Intelligence for a complex environment: transforming traditional intelligence with insights from complexity science and field research on NATO

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2. Intelligence Transformation

The first chapter briefly described the challenges for intelligence in moving from the Cold War to the present. This chapter examines the reaction of intelligence on these changes, and answers the research question *What is the status of intelligence transformation?*[33]

To establish a proper depth of research for a transformation this study identifies three fundamental shifts, in varying volume, within the study of intelligence; critique on the intelligence cycle, the development of (new) theory, and a paradigm debate. They form, what I name, a 'trinity of transformation' of issues that are not entirely separate, nor are they exactly the same. The intelligence cycle, being well established, can be regarded as the methodology of intelligence theory. It is *'part of the conceptual language used in developing theoretical approaches to intelligence'*.[34] This can have negative consequences because it *'influences and probably limits discussions'* on intelligence in general.[35] In its turn, intelligence theory relates to the epistemological and ontological assumptions of the field; it shows what is considered knowledge and how it is obtained. The paradigm debate enables to speak of intelligence transformation in a more holistic way. Intelligence theory and the intelligence cycle are key characteristics of the intelligence paradigm but are not equal to it. The idea of a paradigm includes the former two topics and builds on them. In a sense the three topics are communicating vessels where they all contribute to each other's meaning and understanding. As such these topics lie at the very heart of (the organisation of) intelligence and, furthermore, are often discussed in complexity related terminology. Together these topics have a strong potential to fundamentally transform intelligence.

This chapter consists of five sections. The first section explains what intelligence is, as a background to the trinity topics that are examined in the following three

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[33] Parts of this chapter have been published in Bram Spoor and Maarten Rothman, "On the Critical Utility of Complexity Theory in Intelligence Studies," *Intelligence & National Security* 36, no. 4 (2021).

[34] Peter Gill, "Theories of Intelligence," in *The Oxford Handbook of National Security Intelligence*, ed. Loch K. Johnson (New York, NY: Oxford University Press, 2010), 48.

[35] Wilhelm Agrell, "Intelligence Analysis after the Cold War," in *National Intelligence Systems: Current Research and Future Prospects*, ed. Gregory F. Treverton and Wilhelm Agrell (New York, NY: Cambridge University Press, 2009), 107.

sections. The fifth, last, section concludes by presenting the status of transformation within intelligence.

2.1 Introducing intelligence

When discussing the history of intelligence many publications invoke Sun Tzu, Machiavelli, and Clausewitz. Often the same publications put this in perspective by pointing out intelligence is a fairly new term. Historical sources often speak of information on adversaries, secretly sought and kept by kings and generals. It was gained via informants or intercepting letters. Espionage as we now call it. The term intelligence is commonly used to refer to espionage having become a bureaucratic state-activity since the late 19th or early 20th century.[36] In a military sense the First World War saw reconnaissance become intelligence with large scale collection of information on enemy forces by radio intercepts, by reconnaissance airplanes, and from prisoners of war. To be effective, all this information had to be studied and sent to higher commands to aid decision making. Standards for doing so turned into intelligence doctrine being imposed on all levels and formations.[37] The further professionalisation and canonisation of intelligence also entail efforts to define it.

Intelligence is hard to define. There is an abundance of partly overlapping definitions but little agreement among them. The search for a universal definition of intelligence is a common and much problematised topic.[38] Most publications thus begin with their own version of a definition. Exemplary for the difficulty of defining intelligence, the first edition (2006) of *Intelligence in an Unsecure World* by authors Gill and Phythian has a different definition than the second and third editions (2012, 2018).

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[36] Michael Herman, *Intelligence Power in Peace and War* (Cambridge: Cambridge University Press, 1996), 9; Michael Warner, *The Rise and Fall of Intelligence: An International Security History* (Washington: Georgetown University Press, 2014), 34-35.

[37] *The Rise and Fall of Intelligence: An International Security History*, 51.

[38] For articles solely on the issue of definition see: Alan Breakspear, "A New Definition of Intelligence," *Intelligence & National Security* 28, no. 5 (2013); Thomas F. Troy, "The "Correct" Definition of Intelligence," *International Journal of Intelligence and CounterIntelligence* 5, no. 4 (1991); Michael Warner, "Wanted: A Definition of Intelligence," *Studies in Intelligence* 46, no. 3 (2002); K. J. Wheaton and M. T. Beerbower, "Towards a New Definition of Intelligence," *Stanford law & policy review.* 17, no. 2 (2006).

This overall patchwork of intelligence definitions, all of which are partly true but not untrue, relates to postmodern ideas on relative truths and the end of metanarratives that argue that the search for a universal definition is beyond the point. While acknowledging this, for scientific clarity and as a way of being self-reflective and explicit about one's approach of a subject, a definition is provided later on in this section.

Intelligence is not unique in its problematic search for a single definition. Other phenomena such as terrorism or climate change share this faith. Still, the pluriform nature of intelligence does not help. In 1946 Kent, intelligence analysis pioneer and Yale university scholar, described intelligence as meaning both a process and the product of that process.[39] Three years later, in his seminal *Strategic intelligence for American world policy* (1949) Kent formulated intelligence as being knowledge, organisation and activity.[40] These two sets of partly overlapping observations on the forms of intelligence are widely incorporated in the definition debate. As apparent from the title of his book Kent was defining strategic intelligence and not intelligence as such. To further complicate the matter other adjectives next to strategic and military are e.g. national security (consisting of defence, foreign policy and internal/external state security), corporate, or peacekeeping. These denominations of intelligence often overlap in meaning but are not exactly the same.

There is also a degree of cultural pluriformity that confuses the issue of what intelligence is. Nations have different intelligence systems, even longstanding allies such as the United States and Great Britain. In the American context, collected information becomes intelligence only after analysis. The British call collected information (raw) intelligence. After analysis it is called (finished) intelligence.[41] The difference is that *'the United States approaches information as a specific component of intelligence, while Britain approaches intelligence as a specific type of information'*.[42]

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[39] Sherman Kent, "Prospects for the National Intelligence Service," *The Yale review* 36 (1946).

[40] *Strategic Intelligence for American World Policy* (Princeton, N.J.: Princeton University Press, 1949).

[41] Philip H. J. Davies, "Ideas of Intelligence," *Harvard International Review* 24, no. 3 (2002): 62-64; Bob de Graaff, *Data En Dreiging: Stap in De Wereld Van Intelligence* (Amsterdam: Boom, 2019), 24.

[42] Davies, "Ideas of Intelligence," 64.

Given all these facets of intelligence many definitions tend to describe what intelligence does rather than define it.[43] Perhaps this stems from the military origins of intelligence and the duality of both doctrine, as canonised military practice, and theoretical academic attempts at a definition. Then again, the urge to describe an ambiguous term as intelligence by its demeanour rather than its nature is commonly understandable. When describing what intelligence does, instead of what it is, almost all definitions use the intelligence cycle to some degree. This model breaks intelligence down into four steps in a cycle. The first step provides the intelligence direction, or task. The second step involves collecting relevant information with the third step enriching this information into intelligence. The fourth step is disseminating the finished intelligence product to the source of the direction (see also section 2.2). Another common notion is that intelligence is to inform decision-making. It is to provide a military commander, government policymakers, or a corporate CEO with decision advantage. In striving for more definitional content the literature often focuses, and disagrees, on e.g. the role of secrecy, if to include counterintelligence and covert action, whether intelligence is for states or also for non-state actors, if intelligence is only about threats or opportunities as well, and if the separation between domestic and foreign intelligence is still valid.

Kent's terminology and the intelligence cycle generally form the building blocks of intelligence definitions. This is not surprising, regarding the fact that it is an easily understandable language to explain a very difficult process. When formulating a definition of intelligence, for purpose of clarity, this research uses the product/process duality and the intelligence cycle (direction, collection, processing, dissemination). To accommodate for the complexity approach to intelligence announced in the introduction of this chapter, a broad definition is sought. Therefore the definition has to contain many of the topics of debate. It must not be limited to states, must include threats as well as opportunities and make no distinction between domestic and foreign because this conflicts with transnational character of non-state threats. Counterintelligence is seen as inherently part of intelligence because of the need to protect sources and methods. Covert action is regarded as a consequence of intelligence and not as intelligence as such. Both terms are therefore not required in a definition. Secrecy is also not included as a pre-requisite for a definition. To some extent secrecy, like counterintelligence, is needed to protect

[43] Claudia Hillebrand and R. Gerald Hughes, "The Quest for a Theory of Intelligence," in *The Palgrave Handbook of Security, Risk and Intelligence*, ed. Robert Dover, Huw Dylan, and Michael S. Goodman (London: Palgrave Macmillan, 2017), 5.

sources and methods but it is not the main characteristic in a time wherein intelligence services, riding on the attention for terrorism and recent intelligence failures, are taking – or forced to take – a more public role as well. Secrecy is also relative because of the data explosion on the open information domain. This, among other developments such as drones, allows non-state actors, unable to organise for costly SIGINT, to employ their own intelligence activities based on open sources.[44] In line with the military focus in this study, the research begins with the NATO definition of intelligence: *'The product resulting from the directed collection and processing of information regarding the environment and the capabilities and intentions of actors, in order to identify threats and offer opportunities for exploitation by decision-makers.'*[45]

The definition begins very narrow. Intelligence is mainly defined as a product. Process is only implied by naming the first three steps of the intelligence cycle. Dissemination is not mentioned, wrongly excluding the communication of intelligence from being part of intelligence itself. The definition then becomes more broad. It explicitly refers to the information-based nature of intelligence, yet there is no mention of secrecy. It does have a classic approach of assessing capabilities and intentions yet everything else is described in neutral and general terms. It is 'environment' and not 'battlefield', 'decision-makers' instead of only 'commander', and the addition of the term 'actor' makes it applicable to both state and non-state/ transnational threats. The aim is to identify both threats and opportunities. Overall, the NATO definition is quite broad, with the omission of two important features. It does not explicitly refer to intelligence as being a process as well as a product. In second instance it does not mention the dissemination step of the intelligence cycle. Therefore a slightly altered version of the NATO definition is used whereby intelligence is: *The product and process of directed collection and processing of information regarding the environment and the capabilities and intentions of actors, and resulting dissemination in order to identify threats and offer opportunities for exploitation by decision-makers.* This definition serves as the background to the trinity of transformation. These three topics are examined next.

[44] Warner, *The Rise and Fall of Intelligence: An International Security History*, 308.

[45] NATO, terminology database, 'intelligence' (record 17638), nso.nato.int/natoterm,

2.2 The intelligence cycle

The universal model of the intelligence cycle forms the structure of intelligence; how it performs its knowledge production. It is a cyclical, step-by-step, scheme of four functions of intelligence: direction, collection, processing and dissemination. Figure 2 shows the generic intelligence cycle, as used in the doctrine of NATO and many of its member states.

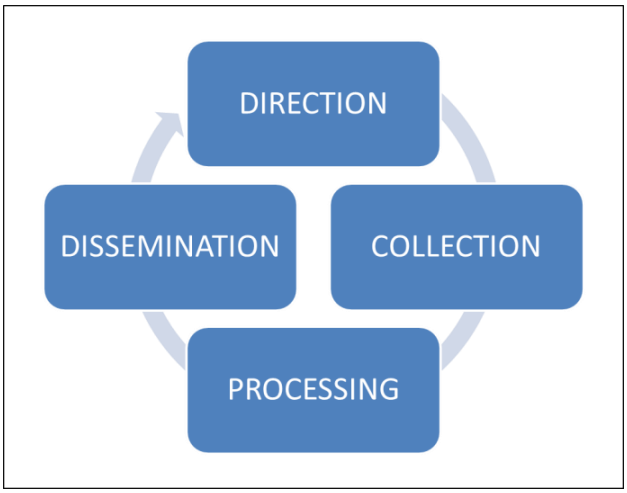

Figure 2: Generic intelligence cycle

In the first step of the cycle a decisionmaker (military commander or policy official) provides a question or problem that needs to be answered. This is translated into intelligence requirements that are pursued in the collection step. Collection is done by several disciplines:

- Retrieving intelligence from cultivated human sources (human intelligence, HUMINT).
- Interception of (non-)communication transmissions (signals intelligence, SIGINT).
- Measurement of technical data of transmissions in order to identify the source (measurement and signature intelligence, MASINT).
- Analysis of imagery from satellites, aerial platforms, or otherwise obtained (imagery intelligence, IMINT).

- Information gathering from publicly available sources (open source intelligence, OSINT).
- Intelligence derived from sound signal or emissions (acoustic intelligence, ACINT).

These collection disciplines are known as the 'INTs', named after their abbreviation and form the generic set of instruments for intelligence. The third step of the intelligence cycle processes the information to intelligence which is then disseminated (e.g. report, briefing) to the decisionmaker.

The four steps form a closed loop; a process with no apparent end since direction follows dissemination, starting a new cycle. The cycle is didactically strong. It enables a quick and simple explanation of intelligence to a complete novice. As a result, the cycle is not only central in formulating intelligence definitions but also in intelligence education, intelligence failure research and the broader study of intelligence. The intelligence process, according to the cycle, where each specialist works on a part of the whole is sometimes referred to as the intelligence factory for its resemblance with a factory with specialist assembly lines. Furthermore, the cycle forms the language of intelligence, in this research as well.

The intelligence cycle is not without its critics. Since the mid-2000s a growing body of literature points to flaws in the model.[46] In essence the critique states that the model is an oversimplification to the point that it is no longer usable. Another topic is the origin of the intelligence cycle. The (related) terms to describe the individual steps of the cycle exist since before the First World War. The graphical invocation of the cycle came into use in US intelligence teaching during the Second World War. The first textbook containing the cycle is attributed to Glass and Davidson in their book *Intelligence is for Commanders* (1948).[47] Around the same time Sherman Kent

[46] e.g. Arthur S. Hulnick, "What's Wrong with the Intelligence Cycle," *Intelligence and National Security* 21, no. 6 (2006); Mark Phythian, ed. *Understanding the Intelligence Cycle*, Studies in Intelligence (Milton Park, Abingdon, Oxon: Routledge, 2013).

[47] Robert Rigby Glass and Phillip B. Davidson, *Intelligence Is for Commanders* (Harrisburg, PA: Military Service Publishing Company, 1948); from: David Omand, "The Cycle of Intelligence," in *Routledge Companion to Intelligence Studies*, ed. Robert Dover, Michael S. Goodman, and Claudia Hillebrand (Abingdon, Oxfordshire: Routledge, 2015), 62.

and his colleagues at the newly formed CIA adopted the cycle as a teaching tool. Kent separated analysis from the processing stage to emphasise its importance. American intelligence uses this five step variant until the present day. With the establishment of NATO the intelligence cycle was embraced to create a uniform understanding for interoperability within the alliance.[48] Initially the cycle was created for intelligence for combat operations, but the increasing complexity of warfare has put pressure on the cycle.[49] Furthermore, besides combat or warfare it now covers all forms of intelligence also concerning (multi)national and complex strategic issues.[50]

Its origin from military doctrine still influences how the intelligence cycle is regarded. Doctrine can be divided into two levels: practical handbooks and manuals providing standard operating procedures for in the field, and higher doctrine to communicate more abstract frameworks and concepts on thinking about war. Davies, Gustafson, and Rigden also applied this division to the debate on the cycle and identify two main camps; proceduralists and conceptualists. Proceduralists see the cycle as prescriptive for intelligence work and the structure of organisations where this work is done. Conceptualist see the cycle as a more abstract idea on which standardised processes are based instead of it being the standard itself. Comment on the intelligence cycle comes from both camps, though conceptualist are generally less dissatisfied.[51] Several authors came up with alternative models to address the cycle's deficiencies. However, the aim here though is not to discuss in depth all the alternative models of the intelligence cycle but give primacy to focus on its overall shortcomings.

The main topic of critique is the cyclical and sequential appearance of the cycle. In reality, the order of the steps is not always as depicted by the model. For example; analysts are often involved with the translation of intelligence requirements to collection tasks to guide collectors and sensors to the most valuable or sought after pieces of information. These missing pieces stem from a process of analysing and dissecting intelligence problems and relating this to the body of knowledge on the

[48] "The Cycle of Intelligence," 61-63.

[49] Geraint Evans, "Rethinking Military Intelligence Failure – Putting the Wheels Back on the Intelligence Cycle," *Defence Studies* 9, no. 1 (2009): 22.

[50] Agrell, "Intelligence Analysis after the Cold War," 108.

[51] Philip H. J. Davies, Kristian Gustafson, and Ian Rigden, "The Intelligence Cycle Is Dead, Long Live the Intelligence Cycle: Rethinking Intelligence Fundamentals for a New Intelligence Doctrine," in *Understanding the Intelligence Cycle*, ed. Mark Phythian (Milton Park, Abingdon, Oxon: Routledge, 2013), 60-61.

subjects already present in reports and databases. This means that in practice, processing takes place first, and the order of the steps is reversed.

Another example is that sometimes not all of the steps are followed. The sub-process within the collection step, termed ISR cycle (intelligence, surveillance, reconnaissance) in doctrine, sees collected information and intelligence being disseminated before reaching the processing step. This can happen in combat situations where life-and-death decisions demand fast information. Another often heard comment is the intelligence cycle has many internal feedback loops that are not depicted. It should represent the inter-relationship between the stages instead of the linear representation of the cycle. *'In practical terms, direction, collection, processing and dissemination continuously communicated back and forth and across the "cycle" more like subroutines calling one another in computer software than the prevailing metaphor of an electromechanical feedback system.'*[52] Hulnick sees the cycle as a *'matrix of interconnections'* and Omand as an *'interactive network'*.[53]

To address this interactivity, NATO doctrine introduced Intelligence Requirement Management and Collection Management (IRM&CM). This add-on process oversees the intelligence cycle to address and guide the internal feedback loops of the cycle to improve efficiency.[54] However, the IRM&CM process is largely missing in academic literature about the intelligence cycle. Expanding on this interactivity, two alternatives to the cycle are interesting. Gill and Phythian argue the cycle is a closed system while an open system is needed because direction is not the only driving factor. They propose a web to replace the idea of a cycle because *'this better reflects the complexity that characterises intelligence, its non-linear form, the centrality of*

[52] Ibid., 64.

[53] Arthur S. Hulnick, "Controlling Intelligence Estimates," in *Controlling Intelligence*, ed. Glenn Hastedt (London: Frank Cass, 1991), 91; See also: "The Future of the Intelligence Process: The End of the Intelligence Cycle," in *The Future of Intelligence: Challenges in the 21st Century*, ed. Isabelle Duyvesteyn, Ben de Jong, and Joop van Reijn (New York, NY: Routledge, 2014); David Omand, *Securing the State* (London: C. Hurst & Co, 2010), 119.

[54] IRM&CM: *'A set of integrated processes and services to manage and satisfy the intelligence requirements by making best use of the available collection, processing, exploitation and dissemination capabilities.'* NATO, terminology database, 'IRM&CM' (record 40708), nso.nato.int/natoterm.

environmental factors in its production, and its impact on its own environment'.[55] Similarly, Clark uses complexity terms to describe his target-centric approach as alternative. He states most intelligence targets are complex systems, or networks, that evolve and are dynamic and non-linear. Instead of following the linear cycle with separate steps intelligence should form network of collector-analyst-customer around a shared target to collaborate in making sense of the problem at hand.[56]

The intelligence cycle does not accommodate for several other phenomena. Omand points to the *'cumulative value of assessed intelligence in providing situational awareness, understanding and prediction, representing more than the impact of individual intelligence reports that may well be fragmentary and incomplete as read by the customer'*.[57] The omission of counterintelligence and covert operations from the cycle are also frequently commented on. The literature mostly sees flaws, or anomalies, in the intelligence cycle as malfunction of system components (the cycle stages) or variables like unclear questions, availability of information/sensors or absence of correcting feedback loops. The reaction of adjusting and refining the intelligence cycle is trying to adapt the old model to new facts. Though this is important for professional self-reflection and historical case studies they might block the perspective that the system as a whole is becoming obsolete. [58]

In conclusion, the main point is the cycle, being a standardisation model *'assumes the process works the same way for all objectives, regardless of complexity and cognitive demands'*.[59] There is for instance a big difference between answering directed questions, even when vaguely formulated, and the activities of forecasting or horizon scanning. Hereby emerging high-impact risks and threats outside the main scope are hoped to be identified as signals among the noise, before they manifest

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[55] Peter Gill and Mark Phythian, "From Intelligence Cycle to Web of Intelligence: Complexity and the Conceptualisation of Intelligence," in *Understanding the Intelligence Cycle* (Routledge, 2013), 24, 38.

[56] Robert M. Clark, *Intelligence Analysis: A Target-Centric Approach*, 5 ed. (Los Angeles, CA: Sage, 2016), 30-45.

[57] Omand, "The Cycle of Intelligence," 66.

[58] Agrell, "Intelligence Analysis after the Cold War," 108.

[59] Judith Meister Johnston and Rob Johnston, "Testing the Intelligence Cycle through Systems Modeling and Simulation," in *Analytic Culture in the US Intelligence Community: An Ethnographic Study* (Washington, DC: Center for the Study of Intelligence, CIA, 2005), 50.

themselves fully.[60] This begs the question where, and if, there is a capability to adjust approaches to different problems located in the cycle. To examine this the intelligence cycle is seen as a cybernetic feedback loop: *'A feedback loop is a circular arrangement of causally connected elements, in which an initial cause propagates around the links of the loop, so that each element has an effect on the next, until the last "feeds back" the effect into the first element of the cycle. The consequence of this arrangement is that the first link ("input") is affected by the last ("output"), which results in self-regulation of the entire system, as the initial effect is modified each time it travels around the cycle.'*[61]

Herman applies this to the intelligence cycle: *'The cycle is a metaphor of a cybernetic system, in which a control unit 'senses' feedback and is programmed to make constant small adjustments of output, 'hunting' for the maximum desired feedback semi-automatically, without high-level decisions. […] In the metaphor of the conventional military cycle the users are the control unit, constantly adapting their stated needs to optimize their intelligence inputs.'*[62] Davies, Gustafson, Rigden judge this a *'very apt expression of the conceptual approach to the intelligence cycle'*.[63] So where collection and analysis are the knowledge creation in the intelligence cycle, the dissemination of intelligence to the initiating direction step starts the cybernetic feedback. This feedback adjusts the intelligence requirements of the originator, or controller, leading to new requirements and starting the process over. This is where the only adjustment takes place, with a new direction by policy and decision makers – it lies outside intelligence. While this is in line with intelligence being subjected to policy, it excludes any flexibility in the rest of the cycle. Whatever the intelligence

[60] For more on the difference between requirements and horizon scanning, see: Mark M. Lowenthal, *The Future of Intelligence* (Cambridge: Polity Press, 2018), 2-3; David Omand, "Is It Time to Move Beyond the Intelligence Cycle? A Uk Practitioner Perspective," in *Understanding the Intelligence Cycle*, ed. Mark Phythian (Milton Park, Abingdon, Oxon: Routledge, 2013), 143; Julian Richards, "Pedalling Hard: Further Questions About the Intelligence Cycle in the Contemporary Era," ibid., 53.

[61] Fritjof Capra, *The Web of Life: A New Synthesis of Mind and Matter* (London: Flamingo, 1997), 56.

[62] Herman, *Intelligence Power in Peace and War*, 293.

[63] Davies, Gustafson, and Rigden, "The Intelligence Cycle Is Dead, Long Live the Intelligence Cycle: Rethinking Intelligence Fundamentals for a New Intelligence Doctrine," 61.

problem is, from tactical combat to strategic complexities, the cycle will always be the cycle; there is no adaptation to the issue at hand.

This cybernetic focus on control through feedback is mirrored in the prevalence of the topic of producer-consumer relations in much of the intelligence literature. Cybernetics examine the system's behaviour rather than the system itself. It is about what a system does, not what it is. More so, it is not about any given, particular act of a system but about the total of possible actions.[64] In this sense, much of the critique on the intelligence cycle, such as internal feedback loops that are not depicted or malfunctions in the individual steps, still stays within the cybernetic frame. While the intelligence cycle has remained basically the same for over 70 years cybernetic ideas on control and organisation have evolved in other fields that offer a broader range of thinking about systems and their problem-solving capabilities (see section 4.2.2). For failing to accommodate the complexity of intelligence Agrell judges the intelligence cycle harshly: *'Of all the weaknesses of the Cold War intelligence paradigm, the hegemony of the intelligence-cycle model is probably the single most important factor in producing an intellectually inadequate concept of intelligence. While the "normal intelligence" supplied the communities with huge blinders, the adherence to the cycle tended to reduce intellectual creativity to information compilations, schematic interpretations, and unimaginative guesswork. With all its developed steering and guidance procedures, the cycle had the devastating consequence of blocking any development in the direction of "revolutionary intelligence" from within the system itself.'*[65]

Revolutionary developments in intelligence, unhindered by the intelligence cycle frame, should be visible in intelligence theorising. This second part of the trinity of transformation is examined in the next section.

2.3 Theories of intelligence

Where the intelligence cycle is a sort of universal methodology; a micro, practical, technical-like process, theory is about the epistemology (how knowledge is produced) and ontology (what is knowledge) of intelligence. While the structure of this research provides an examination of intelligence definitions at the beginning of

[64] W. Ross Ashby, *An Introduction to Cybernetics*, 4 ed. (London: Chapman & Hall Ltd, 1961), 1-3.

[65] Agrell, "Intelligence Analysis after the Cold War," 109.

this chapter, this separation is artificial because definition is part of theory. However, definitions are *'static representations of the more dynamic and foundational conceptual representation of intelligence that can be found in intelligence theories'*.[66] A definition is a snap shot of a vast, ongoing process of feedbacks like a computer network. The fluidity and interconnectedness of this process cannot correctly be understood from its structure.[67] That is where the critique on the intelligence cycle originates; it does not represent the actual feedbacks within the cycle. So good theory should at least capture or provide for the enormous potential of all interconnections between intelligence aspects and with their environment. Still, theorising and conceptualising about intelligence is often considered less interesting and exciting than other topics of research. However, there is already enough literature that *'does nothing but describe the real or imagined 'facts' of intelligence successes and scandals' and therefore only 'adds up to a highly coloured and distorted view of intelligence'*.[68] A more normative approach, instead of descriptive, can help to understand and advance the study of intelligence. Theory and concepts have an *'indispensable role in generating and organizing knowledge'*.[69]

Again, as with the intelligence definitions, this section on intelligence theories will not focus on individual examples in comparison, but rather describe the broad ranges of theory. Individual theories are only used as arguments to form the foundation of statements or as examples. Intelligence theorising has two main characteristics in literature. Firstly, many publications deal with the relation of intelligence studies to the field of international relations, often framing intelligence as its 'missing dimension'.[70] Because of this relation to international relations, intelligence scholars use its theories to examine intelligence. In a general sense this

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[66] Marrin, "Evaluating Intelligence Theories: Current State of Play," 481.

[67] Johnston and Johnston, "Testing the Intelligence Cycle through Systems Modeling and Simulation," 37.

[68] Peter Gill and Mark Phythian, *Intelligence in an Insecure World*, 3 ed. (Cambridge, UK Polity Press, 2018), 27.

[69] Ibid.

[70] Christopher Andrew and David Dilks, *The Missing Dimension: Governments and Intelligence Communities in the Twentieth Century* (London: Macmillan 1984); James Der Derian, *Antidiplomacy: Spies, Terror, Speed, and War* (Cambridge, MA: Blackwell, 1992); Michael G. Fry and Miles Hochstein, "Epistemic Communities: Intelligence Studies and International Relations," *Intelligence and National Security* 8, no. 3 (1993).

is true but it can be argued that intelligence's preoccupation with the War on Terror, with much written on 9/11, the invasion of Afghanistan and Iraqi WMDs, failed to connect it to mainstream debates with international relations.[71] In any case, the relation between intelligence and international relations is very much unidirectional as intelligence is pretty absent in international relations theory.[72] Very few mainstream scholars of history or political science incorporate intelligence literature into their work.[73]

The second characteristic of intelligence theorising is the status of being under-theorised, meaning there are few attempts to theorise, or existing theory is not rich enough.[74] Compounding this is that, aside from international relations, intelligence studies remains relatively isolated from knowledge in other domains and fields.[75]

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[71] Richard J. Aldrich, "Beyond the Vigilant State: Globalisation and Intelligence," *Review of International Studies* 35, no. 4 (2009): 890.

[72] Christopher Andrew, "Intelligence, International Relations and 'under-Theorisation'," *Intelligence and National Security* 19, no. 2 (2004); Len Scott and Peter Jackson, "The Study of Intelligence in Theory and Practice," *Intelligence & National Security* 19, no. 2 (2004): 147.

[73] Johnson, "The Development of Intelligence Studies," 8; Stephen Marrin, "Improving Intelligence Studies as an Academic Discipline," *Intelligence and National Security* 31, no. 2 (2016): 278.

[74] Barger, "Toward a Revolution in Intelligence Affairs," 107; Walter Laqueur, *World of Secrets: The Uses and Limits of Intelligence* (London: Weidenfeld and Nicolson, 1985), 8; Kira Vrist Rønn and Simon Høffding, "The Epistemic Status of Intelligence: An Epistemological Contribution to the Understanding of Intelligence," *Intelligence & National Security* 28, no. 5 (2013): 697; Jennifer Sims, "The Theory and Philosophy of Intelligence," in *Routledge Companion to Intelligence Studies*, ed. Robert Dover, Michael S. Goodman, and Claudia Hillebrand (Routledge, 2015), 42.

[75] Stephen Coulthart, Michael Landon-Murray, and Damien Van Puyvelde, "Introduction: A Pluralistic Approach to Intelligence Sholarship," in *Researching National Security Intelligence: Multidisciplinary Approaches*, ed. Stephen Coulthart, Michael Landon-Murray, and Damien Van Puyvelde (Washington, D.C.: Georgetown University Press, 2019), 3.

However, a general weak theoretical base of intelligence studies is countered by both Lillbacka and Marrin who see a growth in theorising attempts.[76]

Under-theorised or not, several authors see it as unlikely that the many aspects and varieties of intelligence can be made to fit one theory.[77] Historical, cultural and local backgrounds shape different kinds of intelligence and thus differing theories to explain them. This multitude of perspectives can in turn help to understand individual aspects of intelligence.[78] Warner points out the paradox that the idea that *'intelligence is too diverse to be categorised because it is something unique to each political system was itself a theory of intelligence by default'*.[79] Still Warner acknowledges the differences in theories and - using complexity-related terminology - deems it: *'a logical next step to explain intelligence as a reflexive activity, for intelligence systems under comparative scrutiny always interact with other systems (and with the world around them) in dynamic relationships and also in complex manners. Intelligence systems and the regimes that wield them, after all, comprise people, with their tendencies to biases, habits, and non-linear reactions to events'*.[80]

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[76] Ralf G. V. Lillbacka, "Realism, Constructivism, and Intelligence Analysis," *International Journal of Intelligence and Counterintelligence* 26, no. 2 (2013): 304; Marrin, "Evaluating Intelligence Theories: Current State of Play," 479.

[77] Adda Bozeman, "Political Intelligence in Non-Western Societies: Suggestions for Comparative Research," in *Comparing Foreign Intelligence: The US, the USSR, the UK & the Third World*, ed. Roy Godson (Washington, DC: National Strategy Information Center, 1981), 149; Lawrence Freedman, "'Powerful Intelligence'," *Intelligence and National Security* 12, no. 2 (1997): 200-01; Peter Gill, "Theories of Intelligence Where Are We, Where Should We Go and How Might We Proceed?," in *Intelligence Theory: Key Questions and Debates*, ed. Peter Gill, Stephen Marrin, and Mark Phythian (Routledge, 2009), 212.

[78] Stephen Marrin, "Intelligence Analysis Theory: Explaining and Predicting Analytic Responsibilities," *Intelligence and National Security* 22, no. 6 (2007): 825; Lawrence T Mitelman, "Preface to a Theory of Intelligence," *Studies in Intelligence* 18, no. 3 (1974): 19.

[79] Michael Warner, "Theories of Intelligence: The State of Play," in *Routledge Companion to Intelligence Studies*, ed. Robert Dover, Michael S. Goodman, and Claudia Hillebrand (Routledge, 2015), 26.

[80] "Intelligence and Reflexivity: An Invitation to a Dialogue," *Intelligence & National Security* 27, no. 2 (2012): 169.

However, the traditional intelligence focus is on 'them', and does not include 'us'.[81] As of yet there is no *'definitive assessment of the state of intelligence theory'*.[82] What is clear though is that intelligence approaches cover a range of relations between theory and empirical observation. The two extremes at this range can be described as: *'One holds that the role of theory is to order, explain, predict, and that the validity of the theory can be assessed only against empirical data. The other believes that there are no facts independent of theories; all knowledge is socially constructed. Thus, "facts" can never be submitted to decisive empirical validation'*.[83]

This difference between facts independent of theory and facts as socially constructed values is about epistemology.[84] Phythian explains the positivist epistemology as a fact-based approach that beliefs *'theories exist to explain laws'* and *'in the social sciences these laws take the form of hypothesis derived from observation and/or measurement'*.[85] Phythian differentiates between two levels of laws: *'First, there are 'laws' themselves, based on proven and inevitable links. Second, there are 'law-like statements'. These latter are probalistic, derived from observation that demonstrates that a proposition is often and reliably proven but is still not inevitable, and therefore falls short of constituting a 'law'. Theory is then required to help us understand these observations. […] generating hypotheses ('laws') which call for theories to provide explanation and which can lead to corollaries or modifications to the hypothesis'*.[86]

The positivist approach utilises models, like the intelligence cycle, for aiding theorisation. Furthermore, the positivist approach assumes there is an objective

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[81] Wilhelm Agrell and Gregory F. Treverton, *National Intelligence and Science: Beyond the Great Divide in Analysis and Policy* (Oxford ; New York: Oxford University Press, 2015), 48.

[82] Marrin, "Evaluating Intelligence Theories: Current State of Play," 480.

[83] Gregory F. Treverton et al., "Toward a Theory of Intelligence: Workshop Report" (2006), 5.

[84] Stephen Marrin, "Intelligence Analysis and Decision-Making: Methodological Challenges," in *Intelligence Theory: Key Questions and Debates*, ed. Peter Gill, Stephen Marrin, and Mark Phythian (Routledge, 2009), 141.

[85] Mark Phythian, "Intelligence Theory and Theories of International Relations Shared World or Separate Worlds?," in *Intelligence Theory: Key Questions and Debates*, ed. Peter Gill, Stephen Marrin, and Mark Phythian (Routledge, 2009), 56.

[86] Ibid.

truth and a world knowable through measurement and observation, in an intelligence sense this equals 'speaking truth to power' through collection and analysis.[87]

This positivist epistemology is linked to realism, liberalism and idealism in international relations. Hereby the international system is seen as driven by states competing for power in an anarchic situation. States are rational actors that base their decisions on, ideally, complete and accurate information. In the power competition the intentions of other states are an important part of the information need to base one's own strategy on. In part these can be gauged because it is assumed states will always act rationally in self-interest. However, states also try to hide their intentions for others. This is where intelligence comes in; to glean secrets from rival states about their intentions and military capabilities. Gill and Phythian describe this realist approach to intelligence as a 'great game' between states wherein *'threats could be objectively measured, and the "truth" of what happened discovered by the accumulation of oral and written evidence'*.[88] This is based on the assumption that *'more information will lead to more intelligence and thus less ignorance'*.[89] Realist approaches, being state-centric, were applicable during the Cold War but encounter problems with the rise of transnational threats in the post-9/11 era.

In contrast to the fact-based, positivist approach to intelligence, a growing body of literature that advocates a value-based epistemology is less clearly to label.[90] It

[87] Agrell and Treverton, *National Intelligence and Science: Beyond the Great Divide in Analysis and Policy*, 159; Julie Mendosa, "Expanding Mental Models in Intelligence through Diverse Perspectives," *International Journal of Intelligence and CounterIntelligence* 35, no. 4 (2022): 623-24; Phythian, "Intelligence Theory and Theories of International Relations Shared World or Separate Worlds?," 65.

[88] Gill and Phythian, *Intelligence in an Insecure World*, 27.

[89] Omand, "The Future of Intelligence: What Are the Threats, the Challenges and the Opportunities?," 16.

[90] e.g. Claudia Aradau and Mc Cluskey, "Critical Security and Intelligence Studies," in *A Research Agenda for Intelligence Studies and Government*, ed. Robert Dover, Huw Dylan, and Michael S Goodman (Cheltenham: Edward Elgar, 2022); Hamilton Bean, Peter de Werd, and Cristina Ivan, "Critical Intelligence Studies: Introduction to the Special Issue," *Intelligence and National Security* 36, no. 4

entails a variety of approaches that all are not positivist but criticise it. These different approaches are therefore often grouped together as critical (theory). A critical approach to intelligence states that *'intelligence practitioners (and […] academics) are not insulated from the forces of history, culture and social positioning. A critical theorist investigates the consequences of these structures for multiple intelligence stakeholders – especially for those whose voices are suppressed – and intervenes in various discourse communities in order to promote reflection and change.'*[91]

Because of the interwoven web of historical, cultural and social perspectives 'facts' are not observed in isolation and therefore not free of values or labels.[92] This narrative of facts interpreted as values is constructed by the observer and differs from other observers even though they possess the same facts. Instead of describing the world as it is, intelligence analysis *'actively creates'* the world.[93] In essence this is about what constitutes knowledge. Post-positivist denominations, though different in detail, all share this problematisation of knowledge.

A good example of, and philosophical background for this problematization of knowledge is Lyotard's *The Postmodern Condition: A Report on Knowledge* (1986). In his book Lyotard postulates that the post-industrial age and postmodern culture have changed the status of knowledge. The technological developments of these times have an impact on knowledge. The growing use of computers to process data

(2021); Hager Ben Jaffel et al., "Collective Discussion: Toward Critical Approaches to Intelligence as a Social Phenomenon," *International Political Sociology* 14, no. 3 (2020); Gunilla Eriksson, Swedish Military Intelligence: Producing Knowledge, (Edinburgh: Edinburgh University Press, 2016); Nate Kreuter, "The US Intelligence Community's Mathematical Ideology of Technical Communication," *Technical Communication Quarterly* 24, no. 3 (2015); David W Kriebel, "Anthropological Theory and Intelligence," *Global Security and Intelligence Studies* 1, no. 1 (2015); Samantha Newbery and Christian Kaunert, "Critical Intelligence Studies: A New Framework for Analysis," *Intelligence and National Security* (2023). See also other references in this section.

[91] Hamilton Bean, "Intelligence Theory from the Margins: Questions Ignored and Debates Not Had," *Intelligence & National Security* 33, no. 4 (2018): 529.

[92] Gill and Phythian, *Intelligence in an Insecure World*, 28.

[93] Fry and Hochstein, "Epistemic Communities: Intelligence Studies and International Relations," 25.

and communication means that, instead of knowledge being formulated by the human self, the production of knowledge is externalised. Artificial Intelligence currently being the most vivid example of this. As a result knowledge becomes a commodity, indispensable to power. Foreshadowing the phenomena of fake news, troll factories, mass-surveillance, Big Data and cyber espionage Lyotard observed that knowledge: *'is already, and will continue to be, a major – perhaps the major – stake in the worldwide competition for power. It is conceivable that the nation-states will one day fight for control of information, just as they battled in the past for control over territory, and afterwards for control of access to and exploitation of raw materials and cheap labor. A new field is opened for industrial and commercial strategies on the one hand, and political and military strategies on the other'.*[94]

At the same time however, the proliferation of data and information, and the machines to process this mark the end of the state and science as sole authoritative providers of knowledge. This means the great narratives provided to explain society, e.g. political theories and scientific progression, are less valid as they are substituted by a multitude of smaller narratives. The legitimation of providing explanations and meaning – truth and facts – no longer applies to traditional authorities, there are only values; facts observed and deformed by local biases.

The lesson for intelligence in all of this is the post-positivist focus on *'not how to avoid making errors, but rather how to embrace a reflexive mode of inquiry in which the practitioner consciously admits to a bias, and sometimes makes errors because of it, and thus seeks to find ways to overcome that bias'*.[95] A useful approach to be reflexive is postmodern intelligence because it seeks to *'question or undermine 'modernist' rules and conventions of prediction and control and instead emphasize complexity, multiplicity, ambiguity, and uncertainty'*.[96] As presented shortly, complexity theory offers a way to apply this emphasis. Within the small body of post-positivist literature the publications on postmodern intelligence form even a smaller

[94] Jean Françoıs Lyotard, *The Postmodern Condition: A Report on Knowledge* (Manchester: Manchester University Press, 1986), 5.

[95] Mary Manjikian, "Positivism, Post-Positivism, and Intelligence Analysis," *International Journal of Intelligence and Counterintelligence* 26, no. 3 (2013): 567.

[96] Bean, "Intelligence Theory from the Margins: Questions Ignored and Debates Not Had," 534.

part.[97] However, the complexity-like characterizations it often carries – as seen in the quote above – are in line with the language of the trinity of transformation. It is therefore interesting to further explore this postmodern approach to intelligence.

Rathmell introduced postmodern intelligence by applying five postmodern themes to intelligence.[98] The first theme concerns the rejection of modernist unifying theories to explain social phenomena. Postmodernism brings about the 'end of grand narratives' and replaces them with alternative discourses leading to fragmented perspectives on the world. For intelligence, the end of the grand narrative of the Soviet Union meant a fragmentation of targets, roles, and missions. Furthermore, during the Cold War developments were apparently incremental and linear. Now intelligence has to understand a world that appears chaotic with multiple, overlapping and often contradictory narratives. Developments display the properties of non-linear, dynamic systems.

The second postmodern theme, related to the end of grand narratives is the end of objective truth. Instead, is the constructivist approach that the observer shapes reality according to his or her own biases. Rathmell, borrowing from Nye, compares Cold War intelligence problems to puzzles and present day intelligence problems to mysteries.[99] Cold War intelligence knew the problem at hand and could therefore comprehend some kind of objective reality, and envision a solution. Modern day intelligence does not even know if there is a single objective reality it can understand.

The third theme is the idea of 'absent centres and uncertain identities'. Contemporary technological, social, and economic advancements are breaking down binaries such as male/female, human/machine and local/global. The intelligence workforce also finds its traditional identity challenged. Technological advancements that outperform humans challenge the traditional human-machine relation. Whereas the Cold War provided focus for the intelligence effort, nowadays it is

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[97] Myriam Dunn Cavelty and Victor Mauer, "Postmodern Intelligence: Strategic Warning in an Age of Reflexive Intelligence," *Security Dialogue* 40, no. 2 (2009); Chong Guan Kwa, "Postmodern Intelligence: Strategic Warning and Crisis Management," in *Perspectives on Military Intelligence from the First World War to Mali: Between Learning and Law*, ed. Floribert Baudet, et al. (The Hague, The Netherlands: T.M.C. Asser Press, 2017); Andrew Rathmell, "Towards Postmodern Intelligence," *Intelligence and National Security* 17, no. 3 (2002).

[98] "Towards Postmodern Intelligence."

[99] Joseph S. Nye, "Peering into the Future," *Foreign Affairs* 73, no. 4 (1994).

unclear for which department or national organisations, or corporation, intelligence is produced.

At the same time, constituting the fourth theme, these technological, social, and economic advances blur boundaries between states, regions, cultures and corporations. Hard and static boundaries are replaced by more fluid and multifaceted ones. For intelligence the clear boundaries of the Cold War are replaced by fluid boundaries of a myriad of state and non-state threats. Other boundaries that are changing is the increased importance of horizontal knowledge networks over hierarchy, and cooperation with the private sector.

The last theme is the emergence of the knowledge economy. Post-industrial societies go through a *'demassification of production'*. In essence this is a disruption of society by replacing hierarchical structures by networks and broadcast media with interactive personalised media – leading to the end of corporate loyalties and the rise of the autonomous knowledge worker. This means '*the end of the intelligence factory'* according to Rathmell. The knowledge economy, driven by technological and social change, is changing commerce, government, and armed forces – and it will also change the outdated idea of an intelligence factory. Given all these changes described by Rathmell, Richards looks at the intelligence cycle and describes it as a *'Fordist, Taylorian model' that's just 'not postmodern enough'*.[100]

Stated extremely, the positivist and post-positivist approaches are mutually exclusive. Positivism objects the relativism of stating value over facts and accuse it of rendering every approach to build knowledge, when subjected to specific context and thus disabling generalisations, as useless.[101] The post-positivist critics question positivist belief in empiricism and objectivity. They accuse it of denying the inherent uncertainty of an unknowable reality and knowledge construction that involves the biases of the constructors. When looking at this total of theories of intelligence the dominant theory is positivist, realist and objectivist.[102] Phythian states: *'in practice,*

[100] Richards, "Pedalling Hard: Further Questions About the Intelligence Cycle in the Contemporary Era," 48.

[101] Philip HJ Davies, "Theory and Intelligence Reconsidered," in *Intelligence Theory: Key Questions and Debate*, ed. Peter Gill, Stephen Marrin, and Mark Phythian (New York, NY: Routledge, 2009), 199.

[102] Hamilton Bean, "Rhetorical and Critical/Cultural Intelligence Studies," *Intelligence and National Security* 28, no. 4 (2013): 496; Peter Gill, Stephen Marrin, and Mark Phythian, eds., *Intelligence Theory: Key Questions and Debates* (London:

both intelligence customers and practitioners tend to view the world through realist/idealist dichotomy that does not easily accommodate or see the immediate policy relevance of post-structuralist or reflectivist approaches. Practitioners are unlikely to be highly receptive to approaches to IR which deny the possibility of uncovering objective truth when their task is to deliver the most objective analysis possible ('best truth'), and where failure can result from compromising this effort and, instead of telling 'truth to power', tailoring analysis to suit real or imagined customer preferences'.[103]

Gill acknowledges this search for truth in intelligence. He calls it *'praiseworthy'* and states the dominance of positivism is caused by it. Still, Gill also notes searching for truth can be *'highly misleading – the more so the greater the complexity and uncertainty of the threat being assessed'*.[104] From this positivist dominance it follows that post-positivist, or critical approaches, are underrepresented in intelligence theories.[105] In general, this means that the little novel theory that exists, is also not very outspoken and comprehensive. Specifically, next to the dominance of realist empiricism, there is not enough attention for new epistemologies, while this could offer valuable insights for the intelligence enterprise of the 21st century. Alternative theories and models *'can discern connections that were not evident'* in established ones.[106]

This imbalance between, roughly categorised, positivist and post-positivist intelligence theories can perhaps be explained by intelligence studies being a relatively new academic discipline. It has had too little time to evolve – compared to the related disciplines of International Relations or Security Studies – leading to the current new-born state of its critical variant. Marrin concludes that *'While there has been recent progress on developing different kinds of intelligence theory, intelligence*

Routledge, 2009); Manjikian, "Positivism, Post-Positivism, and Intelligence Analysis," 565.

[103] Phythian, "Intelligence Theory and Theories of International Relations Shared World or Separate Worlds?," 61.

[104] Peter Gill, "Intelligence, Threat, Risk and the Challenge of Oversight," *Intelligence & National Security* 27, no. 2 (2012): 212.

[105] Hamilton Bean, "Intelligence Theory from the Margins: Questions Ignored and Debates Not Had," ibid.33, no. 4 (2018): 528; Marrin, "Evaluating Intelligence Theories: Current State of Play," 483-84.

[106] Gill and Phythian, *Intelligence in an Insecure World*, 28.

studies has not yet effectively created schools of thought or fostered these structured debates'.[107]

From a Kuhnian perspective, in times of crisis scientists turn to *'philosophical analysis as a device for unlocking the riddles of their field'*.[108] Science normally tends to avoid philosophy because the paradigm is working and there is no need to question it. This also explains the relatively small amount of intelligence theories that reject the existing positivist paradigm. This underdevelopment and proliferation of new theories in intelligence studies is mirrored in the transformation debate, which I characterised as fragmented.

From the fragmented intelligence transformation debate and the theoretical imbalance it is logical and important to investigate these new theories of post-positivist, or critical, approaches to intelligence and explore their potential. As De Werd states: *'The implications for intelligence of critical philosophical approaches are profound, at various levels: the debate over paradigms in intelligence studies, the structuring of intelligence processes in organizations, and the analysis of intelligence problems'*.[109] This research therefore relates to a postmodern approach of intelligence. Where postmodern intelligence is often infused with terms like complexity or non-linear, like the other sides of the transformation trinity, it is interesting for one more reason. In other fields postmodern approaches have often led to the application of complexity theory.[110] This is a logical development. A postmodern view on knowledge seems to connect quite easily to complexity science, as philosopher and complexity researcher Cilliers shows: *'As far as postmodernism is concerned, the argument is simply that a number of theoretical approaches, loosely (or even incorrectly) bundled together under the term 'postmodern' (e.g. those of Derrida and Lyotard), have an implicit sensitivity for the complexity of the phenomena they deal with. Instead of trying to analyse complex phenomena in terms*

[107] Marrin, "Improving Intelligence Studies as an Academic Discipline," 270-71.

[108] Thomas S. Kuhn, *The Structure of Scientific Revolutions*, Fourth edition. ed. (Chicago: The University of Chicago Press, 2012), 88.

[109] Werd, "Critical Intelligence: Analysis by Contrasting Narratives: Identifying and Analyzing the Most Relevant Truths," 18. See also: "Critical Intelligence Studies? A Contribution," *Journal of European and American Intelligence Studies* 1, no. 1 (2018).

[110] Paul Cilliers, *Complexity and Postmodernism: Understanding Complex Systems* (London: Routledge, 1998).

of single or essential principles, these approaches acknowledge that it is not possible to tell a single and exclusive story about something that is really complex.'[111]

Cilliers very explicitly connects postmodernism to complexity. He states that Lyotard's description of the postmodern condition *'is in fact a description of the network of our society and of the manner in which it produces and reproduces knowledge. […] this network has become too complex for general or overarching descriptions'*.[112] Cilliers shows complexity theory and the postmodern society are both about open systems with many non-linear interactions that lead to novel behaviour and knowledge.[113] Complexity and postmodernism see relations as non-linear. Their product is more than the sum of its parts making reductionism irrelevant. Cause and effect cannot be discovered and precise prediction is impossible, resulting in ever present deep uncertainty. De Graaff contrasts intelligence's enduring positivism with the postmodern realisation of many social scientists that the ambition of imitating the natural sciences with its positivist laws and certainties has led to a crisis. If the social sciences are to deliver truth and indisputable certainties, there is little science left. To drive the point home, De Graaff cites American sociologist Wallerstein. In his book *The Uncertainties of Knowledge (2004)*, Wallerstein, drawing on complexity science, states the *'cultural end of certainties'* has been reached and that the only *'intractable reality'* is uncertainty.[114]

From the handful of articles on postmodern intelligence, only Dunn and Mauer have followed this relation between postmodernism and complexity theory. Rathmell mentions complexity theory as promising, but does not apply it.[115] Dunn and Mauer apply it to warning intelligence stating the combination of postmodernism and complexity theory *'might increase understanding of the limitations of knowledge and lead to the establishment of a political discourse of uncertainty'* in the context of intelligence.[116]

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[111] Ibid., VIII.

[112] Ibid., 116.

[113] Ibid., 119-23.

[114] Bob de Graaff, "Intelligence and Intelligence Studies. Time for a Divorce?," *Romanian Intelligence Studies Review*, no. 21 (2019): 17.

[115] Rathmell, "Towards Postmodern Intelligence," 100.

[116] Dunn Cavelty and Mauer, "Postmodern Intelligence: Strategic Warning in an Age of Reflexive Intelligence," 125.

2.4 A paradigm shift

The literature often frames the process of moving from Cold War intelligence to a new form as a paradigm shift.[117] This term is introduced by the American philosopher of science Thomas Kuhn who used it to describe the development of science in his influential work *The Structure of Scientific Revolutions* (1962). It can be a helpful concept to study the shift towards post-Cold War intelligence, provided it is based on a proper theoretical explanation and not used too loosely – as is often the case. This section therefore examines what Kuhn meant with 'paradigm' (shift), before discussing several authors who apply it to intelligence with proper theoretical Kuhnian substance.

Kuhn states that the history of science is not a single, linear story of progress through the accumulation of facts. Science is about revolutions, not evolution. In a pre-revolution state 'normal science', as Kuhn names it, adheres to a paradigm. This is a model of laws, theory, application and instrumentation *'from which spring particular coherent traditions of scientific research'*.[118] Not only is research done according to the characteristics of the model, like the intelligence cycle, newcomers to the community – students – are educated in the model as well. A paradigm is scientifically successful because of two reasons. It has enough commonalities in its explanation of the world to attract a certain scientific community or discipline. Simultaneously, it leaves enough questions unanswered for practitioners to pursue scientific research. As mentioned above, this research is done according to the paradigm the researchers are part of. In a way the research aims at extending and defining the ruling paradigm more clearly. Kuhn therefore calls this *'mopping up operations'*.[119] Because the scientific work is done to optimise the ruling paradigm, there is little aim to produce novelties. In this perspective, adjusting and refining the intelligence cycle is a mopping up operation.

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[117] e.g. James B. Bruce, "Dynamic Adaptation: A Twenty-First Century Intelligence Paradigm," (2004). (unpublished, unclassified, internal, relasead CIA paper); William J. Lahneman, National Intelligence Agencies and Transnational Threats: The Need for a New Intelligence Paradigm, (College Park, MD: Center for International & Security Studies, U. Maryland, 2008). See also other references in this section.

[118] Kuhn, *The Structure of Scientific Revolutions*, 11.

[119] Ibid., 24.

Such operations do not mean novelties are not found. Research can generate empirical facts (discoveries) or theories (inventions) that do not fit the paradigm of said research. Perhaps, in a Kuhnian sense, the anomalies of the cycle are pointing towards the explanatory failure of 'normal intelligence'. The newly discovered facts, in the words of Kuhn, are *'incommensurable'* with existing traditions of research. Sometimes it takes time to even become aware of these results. But when they are acknowledged as something to scientifically explain, they are at first incorporated into the existing paradigm. If this is not possible, the ruling paradigm can begin to shift. This starts with a small disenfranchised scientific community that lacks any critical mass. However, as the paradigm continues to be criticised more anomalies are found. A crisis begins to emerge that, as its ultimate outcome, can destroy the ruling paradigm in favour of a new one. Confronted with this crisis existing paradigms lose their monopoly while there is still no new paradigm to replace it. Normal science then resorts to extraordinary research, outside of the paradigm. This crisis of the old paradigm and transition towards a new paradigm has several symptoms. There is a *'proliferation of competing articulations'* that is accompanied with voiced discontent regarding the existing paradigm. This invokes a *'willingness to try anything' in research and a 'recourse to philosophy and to debate over fundamentals'*.[120] Though small in volume, this is where the proliferation of post-positivist intelligence theories comes into play.

Having examined Kuhn's paradigm concept, applications of it to intelligence transformation are reviewed next. One example is Moore, who states the failures of the intelligence to predict the attacks of 11 September 2001 and correctly ascertain the state of Saddam Hussein's programs of WMD are examples of Kuhnian systemic reframing crises. The Cold War approach of the understanding of problems does not fit new phenomena. It became painfully clear that *'the epistemology of normal intelligence is insufficient and new knowledge is needed. The recent failures highlight the necessity for change, as does the graying of the intelligence sensemaking workforce — new people faced with new and emerging issues should be comfortable with finding new ways to systematise their work. The changed contexts and data, once they confront practitioners with problems that are unintelligible in normal intelligence, will reflect the idea that a Kuhnian-style revolution in intelligence is underway.'*[121]

[120] Ibid., 91.

[121] Moore, *Sensemaking: A Structure for an Intelligence Revolution*, 47-48.

Many discussion of paradigms from intelligence literature, theoretically heavy or light, begin with the duality of state and non-state actors. This is not surprisingly because of the observation made earlier on intelligence in general regarding non-state actors as the most important driver of change. George sees problems with fitting non-state actors to the traditional intelligence paradigm: *'a paradigm which develops critical information through a national, classified system of collection and analysis. This paradigm has been effective in organizing US intelligence –as well as many other national intelligence systems in other countries – for what have been largely state-centric challenges'*.[122] To address transnational threats, the new paradigm should abandon its tradition of total secrecy, according to George. Intelligence should instead exploit the open sources of the Information Revolution and synthesise knowledge from the academic, private and government sectors. This collaboration is needed to cope with the deep uncertainty of the post-Cold War, multipolar world: *'As the 21st century is expected to be far less predictable and dynamic, the objective is to scan the horizon for emergent issues and so called weak signals that are harbingers of futures for which few governments have begun preparing. […] While the traditional paradigm would focus on specific "hard targets" for specific facts (also known as plans, intentions and capabilities), the collaborative model is scanning for interesting interconnections among issues, anomalies from what experts might normally expect to see, and other insights, which in the traditional paradigm would be considered irrelevant or too unconventional to be of use.'*[123]

The rise of non-state actors does not exclude traditional state-based threats. Lahneman correctly states a new paradigm should incorporate the old one based on state actors.[124] Still, a true new paradigm should contain more than a change of its referent object. It must form something completely different in all its aspects. To do so, Lahneman uses a puzzle analogy. In the traditional paradigm intelligence is about solving puzzles to which pieces are missing. Collecting as many and important puzzle pieces as possible forms a basis from which analysis can make assessments and estimates about the complete puzzle. Puzzle pieces fall into three categories: secrets, mysteries, and open source. Secrets are information that actors secure from other

[122] George, "Meeting 21st Century Transnational Challenges: Building a Global Intelligence Paradigm."

[123] Ibid.

[124] Lahneman, *Keeping U.S. Intelligence Effective: The Need for a Revolution in Intelligence Affairs*, 118-19.

actors but is still knowable. Mysteries are information that is unknowable. Contrary, open source information is easy to gain but comes with the risk of overload. The focus in this traditional paradigm is on solving secrets. In this process the puzzle pieces were relatively static; they were predictable and changed only slowly over time. This comes from the Cold War where the Soviet Union was a closed state, difficult to gain insight into. Missile launch sites and Soviet leaders do not move their position suddenly or often. Furthermore big puzzle pieces were more important than small pieces because they tell more of the whole than small pieces.[125]

Lahneman's paradigm to address transnational threats is called adaptive interpretations. Instead of solving incomplete puzzles with secrets, adaptive interpretations is about solving extremely complicated puzzles for which however almost all of the pieces are available. This is because most pieces are neither secrets or mysteries but are found in open source information. To process this, constant information collection and sharing instead of ad-hoc and problem based structures are needed. Next, this information must be continuously updated because the many and small pieces of adaptive interpretations are much more dynamic. Their information value and relation to other pieces changes and adapts to each other. Terrorists and their leadership change position quickly as opposed to Soviet weapons and politicians.[126] Summarising the paradigms, Lahneman provides a table:

[125] Ibid., 116-18.

[126] Ibid., 119-20.

Characteristic	Traditional paradigm (solving incomplete puzzles)	New paradigm (performing adaptive interpretations)
Nature of threat	Predominantly military.	Predominantly non-military.
Information requirements	Limited: emphasises secrets.	Enormous: most required information is not secret.
Nature of indicators (pieces to puzzles / adaptive interpretations)	Large and small pieces.	All pieces are small.
Importance of pieces	Large pieces are more important than small pieces. Values are static.	The value of each small piece can change from moment to moment.
Durability of solutions	Relatively constant: 'Picture' experiences slow, incremental changes.	Dynamic: values of pieces and, therefore, meaning of adaptive interpretations, change rapidly.
Need for updates to analysis	Periodic (to detect major changes).	Continuous.

Table 1: Difference between traditional and new intelligence paradigms.[127]

The dynamic and changing character of Lahneman's adaptive interpretations links to George's use of terms like *'emergent issues'* and *'interconnections'* and *'anomalies'* as being the object of his collaborative paradigm. This type of terms relates to the notion of complexity.

[127] Ibid., 120.

Treverton, who writes extensively on improving intelligence, shares this complexity-like approach. Though he does not always refer to paradigms, when he does, Treverton – like Lahneman – give substantially more body and theory to the idea of a paradigm shift than many other authors. Treverton describes the traditional paradigm as focused on a single foe (Soviet Union), depended on secrets to solve puzzles and with collection separated from analysis. This was done to safeguard the secret sources and methods. Also, because everything gained from the secretive Soviet state was worth analysing and told something about the whole, analysis was not always involved in formulating collection requirements. Another separation is intelligence from policy. To not become subjective to policy – intelligence is considered objective truth – intelligence was done by intelligence officials and policy done by government officials.[128] This process was centralised, or stove-piped, and differentiated between domestic and foreign threats.[129] In another work Treverton contrasts the old paradigm of the Cold War with the phenomena of terrorism. He does so with a table quite reminiscent of Lahneman's:

[128] Agrell and Treverton, *National Intelligence and Science: Beyond the Great Divide in Analysis and Policy*, 159; Sims, "The Theory and Philosophy of Intelligence," 43.

[129] Gregory F. Treverton, *Reshaping National Intelligence for an Age of Information* (New York City, NY: Cambridge University Press, 2003), 221.

	Old: Cold War	New: Age of Terror
Target	States, primarily the Soviet Union.	Transnational actors, also some states.
'Boundedness'	Relatively bounded: Soviet Union ponderous.	Much less bounded: terrorists patient, but new groups and attack modes.
'Story' about target	Story: states are geographic, hierarchical, bureaucratic.	Not much story: non-states come in many shapes and sizes.
Information	Too little: dominated by secrets.	Too much: broader range of sources, although secrets still matter.
Interaction with target	Relatively little: Soviet Union would do what it would do.	Intense: terrorists as the ultimate asymmetric threat.

Table 2: From the Cold War to an Age of Terror.[130]

With Treverton the complexity is hinted at with the boundedness of intelligence problems. The Soviet Union could be defined according to its geographic, hierarchical and bureaucratic boundaries. The problem could be shaped and from its parts the whole could be constructed, and vice versa. Transnational actors are unbounded problems in that they change shape and size and new actors arise.

The goal here is not to strive for an exhaustive and clearly described paradigm shift, if that is even possible. The account of moving intelligence beyond the Cold War, condensed in above, is sufficient for now. If anything, it is important to realise the Cold War paradigm was *'so dominating that it was regarded not as a way to see the*

[130] Gregory F. Treverton, *Intelligence for an Age of Terror* (Cambridge: Cambridge University Press, 2009), 2. See page 22 in this publication for an extented version of the table.

world but as the world itself'.[131] This requires a thorough examination of how intelligence functions in the post-Cold War era. A pertinent feature of this era is the idea of hybrid warfare and grey zone operations. While issues of hybridity are also present in the paradigm tables from Lahneman and Treverton, it took the Russian invasion of Crimea for hybrid warfare to really take the stage.

The debate on intelligence theories and paradigms share a focal point of state-centric intelligence turning to non-state targets.[132] However, Russian operations in Ukraine and an assertive China draw attention to hybrid and grey zone. While hybrid and grey zone mostly narrow the actors back to states, it broadens ideas on strategy, methods and what is considered a weapon. Section 3.4.2 provides more details on the event of the Russian annexation of Crimea and its hybrid character. For now the focus is on the ambiguity regarding the debate on hybrid and grey zone, and its implications for intelligence.

In short, the terms hybrid and grey zone are based on vague concepts and poor definitions.[133] They mean different things. Grey zone conflict is often described as activities between peace and war.[134] Hybrid warfare in general concerns a mixed-methods approach to warfare. In part, hybrid warfare is done in the grey zone.[135] Hybrid warfare is often associated with Hoffman who used it to describe the early 21st Century convergence of regular and irregular forms of warfare, employed by state and non-state actors, with the inclusion of terrorism and criminal activities.[136] Non-violent means are only broadly incorporated in the concept later on. In this broadening of the initial hybrid concept the attention for cyber, informational and

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[131] Agrell, "Intelligence Analysis after the Cold War," 94.

[132] Agrell, "The Next 100 Years?: Reflections on the Future of Intelligence," 133-34.

[133] Jan Almäng, "War, Vagueness and Hybrid War," *Defence Studies* 19, no. 2 (2019); Chiara Libiseller, "'Hybrid Warfare' as an Academic Fashion," *Journal of Strategic Studies* (2023).

[134] For a comparison of several Grey Zone definitions, see: Frank G Hoffman, "Examining Complex Forms of Conflict: Gray Zone and Hybrid Challenges," *Prism* 7, no. 4 (2018).

[135] Donald Stoker and Craig Whiteside, "Blurred Lines: Gray-Zone Conflict and Hybrid War-Two Failures of American Strategic Thinking," *Naval War College Review* 73, no. 1 (2020): 13.

[136] Frank G. Hoffman, *Conflict in the 21st Century: The Rise of Hybrid Wars* (Arlington, VA: Potomac Institute for Policy Studies, 2007), 14.

psychological instruments seem to get the most attention. It can be stated that the concept *'mushroomed to explain everything known and unknown about events that seemed to be a mixture of novel enigmas and brute force'*.[137] As the case study research shows, this ambiguity in the meaning of both concepts is problematic when trying to understand and defend against hybrid warfare or grey zone operations.

For reasons of clarity this research will only use the term hybrid. It is considered a mix of regular and irregular forms of warfare as well as non-violent means. Part of this mix, such as cyber-attacks and influence operations, take place in the grey zone as they are not considered peace or traditional war. Hybrid and grey zone remain contested concepts but there are several aspects commonly present in all current concepts that are specifically of note to intelligence. While denial and deception have always served to support other operations, with hybrid threats denial and deception are the operation, they *'are designed to blur the distinction between peace and war, as well as complicate and fall below the target's detection and response thresholds'*.[138] Actors that employ hybridity aim to achieve strategic goals incrementally.[139] This makes it difficult for the warning function of intelligence. In the case of Crimea there are no accounts that Western intelligence agencies had any prior warning.[140]

The blurring of peace and war and mitigating a target's detection and response thresholds are overlapping concepts. The blurring of peace and war is done by secretly and sometimes illegally operating in the space in between, often referred to as the grey zone, with a variety of means (hybrid), including non-military, without escalating to open conflict or officially declaring war. Therefore grey zone operations are difficult to detect and respond to and as such constitute 'wicked problems' that

[137] Palle Ydstebø, "Russian Operations: Continuity, Novelties and Adaptation," in *Ukraine and Beyond: Russia's Strategic Security Challenge to Europe*, ed. Janne Haaland Matlary and Tormod Heier (Palgrave Macmillan, 2016), 149.

[138] Patrick Cullen, "Hybrid Threats as a New 'Wicked Problem' for Early Warning," (Helsinki: Hybrid Center of Excellence, 2018), 2.

[139] James J Wirtz, "Life in the "Gray Zone": Observations for Contemporary Strategists," *Defense & Security Analysis* 33, no. 2 (2017): 107.

[140] Mark Galeotti, "Hybrid, Ambiguous, and Non-Linear? How New Is Russia's 'New Way of War'?," *Small Wars & Insurgencies* 27, no. 2 (2016): 285.

are complex.[141] Because of the discrete nature of grey zone operations, intelligence services with their experience in covert action are often involved in the execution.

Staying below the detection threshold is done by using proxies and strategically exploiting the ambiguity and uncertainty of who or what the adversary is. In Crimea, for example, Russian intelligence organised units comprised of local militia, Cossacks, and former agents of the dissolved Berkut special police.[142] Another, famous, example are the 'little green men' that spearheaded Russia's annexation of Crimea. Furthermore, *'although hybrid threats share the same strategic characteristics, the diversity of ways in which individual hybrid threats match multiple instruments of power against the specific weaknesses of the society targeted can result in each individual hybrid threat campaign having a unique signature'*.[143] The complexity of this multitude of intentions, capabilities and actors not only works against detection but also makes it very difficult to respond. Attribution, and with it a legal reaction, are almost impossible with the existence of even minor plausible deniability on the side of the suspected actor.

The response issues are also very much institutional. Does the detection problem ask for the creation of a new 'hybrid intelligence' or does it require more and better data fusion?[144] In countering hybrid threats, intelligence and security services are a logical first line of defence. However, with hybrid threats conducting a whole-of-society approach against their targets, the response should be accordingly. Therefore, shared situational awareness, intelligence sharing, counterintelligence efforts and cooperation, between a broad range of actors and organisations are often mentioned as both challenges and recommendations.[145] This goes for national level

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[141] Cullen, "Hybrid Threats as a New 'Wicked Problem' for Early Warning."; Hoffman, "Examining Complex Forms of Conflict: Gray Zone and Hybrid Challenges."

[142] Gregory F. Treverton et al., "Addressing Hybrid Threats," (Swedish Defence University, 2018), 20.

[143] Cullen, "Hybrid Threats as a New 'Wicked Problem' for Early Warning," 4.

[144] Gregory F. Treverton, "The Intelligence Challenges of Hybrid Threats: Focus on Cyber and Virtual Realm," (Swedish Defence University, 2018), 13.

[145] E. H. F. Donkersloot, "Hybrid Threats from the East ; the Gerasimov Doctrine and Intelligence Challenges for NATO," *Militaire spectator: tijdschrift voor het Nederlandsche leger* 186, no. 9 (2017); Björn Fägersten, "Forward Resilience in the Age of Hybrid Threats: The Role of European Intelligence," *Forward Resilience: Protecting Society in an Interconnected World* (2017): 8-9; Sergiu

as well as NATO and EU. The problems for intelligence in making sense of, and responding to, hybrid threats are broadly reflected in the case study. Any theoretical progress in understanding hybrid is not reflected there, as many respondents turn out to be confused on the issue.

2.5 Conclusion: What is the status of intelligence transformation?

Having problematised intelligence along the frame of the trinity of transformation, this section provides an answer to the first research question in describing the status of fundamental changes in intelligence. Liaropoulos summarises the state of intelligence aptly: *'In the dawn of the twenty-first century, the international environment has been transformed and is more complex compared to the one that shaped the intelligence services during the second half of the twentieth century. In particular, whereas the Cold War provided a reasonably predictable and linear framework for the intelligence community, that cannot be argued for the security environment at the beginning of the twenty-first century. Requirements for providing intelligence support have changed greatly. There is greater complexity and variety of enemies and threats. The linear understanding that characterized most of the intelligence issues during the Cold War is long gone. In the post 9/11 security environment there is a great need to re-examine the way intelligence is collected and translated into policy.'*[146]

The debate on this re-examination of intelligence is characterised as fragmented debate. To this, Boelens adds the omission of intelligence for war fighters in the RIA debate, underlining the research focus of this project. He states that RIA *'focuses mainly on the strategic level of intelligence and the restructuring of national intelligence services. By contrast, there seems to be only a limited academic debate and analysis concerning the intelligence process at the operational and tactical levels in which military forces are actually confronted with this changed context.'*[147] In

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Medar, "Intelligence in Hybrid Warfare," in *Countering Hybrid Threats: Lessons Learned from Ukraine*, ed. Niculae Iancu, et al., NATO Science for Peace and Security Series (Amsterdam: IOS Press, 2016), 52; Treverton et al., "Addressing Hybrid Threats," 80.

[146] Liaropoulos, "A (R)Evolution in Intelligence Affairs? In Search of a New Paradigm," 6.

[147] Boelens, "The Revolution in Intelligence Affairs: Problem Solved?," 121.

short, there is more disagreement than insight in what exactly constitutes intelligence, both as a whole and in the war fighting sense.

With the devaluation of the intelligence cycle, conflicting theories and a paradigm debate, aggravated by hybrid warfare, intelligence clearly shows symptoms of a proper Kuhnian paradigm shift or crisis. The old paradigm cannot incorporate emerging anomalies. It has lost its monopoly while a new paradigm has yet to form. Though it must be said that novelties of fact (discoveries) dominate the anomalies. Novel post-positivist theories (inventions) are but a small group that lacks the mass of, for example, the factual flaws of the intelligence cycle. This Kuhnian crisis means the narrative on intelligence has become one of plethora, openness and disorder. This current state of complexity, fragmentation and ambiguity is aptly framed by Lyotard in his description of postmodernism: *'Simplifying to the extreme, I define postmodern as incredulity toward metanarratives. […] The narrative function is losing its functors, its great hero, its great dangers, its great voyages, its great goal. It is being dispersed in clouds of narrative language elements —narrative, but also denotative, prescriptive, descriptive, and so on. Conveyed within each cloud are pragmatic valencies specific to its kind. Each of us lives at the inter section of many of these. However, we do not necessarily establish stable language combinations, and the properties of the ones we do establish are not necessarily communicable.'*[148]

In this light it is only logical that the debate on improving intelligence is fragmented. With the old metanarrative of Cold War intelligence diminishing, new perspectives on intelligence that are unbounded by the old emerge. The transformation debate is held, paraphrasing Lyotard, at the intersections of differing notions of intelligence. While recognising and placing much of the topics of the preceding sections in Lyotard's description, the implicit notions of complexity as seen in the trinity of transformation are a remarkably similar.

The trinity of transformation in intelligence in this chapter is mainly theoretical, based on academic and professional publications. These studies are influenced by practice of course, but are narrow in their focus on theoretical debate rather than real world developments. Fundamental changes in intelligence should also be reflected in the real world. That is the subject of the next chapter.

[148] Lyotard, *The Postmodern Condition: A Report on Knowledge*, xxiv. Original: La condition postmoderne: rapport sur le savoir (Paris, Minuit, 1979).