and the information provides the answer. Intuition is nothing more and nothing less than recognition'.[14] Therefore, for us to rely on our intuition we need to have a problem within a stable environment that we are able to learn from and can clearly determine cause and effect.[15] If we are relying solely on our intuition, it would want to be based on repeated exposure to a stable environment.

---

13 ibid, p 9.

14 Simon, Herbert, 1992, 'What is an "explanation" of behaviour?', *Psychological Science*, vol 3, no 3, May, p 155.

15 Kahneman, *Thinking, Fast and Slow*, p 241.

The point is not to ignore creative thinking or intuition, but it cannot be enough for us to say 'I've got a hunch' and leave it at that.

Information

Analysts use information to form, amend and support their judgements. In the absence of information on a specific problem, we will commence researching information that we think is relevant to the problem. Information here is defined as *data containing meaning*[16] in contrast with intelligence, which we previously defined as *information that has been analysed*. As analysts, we form and justify our judgements based upon our understanding of information. This means that how we interpret information is critical. As has been noted, '[t]he data do not interpret themselves. Humans must take and analyse them or they simply remain a mass of unconnected pieces of information'.[17] When reviewing information, we are attempting to arrive at a coherent and credible explanation or conjecture, in essence a story. Analysts are attempting to make a coherent story out of voluminous, diverse and often conflicting information. However, information presents a number of challenges for analysts.

Overabundance of Information

The increasing volume of information produced on any given topic means that we will rarely (if ever) be able to get across all relevant information. The ubiquitous use of information technology in most aspects of our lives has seen the proliferation of information at such an enormous rate that it has become an issue for society. Rather than decreasing uncertainty, an overabundance of information has often served to confuse and create uncertainty. Moreover, despite recent excitement over 'big data', a more cautious approach to some of the claims being made has been suggested.[18]

---

16 Floridi, Luciano, 2005, 'Is semantic information meaningful data?', *Philosophy and Phenomenological Research*, vol LXX, no 2, March, p 353.

17 Wastell, Colin, Clarke, Graeme & Duncan, Piers, 2006, 'Effective intelligence analysis: the human dimension', *Journal of Policing, Intelligence and Counter Terrorism*, vol 1, no 1, October, p 37.

18 Refer to Silver, Nate, 2012, *The Signal and the Noise: Why So Many Predictions Fail – But Some Don't*, Penguin Press, New York, NY, pp 9–12.

In dealing with an overabundance of information, having a specific question in mind is important if we are to make any sense of the information.[19] Without a specific question or problem in mind, we have no frame of reference to identify what is and is not relevant. With a specific problem or question, analysts can at least look at the information and determine what we can know, what judgements we can make and identify the gaps in knowledge.

Information Diversity

The diversity of information also provides a challenge for analysts. The common term *all source* should underscore that analysts are dealing with very diverse bits of information from entirely different contexts:

> Unlike the domains of science and business, where experts' data are tightly controlled, the data of intelligence analysis are enormously complex and multivariate. A HUMINT report is far different from a satellite image, and both are different, in several ways, from a conversation recorded on a Web log.[20]

Single-source analysts still face difficulties of interpretation, but they can at least build up an understanding of the context, limitations and strengths of a particular source of information (eg satellite imagery). In contrast, the all-source analysts are faced with the difficulty of attempting to understand the context and an enormously diverse range of information.[21]

Information credibility

Assessing the credibility of information is critical for determining what confidence we should have in the information. Ultimately, we need to ask ourselves, 'Can I trust this information?' Establishing the validity of evidence or information on which we base our judgements is critical, albeit not always done.[22] There are useful

---

19 Spellman, Barbara A, 2011, 'Individual reasoning', in Fischhoff, Baruch & Chauvin, Cherie (eds), *Intelligence Analysis: Behavioral and Social Scientific Foundations*, The National Academies Press, Washington, DC, p 129.

20 Herbert, 'The intelligence analyst as epistemologist', p 680.

21 Thompson, Hopf-Weichel & Geiselman, *The Cognitive Bases of Intelligence Analysis*, pp 3-7.

22 Moore argues information does not appear to be fully validated within intelligence analysis for a number of reasons, including: wishful thinking, initial readings suggest validity, assumed validity based on past experience, and decision that it is not worth the effort. Moore, David T, 2011, *Sensemaking: A Structure for an Intelligence Revolution*, National Defense Intelligence College, Washington, DC, p 146.

questions we can ask to help validate information, looking at both the information itself as well as the source. For example:

Who or what was the source? What was the source's access? What is the source's reliability? Is the information plausible? —Morgan D Jones[a]	How reliable is the information source? Has the source provided information before? How accurate is the information? How recent is the information? —Hank Prunckun[b]

a Jones, Morgan D, 1998, *The Thinker's Toolkit: 14 Powerful Techniques for Problem Solving*, Three Rivers Press, New York, NY, p 180.

b Prunckun, Hank, 2010, *Handbook of Scientific Methods of Inquiry for Intelligence Analysis*, Scarecrow Press, Lanham, MD, p 29.

Perhaps the most well-known criteria for judging the credibility of information and reliability of the source is the Admiralty Scale.[23] Under the Admiralty Scale, source reliability is defined using letters (A to F):

A – Completely reliable

B – Usually reliable

C – Fairly reliable

D – Not usually reliable

E – Unreliable

F – Reliability cannot be judged[24]

Information credibility is defined numerically (1 to 6):

1 – Confirmed by other sources

2 – Probably true

3 – Possibly true

4 – Doubtful

5 – Improbable

6 – Truth cannot be judged[25]

23 Ministry of Defence (UK), 2011, Joint Doctrine Publication (JDP) 2-00: *Understanding and Intelligence Support to Joint Operations*, Third Edition, Development, Concepts and Doctrine Centre, Shrivenham, pp 3-20 & 3-21.

24 ibid, p 3-21.

25 ibid.

Irrespective of the approach used when trying to validate information, we should remember that they are guidelines rather than rules.[26]

Context

As analysts, we bring our own perspectives and context to a problem.[27] Analysts will interpret identical information differently, based on their own mindsets, but also on the context of the problem that they are working and the group, organisation or agency from which they have come. Within a military context, people would be no doubt aware of how different Services (Navy, Army and Air Force), even different country's agencies, will interpret exactly the same information differently. Just as the buyer and seller of a house are viewing exactly the same object, they are considering it from different perspectives, and are arriving at different conclusions.

Why does this matter? Once we realise that people can interpret the same information differently, it highlights the importance of getting back to the source documents and reading them for ourselves. Wherever possible, we should look at primary data for ourselves rather than rely on already-analysed information. Where the time or access prevents this, then there is the risk of extrapolating misunderstandings and misinterpretations or of having to accept others' judgements at face value.

Evidence

We can define evidence as information that supports an argument or hypothesis. Evidence is important to consider as it gets back to what we are using to justify our beliefs. One can consider something as evidence only against a problem, hypothesis, theory or question; information is taken as evidence *of something*. The key question then is, 'What is this information evidence of?' A common approach within intelligence analysis has been the use of Richard J Heuer's 'Analysis of Competing Hypotheses' (ACH) that considers how a number of hypotheses

26 Prunckun, *Handbook of Scientific Methods of Inquiry for Intelligence Analysis*, p 31.

27 Hutchins, Susan G, Pirolli, Peter L & Card, Stuart K, 2007, 'What makes intelligence analysis difficult?: a cognitive task analysis', in Hoffman, Robert R (ed), *Expertise Out of Context*, Lawrence Erlbaum Associates, New York, NY, 2007, p 302.

hold up against collected information.[28] For example, the mobilisation of military forces can be evidence of a number of hypotheses: preparations for war, a show of strength, preparations for a military exercise, preparations for a military coup, or a reaction to a breakdown in law and order. The ACH technique recognises that information can be taken as evidence for a number of credible and plausible theories. The point is to weigh up evidence across a number of hypotheses and make a judgement based on the one supported by the most amount of evidence.

Diagnostic Evidence

Information that clearly supports one theory over all others is described as highly diagnostic evidence.[29] This concept comes out of the medical profession and it is useful to highlight how this might work with a medical example adapted from *Psychology of Intelligence Analysis*. If someone goes to the doctor with the following symptoms: a headache, nausea, a runny nose, and tiredness, these symptoms can point to any number of possibilities so are of limited diagnostic value. In contrast, if they also had clear fluid flowing from their ears, this is a highly diagnostic piece of evidence because it indicates a serious head injury. To put this within an analytical context, the more diagnostic the evidence, the more useful it is in confirming a specific hypothesis.[30]

Negative Evidence

The issue of 'negative evidence' is worth briefly touching on. Being able to say something is not happening can be as important as saying something is, because

---

28 For more information, refer to Heuer, Richards J, Jr, 1999, *Psychology of Intelligence Analysis*, Center for the Study of Intelligence, Washington, DC, Chapter 8. In addition, criticism of the approach including research into its utility (or lack of) in not assisting trained analysts overcome confirmation bias is included in Cheikes, Brant A, Brown, Mark J, Lehner, Paul E & Adelman, Leonard, 2004, *Confirmation Bias in Complex Analyses*, Mitre Technical Report, Center for Integrated Intelligence Systems, Bedford, MA, October. However, like many areas within the field of intelligence analysis, the research on the strengths and weaknesses of this approach remains limited. For example, the MITRE research involved just 24 analysts. Consequently, like most structured techniques within intelligence analysis, we are a long way from definitive conclusions on the approach. The benefit of the approach is that it makes analysis more transparent, which in itself is a positive.

29 Heuer, *Psychology of Intelligence Analysis*, p 45.

30 ibid, p 45-46.

it can save money, time and resources.[31] For example, we can look at a country and confirm that they are *not* preparing for war if they are *not* mobilising their military forces. This conclusion is based on a number of observable factors, namely personnel, weapons and equipment that are not at a higher state of readiness, are not being deployed, and are not being armed. This differs from an absence of evidence.

Absence of Evidence

Depending on the problem, the absence of evidence is not necessarily the evidence of something not occurring. A useful question to ask is, 'What is happening above or below the "threshold of detection"?'[32] or 'What can I reasonably expect not to see in the information, even if it is occurring?' The scale of the problem can be useful in determining the significance of an absence of evidence. Following on from the previous example of confirming if a country is mobilising for war, the absence of evidence of mobilisation is significant because we are talking about a large-scale event. If they were mobilising, we would expect to see some evidence of it, regardless of how much they were trying to hide it. In contrast, the absence of evidence of a terrorist attack being planned does not provide this level of confidence because it is on a much smaller scale. Further, recent history has highlighted the difficulty in attempting to detect plans for terrorist attacks.

'Alexander's Question'

The use of 'Alexander's Question' is a useful technique for problem solving and analysis.[33] Alexander's Question is simply, 'What new information would make you change your mind?' By answering this question, we are deliberately forced to consider our own judgements and assumptions. Alexander's Question also serves to highlight whether or not we are setting reasonable standards for changing our position on an issue. Key for us as analysts is to develop falsifiable conjectures

---

31 Cooper also makes the point that '[p]erhaps the scarcest resource is a senior decisionmaker's attention, which can easily be wasted'. Cooper, Jeffrey R, 2005, *Curing Analytic Pathologies: Pathways to Improved Intelligence Analysis*, Center for the Study of Intelligence, Washington, DC, p 17.

32 Smith, Andrew, 2005, 'Detecting terrorist activity: defining the state's "Threshold of Pain"', *Australian Defence Force Journal*, no 168, pp 31–32.

33 Jones, *The Thinker's Toolkit: 14 Powerful Techniques for Problem Solving*, p 185; and Arkes, Hal R & Kajdasz, James, 2011, 'Intuitive theories of behavior', in Fischhoff, Baruch & Chauvin, Cherie (eds), *Intelligence Analysis: Behavioral and Social Scientific Foundations*, The National Academies Press, Washington, DC, p 165.

(ie theories that can actually be proven wrong) rather than theories in which '*everything supports my assessment*', a kind of '*heads-I-win-tails-you-lose*' approach to analysis. Alexander's Question promotes analytical humility by forcing us to consider that our initial judgement might, in fact, be wrong. This approach also provides us with the opportunity to look for the information that would show us we were wrong, and enable us to better calibrate our assessment.

CHAPTER 6
LANGUAGE: ANALOGIES AND METAPHORS

The words we use to think about and describe things are fundamentally important. Words help us to explore and expand our knowledge but they can just as easily trap and constrain our thinking. Two incredibly powerful aspects of language and thinking that are fundamental to analysis are analogies and metaphors.

Analogy

Analogous reasoning is one of the most popular analytic approaches within intelligence analysis.[1] An analogy is a comparison between two distinct entities based on their perceived similarities. Analogies reflect the following reasoning:

- X is not well understood.
- Y is well understood.
- X and Y are comparable.
- So we can use Y to help us to understand X.

Analogies are an attempt to take what we know and apply it to helping us understand what we do not know. As touched on earlier, analogies are a form of inductive reasoning—we can use them to go out on a limb. Analogous reasoning is common within military intelligence as we are often dealing with highly ambiguous situations about which we need to make a judgement. For example:

---

1 Treverton, Gregory F, 2005, 'Foreword', in Johnston, Dr Rob, *Analytic Culture in the U.S. Intelligence Community: An Ethnographic Study*, The Center for the Study of Intelligence, Washington, DC, p xi.

- Previous conflicts are used as the basis for understanding the nature and outcomes of current and future conflicts.
- The likely tactics of a new threatening non-state actor is considered within the context of other, better known groups.
- An opposing military's likely future behaviour is assessed against how we think our own military would behave in a similar situation.

Analogies are useful based on the strength of their similarities. Everything can be compared on some level—for example, a bumblebee and a nuclear bomb can both cause damage—but it is the strength of the similarities that is important. In this respect, *analogous reasoning* operates as a form of inductive reasoning. Philip Tetlock provides some sound guidance on the use of analogies: use multiple analogies for a situation, and identify how situations are both alike *as well as* how they are different.[2] So, when we hear somebody using an historical analogy to support an argument, we should ask:

- How is the situation similar?
- How is the situation different?
- What do these similarities and differences suggest about how much we can draw from the analogy?

Research into forecasting has found that those better at guessing what will happen in the future draw on multiple analogies for any situation. It was found that those who use multiple analogies when making predictions are still not necessarily very good, but they are better than those who rely on a single analogy.[3]

This brings us to the question of how unusual is the situation that we are seeking to understand? If the situation is rarely seen then we will have fewer analogies to draw on, and have less confidence in our use of analogous reasoning. In contrast, if the situation is seen more frequently we will have many analogies to compare it to, and will be more confident in the conclusions we arrive at with analogous reasoning. Often intelligence analysts are dealing with the first type of situation, relatively rare or unique events (unconventional warfare, terrorist attacks, and insurgencies). Because these events occur rarely, there is a risk of using a small number of similar events to come up with an overconfident assessment of what will happen.

---

2 Tetlock, Philip E, 2005, *Expert Political Judgement: How Good Is It? How Can We Know?*, Princeton University Press, Princeton, NJ, p 92.

3 ibid.

Ultimately, as analysts we should remind ourselves that just because it happened one way in the past *does not mean* that it will happen the same way again. Indeed, part of deception and surprise (stratagem) is trying to convince an opponent that the future will be the same as the past.[4] So, while analogous reasoning can help, we need to remember to ask how the situation is both alike and different, and not seek to minimise the specific and unique aspects of each situation.

Metaphor

It's a jungle out there.

Aristotle described a command of metaphors as 'the mark of genius, for to make good metaphors implies an eye for resemblances'. Metaphors are a type of analogy in that they compare two things, but go further in claiming that on some level they *are* the same. For example, 'It's a jungle out there' claims that society is a life and death struggle for survival. Metaphors are usually so ingrained in our language that we use them without being conscious of them. So we can use metaphors like assumptions, unquestioningly accepting the validity of the similarities being claimed.

Metaphors within intelligence are plentiful: *intelligence illuminates, intelligence is the front line, information is wheat or chaff, information is a signal or noise*. Taking the metaphor of information as either wheat or chaff, we accept information as either useful or irrelevant, overlooking that the metaphor masks the fact that information can be both useful for one question while irrelevant for another (but chaff can never change to wheat). The same applies to the signal and noise metaphor. Whether or not information is a 'signal' or merely 'noise' depends entirely on the problem at hand, information can be both. Though these might seem overly pedantic examples, the point is that when we unconsciously accept a metaphor we accept its validity entirely and all the assumptions that come with it. Certainly, metaphors can have a powerful influence over the way that those inside and outside of intelligence think about analysis.

The *connect-the-dots* metaphor was used by the 9/11 Commission to describe intelligence analysis, and continues to be used. Yet, it has also been highlighted that this is an overly simplistic metaphor for what analysts actually do.[5] The concept is

---

4 For a detailed analysis on stratagem in modern warfare refer to Whaley, Barton, 2007, *Stratagem: Deception and Surprise in War*, Artech House, Boston, MA.

5 Puvathingal, Bess J & Hantula, Donald A, 2012, 'Revisiting the psychology of intelligence analysis: from rational actors to adaptive thinkers', *American Psychologist*, vol 67, no 3, April, pp 199–210.

taken from a children's activity in which a line is drawn between clearly numbered dots on a page to reveal a picture. As has been observed, the metaphor:

> … assumes that all the dots in a given puzzle are present and the task facing the analyst is simply to join them in order to solve the puzzle. In reality, the intelligence analyst is more likely to be confronted by a picture that is unclear precisely because it contains too few dots. The job of the analyst is to make sense of the picture that sight of the missing dots would bring—i.e. reveal the 'full picture.'[6]

Another popular metaphor within the field is that of intelligence analysis as a jigsaw puzzle. There are a number of positives with the metaphor, including: everybody understands what a puzzle is, a puzzle suggests that structure and patterns exist, that situations can be resolved, and it provides a mental picture for junior analysts. However, the puzzle metaphor contains a number of questionable assumptions. The metaphor assumes that we are dealing with a fixed, unchanging picture rather than a dynamic situation. This overlooks the fact that our understanding of situations changes (often entirely), rather than being revealed one neat piece at a time. Additionally, the metaphor claims that each new piece of information fits precisely, without contradiction, and makes the picture clearer. Indeed, the metaphor suggests that there is no need for interpretation; once correctly assembled, the picture is self-evident to everyone.

The problem with many metaphors like connect-the-dots, puzzle, and wheat and chaff is that they present intelligence analysis as a simple problem, fixed, unchanging, straightforward and solvable. They suggest that intelligence analysis is simply drawing a line, connecting some puzzle pieces, separating some objects and the situation will become obvious. Whenever we use metaphors (or hear them used), rather than accepting them at face value, we should think them through. This includes identifying the assumptions that they contain, why they work and why they fall down.

---

6 Phythian, Mark, 2009, 'Intelligence analysis today and tomorrow', *Security Challenges*, vol 5, no 1, Autumn, p 70.

CHAPTER 7
EXPERTISE, PREDICTION AND SURPRISE

Expertise

We all have an idea of what an expert is. They are somebody who has extensive knowledge and skills in a particular field. They are the kind of person that we go to for answers and the kind of person whose opinion we rely upon. Within the field of intelligence analysis, this concept of an expert is critical—both because, as analysts, we draw upon the opinions and judgements of those considered to be experts and because at some stage people will come to see ourselves as experts. Even after a very short time, we might actually find ourselves as the most knowledgeable person on the specific problem or situation that we are analysing.[1] The important point is for us as analysts to understand the limits of expertise and attach appropriate confidence to our assessments based on what is knowable and what is not.

Before we simply take experts' opinions at face value or before our own heads get too big thinking of how we might someday be considered an expert, let us actually look a little more deeply at the concept of *expertise*. Analysts deal with reports, statements and assessments on a daily basis by people purporting to be experts. Understanding when we can rely on somebody else's expertise and when we cannot is important. This also helps us to appreciate areas in which we might consider ourselves expert and areas where we should not. So what do we mean by experts, and when should we pay attention to what they have to say?

A lot of research has already gone into what expertise is and what makes someone an expert. Several factors that have been identified as defining an expert include:

---

1 Petersen, Martin, 1985, 'Managing/teaching new analysts', *Studies in Intelligence*, vol 30, Fall, pp 3–4, viewed 4 September 2014, <http://www.nationalsecuritylaw.org/files/received/CIA/Petersen-Managing_Teaching_New_Analysts.pdf>.

knowledge, traits, skills, strategies, and the characteristics of the task that they are doing.[2] Of these, research suggests that task characteristics are critical in determining whether or not people can be considered to be *experts*. The task characteristics are different depending upon the particular domain (ie subject area or field); for example, physics, mathematics, psychology, intelligence analysis, engineering, or medicine. When looking at performance in terms of expertise we are talking of the ability to perform a task competently, something that regularly includes the ability to make accurate judgements within a subject area.[3]

In considering the literature on expertise, James Shanteau found the following domains in which good expert performance had been observed: weather forecasters, livestock judges, astronomers, test pilots, soil judges, chess masters, physicists, mathematicians, accountants, grain inspectors, imagery analysts, and insurance analysts. Poor expert performance had been observed in: clinical psychologists, psychiatrists, astrologers, student admissions, court judges, behavioural researchers, counsellors, personnel selectors, parole officers, lie detector judges, intelligence analysts, and stockbrokers. Of interest, nurses, physicians and auditors had been observed displaying both good and poor expert performance (a point we will discuss). The point of these findings is that it is not so much about the 'expert' as it is about the subject area. Of those areas in which people demonstrated poor levels of expertise, one of the consistent factors was that they were making decisions about people's behaviour rather than things. The people-based problem areas were not producing experts.[4]

Identifying cause and effect in human behaviour is inherently difficult. This is because people can react entirely differently to identical influences, and even differently to the same situation. In terms of research, controlling variables to allow robust experiment design to identify cause and effect in human behaviour is extremely difficult. We might make generic statements about future human behaviour at the collective level—that is, there will be wars in future, people will continue to obey the law while some others will break it—without *knowing* specific situations ahead of time. The difficulty with judgements about human behaviour is that it 'often fails to provide the needed cues for timely feedback, and at a collective level is subject to too many unpredictable events and decisions at the same time as

2 Shanteau, James, 1992, 'Competence in experts: the role of task characteristics', *Organizational Behavior and Human Decision Processes*, vol 53, no 2, p 257.

3 ibid.

4 ibid, p 258.

it is subject to known trends and forces'.[5] Further, the actions of our own forces and governments will change the basis for original analysis, making it more difficult to identify cause and effect.[6] Does this mean that analysts cannot be experts?

To answer this question, we can consider Shanteau's research showing that three professions (nurses, physicians and auditors) displayed characteristics of experts in some tasks and non-experts in others. Daniel Kahneman and Gary Klein referred to this as 'fractionated expertise', arguing that this is common across professions, with expertise able to be developed where the focus is on 'hard' data rather than 'soft' data.[7]

Taking this concept, it is worth suggesting some areas where expertise might be developed and others where analysts will be unlikely to achieve expertise. We can put more confidence in things rather than people, eg what weapons are available, but not necessarily how they will be used. These areas of expertise could include organisations, orders of battle, tactics and doctrine, weapons, and historical behaviours. However, we are unlikely to be experts in terms of predicting an adversary's future behaviour or their reactions to external influences. To verify this, we need only look to prewar assessments (of any conflict) of an adversary's assessed future behaviour and contrast this with what actually happened. So, as analysts we might know a great deal about a conflict,[8] an organisation, a country's military and weapons systems, and may be expert on these. We can also develop expertise in the application of analytic techniques and methods themselves, without being an expert in the domain to which they are applied. When dealing with human behaviour, if we believe that we are expert on judging how people will behave then we are likely to come unstuck.

The observation that expertise does not transfer across domains and fields has been consistently made within the literature but is worth deliberately stating here to highlight the importance of this to analysts. Being an expert in one area does not make us an expert in another. This is an important factor for analysts to consider, both in terms of who is making an assessment and on what and when, as analysts, we ourselves begin looking at in new areas or subjects. For example, being an

---

5 Moore, David T, 2011, *Sensemaking: A Structure for an Intelligence Revolution*, National Defense Intelligence College, Washington, DC, p 80.

6 Hastie, Reid, 2011, 'Group processes in intelligence analysis', in Fischhoff, Baruch & Chauvin, Cherie (eds), *Intelligence Analysis: Behavioral and Social Scientific Foundations*, The National Academies Press, Washington, DC, p 172.

7 Kahneman, Daniel & Klein, Gary, 2009, 'Conditions for intuitive expertise: a failure to disagree', *American Psychologist*, vol 64, no 6, September, p 522.

8 ibid, p 523.

expert in the technical functioning of a weapons system does not make that person an expert in the how, why or when a group or individual might use that weapon. Rob Johnston illustrates this, pointing out that being an expert chess player does not automatically make that person an expert poker player (though both are games), and a biochemist cannot simply go and perform neurosurgery (though both look at human physiology). As Johnston notes, 'the more complex a task, the more specialized and exclusive is the knowledge required to perform that task'. Johnston's conclusion is highly pertinent for us as analysts, '… an expert may know his specific domain, such as economics or leadership analysis, quite thoroughly, but that may still not permit him to divine an adversary's intention, which the adversary may not himself know'.[9] Having considered how areas involving making judgements about human behaviour lacked true experts, this should provide us with a basis for considering the area of prediction.

Prediction

> *… there is nothing usual about the future.*
>
> Nassim Taleb[10]

Given the frequent use of the term *prediction* within the field, consideration of what is and is not predictable is worthwhile. Concepts such as 'Predictive Battlespace Awareness' encourage the perception that intelligence can achieve prediction, even in complex and dynamic human environments.[11] There are essentially two types of change that must be predicted: regular, or cyclical, changes (eg the changing seasons); and discontinuous changes—those that occur on a one-time, *ad hoc,* basis.[12] We can expect people to be able to predict recurring natural phenomenon or where clear causal relationships can be established, but where changes are unusual or ad hoc events then prediction becomes virtually impossible.[13]

---

9 Johnston, Dr Rob, 2005, *Analytic Culture in the U.S. Intelligence Community: An Ethnographic Study*, The Center for the Study of Intelligence, Washington, DC, pp 63 & 66.

10 Taleb, Nassim Nicholas, 2010, *The Black Swan: The Impact of the Highly Improbable*, Penguin Books, London, p 135.

11 For a critique of concepts like Predictive Battlespace Awareness, refer to Lewis, Major Dennis, 2004, *Predictive Analysis: An Unnecessary Risk in the Contemporary Operating Environment*, US Army School of Advanced Military Studies, Fort Leavenworth, KS, pp i &22.

12 Mintzberg, Henry, 1994, *The Rise and Fall of Strategic Planning*, The Free Press, New York, NY, pp 228, referred to in Lewis, *Predictive Analysis: An Unnecessary Risk in the Contemporary Operating Environment*, pp 23–24.

13 Lewis, *Predictive Analysis: An Unnecessary Risk in the Contemporary Operating Environment*, pp 23–24.

So where do we stand on predicting future events? People have been trying and researching this problem for years, and when it comes to predicting people's behaviour and dealing with people-based problems the findings are not positive. Nate Silver, who is known for a string of successful predictions of election outcomes and voter tendencies in the United States, makes the following observation: 'There is no reason to conclude that the affairs of man are becoming more predictable. The opposite may well be true. The same sciences that uncover the laws of nature are making the organization of society more complex'.[14] TN Dupuy in his book *Numbers, Prediction, and War* argues, '[t]here is no known methodology, no conceivable methodology, that can accurately predict future events. This of course applies to all models used for predictive purposes'.[15] Again, the key issue relates to the problem of identifying causal relationships that provide a firm basis for predictions of future behaviour. Moreover, even when we know the causes of events, this does not make these events predictable. Tetlock highlights that the US National Transportation Safety Board (NTSB) identifies a number of common causes of aircraft accidents, including tired pilots, bad weather, uncertain and cryptic communication, breakdown in radio communication, and people panicking in the face of death. After an accident the NTSB can pick out the combination of causes of disasters, and explain what happened, but they cannot (and do not) attempt to predict the *if* or *when* of future aircraft accidents.[16]

The following activity is worthwhile to highlight the difficulties of prediction, as well as the impact that the distance of time has on our confidence in making such predictions. Ask yourself the following questions in terms of both one week from today and five years from today:

- What job will I be in?
- Where will I be living?
- How much will I be earning?
- Will I be in a relationship?
- What will have been my greatest achievements during the period?

---

14 Silver, Nate, 2012, *The Signal and the Noise: Why So Many Predictions Fail – But Some Don't*, Penguin Press, New York, NY, p 448.

15 Dupuy, TN, 1985, *Numbers, Prediction, and War: The Use of History to Evaluate and Predict the Outcome of Armed Conflict*, Hero Books, Fairfax, VA, p 147, quoted in Lewis, *Predictive Analysis: An Unnecessary Risk in the Contemporary Operating Environment*, p 20.

16 Tetlock, Philip E, 2005, *Expert Political Judgement: How Good Is It? How Can We Know?*, Princeton University Press, Princeton, NJ, p 35.

- What will have been my greatest failures during the period?
- What relationships will have ended during the period?
- What new relationships will have started during the period?
- What will have been the most significant events to have directly impacted my life over the period?

If we are honest with ourselves, the activity will highlight just how difficult prediction is, even if you are the best-placed person to make the prediction. The activity encourages us to think about our own internal motivations and actions as well as external factors, highlighting that we are influenced by our own deliberate behaviour as well as external events. The activity also emphasises that the longer the period of time the more difficult it is to make a confident judgement. However, that is not to suggest that even guessing one week out is easy. For example, while we might not have changed jobs a week from today, we will still be challenged by the question, 'What will have been the most significant events to have directly impacted my life over this week?' The activity also encourages humility by recognising that if it is difficult to predict our own behaviour due to numerous external and unidentified factors, how much harder is it for us as analysts looking at an adversary from the outside.

So do analysts attempt prediction within the field? The most common predictions within analysis are often unconsidered statements about an opponent's future behaviour. These predictions usually only appear verbally in discussions and debates, and take the form of definitive statements that an opponent '*won't* do that' or they '*will* do this'. The problem with such statements is that they actually encourage surprise to occur, because the person making it has entirely disregarded all but one behaviour, instead of recognising that there might be many plausible actions that an adversary might take.

Like any field, intelligence analysis has many confident (and at times overly confident) analysts when it comes to judgements about what will happen in the future. This confidence can be actively encouraged (even highly regarded) within organisations. The problem is that research has shown that high levels of confidence do not necessarily indicate accurate predictions.[17] Even in the face of an incorrect prediction, people may very well continue being overly confident simply

17 Slovic, Paul, 1973, 'Behavioral problems of adhering to a decision policy', paper presented at the Institute for Quantitative Research in Finance in May 1973, Napa, CA, p 5.

explaining away failed predictions as beyond their control, nearly right, mostly right, or just wrong about the timing (and that it will still happen).[18]

At the macro level, anticipating the types of attacks that might occur or the kinds of warfare in which militaries are likely to engage is very different to predicting a specific timing and location of an attack or identifying the protagonists that will be involved. Otherwise these attacks could be prevented, conflicts avoided or militaries entirely prepared, equipped and trained for a specific type of conflict against a specific enemy. As Moore notes, broad anticipation of trends, even generic concerns, are not predictions, highlighting that:

> … one might detect indicators suggesting that an upcoming event similar to one in the past is possible, likely, or even reasonable. On this basis, one could, for example, have anticipated that sooner or later foreign terrorists would again attack the United States by targeting some high-value building or event, such as the World Trade Center. This is a far cry from predicting that Al Qaeda terrorists would fly airplanes into the World Trade Center and the Pentagon on the morning of 11 September 2001.[19]

Where does this leave us as analysts? Perhaps the best approach is to distinguish between a prediction and a conjecture[20] and look at judgements of future behaviour as conjectures (a hypothesis) rather than predictions (as a certainty). The term *conjecture* underscores the idea of refuting and a recognition that these things are not certain and are open to alternative explanations.

Prediction Markets

Given recent attention to prediction markets, it is worth briefly touching on these. Prediction markets involve groups of people speculating on the outcomes of usually well-defined, short-term future events, such as political elections, product delivery dates, commodity pricing or sporting outcomes. As Hastie observes '… prediction markets are restricted to applications in which a well-defined outcome set to occur in the near future can be verified'.[21] Prediction markets can certainly form a source of information for analysts to consider if looking at relevant or related topics. Nevertheless, they lack many of the basic requirements expected

---

18 Tetlock, *Expert Political Judgement: How Good Is It? How Can We Know?*, pp 129–143.

19 Moore, *Sensemaking: A Structure for an Intelligence Revolution*, p 40.

20 Ben-Israel, Isaac, 1989, 'Philosophy and methodology of intelligence: the logic of estimate process', *Intelligence and National Security*, vol 4, no 4, p 667.

21 Hastie, 'Group processes in intelligence analysis', p 188.

of analysts who are making judgements that inform often critical and significant decisions and actions. For example, prediction markets lack the transparency expected of analytical reporting, including: Who is making the judgement? Why are they making the judgement? What information are they using? What information are they deliberately omitting? What information are they ignorant of? There have been concerns raised over an inability to understand the rationale behind forecasts, the potential for prediction markets to be manipulated, and the ethics of using prediction markets for national security issues.[22] Ultimately, what government would justify making potentially significant decisions or taking actions based upon the suggested outcome of a prediction market?

Prediction versus Retrodiction

> *Retrodiction is enormously easier than prediction.*
>
> Philip E Tetlock[23]

The distinction between prediction and retrodiction is worth highlighting. Knowledge of past events does not equal accurate prediction of future events and too often people confuse retrodiction (the ability to explain past events) with prediction (foreknowledge of the future).[24] After significant events (from terrorist attacks to market crashes), the media is full of experts providing in-depth explanations of how obvious something was and the causes for it occurring. As Taleb points out '[t]he very same journalists, economists, and political experts who did not see the crisis coming provided abundant ex-post analyses about its inevitability.'[25] There is a clear difference between predicting compared with being wise *after the fact.* For those people we remember making a few accurate predictions, look at their entire predictive record; if people are able to genuinely predict future events, they should have been consistently accurate across all predictions, not just accurate once or twice. Further, history could certainly have followed any number of paths meaning that knowledge (and even an understanding of the causes) of past events does not equal accurate prediction of future events. An understanding of the past helps us, but the past is no guarantee of what is going to happen in the future.

---

22 Heuer, Richards J, Jr & Pherson, Randolf H, 2011, *Structured Analytic Techniques For Intelligence Analysis*, CQ Press, Washington, DC, p 210.

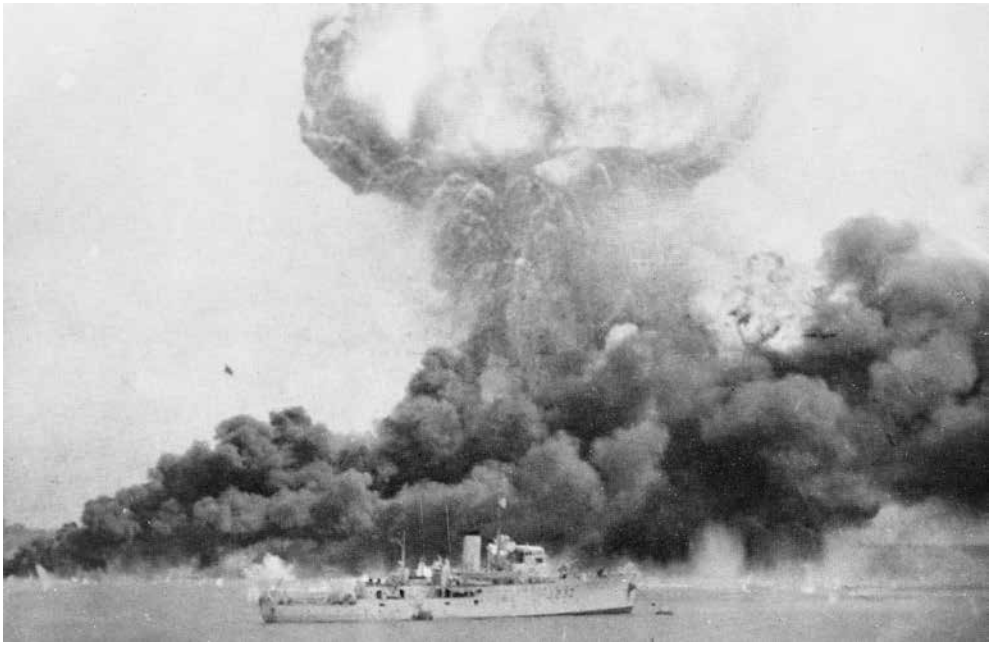
23 Tetlock, *Expert Political Judgement: How Good Is It? How Can We Know?*, p 35.

24 Taleb, *The Black Swan: The Impact of the Highly Improbable*, p 321.

25 ibid.

Surprise

It is natural for us to hold certain expectations about our short, medium and long-term futures. These can include what we are going to do for lunch, how our sporting team will perform this season, and what we will do in retirement. We all have expectations about how the future will play out. These expectations are often based on previous experiences, meaning that simply by holding expectations we will be surprised when the future does not follow these expectations. One example is the Japanese airborne attack on Darwin on 19 February 1942. Despite the Japanese previously conducting an attack on Pearl Harbor two months earlier, the attack on Darwin still came as a surprise. With expectations being based on previous experience, as there had never been an attack on Darwin, the expectation was that 19 February would be the same. Once the first attack on Darwin occurred, people's expectations of the future changed based on their new experience, with a greater expectation of further attacks.



Japanese attack on Darwin, 19 February 1942
(Photograph: Australian War Memorial 128108)

While some things might turn out the way we expected, or within bounds of which we are comfortable, at other times the future will be nothing like we expected. The result? Surprise. If we pay attention, we will notice how we are surprised every single day because our perceived future never quite matches the reality that unfolds. The

scale of the surprise and the consequences of being incorrect will mostly be minor: we do not get our usual car park, somebody with whom we work was off sick, an unexpected email arrived, we were given a new task, or there was a long line at the shop (or a short one). Each of these actually represents a surprise in the form of an unexpected or unanticipated future. Therein lies the surprise, the future turns out differently to what we expected, however small or insignificant. So where does this lead us in terms of analysis, prediction and dealing with human behaviour?

Anticipation Versus Prediction

One idea that is advocated by a number of authors, and that most of us actually adopt in our everyday lives, is to look more at anticipation than prediction. Nassim Taleb, in his book *The Black Swan*, argues that the more possible futures we consider the better prepared we are to deal with whatever future arrives. The rationale is that we reduce the surprise effect if we have anticipated the kind of event. He refers to this as turning Black Swans into Gray Swans.[26] Moore makes a similar argument, advocating anticipating the broad course of events rather than aiming for prediction of specific future incidents.[27] This broader anticipation of a multitude of alternatives is perhaps better reflected in planning than analysis. Planners tend to expect that things will not necessarily work out exactly the way they want; hence the need to consider how things might go wrong and how the plan will need to adapt. This can be seen in the deliberate use of scenario-based planning, where a number of different scenarios are considered, rather than planning for one scenario. Similarly, Western militaries tend to be designed to be able to fight and adapt to any number of different conflicts (as well as adapt to peacekeeping tasks) rather than designed for just one specific type of conflict. Having just one perspective about what will happen in the future encourages two things: it encourages confirmation bias by encouraging us to match all future information to our initial theory; and it almost guarantees that we will be surprised. Instead, allowing multiple alternative considerations encourages a broader perspective and arguably lessens surprises by acknowledging that there are many logical conjectures on what could happen in the future.

26 ibid, pp 211–213.

27 Moore, *Sensemaking: A Structure for an Intelligence Revolution*, p 129.

CHAPTER 8
COMPLEXITY, UNCERTAINTY, UNINTENDED CONSEQUENCES AND ASSUMPTIONS

The concepts of complexity, uncertainty, unintended consequences and assumptions are regular features of discussions about analysis. These concepts are worth considering in some detail to understand their importance to analysis.

Complexity

The term *complex* frequently appears within the intelligence field to describe any number of situations, operations, issues and problems.[1] We could define complexity as relating to a situation, issue or topic that is inherently complicated, often because of multiple interacting parts. Yet, we are often made to believe that even the most complex situations can be adequately explained in a 30-second television report or a three-paragraph article. Instead, even when we look at what appear to be simple situations, the more we look the more we become aware of their complexity. Heuer provides some practical guidance for dealing with complexity:

> There are two basic tools for dealing with complexity in analysis—decomposition and externalization.
>
> Decomposition means breaking a problem down into its component parts …

1 We are differentiating here from complex as relating to technical equipment and weaponry which, though complicated in terms of numerous interacting parts and technological applications, is a 'bound' problem. That is, these systems can be understood, albeit potentially with a lot of effort. In contrast, how a group or individual might adapt such weapons to a specific conflict, and the timing, locations and factors influencing their use, might be a complex problem.

> Externalization means getting the decomposed problem out of one's head and down on paper or on a computer screen in some simplified form that shows the main variables, parameters, or elements of the problem and how they relate to each other.[2]

There are a number of tools that can be used to decompose and externalise a problem, for example *mind mapping*. Mind mapping, popularised by Tony Buzan, is a useful visualisation tool for displaying numerous aspects of a problem and their relationships.[3] Let us take a relatively simple problem: 'Should I buy a car?' The question is a common one, which most of us have already had to make. While a simple problem, even relatively straightforward issues can become quite complex when we identify all of the factors that can potentially influence this decision (Figure 8.1).

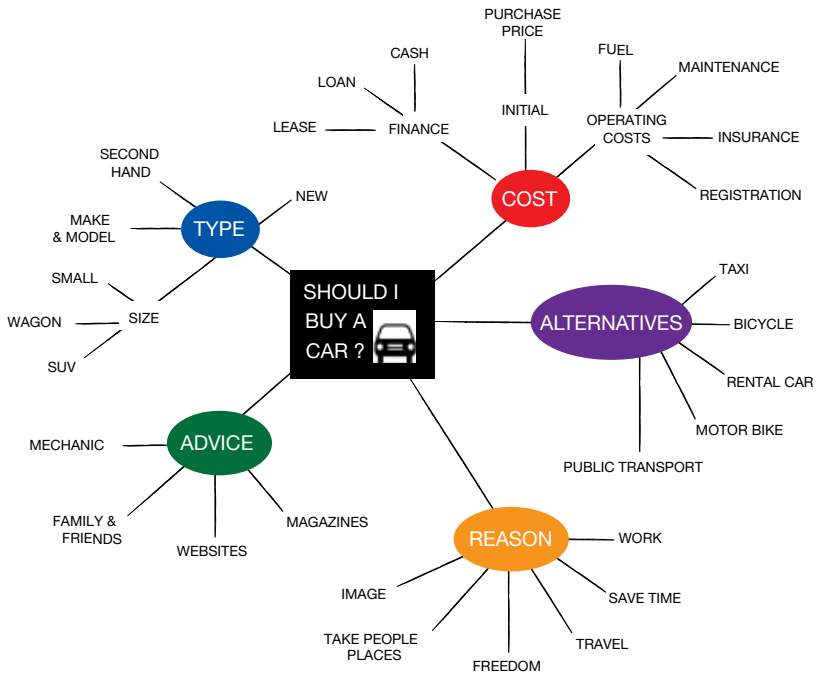


Figure 8.1: Example of mind mapping technique

When it comes to intelligence problems, the situations we deal with will usually contain far greater levels of complexity. Further, these situations are dynamic,

2 Heuer, Richards J, Jr, 1999, *Psychology of Intelligence Analysis*, Center for the Study of Intelligence, Washington, DC, pp 85–86.

3 Buzan, Tony, 1997, *Use Your Head*, BBC Books, London.

frequently changing and often involve us attempting to adopt an adversary's perspective or a world view. The point is not to be overwhelmed but, taking Heuer's advice, break out the problem and externalise it. Decomposing and externalising will not remove the complexity from the situation but it will help us better understand it.

Uncertainty

If complexity relates to a situation, we can say that uncertainty relates to our own understanding. A useful definition of uncertainty is 'what we do not know or understand about a given situation.'[4] As analysts, we should understand that uncertainty is normal—we will always have limits in our knowledge. We can seek to reduce our uncertainty, but we will never entirely eliminate it.

In conflict there already exists a term that captures this uncertainty, namely *the fog of war*. Whaley defines this inspired phrase as 'the state of uncertainty resulting from the inability of a military information system to either accurately or speedily monitor the events of battle.'[5] As analysts, our understanding of situations will also be incomplete because of time pressures to make judgements, an over or under-abundance of information, and the often-changing nature of situations.

Information on people's stated future intentions can be useful in reducing uncertainty about the future, so long as we understand that people who have decided on an action might not carry it through to completion. Certainly, intended behaviour might not occur as planned, even to the surprise of those planning to undertake it. History indicates that at least one third of large-scale military operations are unable to meet their own time lines, with delays due to unrealistic planning or external factors, rather than attempts at surprise or deception.[6] Additionally, people frequently change their minds; they might decide to do nothing or something entirely different. People will act and react in entirely unanticipated ways based on emotional responses rather than calculated logic, adding to our uncertainty of what will happen. As has been observed, 'Countries, armies, and individuals are not mechanical, and much more of human nature

4 Schmitt, Major John F & Klein, Gary A, 1996, 'Fighting in the fog: dealing with battlefield uncertainty', *Marine Corps Gazette*, vol 80, no 8, August, p 63.

5 Whaley, 2007, *Stratagem: Deception and Surprise in War*, Artech House, Boston, MA, p 136.

6 ibid, p 94.

involves emotion rather than logic.'[7] This leads us to the issue of unintended consequences.

Unintended Consequences

Unintended consequences affect both the complexity of situations and our own uncertainty about the situation. People will often react differently to how we might expect them to do. Why is this important? Because we are often analysing how an opponent (well-defined or otherwise) might react to us. Adversaries are living and thinking entities that will change their behaviour based on our actions or other unanticipated factors.

How people will react to threats or incentives is not predictable. Steven Levitt and Stephen Dubner argue, '… one of the most powerful laws in the universe is the law of unintended consequences'. To illustrate the point they describe how many governments around the world have started to base their rubbish pick-up fees on volume—with the expectation that if people had to pay for each extra bag of garbage they would have a strong incentive to produce less garbage. However, this new way of pricing resulted in a number of unexpected consequences, including people stuffing more rubbish in their bags, the dumping of garbage in the woods, sewers in Germany being infested with rats because so much uneaten food was being flushed down the toilet, an increase in backyard rubbish burning in Ireland, and increased hospitalisation of people accidentally setting themselves on fire when burning rubbish.[8] While there is no guarantee that we will be able to identify unintended consequences *before* they occur, simply recognising that actions can have unintended consequences is a good start. Keeping an open mind is better than ignoring the possibility that people may not react the way we anticipate.

Assumptions

Assumptions have been described as the most dangerous form of knowledge. Why? Because an assumption carries with it unconsidered information, knowledge that is not subject to thought or critique. However, assumptions are a fact of life; we all have them and we all rely on them. Within intelligence analysis, assumptions are

---

7 Lanning, Lt Col (Ret) Michael Lee, 1996, *Senseless Secrets: The Failures of U.S. Military Intelligence, From George Washington to the Present*, Carol Publishing Group, Secaucus, NJ, p 297.

8 Levitt, Steven & Dubner, Stephen, 2009, *SuperFreakonomics*, Allen Lane, New York, NY, pp xii & 139.

critical because of their potential consequences. The best that we can do is identify them and make them explicit.[9]

Whenever we read a piece of analysis or an article, or watch a report, it will always contain assumptions. These are not necessarily a matter of people trying to mislead but can simply be a reflection of people's world views, perspectives and opinions. The point is that assumptions exist and, as analysts, we need to be aware of them and identify them. There are really two forms of assumptions to identify: assumptions reflected in *what is written* or *stated*; and assumptions made in terms of *what is not written* or *stated*. While not suggesting that assumptions are lies, the delineation of lies of *commission* and *omission* appear relevant to identifying assumptions. That is, there are:

- Assumptions of commission – assumptions evident in what is stated.
- Assumptions of omission – assumptions evident in what is not stated.

Including a set of stated assumptions at the outset of written analytical reports is therefore a valuable technique. Writing out our assumptions is useful because it:

- forces us to consider and articulate what it is we are taking as agreed or accepted
- highlights to readers our identified assumptions
- helps readers identify what assumptions have not been deliberately identified or considered.

Whenever one of our assumptions turns out to be inaccurate, there is a requirement for an entirely new estimate.[10] So not only should assumptions be made explicit but, wherever possible, they should also be able to be disproven.

9 Heuer, *Psychology of Intelligence Analysis*, p 41.

10 Ben-Israel, Isaac, 1989, 'Philosophy and methodology of intelligence: the logic of estimate process', *Intelligence and National Security*, vol 4, no 4, pp 696–697.

CHAPTER 9
EXPLANATIONS AND ESTIMATES

As analysts, we seek to provide explanations of what has happened and judgements about the likelihood of future events. These explanations and judgements are often based on perceptions of cause and effect and whether or not we perceive patterns in human behaviour.

Cause and Effect

One of the fundamental lessons in life is that of cause and effect. We see cause and effect on a daily basis in our lives and the lives of those around us: we cut our finger and we bleed, we put fuel in our car to make it go, we drink fluid to stay hydrated, and we plug appliances into the electrical socket so they work. Without a basic understanding of how certain actions result in outcomes we would struggle to function as a member of society. On a broader scale, we can also see this cause and effect: a pilot makes a serious error when flying an aircraft and it crashes, droughts destroy crops, excessive rain results in floods, and a poorly constructed building falls down. In the examples given, the situations are relatively straightforward, with causes and effects generally accepted and identifiable.

As discussed in expertise and prediction, cause and effect is far easier to identify when it comes to the *natural environment* compared to *human behaviour*. The difficulty in attempting to clearly link cause with effect in human behaviour is seen in research into why people engage in terrorism. Numerous possible causes of why people commit terrorist attacks have been suggested, including poverty, exposure to violence, issues with parents, depression, psychological disorders, and criminality. The results? Inconclusive. One of the major limitations in attempting to link cause with effect in behaviour is that numerous people with identical backgrounds and experiences have *not* engaged in terrorism.

We all like to provide explanations for behaviour, situations and events. This powerful instinct influences the way we interpret situations and the judgements about future behaviour that we make. In life, we look for patterns and explanations for events and behaviour to help us understand our world. This concept of cause and effect influences our analysis as we seek coherency and explanations out of a mass of diverse and contradictory information on a specific problem. The more coherent the story we develop the more convincing it will be, but that does not mean that it is accurate. As Morgan D Jones notes:

> We feel the need to find explanations for **everything**, regardless of whether the explanations are accurate.
>
> It isn't that we humans **like** to have explanations for things; we **must** have explanations. **We are an explaining species**. Explanations, by making sense of an uncertain world, apparently render the circumstances of life more predictable and thus diminish our anxieties about what the future may hold.[1]

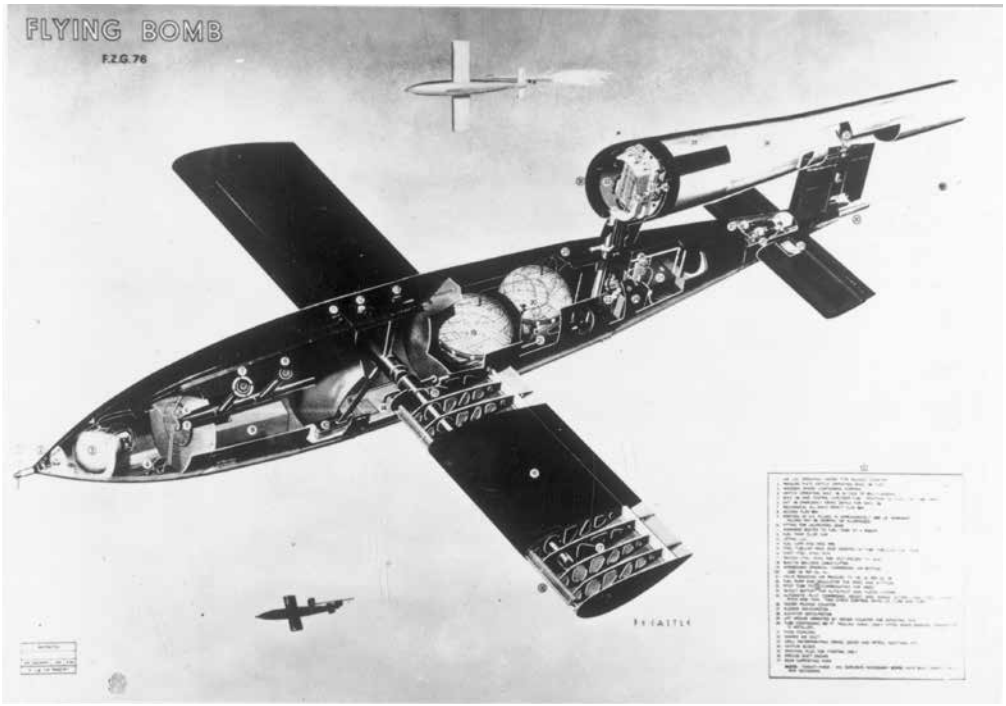
Explaining cause and effect in human behaviour appears most promising when looking backwards and multiple possibilities have already been narrowed to one event. However, this ignores that even if we know the event, we will often disagree about the actual causes. Further, identical stimuli can produce different effects. As an example, if we were to give a group of people $100 each, they will use this money in entirely different ways. Some people would save the money, some would spend it (and those that do would spend it on different things), some might give it away, and some might do combinations of some or all of the previous.

Interpreting Behaviour

Because we are pattern-seeking beings, we are also fooled by apparent patterns in situations and activities around us, even when these often involve unintentional or random behaviours. Thus, we can infer far more intentionality from poorly considered, accidental or even uncoordinated behaviour. One example of over-analysing observed behaviour, described by Thomas Gilovich, relates to German V-1 rocket attacks on London in World War II. The V-1 rocket was an unmanned flying bomb, which the Germans used to attack England between June and October 1944. A number of theories were developed by Londoners as to the German's intentions and rationale behind the locations of where these rockets were landing (including avoiding neighbourhoods where German spies were living). After the

1 Jones, Morgan D, 1998, *The Thinker's Toolkit: 14 Powerful Techniques for Problem Solving*, Three Rivers Press, New York, NY, p 34.

war, the locations of these bombings were analysed and an explanation of the bombing locations was confirmed.[2]



Cutaway view of German V-1 rocket
(Photograph: Australian War Memorial 102042)

As Gilovich demonstrated, the actual bombing locations were random. The German guidance system on the V-1 was not sophisticated enough to accurately guide the V-1 bombs onto specific targets. In reality, the Germans were aiming for the centre of London and hoping for the best outcome.[3] The point is that even deliberate behaviour might lead to random outcomes rather than pointing to a well-orchestrated and well-executed strategy.

Alternatively, we can also identify behaviour that is planned and results in deliberate and coordinated outcomes. The 2013 Boston Marathon bombings provide such an example. Two bombs were detonated near simultaneously, several

2 Thomas Gilovich, 1991, *How We Know What Isn't So: The Fallibility of Human Reason in Everyday Life*, The Free Press, New York, NY, pp 19–20, discussed in Thaler, Richard H & Sunstein, Cass R, 2008, *Nudge: Improving decisions about health, wealth, and happiness*, Penguin Books, London, pp 30–32.

3 ibid.

hundred metres apart at the end of the marathon course. An analyst could argue very quickly that the bombings were coordinated and deliberately targeted the Boston Marathon. It is highly unlikely that two independent groups or individuals would coincidentally plant bombs several hundred metres apart to go off on exactly the same day, at exactly the same time, during the same major event. As analysts, we should neither disregard patterns or coincidences, nor assign deliberate design at each level of human behaviour. Deliberate behaviour can be well coordinated but other times the outcomes can appear more clearly planned or coordinated than was actually the case.

Statements of Uncertainty

We have previously discussed how uncertainty relates to our lack of knowledge about a given situation, emphasising that uncertainty is normal and unavoidable. What we will look at now is a method for capturing this uncertainty in our analysis.

The issue of uncertainty in analysts use of language has been highlighted within the field since (at least) Sherman Kent's 1964 article *Words of Estimative Probability*. Kent highlighted that people interpret words differently and when asked to put a numerical estimate against words commonly used in intelligence analysis reporting. The example Kent gave was interpretations of the likelihood meant by the term 'serious possibility', observing that it was taken to mean anything from 20 to 80 per cent certainty, depending on the individual being asked.[4]

Words alone can be interpreted differently by people in terms of the certainty that they are believed to convey. People can read what they want into these words and mistake our uncertainty for confidence and our confidence for uncertainty. Consequently, the argument that using odds ratios or numerical probability ranges should be standard practice appears sound.[5] That does not mean that assigning numerical probabilities is easy. To assist, Kent provided seven terms with proposed numerical ranges:

- Certainty (100%)
- Almost certain (93% give or take about 6%)

---

4 Kent, Sherman, 1964, *Words of Estimative Probability*, Center for the Study of Intelligence, Washington, DC, viewed 4 September 2014, < https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/books-and-monographs/sherman-kent-and-the-board-of-national-estimates-collected-essays/6words.html>.

5 Heuer, Richards J, Jr, 1999, *The Psychology of Intelligence Analysis*, Center for the Study of Intelligence, Washington, DC, p 183.

- Probable (75% give or take about 12%)
- Chances about even (50% give or take about 10%)
- Probably not (30% give or take 10%)
- Almost certainly not (7% give or take 5%)
- Impossibility (0%)[6]

Until intelligence analysis as a field has arrived at a more precise means of estimating likelihood, this 'give or take' approach in providing a numerical range for statements appears sensible.[7] Using a numerical range avoids the kind of false precision that a specific number might be interpreted as providing. The point for us as analysts is to avoid ambiguous terms or vague language, with the use of a numerical range to clarify meaning appearing to be a logical approach.

Scenarios and Likelihood

Compare the following two scenarios and identify which is the more likely of the two:

A. Over the next five years, Japan experiences a tsunami causing the deaths of more than 10 000 people.

B. Over the next five years, Asia experiences a natural disaster causing the deaths of over 10 000 people.

This exercise highlights that that adding details to a scenario makes them more persuasive but also less likely to come true.[8] Consequently, B above is the *more likely* scenario because it is general (and actually includes scenario A as well). The purpose is to encourage analysts not to believe a more detailed scenario is more likely to happen. As analysts, we often confront fellow analysts, operators or decision-makers with a 'favourite' single scenario of what could happen in the future. Despite often being highly detailed, and passionately argued, these specific scenarios are still less likely to occur than more generic scenarios.

One approach in using scenarios is to place probabilistic estimates on the likelihood of a number of scenarios occurring. Regardless of how many scenarios are being

---

6 Kent, *Words of Estimative Probability*.

7 A popular suggestion has been the use of Bayesian probability in intelligence analysis for assigning numerical probabilities to hypotheses and scenarios.

8 Kahneman, Daniel, 2011, *Thinking, Fast and Slow*, Penguin Books, London, p 160.

considered, their total probabilities must add up to 1.0 (100%). Comparing the likelihood of a range of scenarios is evident when we are considering an adversary's possible courses of action. So if we are assessing the likelihood of an enemy either: (a) conducting an attack; (b) remaining in a defensive position; or (c) withdrawing—they could *not* each have a 50% (0.5) probability of occurring, as that comes to 150% (1.5). Instead, the three options could be 50% (0.5) chance of an attack; 35% (0.35) chance of remaining in a defensive position; and a 15% (0.15) chance of withdrawing. Again, regardless of the number of scenarios being considered, their total likelihood of occurring must add up to 1.0.

CHAPTER 10
ENVIRONMENT AND SITUATION

Work Environment and Social Situation

As analysts, we work within organisational environments and social situations that strongly affect our behaviour and how we perceive and interpret the world. The impact that social and environmental settings can have on human behaviour was examined in the infamous Stanford Prison Experiment facilitated by Philip Zimbardo. Conducted in 1971, the experiment used university students who volunteered to play the role of prison guards or prisoners in a simulated prison set up in the basement of a building at Stanford University. During the experiment, a number of students playing the role of prison guards rapidly degenerated into sadistic and abusive behaviour. After only six days, the experiment had to be abandoned after an independent observer raised questions over the ethics of the experiment. One of Zimbardo's main conclusions was that situations matter and that their influence on a person's character and behaviour is greater than many believe possible.[1]

The conclusions from the Stanford Prison Experiment have subsequently come in for criticism and questioning, with later research highlighting that an individual leader can have a positive and influential impact within social situations.[2] This is a positive as it highlights that we do not simply have to adhere to social or situational pressures or unquestioningly conform to our environment. Nevertheless, the

1 Zimbardo, Philip, 2011, *The Lucifer Effect: How Good People Turn Evil*, Random House, New York, NY, pp 8 & 211–212.

2 For example, refer to the 'BBC Prison Study', viewed 4 September 2014, <http://www.bbcprisonstudy.org>.

observation remains that social settings and the organisational environment can have a significant impact on an individual's behaviour.[3]

As analysts, we will be heavily influenced by the organisational culture and social behaviours of the groups in which we work. Most of us will not have a choice of the teams to which we are assigned or the people with whom we work. Consequently, social and organisational factors are part of the analytic process and we cannot separate the cognitive aspects of intelligence analysis from the cultural context in which we work.[4] What this suggests is the importance for us to deliberately thinking about the environment in which we work, and the influence that it has on the way we behave and interpret the world.

In any work environment, but particularly a military one, there are pressures that exist, both explicit and implied. Examples of environmental and situational influences facing us include: working in a hierarchy (as evident by uniforms, rank, medals, etc); group pressures; commander's expectations; pressure for early closure; pressure to conform to existing analysis; limited or no feedback on analysis; and a high level of responsibility. Where analysts are deployed, we can also experience fatigue, long work hours, potentially high-consequence decisions, and isolation from external views. By being conscious of these pressures, we can try to avoid unquestioning acceptance of these and adopt a more considered approach in our behaviour and analysis.

Conformity

Rob Johnston highlights two types of conformity pressures that we face as analysts: the pressure to conform to a corporate judgement; and the pressure on analysts to conform to their own previous assessments.[5] Both of these are worth considering in some detail.

---

3 For example, refer to Walter Mischel as discussed in Arkes, Hal R & Kajdasz, James, 2011, 'Intuitive theories of behavior', in Fischhoff, Baruch & Chauvin, Cherie (eds), *Intelligence Analysis: Behavioral and Social Scientific Foundations*, The National Academies Press, Washington, DC, pp 144–145.

4 Johnston, Dr Rob, 2005, *Analytic Culture in the U.S. Intelligence Community: An Ethnographic Study*, The Center for the Study of Intelligence, Washington, DC, p 6.

5 ibid, pp 22–24.

The Corporate Line

> *The maintenance of a corporate judgement is a pervasive and often-unstated norm in the Intelligence Community, and the taboo against changing the corporate product line contributes to confirmation biases.*
>
> Rob Johnston[6]

The desire to conform is a normal part of being human. Conformity relates to our desire to be accepted, resulting in us trying to align ourselves with the group. Most of the time we much prefer to get on with those around us (family, work colleagues, friends) than to be in conflict with them. The pressure to conform is often implicit and can exist from the outset of looking at a problem. As Johnston highlights, when we are given a question or a problem to address, the first thing we do is a literature search, which principally involves looking at previous assessments. So it becomes immediately apparent what is the corporate line, resulting in a tendency to look for data that confirms the existing corporate judgement, which is the most time-efficient approach.[7]

If previous assessments have all agreed that the enemy is not preparing an attack, then there is pressure to maintain this assessment. Significant investment of time and resources, changes in plans, rethinking favoured positions, telling others that we think they were wrong—all these factors place implied pressure on us to agree with existing assessments. However, none of them relate to *what is the real situation?* and *is the enemy actually preparing to attack*? This situation was apparent in Israeli intelligence's failure to anticipate Egypt's attack in 1973. The intelligence community disregarded warning indicators because they contradicted previously published assessments that had minimised the likelihood of war.[8]

Our Previous Assessments

In addition to perceived pressure to adhere to others' published assessments, we also feel pressured to adhere to our own previous assessments (even more so where these have been formally briefed or published). Again, Johnston captures

---

6 ibid, p 23.

7 ibid, pp 22–24.

8 Ben-Zvi, Abraham, 1976, 'Hindsight and foresight: a conceptual framework for the analysis of surprise attacks', *World Politics*, vol 28, no 03, April, p 386, quoted in Brei, William S, 2005, 'Getting intelligence right: the power of logical procedure', in Lightfoot, James E (ed), *Learning With Professionals: Selected Works from the Joint Military Intelligence College*, Joint Military Intelligence College, Washington, DC, p 63.

this issue when he observes that '[a]n analyst can change an opinion based on new information or by revisiting old information with a new hypothesis; in so doing, however, he or she perceives a loss of trust and respect among those with whom the original judgement was shared. Along with this perceived loss of trust, the analyst senses a loss of social capital, or power, within his or her group.'[9]

As analysts, we need to make judgements based on available information and have the common sense to change our judgements in response to new information. The recommendation is to follow the facts, not our ego. While initially uncomfortable, it is worthwhile for an analyst to develop a reputation for following the information where it leads rather than maintaining a position in the face of information indicating alternative explanations. As we do, people will then develop trust in our assessments. Given the unpredictability in human behaviour, constant flow of new information, and the uncertainty of conflict situations we should expect assessments to change as our understanding of a situation improves.

Dissent

The importance of considering alternative views and contrary opinions is regularly lauded within intelligence analysis. In practice, this should take the form of analysts discussing and debating genuinely held differing opinions on a problem (not simply being disagreeable). Considering dissenting and differing opinions is a valuable means of considering a broader range of perspectives and judgements than might otherwise be identified. Indeed, the desire for group consensus is an important factor in poor group decisions (*groupthink)*; while group consensus is perceived as a success, it is often indicative of a failure to consider alternatives or the negative aspects of the group's position.[10] A willingness to consider a diverse range of perspectives is an advantage for a team presented with a difficult problem. The performance of problem-solving groups has been shown to improve where group members had independently thought of correct solutions to a problem, rather than considering solutions only within a group setting.[11]

---

9 Johnston, *Analytic Culture in the U.S. Intelligence Community*, p 23.

10 Nemeth, Charlan Jeanne & Nemeth-Brown, Brendan, 2003, 'Better than individuals? The potential benefits of dissent and diversity for group creativity', in Paulus, Paul B & Nijstad, Bernard A, *Group Creativity: Innovation through Collaboration*, Oxford University Press, Oxford, pp 63–64, referred to in Heuer, Richards J, Jr & Pherson, Randolf H, 2011, *Structured Analytic Techniques For Intelligence Analysis*, CQ Press, Washington, DC, p 301.

11 Refer to Hastie, Reid, 'Group processes in intelligence analysis', in Fischhoff, Baruch & Chauvin, Cherie (eds), *Intelligence Analysis: Behavioral and Social Scientific Foundations*, The National Academies Press, Washington, DC, p 176.

Teams can try to incorporate dissenting views into discussions by introducing artificial dissent, such as getting one team member to adopt a deliberately critiquing role. However, research into efforts at introducing 'contrived dissent', such as having a devil's advocate, have failed to produce consistent improvements in group decisions.[12] Instead, genuine dissent appears to result in more information being discussed and identified, leading to better decisions.[13] Developing environments within which people are encouraged to question, challenge and debate ideas and approaches should be a priority. Once an environment that encourages debate and dissent is lost, it is extremely difficult to regain. This should be of particular concern when contrived dissent does not appear to match the value of genuine dissent.

12 ibid, p 184.

13 For example, refer to Schulz-Hardt et al, 2006, 'Group decision making in hidden profile situations: dissent as a facilitator for decision quality', *Journal of Personality and Social Psychology*, vol 91, no 6, December, pp 1080–1093.

CHAPTER 11
CRITICAL THINKING AND FORMAL METHODS

Critical Thinking

> *… critical thinking is ultimately about the process of forming well-justified true conclusions (i.e., knowledge).*
>
> Noel Hendrickson[1]

Much of this book has been about critical thinking. We have looked at ways to develop considered and robust judgements as well as being conscious of how we are approaching problems. If we define critical thinking as *purposeful reflective judgement*, we can think about cognitive skills that critical thinkers display, such as evaluation, interpretation, inference, analysis, explanation, and self-regulation (ie evaluating how we are making judgements).[2] There are a number of reasons why adopting a critical thinking approach to intelligence analysis is important. These include:

- identifying biases, weak arguments and poor thinking and reasoning
- identifying areas that need improving, arguments that need strengthening and clarifying what we do and do not know
- increasing the rigour, clarity and transparency of our thinking and ultimately our analysis
- making our assumptions explicit

---

1 Hendrickson, Noel, 2008, 'Critical thinking in intelligence analysis', *International Journal of Intelligence and Counterintelligence*, vol 21, no 4, p 679.

2 Facione, Peter A, 2011, *Critical Thinking: What It Is and Why It Counts*, Insight Assessment, San Jose, CA, viewed 4 September 2014, <www.insightassessment.com/CT-Resources/Critical-Thinking-What-It-Is-and-Why-It-Counts>.

- encouraging humility in our analysis by acknowledging that we *can* be wrong
- encouraging continuous improvement

Intelligence analysis provides the basis for important and potentially wide-reaching decisions. This is why we need to employ a considered, critical and defensible approach. One way of adopting a critical approach is by using formal methods, which encourage us to think critically about our thinking, our judgements, and ultimately our assessments.

Formal Methods

> *Structured analytic techniques can mitigate some of the human cognitive limitations, side-step some of the well-known analytic pitfalls, and explicitly confront the problems associated with unquestioned assumptions and mental models. They can ensure that assumptions, preconceptions, and mental models are not taken for granted but are explicitly examined and tested.*
>
> Richards J Heuer, Jr & Randolf H Pherson[3]

Formal methods, or structured analytical techniques, are analytical methods that can be consistently applied to a variety of problems. Most formal methods are not unique to intelligence analysis, but have been developed in other fields used by analysts. Many of these techniques broadly fall under the field of Operations Analysis or Operations Research, in particular 'soft' Operations Research or qualitative techniques, in contrast to 'hard' Operations Research or quantitative techniques. One benefit of adopting formal methods is that many have already been applied to problems in other fields, with their usefulness evaluated, peer reviewed and results formally published.

It is not that formal methods guarantee that by using them we will produce the 'right' answer. Remember, we are often dealing with complex, uncertain and changing situations, usually involving people. It might not matter how good our analysis is, things can happen that are quite simply unforeseeable. So if formal methods cannot *guarantee* success then why would we choose to use them? Graphically, this question is answered below (Figure 11.1).

---

3 Heuer, Richards J, Jr & Pherson, Randolf H, 2011, *Structured Analytic Techniques For Intelligence Analysis*, CQ Press, Washington, DC, p 24.

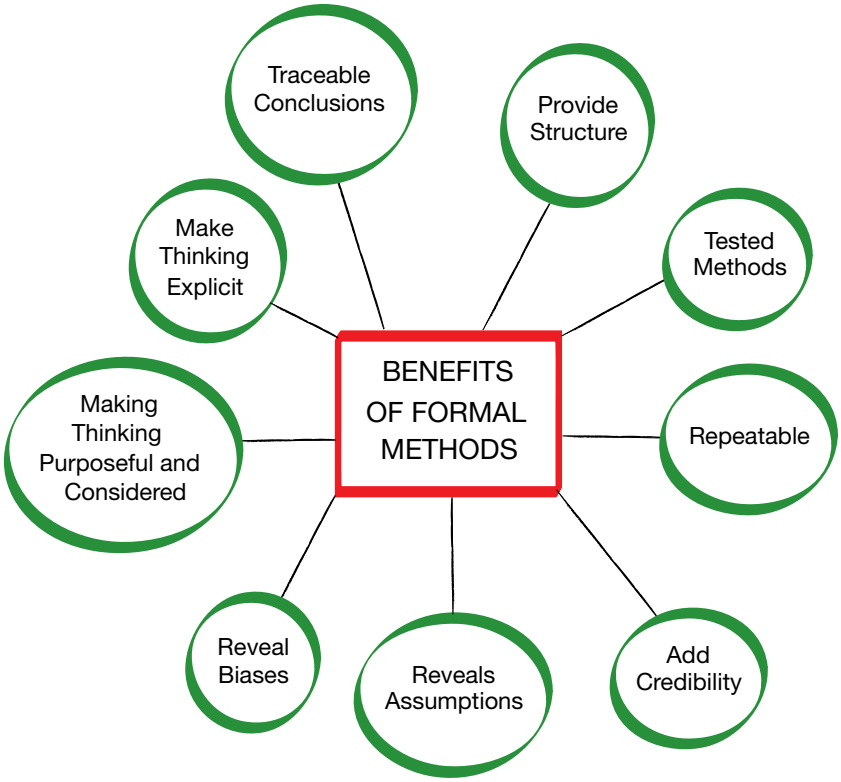


Figure 11.1: Benefits of formal methods

Intelligence analysis is not simply a set of conclusions or assessments. For credibility, there must be some understanding of how and why an analyst reached one set of conclusions and not others. As one analyst observed, a weak piece of analysis 'typically speculates on what happens next but seldom provides the reason an analyst believes the speculation is correct'.[4] Formal methods and techniques do appear to be a more credible alternative than what is the most common practice within intelligence analysis, namely limited brainstorming based on previous analysis, producing a bias towards confirming earlier perspectives.[5]

There are numerous formal methods available. Many techniques involve a great deal of time, people and resources to properly set up and run. Consequently, the

4 Petersen, Martin, March 2011, 'What I learned in 40 years of doing intelligence analysis for US foreign policymakers', *Studies in Intelligence*, vol 55, no 1, p 17.

5 Treverton, Gregory F, 2005, 'Foreword', in Johnston, Dr Rob, *Analytic Culture in the U.S. Intelligence Community: An Ethnographic Study*, The Center for the Study of Intelligence, Washington, DC, p xi.

formal methods included in this book are ones that can be used both individually or as part of a small team, require limited resources (often just a pen and paper), and can be used quickly. Five formal methods have been included in this book: Backcasting (described in Chapter 4), Mind Mapping (described in Chapter 8), Nominal Group Technique, Pre-Mortem Analysis, and Indicators of Change, with the last three described here.

Nominal Group Technique

Nominal Group Technique (NGT) is a valuable alternative to traditional brainstorming, and is sometimes referred to as a form of structured brainstorming or individual brainstorming. In traditional brainstorming, an idea is presented to a group and individuals voice their ideas, which are then written down by a facilitator. The purpose is to identify diverse and novel solutions to a problem. NGT differs in that, while a group is still presented with a problem, each team member thinks about the problem in silence and then writes down their answers and suggestions (instead of voicing them aloud). These are then collected, collated and considered and presented back to the group. Again, the group can individually vote on the ideas they believe worth pursuing or explore these more deeply, again by writing down their answers. This then leads to a solution that the team can pursue.[6]

Evidence strongly suggests that group brainstorming is less productive compared with individual brainstorming.[7] Some of the problems with traditional brainstorming are that small numbers of individuals can dominate discussions, quieter people might not contribute, the first idea voiced tends to frame (and narrow) the ideas that follow. Further, group brainstorming has been shown to result in a fixation on ideas, resulting in group conformity and to less breadth of ideas considered compared with the collated results of individual brainstorming.[8] Simply getting individuals to independently consider an issue, write down their answers, and then collate them has a number of benefits. This form of individual brainstorming encourages all members of the team to provide ideas, prevents one person dominating discussions, avoids conformity and fixation on spoken ideas, and achieves a more diverse and novel range of ideas. Whether or not we follow each of the steps of NGT, the simple act of initially getting the members of

6 Delbecq, AL & Van de Ven, AH, 1971, 'A group process model for problem identification and program planning', *Journal of Applied Behavioral Science*, vol 7, no 4, July, pp 466–492.

7 Kohn, Nicholas W & Smith, Steven M, 2011, 'Collaborative fixation: effects of others' ideas on brainstorming', *Applied Cognitive Psychology*, vol 25, no 3, p 359.

8 ibid, pp 359–371.

any group to individually write down their answers to a problem appears to be an invaluable method for generating the widest variety of alternatives and genuinely 'out-of-the-box' thinking.

Pre-Mortem Analysis

Most people are aware of what a *post-mortem* is—a medical examination of a body to identify a cause of death. *Pre-Mortem Analysis* is an approach developed by Gary Klein for considering why something might go wrong *before the event* rather than after it. A pre-mortem starts with the assumption that a project *has failed* and asks people to identify plausible reasons to explain why it *did* go wrong.[9] The method assists in proactively identifying potential causes of failure *before* they happen and encourages people to develop and implement strategies to avoid such a failure. Pre-Mortem Analysis is a useful technique for intelligence analysts to consider ways in which our assessments might turn out to be wrong, and has been recommended by a number of authors.[10] Analysts would use a pre-mortem when considering their analysis or assessments of a future situation. Analysts would assume that the analysis was wrong and identify plausible reasons why. In conducting a pre-mortem within a group setting, Nominal Group Technique is the recommended approach. Again, this ensures that everyone's input is collected and as many reasons as possible are identified. Pre-Mortem Analysis is a particularly useful tool for considering how threat assessments might be incorrect. For example, where analysts believe that the level of threat to personnel is Low, a pre-mortem approach starts with the assumption that the threat level was actually High, and seeks to identify reasons why the threat level changed so dramatically. Reasons for a dramatic change in threat within a country might include terrorism, natural disasters, health issues (eg severe acute respiratory syndrome (SARS)), crime, a breakdown in law and order, specific targeting of personnel, civil war, or conventional war. If done well, the results of a pre-mortem can be used as the basis for another formal method, developing Indicators and Warnings.

---

9 Klein, Gary, 1998, *Sources of Power: How People Make Decisions*, MIT Press, Cambridge, MA, pp 71–72.

10 For example, Heuer & Pherson, *Structured Analytic Techniques For Intelligence Analysis*; and Hall, Wayne Michael & Citrenbaum, Gary, 2010, *Intelligence Analysis: How to think in Complex Environments*, Praeger Security International, Santa Barbara, CA.

Indicators and Warnings

Indicators and Warnings, also referred to as indicators or signposts of change, is a popular technique within intelligence analysis. Indicators are simply observable signs that let us know that something is happening, most often associated with scenarios or situations about which we are particularly concerned. These indicators provide us with a set of consistent cues that we can monitor over a period of time to determine whether a situation is changing, and what scenario is becoming most likely.

Demonstrating how we can use multiple techniques, we can take the results of our Pre-Mortem Analysis where we have already identified a list of scenarios about which we are concerned. Using the Indicators and Warnings approach, we can then develop a list of criteria for each scenario that will provide an objective baseline for tracking events.[11] The intention is that as these criteria are met, we will be able to provide warning of a changing situation, rather than only becoming aware of it once it has occurred (or the situation has deteriorated entirely). Using the technique, we would:

- identify a set of scenarios
- create lists of activities, events or actions expected to occur in each scenario
- review and update the lists to identify changes
- identify the most likely scenario based on the number of observed changes[12]

How we go about developing these indicators is critical. It is pointless to rely on an indicator that we cannot see occurring or one that provides limited or no warning. For example, if we are selecting indicators to warn of an attack on our country, a poor indicator would be an actual attack itself. Good indicators are observable, relevant to the situation of concern, reliable, stable and diagnostic.[13] Indicators are also useful as they provide a means for depersonalising arguments and focusing on a more objective set of criteria. Continuing on, Indicators and Warning lists can be included in finished reports to enable consumers of intelligence to track events themselves, adding rigour and credibility to the judgements we are presenting.[14]

---

11 Ministry of Defence, 2013, *Red Teaming Guide*, Second Edition, Development, Concepts and Doctrine Centre, Shrivenham, p A-15.

12 ibid, pp A-15 & A-16.

13 Heuer & Pherson, *Structured Analytic Techniques For Intelligence Analysis*, p 136.

14 Ministry of Defence, *Red Teaming Guide*, p A-15.

CHAPTER 12
MINDSETS, BIASES AND ARGUMENTS

Warnings over the pitfalls of mindsets and cognitive biases frequently appear in discussions about intelligence analysis. By highlighting mindsets and common biases, the aim is to make us more aware of them and minimise their negative impacts. Mindsets and biases are also reflected in arguments. While arguments can be useful in ensuring that our analysis is considered and robust, some arguments can actually hinder clear thinking.

Mindsets

> *There is no such thing as context-free decision making. All judgments and decisions rest on the way we see and interpret the world.*
>
> Scott Plous[1]

Mindset is a term frequently used within intelligence analysis. Dictionary definitions of mindset include 'a mental attitude determining how we interpret situations', 'a fixed mental attitude', 'fixed state of mind' or 'ideas and attitudes that a person approaches a situation with'. A mindset relates to *how we think*, in particular how we see and interpret the world. Mindsets are normal, we all use them to enable us to incorporate new information, learn from experiences and adapt to situations. However, our mindsets can also hinder us. People have a tendency to perceive what they *expect* to perceive; these expectations subconsciously tell us 'what to look for, what is important, and how to interpret what is seen'.[2]

---

1 Plous, Scott, 1993, *The Psychology of Judgment and Decision Making*, McGraw-Hill, New York, NY, p 13.

2 Heuer, Richards J, Jr, 2005, 'Limits of intelligence analysis', *Orbis*, vol 49, no 1, Winter, p 80.

The way that we immediately perceive and interpret the actions and behaviours of a potential adversary reflects our mindset. While accepting that we do things by accident we can tend to view every action of an adversary as deliberate, calculated and intentional; we assume every 'blink' as a 'wink'.[3] For example, if a country decides to purchase a new fleet of fighter aircraft, our own immediate interpretation of these actions will likely reflect our mindset. We could see these actions as evidence that they are preparing for war. However, there are numerous possible explanations, not all of which are sinister, including the country actually feels threatened by their neighbours, they are updating ageing fighters, they are wanting to improve their interoperability with other countries, they have been offered the aircraft at a great price—too good to refuse— or they have been meaning to do it for a while but only now have the finances. The breadth of plausible explanations shows why we need to maintain a questioning attitude if we are to accurately assess the situation. While we cannot get away from mindsets, it does not mean that we accept them unquestioningly.

Cognitive Biases

Another concept frequently discussed within the intelligence literature is that of biases, specifically biases in the way that we think (cognitive biases). Each of us will have been exposed to different types of cognitive biases in our lives, even fallen into a few of them ourselves. Consequently, the kinds of biases that we have already experienced are similar (if not identical) to those we encounter within intelligence analysis.

We can think of cognitive biases as inaccuracies or misinterpretations in the way we remember, think about, interpret or explain things. These can be things that have already happened, are happening, or we thought were going to happen. It might be when we were overconfident about a decision, relied on somebody else's opinion, or simply made an assumption. By considering common cognitive biases, we can better understand how we can go wrong, how others can go wrong, and what we should deliberately look out for. Analysts are not alone in being subject to cognitive bias. Those reading our analysis, including military commanders, operators, and policymakers are all vulnerable to cognitive biases.

Research into the types of cognitive biases, and their frequency, within intelligence analysis is ongoing. Even existing research has at times produced mixed results

3 Kurtz, Cynthia F & Snowden, David J, 2003, 'The new dynamics of strategy: sense-making in a complex and complicated world', *IBM Systems Journal*, vol 42, no 3, p 463.

on the types of biases that analysts within the field actually display.[4] So what is included here is list of commonly discussed biases that people are known to adopt and are, therefore, likely to be evident within intelligence analysis to some degree.

- *Confirmation Bias.* Confirmation bias is where we start with an initial hypothesis, and then look for information that confirms this hypothesis, rather than information that may contradict or suggest other hypotheses.[5] With confirmation bias, we give greater weight to information that supports our theory, with the bias potentially more pronounced where people are motivated to believe the hypothesis.[6]
- *Hindsight Bias.* The hindsight bias is reflected in people overestimating how much they knew (or how much was knowable) *after the event*. This works in a number of ways within intelligence analysis: as analysts, we can overestimate the accuracy of our previous judgements, consumers underestimate how much they learned from intelligence reports, and overseers of intelligence reviewing intelligence failures believe the past more foreseeable than it was.[7]
- *Narrative Fallacy*. According to Nassim Taleb, the narrative fallacy reflects our preference for compact, simple stories over complex, unclear situations. Taleb argues that the narrative fallacy is reflected in our desire to provide explanations or a coherent story to sequences of facts with which we are presented, looking for links and relationships that might not be there.[8] We therefore need to be alert to the influence that convincing stories can have, particularly where limited evidence exists.
- *Desire to Simplify.* Dietrich Dörner notes that people have a desire to simplify the complex, to reduce everything as dependent on a central variable, making us feel that things are neat and understandable. Unfortunately, this tendency to oversimplify can result in a failure to

4 For example, refer to the discussion in Puvathingal, Bess J & Hantula, Donald A, 2012, 'Revisiting the psychology of intelligence analysis: from rational actors to adaptive thinkers', *American Psychologist*, vol 67, no 3, April, pp 199–210.

5 Heuer, Richards J, Jr, 1999, *Psychology of Intelligence Analysis*, Center for the Study of Intelligence, Washington, DC, p 44.

6 Risen, Jane & Gilovich, Thomas, 2007, 'Informal logical fallacies', in Sternberg, Robert J, Roediger III, Henry L & Halpern, Diane F (eds), *Critical Thinking in Psychology*, Cambridge University Press, Cambridge, pp 112–113.

7 Heuer, *Psychology of Intelligence Analysis*, p 161.

8 Taleb, Nassim Nicholas, 2010, *The Black Swan: The Impact of the Highly Improbable*, Penguin Books, London, pp 63–64 & 79.

understand and address the problems with which we are dealing.[9] Given the inherent complexity in problems that we face, the risk is that the more we simplify, the further away from reality we move. This is not to say that things cannot be simplified, but perhaps to draw on the guidance that *everything should be made as simple as possible, but no simpler*.

- *Outcome Bias.* The outcome bias is where the outcome of a decision is used to determine the quality of the decision, even though the outcome is not known when the decision is made.[10] Within intelligence analysis, this can be seen when the quality of intelligence analysis is viewed as dependent upon the outcome of the situation.[11] For example, if an operation is successful then we think the analysis must have been good, whereas if an operation is a failure then the analysis must have been poor. In reality, success or failure might occur regardless of the quality of intelligence analysis. An additional aspect is that we might regularly forget our incorrect assessments and remember only the ones that we believe we got right.
- *Availability Bias*. We base our assessment on the likelihood of events based on those events that most easily come to mind.[12] It might be easy to recall a specific type of threat or attack (such as a spectacular mass-casualty terrorist attack) than other types of more likely, though possibly less spectacular, threatening behaviour.

While our biases are not limited to these, those described here are some of the most commonly referred to and provide a start point for being aware of how our thinking can be flawed.

Arguments

Analysts encounter arguments on a daily basis over just about every aspect of analysis: the accuracy of a hypothesis, evaluation of evidence, the rationale for

9 Dörner, Dietrich, 1989, *The Logic of Failure: Recognizing and Avoiding Error in Complex Situations*, Perseus Books, Cambridge, MA, p 188.

10 Baron, Jonathon & Hershey, John C, 1988, 'Outcome bias in decision evaluation', *Journal of Personality and Social Psychology,* vol 54, no 4, April, pp 569–579.

11 Charles Allen, quoted in Cooper, Jeffrey R, 2005, *Curing Analytic Pathologies: Pathways to Improved Intelligence Analysis*, Center for the Study of Intelligence, Washington, DC, p 38.

12 Kahneman, Daniel, 2011, *Thinking, Fast and Slow*, Penguin Books, London, Chapter 12.

assessments, and even the best way to present findings. Arguments are valuable for encouraging us to consider alternative perspectives and explanations, and arrive at reasoned judgements. Mostly arguments are a give and take of ideas in which we are forced to consider, justify and even reconsider our assumptions, perceptions and conclusions. However, not all forms of argument are helpful or useful in achieving better analysis.

Poor arguments, or as we could label them *conversation killers*, are those arguments that avoid the actual assessment, judgement or logical process. Instead, they focus on other aspects that actually have little or nothing to do with the judgement itself. These conversation killers are used to shut down debate, ignore alternatives and encourage poorly reasoned judgements. We will no doubt have already heard many of these and, unfortunately, have actually used some of them ourselves. By recognising these conversation killers, the intention is that we will try to avoid these in future and focus on the actual issues within the argument, not on the peripherals. As difficult as it is, we need to recognise that a good judgement can survive critique, questioning and challenges.

The following arguments are usually designed to kill a conversation instead of opening up discussion or encouraging alternative ideas. We can see that they are not legitimate ways of arguing, and some possible counters to them are included. The first three conversation killers are particularly evident in public discourse. Indeed, watching debates and arguments in the media is a useful way to learn to recognise these. These three poor arguments are:

- *Mocking the other person.* This tactic is increasingly evident in debates with the focus on belittling the other person. It might be popular, get a laugh, influence people and even appear to carry the day, but mocking is not an argument. If sarcasm is the lowest form of humour, then mocking is the lowest form of argument.
- *Attacking an argument based on 'age'.* In this situation, a judgement is attacked not on the strength of evidence, but that a premise that it is 'outdated'. Again, this tactic is not actually addressing the argument itself but attempting to dismiss it entirely on the assumption that old is bad, new is good, and whatever is yet to come is better still.
- *Stating that an argument is simplistic.* This tactic again avoids the core argument but tries to undermine the argument based on simplicity, as nobody wants to be perceived as simple or stupid. Certainly, as discussed in biases, people can oversimplify a problem. However, attacking an argument as 'simple' (which can be an entirely subjective term) still avoids

the core of the argument. It is worth recognising that in any argument, one must simplify. Even complex concepts need to be simplified to some degree to be explained. Consequently, at some level all arguments are simplifications, so the criticism could be applied to just about anything presented.

Within structured organisations, there are a number of arguments, which can occur all too frequently. Like the arguments listed above, these conversation killers do not actually address the central issue being considered.

- *Default to rank*. Shutting down an argument based on rank or seniority is unfortunately a common tactic. Nevertheless, rank does not make it right and the most senior person in the room is not necessarily the most knowledgeable.
- *Default to experience*. This argument avoids the core issue and defaults to somebody's experience as having the final say. This is apparent in statements such as 'In my experience …', 'When I was …', and 'That didn't happen when we …' (ie so it will not happen now). The problem is that experience does not necessarily equate to accurate perception. One legitimate question is whether or not previous experiences are actually relevant to the problem at hand? Additionally, relying on experience means that we need a lot of it, we need to have learnt the right lessons from it, and the lessons should remain relevant.
- *Flat out denial.* This is where an argument is rejected entirely out of hand. This is apparent in statements like 'You haven't convinced me', 'You're wrong' and 'That won't happen', particularly where there is no attempt at discussing which points the person disagrees with. Nevertheless, an assessment can be accurate regardless of whether or not it is believed by those hearing or reading it. For example, a person may not accept that the earth is round, but their lack of belief does not mean that the world will change to fit their perceptions.
- *False dilemma*. A false dilemma is where two options are presented in such a way that they are seen as the only plausible explanations. The problem is that there might be any number of plausible explanations, but a false dilemma artificially limits options to an 'either/or' judgement.
- *'What would they know'*. This is obviously attacking the person not the idea, assessment or argument. You will note that while this should be a question (opening up discussion), it is more often used as a statement

(used to shut down debate). Again, this fails to address the strength of an argument itself and ignores that an argument does not rest on the person delivering it but on the logic and validity of the premises and conclusions.

- *The mysterious 'it'*. This relates to the offhanded remark often used to entirely disregard an individual, group or organisation's assessment with the statement 'they just don't get *it*'. This is similar to attacking the person, and does not relate to the argument but focuses on the person or group making the judgement. When we hear this statement, we can try getting the person to explain what 'it' is. Too often, they are unable to produce a coherent description and it turns out to be something other than the analysis itself.
- *Shifting ground*. Shifting ground is often an attempt to ignore an argument by changing the problem after the analysis has been completed. This is evident in terms like 'that's not actually what we were looking at', 'that's not the real issue' or 'actually, we're looking at a different aspect'. This can be an attempt to nullify differing judgements and assessments rather than addressing the argument itself. Getting the original problem or question in writing is a good approach if we anticipate that this is going to become an issue.

This is not an exhaustive list of poor arguments to which we might be exposed as analysts. The point is to be aware of them, think of how to counter them, and try to avoid using them ourselves. By discussing these arguments here, the aim is that we will hear them less often.

CHAPTER 13
UNFINISHED INTELLIGENCE

Deferred Judgement

> *We commonly begin our analysis of a problem by formulating our conclusions; we thus start at what should be the end of the analytic process.*
>
> Morgan D. Jones[1]

As difficult as it is for all of us, deferring our judgement is an important skill to practise. It is easy for us to *immediately* come up with a theory or a conclusion when presented with a problem to analyse. The shortcoming of this approach is that we fall into the attitude of 'We've got our answer, now we just need to prove it'. Instead, rather than jumping to a conclusion the better approach is to try to maintain an open mind, consider multiple possibilities, and see where the information takes us. This is easier said than done, but there are consequences to making up our mind too quickly. We have already spoken about *confirmation bias* where we make the information fit into our first theory or conclusion, and filter out information that contradicts our theory. This is similar to the concept of 'seizing and freezing', in which we seize on an initial conclusion and freeze out all contradictory information.[2]

Once we have 'committed' to a position, it appears to be very difficult to shift from this and it requires far more evidence to move us from our initial judgement. As

---

1 Jones, Morgan D, 1998, *The Thinker's Toolkit: 14 Powerful Techniques for Problem Solving*, Three Rivers Press, New York, NY, p 11.

2 Arie Kruglanski and Donna Webster, discussed in Arkes, Hal R & Kajdasz, James, 2011, 'Intuitive theories of behavior', in Fischhoff, Baruch & Chauvin, Cherie (eds), *Intelligence Analysis: Behavioral and Social Scientific Foundations*, The National Academies Press, Washington, DC, pp 154—155.

has been argued, '[p]eople form impressions on the basis of very little information, but once formed, they do not reject or change them unless they obtain rather solid evidence'.[3] We can also become emotionally invested in our initial judgements if we perceive a loss of face in changing our position.[4] Instead, we might think of a comparison with weather forecasting and sports betting, forecasters in both of these fields constantly update and amend their forecasts and odds in light of new information. Even then, they can get it wrong.

Keeping an open mind is difficult, particularly in a time-compressed environment. Additionally, this lack of closure makes us uncomfortable as we have to reconsider what we might have already accepted.[5] Nevertheless, if we are striving for accuracy, then following where the information takes us appears far more logical than determining where the information should lead. Perhaps the best approach to keeping an open mind is to practise the attitude of asking 'What does this mean?' before concluding 'This is what it means.'

Unfinished Intelligence

One of the terms regularly used in intelligence analysis is *finished intelligence*. Finished intelligence is the analytical product that we develop and distribute, usually in the form of a report, assessment or brief. However, the idea of 'finished' intelligence potentially hinders rather than helps us. Why? Many of the situations intelligence analysts deal with remain ongoing and unfinished long after the analysis has been published.

Threats change, adapt and react to our own behaviours and tactics, people go on making decisions, altering their behaviour, and history keeps on being made. Because intelligence analysis deals with people-based problems, these situations continue. It is our published assessments that become fixed and permanent, not necessarily the situation. Consequently, even though we do need to commit to an assessment, a better approach is to think of most intelligence analysis as unfinished. By thinking of intelligence as unfinished, we are reminded of the need to rethink and revisit our original (even published) assessments. Ultimately, we do not want our personnel thinking to be that they are safe and secure if the situation on the ground has changed.

---

3 Heuer, Richards J, Jr, 2005, 'Limits of Intelligence Analysis', *Orbis*, vol 49, no 1, Winter, pp 83–84.

4 Johnston, Dr Rob, 2005 *Analytic Culture in the U.S. Intelligence Community: An Ethnographic Study*, The Center for the Study of Intelligence, Washington, DC, pp 22–24.

5 Arkes & Kajdasz, 'Intuitive theories of behavior', p 164.

Critique and Review

One of the key aspects of intelligence analysis is that of secrecy—intelligence remains (and much of it will likely remain) a largely secretive activity. While secrecy is critical to ensuring that operations, information and sources remain safeguarded, there are drawbacks. One apparent drawback is that the same secrecy used to protect sensitive information and analysis actually hinders the development of intelligence analysis. Due to the sensitive nature of the subject matter, intelligence analysis is largely shielded from the kind of systematic external critique from which other fields of research benefit. Two approaches that offer the potential for somewhat redressing the otherwise insular nature of analysis are those of peer review and after action reviews.[6]

Peer Review

Within the scientific and academic communities, emphasis is placed on the peer review of articles and papers *prior to* their acceptance for publication. The idea behind peer review is that it provides an independent and impartial critique of research and findings by other people within the field. By subjecting work to external critique, the aim is to produce high-quality and credible research. Though peer review has both strengths and weaknesses, the field of intelligence analysis does not have a similarly ingrained culture of independent or external critique. Some of this is due to secrecy and limits on access to information and analysis. The problem is that these limits actually decrease the diversity of perspectives brought to a particular situation or issue. Consequently, any opportunity for peer review and critique by those removed from the immediate analysis should be encouraged.

Using a peer review approach prior to publishing analysis is worthwhile, even if only to identify weaknesses in the analysis, unanswered questions or alternative perspectives. Given the constraints on time and the organisational approval processes, peer review is likely to be done by people we already know. Indeed, it might be us proactively approaching peers to request feedback on our analysis. In this case, a couple of guidelines are worth following. First, we need to identify peers who will provide honest and constructive feedback, not people who will tell us what they think we want to hear. Second, we should not 'set the scene' for our reviewers by over-explaining the product before they have read it; the analytical product should be self-contained and speak for itself. Finally, when we get feedback, we

6 A number of authors make the argument for formal critique and after action reviews, including Jeffrey R Cooper and Rob Johnston.

need to genuinely thank the person for their time and effort and actually listen to what they have to say. While we might not accept all the feedback, or make all the recommended changes (which is fine), finding a peer who will genuinely critique our work is invaluable. Indeed, we might find ourselves being able to assist others by providing feedback. Then we will appreciate both sides of peer review, receiving and giving feedback.

After Action Reviews and Crew Debriefs

What percentage of our analysis turns out to be accurate? Only by going back and looking at *what we assessed* and *what actually happened* can we answer this. Militaries use *after action reviews* to look at operations, training and exercises to establish what happened, why it happened and how to incorporate lessons. The value is that after action reviews are used to evaluate both successes and failures.[7] Aircrew use a similar approach in the form of *crew debriefs* following each mission to examine what happened and why, what worked and did not, and what changes can be incorporated to improve the next mission. A benefit of *crew debriefs* is that anybody, regardless of rank or position, can raise issues and observations. Further, the crew debrief only concludes once all issues are addressed or allocated for follow-up.

Intelligence analysis already has an established culture of debriefing crews and operators after the completion of missions in the form of *post-mission debriefs*. These debriefs are conducted to help identify changes in adversary behaviour and tactics, and provide another useful source of information and to support analysis for future missions. Given that intelligence analysts have been involved in post-mission debriefs for decades, it would take very little to adopt a similar approach for considering our own analytic performance.

7 Johnston, *Analytic Culture in the U.S. Intelligence Community*, p 85.

Intelligence Officer debriefing aircrew from No 460 Squadron (RAAF) following a Lancaster mission over Germany during World War II

(Photograph: Australian War Memorial P05155.019)

Given how often we work in teams, the *crew debrief* or *after action review* approach is a particularly useful technique for reviewing performance. These also align with calls for intelligence analysis to adopt institutionalised self-examination and systematic lessons-learned processes.[8] In terms of analysis, such a process would involve looking at: 'What analysis was accurate?', 'What was inaccurate?', 'Did the analysis meet the client's needs? Why or why not?' and 'What can be incorporated into future analysis?' Such a review would also highlight how long the analysis took, the scope and depth of research undertaken, and the total resources required.

Analytic Principles

The final topic of this book is the concept of analytical principles. The purpose is to deliberately think about what principles we as analysts believe should guide our behaviour. Research has indicated that professional standards and codes of ethics,

8 Cooper, Jeffrey R, 2005, *Curing Analytic Pathologies: Pathways to Improved Intelligence Analysis*, Center for the Study of Intelligence, Washington, DC, pp 5–6 & 54.

though previously out of favour, do have a positive impact on the behaviour of those who are made aware of them.[9]

William Brei provides a useful set of principles for us to strive towards as intelligence analysts: Accuracy, Objectivity, Usability, Relevance, Readiness, and Timeliness.[10] Certainly, this is a useful set of principles for analysts to strive towards. There will always be debate over whether or not a principle like *objectivity* is achievable, particularly given that our mindsets influence the way we each interpret information. Nevertheless, by making the basis for our judgements as transparent as possible, we are certainly making deliberate efforts to be more objective.

Two further inclusions to Brei's list appear valuable. The first is that of *integrity*; that is honesty in every aspect of our analysis and adherence to the legal framework within which we work. The final and, arguably, most important attribute for an analyst is *humility*. Humility does not mean weakness, a lack of confidence, or any attempt at false humility. This is about recognising that, as analysts, we do not know it all and, despite our best attempts, we can be wrong. Further, humility is also reflected in an openness to alternative ideas and an ongoing desire to continue learning and improving.

9 Ariely, Dan, 2009, *Predictably Irrational: The Hidden Forces that Shape Our Decisions*, Harper, London, pp 206–215.

10 Brei, William S, 2005, 'Getting intelligence right: the power of logical procedure', in Lightfoot, James E (ed), *Learning With Professionals: Selected Works from the Joint Military Intelligence College*, Joint Military Intelligence College, Washington, DC, p 51.

CHAPTER 14
SUMMARY

The knowledge and methods described in this book are designed to meet the needs of junior analysts entering the field and act as a reference for more experienced analysts. The insights and techniques contained were included as they are able to assist us in dealing with a diverse range of analytical problems, whether operating as an individual analyst or as part of a team.

While intelligence analysis supports decision-makers, it is itself a form of decision-making. Intelligence analysis is a continual process of forming judgements based on available information while dealing with inherent uncertainty. The problems facing us as analysts are often complex, people-based and future-oriented, making them challenging on a number of levels. Regardless of the inherent difficulty, intelligence analysis is important as it provides the basis for significant decisions and actions. This reinforces the need for us to ensure that our thinking is considered, rigorous, defensible and, as much as possible, transparent.

This book provides practical approaches and insights to encourage us to think critically about situations, recognise cognitive biases, consider alternatives, and be able to justify our analytical judgements. In essence, it is about being able to make reasoned and supported judgements. As analysts, we should be able to understand and explain how and why we reached a certain conclusion, consider alternative possibilities, and reconsider assessments in light of new information.

Key Points

- Intelligence analysis is difficult. Expectations can be realistic or not.
- What is the *context, type* and *actual* problem?
- Time. Be prepared, backcast a time line, stick to it and plan the task realistically.
- What are the facts, judgements and pertinent unknowns?
- Inductive and abductive reasoning are more common in analysis than deductive reasoning.
- We cannot get across all the information.
- What does the evidence support? And what would it take to change my mind?
- Analogies and metaphors can help and hinder.
- Expertise tends to relate to understanding things rather than people. Attempting to *predict* human behaviour is fraught with danger.
- Assumptions exist everywhere, reflected in both what is said and what is not.
- Cause and Effect. We can see patterns that do not exist and look for explanations that are not there. Similar causes can produce different effects.
- Interpreting behaviour. Neither disregard coincidence nor assign deliberate design at each level of human behaviour.
- Numerical ranges on statements of uncertainty help clarify what we mean.
- Environments and social situations influence us, but we are not slaves to them.
- The desire to conform is a powerful influence on analysts.
- Formal methods aid critical thinking and make our thinking explicit and transparent.
- Mindsets. We cannot get away from them, but we can acknowledge them.
- Cognitive biases negatively impact the way we think. We need to recognise them to try and avoid them.

- Poor arguments can be *conversation killers*, shutting down debate. Good judgements can survive critique, questioning and challenges.
- Accuracy in intelligence is critical. Defer judgement, maintain an open mind, consider multiple possibilities, and see where the information takes you.
- Situations and issues are ongoing so think of analysis as unfinished business.
- Analytical principles are useful for considering the behaviours we want to adopt, key amongst these is humility.

References

Andrew, Christopher, 2004, 'Intelligence, international relations and "under-theorisation"', *Intelligence and National Security*, vol 19, no 2, Summer, pp 170–184

Ariely, Dan, 2009, *Predictably Irrational: The Hidden Forces that Shape Our Decisions*, Harper, London

Arkes, Hal R & Kajdasz, James, 2011, 'Intuitive theories of behavior', in Fischhoff, Baruch & Chauvin, Cherie (eds), *Intelligence Analysis: Behavioral and Social Scientific Foundations*, The National Academies Press, Washington, DC, pp 143–168

Baggini, Julian & Fosl, Peter S, 2010, *The Philosopher's Toolkit: A Compendium of Philosophical Concepts and Methods*, Second Edition, Wiley Blackwell, Chichester

Baron, Jonathon, & Hershey, John C, 1988, 'Outcome bias in decision evaluation', *Journal of Personality and Social Psychology*, vol 54, no 4, April, pp 569–579

BBC Prison Study, viewed 4 September 2014, <www.bbcprisonstudy.org>

Ben-Israel, Isaac, 1989, 'Philosophy and methodology of intelligence: the logic of estimate process', Intelligence and National Security, vol 4, no 4, pp 660–718

Betts, Richard K, 1978, 'Analysis, war and decision: why intelligence failures are inevitable', World Politics, vol 31, no 01, October, pp 61–89

Brei, William S, 2005, 'Getting intelligence right: the power of logical procedure', in Lightfoot, James E (ed), Learning With Professionals: Selected Works from the Joint Military Intelligence College, Joint Military Intelligence College, Washington, DC, pp 47–76

Browne, M Neil & Keeley, Stuart M, 2007, Asking the Right Questions: A Guide to Crit*ical Thinking*, Eighth Edition, Pearson Prentice Hall, Upper Saddle River, NJ

Buzan, Tony, 1997, Use Your Head, BBC Books, London

Cooper, Jeffrey R, 2005, Curing Analytic Pathologies: Pathways to Improved Intelligence Analysis, Center for the Study of Intelligence, Washington, DC

Daase, Christopher & Kessler, Oliver, 2007, 'Knowns and unknowns in the "war on terror": uncertainty and the political construction of danger', Security Dialogue, vol 38, no 4, pp 411–434

Davis, Jack, 2002, Improving CIA Analytic Performance: Strategic Warning, Sherman Kent Center for Intelligence Analysis Occasional Papers: Volume 1, Number 1, September

Delbecq, AL & Van de Ven, AH, 1971, 'A group process model for problem identification and program planning', Journal of Applied Behavioral Science, vol 7, no 4, July, pp 466–492

Ministry of Defence, 2013, Red Teaming Guide, Second Edition, Development, Concepts and Doctrine Centre, Shrivenham,

Dörner, Dietrich, 1989, The Logic of Failure: Recognizing and Avoiding Error in Complex Situations, Perseus Books, Cambridge, MA

Facione, Peter A, 2011, Critical Thinking: What It Is and Why It Counts, Insight Assessment, San Jose, CA, viewed 4 September 2014, <www.insightassessment.com CT-Resources/Critical-Thinking-What-It-Is-and-Why-It-Counts>

Fingar, Thomas, 2011, 'Analysis in the U.S. intelligence community: missions, masters, and methods', in Fischhoff, Baruch & Chauvin, Cherie (eds), Intelligence Analysis: Behavioral and Social Scientific Foundations, The National Academies Press, Washington, DC, pp 3–27

Floridi, Luciano, 2005, 'Is semantic information meaningful data?', Philosophy and Phenomenological Research, vol LXX, no 2, March, pp 351–370

Flyvbjerg, Bent, 2006, 'From Nobel Prize to project management: getting risks right', Project Management Journal, vol 37, no 3, August, pp 5–15

Gettier, Edmund L, 1963, 'Is justified true belief knowledge?', Analysis, vol 23, no 6, June, pp 121–123

Gilovich, Thomas, 1991, How We Know What Isn't So: The Fallibility of Human Reason in Everyday Life, The Free Press, New York, NY

Hall, Wayne Michael & Citrenbaum, Gary, 2010, Intelligence Analysis: How to Think in Complex Environments, Praeger Security International, Santa Barbara, CA

Hastie, Reid. 2011, 'Group processes in intelligence analysis', in Fischhoff, Baruch & Chauvin, Cherie (eds), Intelligence Analysis: Behavioral and Social Scientific Foundations, The National Academies Press, Washington, DC, pp 169–196

Herbert, Matthew, 2006, 'The intelligence analyst as epistemologist', International Journal of Intelligence and CounterIntelligence, vol 19, no 4, pp 666–684

Heuer, Richards J, Jr, 1999, Psychology of Intelligence Analysis, Center for the Study of Intelligence, Washington, DC

Heuer, Richards J, Jr, 2005, 'Limits of intelligence analysis', Orbis, vol 49, no 1, Winter, pp 75–94

Heuer, Richards J, Jr & Pherson, Randolf H, 2011, Structured Analytic Techniques For Intelligence Analysis, CQ Press, Washington, DC

Hutchins, Susan G, Pirolli, Peter L & Card, Stuart K, 2007, 'What makes intelligence analysis difficult?: a cognitive task analysis', in Hoffman, Robert R, (ed), Expertise out of Context, Lawrence Erlbaum Associates, New York, NY, pp 298–304

Johnson, Loch K, 2007, 'An introduction to the intelligence studies literature', in Johnson, Loch K (ed), Strategic Intelligence – Volume 1: Understanding the Hidden Side of Government, Praeger Security International, Westport, CT

Johnston, Dr Rob, 2005, Analytic Culture in the U.S. Intelligence Community: An Ethnographic Study, The Center for the Study of Intelligence, Washington, DC

Jonassen, David H, 2004, Learning to Solve Problems: An Instructional Design Guide, Pfeiffer, San Francisco, CA

Jones, Morgan D, 1998, The Thinker's Toolkit: 14 Powerful Techniques for Problem Solving, Three Rivers Press, New York, NY

Kahneman, Daniel & Klein, Gary, 2009, 'Conditions for intuitive expertise: a failure to disagree', American Psychologist, vol 64, no 6, September, pp 515–526

Kahneman, Daniel, 2011, Thinking, Fast and Slow, Penguin Books, London

Kent, Sherman, 1964, Words of Estimative Probability, Center for the Study of Intelligence, Washington, DC, viewed 4 September 2014, < https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/books-and-monographs/sherman-kent-and-the-board-of-national-estimates-collected-essays/6words.html>

Klein, Gary, 1998, Sources of Power: How People Make Decisions, MIT Press, Cambridge, MA

Kohn, Nicholas W & Smith, Steven M, 2011 'Collaborative fixation: effects of others' ideas on brainstorming', Applied Cognitive Psychology, vol 25, no 3, pp 359–371

Kurtz, Cynthia F & Snowden, David J, 2003, 'The new dynamics of strategy: sense-making in a complex and complicated world', IBM Systems Journal, vol 42, no 3, pp 462–483

Lanning, Lt Col (Ret) Michael Lee, 1996, Senseless Secrets: The Failures of U.S. Military Intelligence, From George Washington to the Present, Carol Publishing Group, Secaucus, NJ

Lefebvre, Stéphane, 2004, 'A look at intelligence analysis', International Journal of Intelligence and CounterIntelligence, vol 17, no 2, pp 231–264

Levitt, Steven & Dubner, Stephen, 2009, SuperFreakonomics, Allen Lane, New York, NY

Lewis, Major Dennis, 2004, Predictive Analysis: An Unnecessary Risk in the Contemporary Operating Environment, US Army School of Advanced Military Studies, Fort Leavenworth, KS

Luft, Joseph & Ingham, Harrington, 1970, 'The Johari window, a graphic model of interpersonal awareness', in Luft, Joseph, Group Processes: An Introduction to Group Dynamics, Second Edition, Mayfield Publishing, Palo Alto, CA

Ministry of Defence (UK), 2011, Joint Doctrine Publication (JDP) 2-00: Understanding and Intelligence Support to Joint Operations, Third Edition, Development, Concepts and Doctrine Centre, Shrivenham

Moore, David T, 2007, Critical Thinking and Intelligence Analysis, Occasional Paper Number Fourteen, National Defense Intelligence College, Washington, DC

Moore, David T, 2011, Sensemaking: A Structure for an Intelligence Revolution, National Defense Intelligence College, Washington, DC

North Atlantic Treaty Organization, 2012, NATO guide for Judgement-Based Operational Analysis in Defence Decision Making: Analyst-Oriented Volume: Code of Best Practice for 'Soft' Operational Analysis, NATO Research and Technology Organization, Neuilly-sur-Seine Cedex

Office of the Director of National Intelligence, 2008, Analytic Transformation: Unleashing the Potential of a Community of Analysts, Office of the Director of National Intelligence, Washington, DC, September

Ohno, Taiichi, 1988, Toyota Production System: Beyond Large-Scale Production, Productivity Press, Portland, OR

Ormand, Sir David, 2009, The National Security Strategy: Implications for the UK intelligence community, Institute for Public Policy Research, Discussion Paper, February

Petersen, Martin, 1985, 'Managing/teaching new analysts', Studies in Intelligence, vol 30, Fall, pp 1–9, viewed 4 September 2014, <http://www.nationalsecuritylaw.org/files/received/CIA/Petersen-Managing_Teaching_New_Analysts.pdf>.

Petersen, Martin, 2011, 'What I learned in 40 years of doing intelligence analysis for US foreign policymakers', Studies in Intelligence, vol 55, no 1, March, pp 13–20

Phythian, Mark, 2009, 'Intelligence analysis today and tomorrow', Security Challenges, vol 5, no 1, Autumn, pp 67–83

Pidd, Michael, 2004, Tools for Thinking: Modelling in Management Science, Second Edition, Wiley, Chichester

Prunckun, Hank, 2010, Handbook of Scientific Methods of Inquiry for Intelligence Analysis, Scarecrow Press, Lanham, MD

Puvathingal, Bess J & Hantula, Donald A, 2012, 'Revisiting the psychology of intelligence analysis: from rational actors to adaptive thinkers', American Psychologist, vol 67, no 3, April, pp 199–210

Quiggin, Thomas, 2007, Seeing the Invisible: National Security Intelligence in an Uncertain Age, World Scientific Publishing, Singapore

Schmitt, Major John F & Klein, Gary A, 1996, 'Fighting in the fog: dealing with battlefield uncertainty', Marine Corps Gazette, vol 80, no 8, August, pp 62–69

Schulz-Hardt, Stefan, Brodbeck, Felix C, Mojzisch, Andreas, Kerschreiter, Rudolf & Frey, Dieter, 2006, 'Group decision making in hidden profile situations: dissent as a facilitator for decision quality', Journal of Personality and Social Psychology, vol 91, no 6, December, pp 1080–1093

Shanteau, James, 1992, 'Competence in experts: the role of task characteristics', Organizational Behavior and Human Decision Processes, vol 53, no 2, pp 252–266

Silver, Nate, 2012, The Signal and the Noise: Why So Many Predictions Fail – But Some Don't, Penguin Press, New York, NY

Simon, Herbert, 1992, 'What is an explanation of behaviour?', Psychological Science, vol 3, no 3, May, pp 150–161

Slovic, Paul, 1973, 'Behavioral problems of adhering to a decision policy', paper presented at the Institute for Quantitative Research in Finance in May 1973, Napa, CA

Smith, Andrew, 2005, 'Detecting terrorist activity: defining the state's "Threshold of Pain"', Australian Defence Force Journal, no 168, pp 30–44

Spellman, Barbara A, 2011, 'Individual reasoning', in Fischhoff, Baruch & Chauvin, Cherie (eds), Intelligence Analysis: Behavioral and Social Scientific Foundations, The National Academies Press, Washington, DC, pp 117–141

Taleb, Nassim Nicholas, 2010, The Black Swan: The Impact of the Highly Improbable, Penguin Books, London

Tetlock, Philip E, 2005, Expert Political Judgement: How Good Is It? How Can We Know?, Princeton University Press, Princeton, NJ

Thaler, Richard H & Sunstein, Cass R, 2008, Nudge: Improving decisions about health, wealth, and happiness, Penguin Books, London

Thompson, J R, Hopf-Weichel, R & Geiselman, RE, 1984, The Cognitive Bases of Intelligence Analysis, US Army, Research Institute for the Behavioral and Social Sciences, Alexandria, VA, January

Treverton, Gregory F, 2010 'Addressing "complexities" in homeland security', in Johnson, Loch K (ed), The Oxford Handbook of National Security Intelligence, Oxford University Press, Oxford, pp 343–358.

Warner, Michael, 2002, 'Wanted: a definition of "intelligence"', Studies in Intelligence, vol 46, no 3, pp 15–22

Wastell, Colin, Clarke, Graeme & Duncan, Piers, 2006, 'Effective intelligence analysis: the human dimension', Journal of Policing, Intelligence and Counter Terrorism, vol 1, no 1, October, pp 36–52

Weiner, Tim, 2007, 'Pssst: some hope for spycraft', The New York Times, 9 December, viewed 4 September 2014, <http://www.nytimes.com/2007/12/09/weekinreview/09weiner.html?pagewanted=all&_r=0>

Weiss, Arthur &Wright, Sheila, 2006, 'Dealing with the unknown: a holistic approach to marketing and competitive intelligence', Competitive Intelligence Magazine, vol 9, no 5, September–October, pp 15–20

Whaley, Barton, 2007, *Stratagem: Deception and Surprise in War*, Artech House, Boston, MA

Zimbardo, Philip, 2011, *The Lucifer Effect: How Good People Turn Evil*, Random House, New York, NY