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TAMING THE LEVIATHAN – A NEW APPROACH TO RISK FOR THE MILITARY LEADER

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Taming the Leviathan – A New Approach to Risk for the Military Leader

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ABSTRACT

Military operations involve risk. A central question for military leaders is whether they have the tools available to them to deal with risk. Part of the leader's risk toolbox is the training and education they receive. However the military leader is not exposed to formal training and education modules that specifically address risk. With a lack of formal risk doctrine and training in the CF, the leader may use narrowly defined and inconsistent engineering risk processes or high level generic frameworks that are not easy to standardize, track, understand, or apply. The result may be shallow analysis, poor management, unclear communication and poor decisions involving risk. To address these issues, this paper will first examine some weaknesses of selected risk management processes. A wider understanding of risk will then be developed by other perspectives using philosophical, psychological and sociological theories as a basis for discussion. Finally the paper develops its comprehensive risk approach by layering these wider though processes on top of the common risk management methodologies.

Introduction

Military operations involve risk. In the 21st century there has been a steady shift in the type of military operations from static un-scientific warfare to fighting asymmetric threats using increasingly sophisticated machinery. But, militaries still apply deadly force to the state's problems. The current problems to solve are just different. The military officer must now also deal with the ugly, complex and dangerous beast, the Leviathan, which lies between military success and failure in a more complex and ambiguous world. In fact some modern military problems seem to be what Horst Rittel describes as "wicked problems", complex problems that cannot be solved even by experts, planning and the best efforts of many.¹ In this complex world, the military officer must assess risk, and perform operations.

In performing operations there are key military officers that are normally parts of staffs supporting commanders. Officers and leaders at the operational level, those responsible for making military plans and producing advice to military commanders, are the focus of this paper and must be prepared to address risk. In the leadership domain, all military officers and some non-commissioned officers are the leaders of any military institution.² A central question for these military leaders is whether they have the tools available to them to deal with risk, especially if some military problems are indeed wicked problems.

Part of the leader's risk toolbox is the training and education they receive. A further section of the toolbox is doctrine, or the accepted practices of the profession. However, formal training or doctrine in risk processes may or may not be evident in Western militaries. Traditionally militaries train and educate their members to very high standards. It is now common to subscribe a military officer to the "profession of arms."³ However, in a Canadian

¹ Rittel, Horst and Melvin Webber, *Dilemmas in a General Theory of Planning*, Policy Sciences, Vol. 4 (1973).

² Government of Canada, Canadian Forces, *Leadership in the Canadian Forces: Leading the Institution*, Her majesty the Queen in Right of Canada, 2009, <http://www.cda-acd.forces.gc.ca/cfli-ilfc/Publications-eng.asp>, accessed 14 December 2010.

³ Government of Canada, Canadian Forces, *Duty With Honour: The Profession of Arms in Canada*, Her majesty the Queen in Right of Canada, 2009, <http://www.cda-acd.forces.gc.ca/cfli-ilfc/profession-eng.asp>, accessed 9 December 2010.

military context neither the Canadian Department of National Defence (DND), the broader Canadian military-civilian administrative organization, nor the Canadian Forces (CF), the operational Canadian military, have formal and pervasive management or officer training and education modules that specifically address risk.⁴ There are pseudo-engineering processes that address risk, for instance in the Technical and Operational Airworthiness processes of the Canadian Air Force.⁵ On doctrine, there is an overarching CF doctrine manual that addresses risk management.⁶ But these doctrinal statements are thin and Cartesian, without strong and broad institutional frameworks allowing for the wider institutional operation of basic risk processes.⁷

Thus in a state where there is insufficient training, education and doctrine, often an officer will rely on intuitive processes when faced with risk, and as this paper has already discussed, Rittel argues wicked problems have very few solutions even when an army of experts and professionals are enlisted. With a lack of formal doctrine and training in the CF, the officer may use narrowly defined and inconsistent engineering risk processes on the one hand, and altogether miss many aspects of risk. On the other hand high level generic frameworks are not easy to standardize, track, understand, or apply, and may result in shallow analysis, poor management, unclear communication and poor decisions involving risk. In the CF, a current example of an inadequate risk programme is described in a recent Flight Safety report concerning the failure of a seatbelt system in a jet trainer. In this author's opinion the accidents were due to failed risk processes which resulted in several preventable deaths over a long period

⁴ A qualitative assessment from a career Canadian Forces Officer.

⁵ Government of Canada, Canadian Forces Defence Administrative Orders and Directives (DAOD), DAOD 2015-1 *Department of National Defence/Canadian Forces Airworthiness Program*, 29 June 2007, <http://www.admfincs.forces.gc.ca/dao-doa/2000/2015-1-eng.asp>, accessed 14 October 2010.

⁶ Government of Canada, CF publication B-GJ-005-502/FP-000, *Risk management for CF Operations*, Change 1, November 2007.

⁷ Government of Canada, An excellent current CF example of a complex and difficult risk management process is the Canadian Auditor General's review of the risk analysis for the purchase of the CH-148 Cyclone maritime helicopter. The AG's report outlines shortcomings in the risk management programme. Details can be found at http://www.oag-bvg.gc.ca/internet/English/parl_oag_201010_06_e_34289.html#hd4a, in articles 6.26 and onward.

of time.⁸ This example is but one of many more examples that are threads of a wider institutional ambiguity regarding risk in the military domain, and speak to a possible lack of wider institutional understanding of more robust risk processes.

The weakness in current military risk processes can be addressed by a broad, multi-disciplinary approach. But a common risk approach is not a simple structure to build, especially across a widely diverse institution such as a military. Risk frameworks may be applied inconsistently, risk processes may be conducted differently, the same, or not at all even across departments in a single organization. There are many risk professionals, but there is considerable debate in that community regarding the foundations of their profession.^{9,10} There are many pseudo-engineering risk processes in western society, but there is a distinct lack of other approaches regarding risk.

This paper's thesis, while acknowledging the complexity of the 21st century military environment, is that there is a weakness in the scientific and engineering risk methodologies, there is a need to consolidate and propose a broad multi-disciplinary risk approach for the officer with the bounding processes being identification, analysis, communication, management and decision making. The development of particular models or processes for risk is not the milieu of thought for this paper; rather the construction of a way of thinking to support a risk approach is the aim. As Ackoff argues, and this paper will revisit Ackoff further along, "The best way [to treat a problem, or a risk] is from a transdisciplinary point of view" using systems thinking.¹¹

This paper will first examine some weaknesses of selected risk management processes. These processes were selected as they mirror military processes such as financial, engineering, safety and security. A wider understanding of risk will then be developed by other perspectives

Government of Canada, National Defence, Canada's Air Force, Directorate of Flight Safety, Reports, CT114159 Tutor Crash and Fatality, May 18, 2007, <http://www.airforce.forces.gc.ca/dfs-dsv/nr-sp/index-eng.asp?id=10068>, accessed 9 December 2010.

⁹ Klinke, Andreas and Ortwin Renn, A New Approach to Risk Evaluation and Management: Risk-Based, Precaution Based, and Discourse Based Strategies, *Risk Analysis*, Vol. 22, No. 6 (2002), p 1072-1073.

¹⁰ Conrow, Edmund H., *Effective Risk Management – Some Keys to Success*, 2nd Ed., American Institute of Aeronautics and Astronautics, Inc (Reston, Va., 2003), Preface.

¹¹ Ackoff, Russell L. *Systems Thinking and Thinking Systems*, *System Dynamics Review*, Vol. 10, Nos. 2 and 3 (Summer, Fall 1994), p 187.

using philosophical, psychological and sociological theories as a basis for discussion. Finally the paper develops its comprehensive approach by layering these wider though processes on top of the common risk management methodologies. Thus, this paper's focus is the application of multi-disciplinary theories and concepts for the operational level military staff officer. This paper will argue that by using deeply understood thought processes, philosophical arguments, social theories and communication techniques that any military officer may truly understand the people and the institution that is judging risk and be able to communicate the concepts throughout any complex organization; the mechanical and scientific management of risk can be accomplished by anyone. As Robert Heller argues in *The Naked Manager*, "science can be extremely useful, but is no substitute for the art."¹² This paper moves toward the institutional art, rather than the science of risk.

Limitations of current Risk processes

If one were to enter a library and search for risk studies and methodologies, a vast array of potential risk study areas would emerge. In the financial sector risk is studied extensively, usually for the purpose of protecting the institution from financial ruin. In management the study of risk is usually applied to ensure the organization's survival. In the engineering sector risk is studied and applied as a method for reducing or eliminating the consequences of engineering failure. What follows now is a review of specific institutional risk management processes and their weaknesses that are meant to highlight key aspects for consideration in the built risk approach.

In one example of a current risk management process, the American financial sector's Enterprise Risk Management (ERM) doctrine is a result of the Treadway Commission's look at fraudulent financial reporting in 1987.¹³ The ERM doctrine built in the aftermath is heavily influenced by the concepts of accounting and internal control. Inherent in this doctrinal process is the concept of engineering control – the idea that by measuring, counting, and modeling

¹² Heller, Rober, *The Naked Manager*, Barrie and Jenkins (London, 1972), p 11.

¹³ Tanki, Frank, *What the Treadway Commission's Internal Control Study Means to You*, Journal of Accountancy, 1 Nov 92, downloaded from <http://www.allbusiness.com/accounting-reporting/auditing/332449-1.html>, accessed 22 September 2010.

something a quantifiable output can be achieved and analyzed. There are two goals of ERM: the promise that the mistakes of the past will be mitigated and the aspiration that opportunities will be created in the future. However, the current ERM doctrine is “a design which strongly reproduces the accountant’s conception of what matters.”¹⁴ Taleb goes further, and argues that the current fiscal crisis is not new, and mechanisms such as ERM cannot deal with black swan [in other words, unforeseen] events.¹⁵

The challenge of risk management is to identify and mitigate risks throughout an organization – and quite possibly a society. According to Monahan ERM has a sound methodology based on measurement, but he readily acknowledges that methodology does not overcome the higher thought processes of “Why?”¹⁶ Power states that the current “smothering normativity [sic] of the accounting and auditing logic” is a barrier to wider values based institutional understanding of risk.¹⁷ In an interesting article on the Afghanistan war, Pat Knapp argues that “President Bush took his eye off of the ball in Afghanistan...but what is far more consequential is that we have misidentified the ball altogether.”¹⁸ Justin Fox argues in his analysis of hurricane Katrina responses, that we can still get risk scenarios very wrong, no matter how many whiz kids and statistics we have.¹⁹ The issue of why we measure things is the key question in any methodology.

In a further American example of risk management practice, the extensive National Aeronautics and Space Administration’s (NASA) risk management processes are based on

¹⁴ Power, Michael, *The Risk Management of Nothing*, Accounting, Organization and Society, Number 34 (2009), p 851.

¹⁵ Taleb, Nassim, *The Black Swan*, Random House Trade Paperbacks (New York, 2010).

¹⁶ Monahan, Gregory, *Enterprise Risk Management: A Methodology for Achieving Strategic Objectives*, John Wiley and Sons (Hoboken, NJ, 2008), p viv.

¹⁷ Power, p 851.

¹⁸ Knapp, Pat, *Statism Fails in Afghanistan Too*, The Washington Times, <http://www.washingtontimes.com/news/2010/nov/26/statism-fails-in-afghanistan-too/?page=1>, accessed 26 November 2010.

¹⁹ Fox, Justin, *A Mediation on Risk*, CNN.com Fortune Magazine Article, 3 October 2005, http://money.cnn.com/magazines/fortune/fortune_archive/2005/10/03/8356704/index.htm, accessed 27 October 2010.

engineering principles. The NASA process is heavily weighted towards Risk Informed Decision Making (RIDM), and Continuous Risk Management (CRM). In the NASA RIDM Handbook it is explicitly stated that RIDM is “part of a systems engineering process.”²⁰ All of the NASA risk processes are heavily hierarchical, with lower units responsible for local risks, but also responsible for reporting more serious risks upwards. In NASA’s model, higher institutional risks are defined as the aggregate of all risks in a given domain.²¹ Extensive explicit direction on the probability and calculation of risk, as well as other specific direction on classification of components and is included in this process. In reviewing this NASA program it is apparent that it is heavily weighted to engineering principles in a similar way that ERM relies on accounting. But NASA’s process has endured biting criticism in the face of several spectacular Space Shuttle disasters.²²

In a broader Canadian Government context, and as a possible solution to the CF’s lack of risk doctrine and training, the Treasury Board of Canada’s *Framework for the Management of Risk* is useful.²³ This framework argues for a “principles based approach to integrated risk management”, and is widely based on current civilian risk management structures, policies, and frameworks. One could argue that the Treasury Board of Canada, the Government of Canada’s money managers, is the wrong place to look for a military approach for risk. However the framework they propose for the Government of Canada has a good structure and being based on the current international standard is widely applicable. But, as a generic framework, it has its limitations.

In Taleb’s popular example, he outlines Las Vegas casino risk models. These casino risk models are highly biased towards the probability of gambling losses and theft due to customer manipulation of the odds. He outlines the various exotic techniques the casinos have to hedge

²⁰ NASA Document SP-2010-576 NASA Risk-Informed Decision making Handbook, Version 1.0, April, 2010, found at <http://www.hq.nasa.gov/office/codeq/doctree/SP2010576.htm>, accessed 22 September 2010.

²¹ A complete review of the NASA Risk management process can be found at The NASA Risk Management Page, <http://www.hq.nasa.gov/office/codeq/risk/index.htm>, accessed 22 September 2010.

²² Post Challenger Assessment NASA Risk

²³ Government of Canada, Treasury Board of Canada Secretariat, Framework for the Management of Risk, <http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=19422§ion=text#cha1>, accessed 3 March 2011.

against any gambling loss, and argues that as the risks are purely probabilistic (IE something a human can easily understand) and elaborate means of mitigating the risks were not really necessary. But, he argues, convincingly, that the major risks to a casino most likely lie outside of their traditional risk models of probability and outlines major risks to casino businesses that were not accounted for, such as the revenue lost when a tiger mauled a human performer.²⁴ Slovic, quoted in Wilson and Crouch synthesizes the concept of the known and unknown well (but even so does not acknowledge the Black Swan, or unknown unknown [sic]) by plotting hazards on a two dimensional plot – the Y axis moving from known to unknown, and the X axis from no dread to dread. An example of a Slovic plot is reproduced at Figure 1.

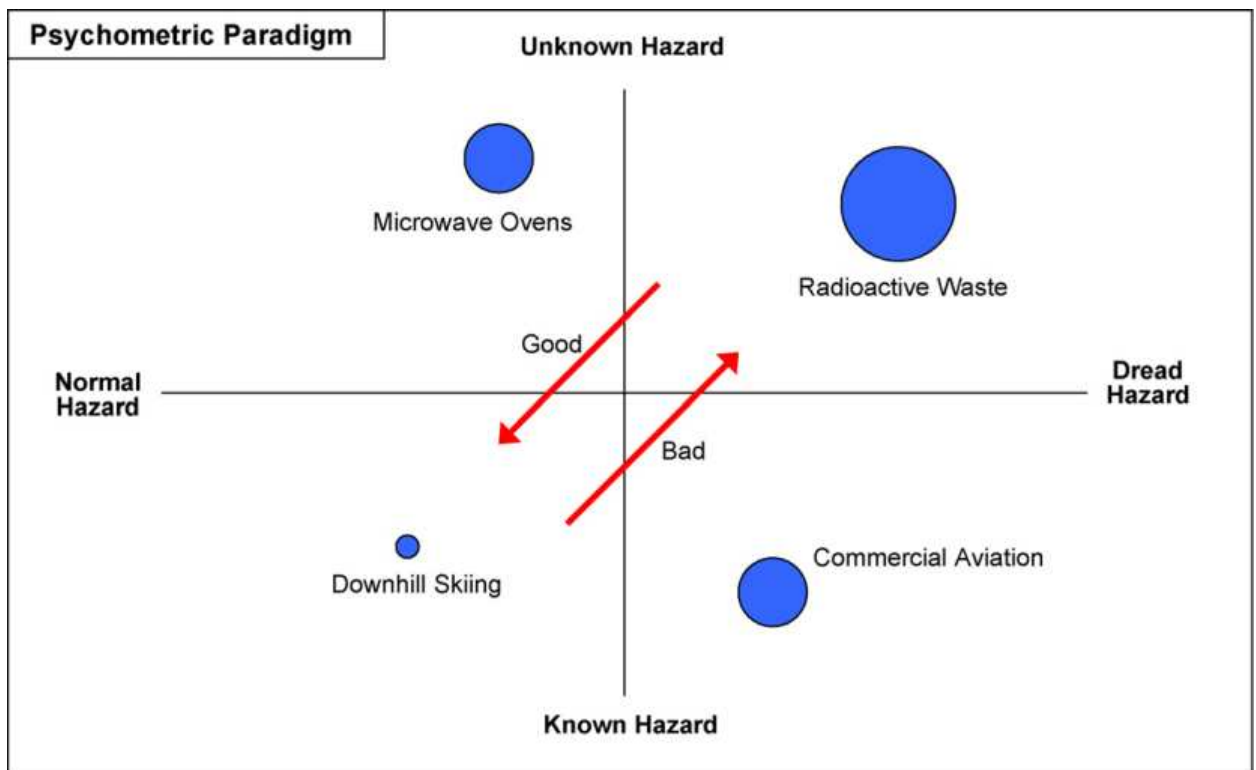


Figure 1 Slovic Plot illustrating known and unknown hazards²⁵

²⁴ Taleb, p 130.

²⁵ Singleton G, et al., Public risk perspectives on the geologic storage of carbon dioxide, Int. J. Greenhouse Gas Control (2008), doi:10.1016/j.ijggc.2008.07.006 (downloaded from WWW.environmentportal.in, 30 July 2012)

So what to make of these examples of risk management processes? Each is relatively well articulated, and each has a focus, and yet spectacular failures are evident. These examples could be characterized as spectacularly corporatist and interest based, but they do mirror in some way existing military processes. But, logically are business and engineering processes even remotely applicable to military affairs given the divergent aims of each organization? Taleb's Black Swans seem to be everywhere – how is the unknown dealt with? There are some analyses of organizational behaviour that could provide clues, and may be demonstrably relevant to the task at hand – a multi-disciplinary military centric approach for risk.

In a broad study of risk management practices in business by Anette Mikes of the Harvard Business School, Michael Power's criticism of technical processes involved in modern business risk management is further reinforced.²⁶ Mikes' use of primary research in the form of interviews with senior staff regarding risk management before and during the current credit crisis reveals widely divergent views, philosophies and uses of risk management within organizations. Her research reveals broad "metrological dramas" within organizations playing out in widely diverse ways. In other words, she reviews the measurement of things, but tends to agree with Power in that these measurements tend to lead to nothing of substance. In the end, business control and risk management did not prevent the credit crisis, much like the Space Shuttle disasters were not avoided. Her conclusion is this – risk management should take on more qualitative approaches as a way of re-invention. As Professor Ladkin argues in his extensive analysis of engineering risks, the logic used to derive risks and then further deal with risk is at times fundamentally flawed.²⁷ Taleb agrees with Ladkin's analysis, but goes even further by arguing that determining causal relationships on faulty logic we can actually trigger an extreme event that was not forecasted, or if the event was envisioned it was of such a remote probability that nothing was done (Taleb calls this type of event a "Black Swan"). Drawing the parallel

²⁶ Mikes, Anette, Measuring and envisioning risks: boundary work in risk management, SSRN Website, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1654254, accessed 8 August 2012.

²⁷ Ladkin, Peter, The Why-Because Analysis Homepage, <http://www.rvs.uni-bielefeld.de/research/WBA/>, accessed 8 August 2012.

between Mikes', Ladkin's and Taleb's work, even the logic of measuring something within an organization can be questioned, and thus the measurement of nothing that Power suggests is certainly in play.

In a Rand report discussing United States Air Force (USAF) cost risk analysis in major systems procurement, the authors conducted interviews with senior officials in order to determine risk management issues within the USAF.²⁸ Using a similar methodology as Mikes, the Rand report finds similar issues within this particular military-fiscal area – quantitative analyses may be meaningless due to uncertainty, and qualitative analyses are subjective and do not allow for the aggregation of lower level risks.²⁹

Thus there is evidence that organizations deal with risk in fundamentally flawed ways, in both quantitative and qualitative domains. Vose argues in his authoritative book on risk analysis, that “the biggest uncertainty in a risk analysis is whether we started off analyzing the right thing in the right way.”³⁰ In addition, the lack of qualitative approaches is identified as organizational weakness. In the theme of think or die, arguably thought is the most important element, and if qualitative thought is not present, risk is not understood by the institution. Thus, one way of addressing risk management failures could be to increase qualitative approaches. But, complexity is an issue that cannot be addressed by just increasing qualitative thought. Complexity is the head of the monster, and must be acknowledged as elemental in modern risk discussion.

It is here that the concept of a wicked problem must be further discussed. The sentiment gathered from the previous review of risk management processes generates a feeling of complex helplessness. With all of these obviously smart people around, why do our processes neglect to solve problems? In this era of smart cars, smart phones and smart refrigerators, why do we continue to experience unforeseen disaster when we have plenty of previous disasters to draw experience from? In fact this helpless sentiment was articulated by Ackoff when describing what he called a “mess” and Rittel and Webber as they lamented about “wicked” problems faced by

²⁸ Arena, p 71.

²⁹ Arena, p 43.

³⁰ Vose, David, *Risk Analysis, A Quantitative Guide*, 3rd Ed, John Wiley and Sons (West Sussex, 2008), p 35.

urban designers and planners.^{31,32} Rittel and Webber's theory is that a wicked problem is one that defies solution, and in fact defies characterization. It is a problem that we struggle to define in the first place, let alone solve. Their problems defy the hubris of systems analysts who claim to be "universal problem solvers." A wicked problem is an infinite bad onion, where the peeling and refreshing and washing of the problem simply uncovers another rotten layer. Their conclusion is this – the theoretical dilemmas uncovered by the study of wicked problems, the lack of any win-win beat, of a true-false lyric or of any non-zero sum rhyme in modern pluralistic society may be the true wicked problems societies face. Truly a wicked problem is not just an end, but a beginning to a new problem.

Wider perspectives on Risk

There is hope for the military commander – there are sound theories to use in building a risk approach upon which this paper will draw, though these theories and the approaches they suggest may be less comforting than an engineering analysis. Even Rittel and Webber argue that there is hope. They state:

“where large system problems are generated, [we should] seek to ameliorate [the] most deleterious effects. Where latent opportunities become visible [we must] seek to exploit them. Where positive non-zero-sum developmental strategies can be designed [we] would of course work hard to install them.”³³

There is hope they argue, and so this paper argues as well. Do not be fooled by a problem, as if we incorrectly try to tame a simple problem while not recognizing its complexity we may generate dangerous situations, but recognize the problem's complex nature, identify the

³¹ Ackoff, R.L. quoted in King, Jonathan, *Learning to Solve the Right Problems: The Case of Nuclear Power in America*, Journal of Business Ethics, Vol. 12 (1993), p 106.

³² Rittel, Horst and Melvin Webber, *Dilemmas in a General Theory of Planning*, Policy Sciences, Vol. 4 (1973), pp 155-169.

³³ Rittel and Webber, p 169.

tools available, attempt to use a methodical approach, and accept there may be no ideal solution.

Amongst academic and professional risk analysis organizations there is general agreement on the higher components of methodical risk analysis. The components are: risk assessment, risk management, risk communication and decision making.^{34,35,36} Within these components, further more specific methods designed to characterize risk are available, both quantitative and qualitative. Within this lower level method are techniques such as cost-benefit analysis, probabilistic analysis, fault tree analysis, strategic objectives at risk (SOAR) and so on. Furthermore, risks have attributes that must be addressed, and various criteria may be used to judge risks. Examples of risk criteria are zero risk, as low as reasonably achievable (ALARA), best available control technology (BACT), and cost-risk-benefit analysis.^{37,38} The Australian DMRF provides a good review of all the processes required for methodical risk treatment, though arguably its “top down systems approach” may be limiting, and the technical approaches somewhat overwhelming. But the Australian approach does state that its processes can be used by anyone in their defence structure, from the soldier to the politician, in separate and distinct ways, or at an enterprise level, injecting a “considerable level of objectivity in the decision making process.”³⁹ But a key common element of any risk management model, before the analysis or assessment phase of the process, is the measurement of risk indicators.

In each sector risk is measured. In the financial sector risk is measured in dollars. Mikes’ and Power’s reviews of financial institution’s risk management records are examples of the

³⁴ Government of Canada, Treasury Board of Canada Secretariat, *Framework for the Management of Risk*

³⁵ Arena, Mark V., et al, *Impossible Certainty, Cost Risk analysis for Air Force Systems*, Rand, (Santa Monica, 2006), p 3-5, http://www.rand.org/pubs/monographs/2006/RAND_MG415.pdf, accessed 14 Oct 2010.

³⁶ Wilson, Richard and Edmund Crouch, *Risk-Benefit Analysis*, Center for Risk Analysis, Harvard University, 2nd Edition, (Harvard University Press, 2001), p 147.

³⁷ Wilson and Crouch, p 153-154.

³⁸ For an example of a taught course in these methodologies refer to MIT’s Open Courseware “Engineering Risk-Benefit Analysis”, as taught in spring 2007, <http://ocw.mit.edu/courses/engineering-systems-division/esd-72-engineering-risk-benefit-analysis-spring-2007/>, accessed 26 January 2011.

³⁹ Australian DRMF, p 72-73.

measurement of money, or the measurement of nothing, they may argue. In engineering, risk is usually measured in the potential for destruction of lives or major damages to infrastructure. A common wicked problem that is the subject of meticulous measurement is the problem of cancers potentially caused by radiation exposure from nuclear power generation.⁴⁰ In military domains risks are often measured in individual areas and then aggregated from multiple domains into “stop light” presentations. This metrological focus in organizational risk is always present but may or may not be accounted for or understood well.⁴¹

Included in the theme of measurement is the criterion of worth. Moving further along the measurement theme, the issue of what to measure and why comes to the forefront. To be blunt, the assumed major focus of this criterion in military operations is the cost or worth (usually in money, but maybe in terms of public support or political cost, or ability to absorb casualties on the battlefield and still win) of a human life. A study by Cohen cited by Crouch and Wilson illustrates the cost of a human life by measuring the past cost of actions that avert human fatalities.⁴² This civilian retrospective analysis avoids the moral implications of a forward view of assigning a price to a human life, and is overly simplistic on a moral military plain but gives insight into a cognitive way of approaching an intractable problem.

In a further measurement or appraisal of the worth of human life, LtCol William Snyder remarks in his systems analysis case studies, that “it is sufficient ... to emphasize that some value has been assigned to human life.”⁴³ But, as Klinke and Renn argue, this focus may be too simple a view. Along with Short and Rosa, they argue that “risk cannot be confined to perceptions and social constructions alone... nether can it be reduced to objective outcomes [such as] fatalities.”⁴⁴ This worth criterion, and the subsequent measurement requirements included therefore is open to qualitative value judgments as well as quantitative analyses, and measurement is not only a quantitative process. Thus the built approach of this paper must acknowledge the fundamental

⁴⁰ King, p 107. and Wilson and Crouch, p 68.

⁴¹ Conrow, p 336.

⁴² Cohen cited in Crouch and Wilson, p 219-220.

⁴³ Snyder, LtCol William, *Case Studies in Military Systems Analysis*, Industrial College of the Armed Forces (Washington, D.C., 1968), p 143.

⁴⁴ Klinke and Renn, p 1076.

thought processes of any measurement system and recognize the complex weave of implications included in any measurement. To analyse or assess, the first step in a methodical approach, the initial measurements must be understood. But, as something is understood and measured there are complexities, uncertainties and ambiguities that must be resolved before any assessment can occur.

Risk is a concept that someone devises where there is a vision of something happening, good or bad. In the retrospective, bad things have already happened, and ours is the effort required to ensure it doesn't happen again; a so-called "Lessons Learned" situation ideally addressed by the "Learning Organization." In a more abstract sense, risk can be envisioned. Risk is something bad that's going to happen – it just hasn't happened yet. Three potentially intractable problems arise when envisioning risk: complexity, uncertainty, and ambiguity.⁴⁵

Complexity in risk is the inability to model, analyse, decompose or otherwise find causal relationships when dealing with risk. Ladkin's work, along with Wilson and Crouch allude to this complexity in their work to determine cause through logical analysis. Complexity is at the heart of Ackoff's argument that interdisciplinary approaches are the only way to address wicked problems.⁴⁶ King reviews what he describes as "interactive complexity", or the "measure of the degree which we cannot foresee all the ways things can go wrong."⁴⁷ Taleb's more popular "Black Swan" is much the same beast, a surprise outcome that wasn't predicted resulting from a complex situation.

In the future domain, risk is the principle of uncertainty. Van Asselt's *Perspectives on Uncertainty and Risk* is an excellent resource on the broader concept of uncertainty and risk. In essence uncertainty revolves around variability, systematic and random measurement errors, indeterminacy, and lack of knowledge.⁴⁸ In addition, Van Asselt argues that wider interdisciplinary approaches to understanding are required when faced with uncertainty. In the

⁴⁵ Ibid, p 1085.

⁴⁶ Ackoff, R.L., *Systems Thinking and Thinking Systems*, System Dynamics Review, Vol. 10 No's 2 and 3 (summer-Fall, 1994).

⁴⁷ King, p 108.

⁴⁸ Klinke and Renn, p 1079.

military domain, Van Creveld argues that command uncertainty in war must be acknowledged and processes put in place to deal with it.⁴⁹

Ambiguity results from the inability of a wider society or organization to agree on an interpretation of events or facts. This lack of agreement rests on the variability of legitimate interpretations of a risk. In the ambiguity area, value judgments and moral decisions become important.⁵⁰ Ambiguity is a key area which may be addressed by full and complete narrative, with an aim of achieving wider institutional understanding of an issue.

In the face of complexity, ambiguity and uncertainty our predictions of the future many times do not hold true. And, as Taleb argues, we will never know what we do not know, and any thought that a human can predict the future is quite simply wrong. Therefore the knowledge that we do have and the mental processes that we use as humans tend to lead us to unreasonable and unlikely forecasts of the future. In fact, risk processes have been demonstrated to highlight areas of concern, but not acknowledge or address hidden risks. Taleb agrees with Van Asselt by arguing that focusing, or only using specific and detailed scientific and statistical modeling tends to narrow our options and lead to an incorrect view that all risks are being managed. A true wide view of the world with all its possibilities is the best way of coping with his Black Swan, and Quade and Boucher agree by stating that “the most frequent cause of error [in systems analysis is failure] to look at the full range of alternatives [leading to] a cherished belief.”⁵¹ Bousquet argues further that the scientific discourse in military affairs designed to create order and certainty has only been successful in bringing about the requirement for new systems, not reducing uncertainty.⁵² Ralston Saul goes further and argues that narrow interests, corporatism, the recent growth of experts with power and knowledge, have not resulted in a better society just as the time saving mechanical devices of the 1950’s have not increased our leisure time, despite their promises. He argues that corporatism has given society the illusion of more structure and certainty, with the sole aim of advancing their bottom line. “The corporate system depends on

⁴⁹ Bousquet, p 242.

⁵⁰ Ibid, p 1085.

⁵¹ Quade and Boucher, p 350.

⁵² Bousquet, p 244.

the citizen's desire for inner comfort."⁵³ Thus, the military obsession with attempting to create certainty, which is at least facilitated by the corporate entities such as the US military-industrial complex described by Eisenhower, in fact has not reduced uncertainty.

The final discussion in the area of complexity, uncertainty, and ambiguity is the art of prediction. Taleb reviews predictions and forecasts with much cynicism. His central argument is that no person can know the future; otherwise we would know its outcome before it is here. His deconstruction of the notion of simple linear future projections, which are the baseline of many predictions and forecasts in society, is quite thorough. In fact, humans are very prone to believing simple linear models, and their subsequent line to the future, simply because of its narrative power as it is the way we perceive the world. The bottom line is no person can ever know the future, and this notion must be held strongly to counteract our tendency to believe linear models.

These preliminary discussions of methodologies, and concepts in risk set a tone for this paper. These thoughts are presented to set a broad stage for more the specific subjects that follow. In particular, the military context will now be introduced to join this paper with its focus - the military officer.

Like the civilian context risk is always present for the military commander. In the case of the military commander, the process for identifying and dealing with risk is usually conducted intuitively. That is to say, military commanders are usually not specifically trained to use a risk management model to identify risks and then mitigate the effects that risks have in complex situations.⁵⁴ In fact, the military commander may not even have a framework with which to consult when dealing with complex institutional risks, and may rely solely on intuition. Certainly this intuitive ability is valuable as a RAND report suggest.⁵⁵ However, this intuitive ability cannot be developed evenly across all officers, especially when dealing with risk, if there is no specific institutional development process. A more focused process of officer development in the risk area may unlock one of the many doors to an appropriate risk framework.

⁵³ Ralston Saul, John, *The Unconscious Civilization*, House of Annasi Press (Concord, ON, 1995), p 195.

⁵⁴ A deficiency noted in the Canadian Air Force in the preparation of formal flight test training, and anecdotally throughout the Canadian Forces as a whole.

⁵⁵ Camm, Frank et al, *Managing Risk in USAF Planning*, RAND Project Air Force (RAND, 2009), p 106.

In the military domain risk is always present. But, risk can be a negative or something to avoid, or it can be a positive or something to exploit. Thus there are risk avoidance as well as risk taking strategies. The avoidance of risk is evident in areas such as health care, where the public may be completely risk averse, or only willing to support zero risk scenarios. There are also risk taking strategies, where the advantages of risk taking must be weighed with the disadvantages of failure. In the military domain, this paper assumes that military commanders are risk takers simply because it is their business. They go in harms way to execute a plan. But Robert Gates laments the opposite in an address to West Point as those that do not go in harm's way as being rewarded for having a "risk averse, zero defect culture."⁵⁶

Brodtrick reviews the effects of an innovative culture on an organization, a culture in which risk taking for innovation may be present. He argues that risk taking, and thus innovation in an organization, may be faced with positive or negative feedback. In the positive, "risk taking and learning are enhanced [no matter the outcome of the risk taking strategy], improved and made more sophisticated." Whereas in the negative, "even honest errors based on reasonable risk taking result in reprimand, innovation...suppressed in favour of 'going by the book'."⁵⁷ Gates' lament includes the risk adverse officer, who keeps the head down and avoids controversy and risk taking, obviously as a result of Brodtrick's negative. But Brodtrick also argues that the level of risk taking required for innovation and organizational improvement is different for all organizations, depending on the values of that organization. He uses a diagram, shown at Figure 2, to illustrate the hierarchy where members of an organization could be in their culture by showing, albeit in a Cartesian way, how an organization moves from risk avoidance to risk as an opportunity.⁵⁸

	Innovation: Discontinuous	Innovation: continuous	Innovation: ambidextrous
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⁵⁶ Gates, p 3.

⁵⁷ Brodtrick, Otto, *Risk, Innovation and Values: Examining the Tensions*, a report prepared for the Risk management Division, Comptrollership Branch, Treasury Board Secretariat of Canada, 15 April 1999.

⁵⁸ Brodtrick, p 36 and p 46.

Risk: An opportunity Value : Embrace it			
Risk: A necessity Value: Manage it			
Risk: A danger Value: avoid it			

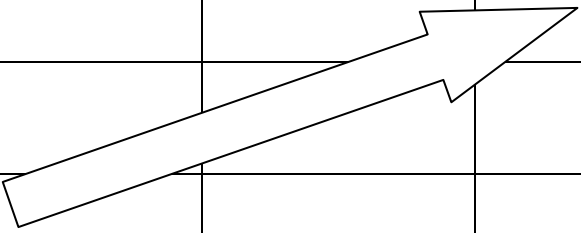


Figure 2 Brodtrick’s Innovation Hierarchy

Obviously the military officer is different from the public servant, the nuclear power station operator, and the grocery clerk, each person having their own institutional and personal values. So, what values does a military officer have? One answer may be seen from an analysis of how a military officer is developed.

In the course of the military commander’s development the ability to identify and deal with risk is usually germinated through the process of tactical actions where risks are inherently black and white – shoot or be shot, advance or retreat etcetera. In the further development of the officer, Caforio argues that operational level and staff experiences are of varied natures and are not designed to specifically address risk but to develop the officer’s multi-disciplinary approach to problems.⁵⁹ This creates a more generalist officer as the officer advances in rank, appointment and experience. A particular criticism of the development of Canadian officers is presented by Haycock, where he addresses the emphasis placed on scientific and engineering in military officer education, and the lack of emphasis on the arts within the officer development framework.⁶⁰ To go further, William Simons argues that a much broader military education is required for the modern officer to transcend parochial service doctrine and produce “flexible,

⁵⁹ Caforio, Giuseppe, *Military Officer Education*, Chapter 15 in *handbook of the Sociology of the Military*, Kluwer Academic/Plenum Publishers (New York, 2003).

⁶⁰ Haycock, Ronald G., *The Labours of Athena and the Muses: Historical and Contemporary Aspects of Canadian Military Education*, in *Military Education, Past Present and Future* (Praeger, Connecticut), 2002, p 167-195.

imaginative, and well rounded minds.”⁶¹ In other words, most of officer development is usually carried out through on the job training in technical domains, bounded by the technical complexity of the systems the officer is tied to along with the doctrine and procedures developed for the application of force, though professional military education including the arts is becoming increasingly the norm.

As the military officer and commander is born through on the job training and multi-disciplinary approaches albeit with an engineering bent, the training and outlook that enable a clear and decisive process of dealing with risk may or may not be present. This ad hoc approach to higher level risk management experience could lend itself to erratic development and application of principles. What this erratic development means to the officer corps is inconsistency, an inability to operate together as one in a large institutional setting or for that matter in a combat scenario. There could be several ways to address these issues, and one possible recourse for the military commander is to rely on a risk management model developed elsewhere, perhaps from a civilian context.

In the civilian world, risk managers were developed in the wake of some spectacular disasters (see Bhopal, the Columbia disaster, or the Great Depression and many others). As a career field, risk managers are typically management gurus who advise commercial leaders on the risks within their organizations. The civilian risk manager, as a narrow specialist management discipline, is now born. However, this civilian business based framework is under criticism. Michael Power, an academic at the London School of Economics and an ardent critic of Enterprise Risk Management (ERM) argues in his book *The Risk Management of Everything* that the current civilian risk management frameworks are less concerned with intelligent organizational solutions and more concerned with regulation and litigation.⁶² In a further recent paper “The Risk Management of Nothing”, Power advocates for a more complex and deeper understanding of integrated organizational risks rather than the narrowly defined calculus of

⁶¹ Simons, William E., *Liberal Education in the Service Academies*, The Institute for Higher Education (Columbia University, 1965), p 29.

⁶² Power, Michael, *The Risk management of Everything – Rethinking the Politics of Uncertainty*, Demos, 2004, p 58-65. This publication can be found at www.google.com/books.

relatively meaningless metrics.⁶³ The risk manager as a civilian profession, and possibly as an example of the corporatist and interest based ideology, clearly has challenges, especially when viewed through the lens of the 2009 financial crisis.

But the military officer has a unique situation. Military officers, particularly at the senior officer level, are multi-disciplinary and thus must usually use their own faculties and resources to solve problems without specialist help. True, there are specialist military officers, but there are no professional risk managers within the military ranks. It is an organizational culture, and a requirement of officer development in the US and in Canada that the officer corps is intellectually capable of addressing most if the institution's administrative and operational needs, and all of the institution's leadership requirements short of the political level.^{64,65} Robert Gates, in his final address as Secretary of Defense to West Point, quotes John F. Kennedy by saying "your military responsibilities will require a versatility and adaptability never before required in war or in peace." Gates goes on to say "America can only succeed with leaders who are themselves full spectrum in their thinking...that will help you at least ask the right questions."⁶⁶ Given Power's criticism of certain business related civilian risk management frameworks, this multi-disciplinary approach to officer development may be a redeeming feature of the military environment.

Thus, the military commander is mostly alone in identifying and dealing with risk, and leading the institution forward in the face of risk, and according to Caforio, increasingly complex conflict scenarios.⁶⁷ Saying this, this paper also acknowledges the civilian/military structure of

⁶³ Power, Michael, *The Risk management of Nothing*, Accounting, Organization and Society, Number 34 (2009), p 851.

⁶⁴ Queen's University Website, Historical Studies in Education, Officer Professional Education in the Canadian Forces and the Rowley Report, Colonel (retired) Randall Wakelam, http://library.queensu.ca/ojs/index.php/edu_hse-rhe/article/view/334/393, accessed 5 October 2010.

⁶⁵ Coombs, Howard G., In Search of Minerva's Owl: Canada's Army and Staff Education (1946-1995). Coombs argues that Canada's Officer development system has mirrored first the Commonwealth system, and then more recently the American system.

⁶⁶ Gates, Robert, Address to West Point 25 February, 2011. Text online at <http://www.stripes.com/news/text-of-secretary-of-defense-robert-gates-feb-25-2011-speech-at-west-point-1.136145>, accessed 3 March 2011.

⁶⁷ *Social Sciences and the Military*, Giuseppe Caforio Ed., Routledge (New York, 2007), p 6.

the Canadian DND. The DND is a government department that uses civilian public servants for administration. These public servants are not required to perform operational military functions, and thus are not required to move frequently. These public servants, on the one hand, often have more experience in their domain than their military officer counterpart, but on the other hand they lack the broad experience of the military officer. The public servant is also a part of a corporate structure, and usually serves very narrow interests. In this construct for the Canadian DND and CF risk programme to be comprehensive, it must include the civilian public servant. But in this paper's view, the CF officer is the one who envisions the military risk. The CF officer is the one who leads the main effort. The CF officer is the one who feels the consequences of any malformed risk plan. The CF officer is accountable and responsible, and thus is mostly alone in campaigning for or against a risk.

This paper argues that this same officer and commander may not have been given the formal tools to methodically and completely address complex institutional risks. When standing alone and accountable in front of a demanding public, the military officer should at least look for a framework to lean upon when addressing risk in order to serve as effectively as possible. In searching for a framework the officer must understand the limitations of existing processes.

One of the critical failures of current risk management frameworks is the inability of organizational systems, operational and political, to fully comprehend wider organizational risk.^{68,69} Beck, in his *Risk Society*, argues that society in general has been progressively “disenchanted with the failure of expert systems to effectively contain and deflect risk.”⁷⁰ Part of this weakness is communication within an organization, and the establishment of a common world view amongst actors in the system or organization. The use of theoretical concepts is critical to developing a deep understanding of the need for a discourse based approach to the common institutional understanding of risk. In other words, the most important element of this paper's proposed risk approach is not the generation of risks (this paper assumes the military

⁶⁸ Ladkin, Peter, *Causal System Analysis*, draft version 14 Aug 2001, <http://www.rvs.uni-bielefeld.de/publications/books/ComputerSafetyBook/index.html>, accessed 27 September 2010, p 17.

⁶⁹ Power, p 851.

⁷⁰ Mythen, Gabe, Reappraising the Risk Society Thesis: Telescopic Sight or Myopic Vision?, *Current Sociology* Vol. 55, No. 6 (2007), p 798.

officer is capable of envisioning risks within their milieu) but the effectiveness of communicating risk and creating an institutional understanding of risk. This paper will rely on selected philosophical, psychological and sociological concepts to describe effective means. Put another way, if an institution has a risk, the risk must be understood fully by the entire institution before any meaningful action can occur. Moving further, once the institution has a common understanding of risk, an idea of how to address the risk must be understood by the organization, and a solution built across the organization.

"The Answer to the Great Question of the Meaning of Life, the Universe and Everything is Forty-two." Douglas Adams, Hitch Hiker's Guide to the Galaxy (1979)

Forty-two. This quote illustrates a feeling of the random and meaningless state of the world. Reading on in the Hitchhiker's Guide, the computer which calculated the answer forty-two replied to humanity "that what the problem really was that no-one knew the question."⁷¹ Philosophically, this illustrates the dilemma that this paper develops regarding risk. It is a difficult subject to address on many levels, and the complexity of risk suits the development of many elaborate systems to deal with it. As Douglas Adams proposes finding the right question is the elusive. Therefore more than anything robust thought must be applied to the problem including finding the right questions to ask and finding the right communication channels to use. The following section of this paper deals with qualitative approaches and key theoretical concepts that are presented for the military officer. As we move past the assessment phase of the common risk framework, it is envisioned that the addition of the approach of this paper will help the officer think in new ways, understand his or her environment better and build better communication strategies. Thus, the methodology of this paper drapes a new qualitative approach on the common methodology of assessment, management, communication and decision making.

⁷¹ BBC Online, The Hitchhiker's Guide to the Galaxy, The Guide, <http://www.bbc.co.uk/cult/hitchhikers/guide/question.shtml>, accessed 28 October 2010.

Determinism – only a perspective of reality

The qualitative approaches to risk suggested in this paper centre on philosophical, psychological, and sociological approaches. In this realm organizational risks require diversity of approach, and broad perspectives. The analysis of risk should touch on a broad array of characteristics in order to deal with relevancy, relativity, meaning, focus and many other attributes of a potential risk. The risk must be understood, not only by the individual but as an organization or society. To understand the dynamics of individual and societal processes at play, the focus of this paper will now turn towards theoretical concepts and the deterministic view of the human. Theory is used to serve as a foundation for understanding for a broader qualitative approach, an approach which should facilitate a wider institutional communication process or risk. It is with this thought that this paper will continue and the treatment and discussion of relevant theory from a philosophical, sociological, psychological, philosophical and logical point of view to address a qualitative deficiency in organizational risk programmes.

So it is with trepidation that this article delves into philosophical enterprises such as what exactly is reality, and existentialist views of why we exist in the first place. The point is this: human beings perceive the universe in their own peculiar way, and we see, hear, feel, and smell the universe in unique ways which influence our behaviour. We generally see the world simply, in a deterministic way, where cause and effect prove to us the existence of something. This paper argues that selected theoretical bases for a deep understanding must be kept in perspective at all times, as they are of direct relevance to the question “Is there risk?”, and if so “What do we do about this risk?”

Humans must interact with the world around them by recognizing the animate and inanimate objects around them, and forming cognitive views of the world. This deterministic view of the world does not take into account the debate over what is real and what is not real by studying, as much as possible, human cognitive capability and perception of the world. Without delving too deeply into philosophy, the human being must be aware of the limitations of its deterministic nature and consciousness. The production of reality by the human being is relative, though we tend to see reality as an absolute.

In constructing reality, we need to construct boundaries to differentiate between objects – otherwise the objects blend together. The human tends to separate objects and examples of the constructed boundaries are temporal, spatial, or moral. In risk analysis facts may be seen as

boundaries; a fact is a fact, undisputed. But looking from another perspective, Ladkin asserts that assumptions and value judgments must be made in order to construct the deterministic view of what facts are relevant.⁷² Thus there are not simply just facts, there are assumptions, values, and morals embedded in any risk assessment. In a more complex view of factual boundaries, frames are often built around situations that cannot be categorized simply.

Framing is the process of putting bounds on experience and is “the act of surrounding situations, acts, or objects with mental brackets.” Frames allow us to make sense out of situations, but they also lead us to “ignore entire acts or objects despite their physical presence.”⁷³ These human boundary creation techniques help us deal with the experiences we have in the world and they are entirely relevant in the approach proposed by this paper.

In organizations boundaries matter and boundaries define what is acceptable and what is not. Boundaries are part of the human framing process, and as Mikes’ research indicates, Gieryn’s boundary-work theories, which describe problem solving by approaching boundaries rather than normalizing behaviour, are very relevant to the discussion of risk management and human social interaction. His treatment of the science versus non-science boundary is also important.⁷⁴ In a classic study on the effects of framing, Tversky and Kahneman argue that rational choice, and particularly the coherence criterion, is in jeopardy due to their findings that framing induces effects on rational choice.⁷⁵ In other words Tversky and Kahneman proved empirically that choices change when the exact same choice situation was framed differently.

The boundary between scientific and non-scientific thought is an important distinction in society. Science has bounded societal understanding of complex problems in many cases, and catered to this human determinism. But, in a study that compared the risk management aspects of three disasters or potential disasters Marchi and Ravetz argue that the science that bounded our knowledge and framed the debate in the past is no longer acceptable. For example in the large

⁷² Ladkin, p 18.

⁷³ Zerubavel, Eviatar, *Islands of Meaning*, an essay included in *The Production of Reality*

⁷⁴ Gieryn, Thomas, *Boundary-Work and the Demarcation of Science from Non-Science: Strains and Interests in Professional Ideologies of Scientists*, *American Sociological Review* Vol. 48 (December, 1983).

⁷⁵ Tversky, Amos and Daniel Kahneman, *The Framing of Decisions and the Psychology of Choice*, *Science*, New Series, Vol. 211, No. 4481 (January 30th, 1981), p 458.

scale toxic gas release at Seveso, Italy, the BSE crisis in the UK and the debate over licensing genetically modified maize the authors show that post normal science, where policy debate amongst a wide variety of actors and stakeholders is necessary to deliver a more robust risk programme, is necessary.⁷⁶ In essence the science that drove expert opinion and thus policy in the past must be trusted but is now only one component of a true risk programme rather than the driving force. Society now understands, particularly with such concrete examples of science used incorrectly in the UK BSE crisis, that policy must not be driven by scientists alone – they are only one piece of the complex problem. Now that science is understood to be only one tool in the risk programme the issue of decision making under risk must be addressed.

A major area of study in framing is decision making under risk. Tversky and Kahneman's thesis that shifts in preference are perceptible when problems are framed in different ways is foundational to this discussion. Thus the requirement of a human being to have a frame for decision making is tempered by the fact that "imperfections of human perception and decision...changes perspective [and this change in perspective] changes the relative apparent size of the object [or intellectual concept], and the relative desirability of options."⁷⁷ They argue that rational choices are in doubt when susceptible to variations in framing.⁷⁸ In an important economic study of rational choice, Eisenor and Strotz, who experiment with the decision to purchase life insurance before an airline flight, demonstrate that when framed in certain ways, and when the consumer is faced with life and death scenarios, economic choices do not follow rational choice models.⁷⁹ In an international political experiment, Schatz and Levine show that identical political messages are received and interpreted differently depending on their frame.⁸⁰ Finally, in an environmental assessment experiment framing was identified as crucial and central

⁷⁶ Marchi, Bruno and Jerome Ravetz, *Risk Management and Governance: A Post-Normal Science Approach*, Futures, Vol. 31 (1999), p 743.

⁷⁷ Tversky, Amos and Daniel Kahneman, *The Framing of Decisions and the Psychology of Choice*, Science, New Series Vol. 211 No. 4481 (January 30, 1981), p 453.

⁷⁸ Tversky, p 458.

⁷⁹ Eisenor, Robert and Robert H. Strotz, *Flight Insurance and the Theory of Choice*, The Journal of Political Economy, Vol. 69 No. 4 (August, 1961), p 368.

⁸⁰ Schatz, Edward and Renan Levine, *Framing, Public Diplomacy, and Anti-Americanism in Central Asia*, International Studies Quarterly Vol. 54 (2010).

when faced with choice.⁸¹ In other words, and in very simple terms, it is not what you say, it is how you say it that matters. The deterministic approach of cause and effect can be broken or changed depending on the frame.

In our discussion on framing the concept of rational choice has insidiously entered our discourse. This paper has shown that framing a situation matters in its perception, and outcomes. Thus how a problem is framed is a value choice, and an ethical decision. But are human beings not rational beings? Well, of course it has also been shown that humans are not rational beings, based on choice experiments. Why is the human an irrational being? Kahneman, in his Nobel lecture, provides clues to why humans act irrationally by using economics. His theory, developed in concert with Tversky, argues that human beings have two systems that support cognition, and the two systems roughly equate to reasoning and intuition.⁸² In a series of experiments Tversky and Kahneman show that reasoning and intuition operate differently and are affected by framing, and are subject to manipulation. It is important to note these gentlemen were economic theorists, and their experiments were simple economic scenarios, not life and death situations where risk decisions may be different. But it is also important to note that their research is critical to the understanding of human reasoning, and particularly in a choice situation under risk.

Thus, the human psychological condition and cognitive capacity, combined with the philosophy of reality and our tendencies to apply simple deterministic views and add value and moral judgments to human frameworks is at issue in any qualitative discussion. When it comes to risk, framing issues must be regarded as fundamental interactions in risk understanding, and communication. But the value and moral judgments of the framing process leave the process open to manipulation, either actively or passively.

In summary, human beings require boundaries to understand concepts. Framing is a way of providing boundaries of thought in order to allow rational choices. But the framing process is open to interpretation and uncertainty, and different ways of framing identical problems have been shown to result in different choices. Thus Tversky and Kahneman argue that the act of

⁸¹ Van der Sluijs, Jeroen P. et al, Combining Quantitative and Qualitative Measures of Uncertainty in Model-based Environmental Assessment: The NUSAP System, *Risk Analysis* Vol. 25 No. 2 (2005), p 489.

⁸² Kahneman, Daniel, *Maps of Bounded Rationality: Psychology for Behavioral Economics*, *The American Economic Review*, Vol. 93, No. 5 (December, 2003), p 1450.

choosing a frame for the presentation of a problem is in fact an important ethical act. The concept of framing is used in all of the risk processes discussed in this paper; analysis, management, communication and decision making and the uncertainties in outcomes based on the type of framing chosen in these processes make framing an important area to consider especially in risky life and death scenarios.

And so the major question here of this paper is how do we, as officers or middle managers, process vast amounts of mostly scientific information gathered relating to risks, produce an informed opinion, frame this opinion properly to achieve traction within a large organization, achieve a high level of discourse amongst a wide variety of societal actors, and then achieve a rational risk decision? Well, this paper has shown that humans are simple deterministic creatures, are not rational and are subject to two independent cognitive systems, intuition and reason, both of which are variable according to how a problem is framed. These findings are instructive, but don't tell us enough. Military officers must deal with real people and the studies of various enlightened people on basic human nature may provide some more clues, more evidence, more meat on the bones, and more ways of dealing with the problem human.

As this paper constructs a qualitative layer for use on top of the foundation risk management methodology, this paper has shown that some basic individual process, such as framing, intuition and reasoning matter. But humans are social creatures. We interact with others every day, and that interaction also matters. Thus, an analysis of sociology must also be part of this paper's qualitative layer. Arguably, the basis for much of the study of sociology is the individual, and who better to begin with than Hobbes.

In basic human nature, some of Hobbes' philosophies of basic human nature are relevant to the deeper understanding of human interaction. In *Leviathan*, Hobbes argues that man is self interested, and has a desire for power and self preservation. He further argues that the war-like state of nature is only controlled by man's contracts with others aimed at being subject to a sovereign power, and this sovereign power has, in turn, the responsibility to protect man. In other words, obedience to strong government is necessary in order to have control over our animal instincts, secure liberty and allow us to have respect for others."⁸³ The importance of Hobbes'

⁸³ Best, Shaun, *A Beginners Guide to Social Theory*, Sage Publications (London, 2003), p 172.

characteristics of man, in this paper's view, are fundamental in Hobbes' further characterization of contracts between individuals, and the state (or institution). In addition, his Leviathan, the word a biblical reference to hell and the complex and ugly serpent that guards its gates, is a reference to society in general. In this case, the Leviathan is in fact also an actor in the social contract theory of Hobbes. Thus, the individual must understand his or her place in the world; understand that he or she must make social contracts with other individuals and with the state (or sovereign, or institution, as you wish).

In addition, according to Callon and Latour, the Leviathan is also a complex but invisible actor that is the union of the small man as well as the powerful man in the form of micro and macro actors, as well as the forms and shapes of human and technical interactions of humans, materials, and so on. Callon and Latour go further in describing the Leviathan as a complex beast that cannot be easily described by metaphor as it is constantly changing. The Leviathan is the actor that is the intangible that could be described as the force or entity that makes something take on a life of its own. In military terms, it's the thing that describes the nature of an operation, where every operation takes on a life of its own; a personality if you will that is not a tangible thing. In the end, Callon and Latour's opinions and notions are much more severe than that of Hobbes' Leviathan. Their notion is of a true monster.⁸⁴

Hobbes' seminal writing on social contract theory and the Leviathan has many useful concepts, whether you as the reader subscribe to its doctrine or not, to draw upon as a foundation for further thought. Social contract theories and postulations, simple as thought they seem, are relevant in this paper's approach. To further this paper's review of basic theory a brief discussion of metaphysics is now presented to add another dimension to these social theories.

The world is made up of objects, but these objects simply do not just exist, they interact with each other. These interactions can be studied scientifically or philosophically, depending on one's point of view. Included in metaphysical questions are the thought that intuition must play a role in any objective analysis. Also included in metaphysical analyses are the ideas that outcomes can be founded in causal relations and thus be determined through analysis, the basis

⁸⁴ Callon, Michel and Bruno Latour, Unscrewing the big Leviathan: how actors macro-structure reality and how sociologists help them to do so, <http://www.bruno-latour.fr/articles/article/09-LEVIATHAN-GB.pdf>, accessed 9 November 2010.

of determinism. On the other hand, outcomes have an element of uncertainty partially based on the free will of human beings, and partially based on the inability of the human mind to fully understand the universe. Even Einstein, almost a purely deterministic voice, lamented about the universe's unpredictability.⁸⁵ Thus, in metaphysics there is a notion of causal determination, such as the basis for any scientific or engineering analysis, and also a notion of randomness, human free will, and other factors which cannot be determined. These two competing notions, part of the basic human reason and part of the intuition, must be recognized as parts of this paper's risk approach.

A further notion is Taleb's Black Swan, where the deterministic world, the cause and effect, and the probability of occurrence is shattered by the unknown unknown [sic], and the hosts of silent witnesses and failed experiments that do not speak to us, and are not recorded for us to see.⁸⁶ This silent evidence is not tangible to us, as we cannot see it, but it existed and it is an object for us to ignore at our peril. Models and predictions based on knowns ignore the many unknowns, and silent unrecorded evidence that may have existed but gone unrecorded, or was ignored by an establishment. Witnesses to the unknown exist in the many important inventions of our time that were developed from a lucky observation, or an unintended experiment. Penicillin was discovered by accident. This family of occurrences, the inadvertent discovery of importance, are witness to chance events, or in another view, were positive risk events, events that took place by people taking chances with open minds.

King places structure on Taleb's thoughts by codifying our errors in judgement by problem type: a type 1 problem has a simple deterministic solution, a type 2 problem has a probability that can be calculated, a type 3 problem is known but we have no idea what the probability is, and a type 4 problem is "emergent", or is the unknown problem with, obviously, no solution as it was never envisioned.⁸⁷ These types of problems illustrate the weakness of our human determinism. We obviously cannot see problems in their entirety if we remain purely within the simple cause and effect space.

⁸⁵ Hawking, Stephen, *Does God Play Dice?*, online lecture found at <http://www.hawking.org.uk/index.php/lectures/64>, accessed 8 October 2010.

⁸⁶ Taleb, Chapter 8.

⁸⁷ King, p 108.

So the unknown plays an important role in risk. But, as humans were are wired to pay attention to knowns, or objects rather than things that cannot be seen or envisioned. If we acknowledge this trait and understand the mechanisms that lead us away from considering the unknown we may have a more robust assessment phase in the common risk methodology. Thus, this paper postulates that if the military officer does not understand the basic workings of a human being there can be no solid foundation upon which to build further structures for risk. Once the basic human being is characterized in some way and a foundation built, the officer must now understand how human beings interact. And so this paper moves from the basic philosophy and psychology of individual humans in a constructed and partially deterministic reality into the basic sociology of human social interaction.

Risk perspectives: Agency and impact

Therefore, this paper will now introduce further selected social theories as a solidification of the risk approach foundation; we have driven the piles into the sand by selecting a definition of the individual human, now we must pour the concrete of the footings, the human as a social being interacting with others, so we can further develop our approach.

To begin this topic, this paper provides a note about this author's readings in the social sciences. The author is not a social scientist, nor had any training in the social sciences. But as a military officer the author has been subject to on the job training in the social sciences in navigating the dense and complex social milieus of many powerful bureaucracies both military and civilian.⁸⁸ In the literature review conducted for this paper the author found some dissent amongst social scientists regarding foundational theory. Brian Turner's initial critique of the social sciences in *The Blackwell Companion to Social Theory* argues that the social sciences have in fact been unable to resolve many fundamental theoretical issues.⁸⁹ However, there are fundamental theoretical constructs valuable for this paper's approach. These constructs were selected to illustrate their agency or perspectives and influences on risk.

⁸⁸ And the author submitted this paper to a social scientist for review.

⁸⁹ *The Blackwell Companion to social Theory*, 2nd Ed, Bryan S. Turner Ed, Blackwell Publishers (Massachusetts, 2000), p 10.

In particular Max Weber, arguably the most prominent European sociologist, promotes a theory of action based on the individual.⁹⁰ His *Nature of Social Action* states that social action is individual human behaviour seen as “subjectively meaningful.” In this theory, Weber argues that there are four types of social action: “social action motivated by a goal, motivated by a value, motivated by an emotion, or motivated by customs or other well established ways of behaving.”⁹¹ In addition, the meaning attributed to any action may be of varying nature from the actual intended meaning, to an abstractly constructed meaning, and in “neither case is the ‘meaning’ to be thought of as somehow objectively ‘correct’ or ‘true’ by some metaphysical criterion.” Weber further makes the argument that there is no clear line between ‘meaningful’ action and ‘purely reactive’ action, indicating that there is no clear way of discerning between the two.⁹² Weber’s “point of departure and the ultimate unit of his analysis is the individual person.” From this point of departure he builds his thoughts by describing two competing ideas; rationalization, and charisma.⁹³

Weber’s rationalization is the thought that society is on a path of scientific, bureaucratic and rule based development, or a progress towards a moral perfection. Though the concept of rationalization is complex the thought is simple – since the enlightenment and throughout the process of industrial and economic development society has been rationalized into more or less rigid structures. Thus Weber describes the concept of deterministic structuralism.

On the other hand Weber recognizes competing phenomena such as charisma. He argues that throughout history there are “heroes and prophets...viewed as truly revolutionary forces in history.”⁹⁴ Thus, Weber acknowledges the tension between rigid structures and charismatic leaders, and the competing institutional requirements and individual needs.

⁹⁰ There is an apparent divide between European social scientists with an arguably deeper understanding of the issue, and American, with a simpler more functionalist and scientific view of the social sciences. Without entering the debate or making judgment, this paper makes it clear that Weber was European.

⁹¹ Best, p 118.

⁹² Weber, Max, *Weber: Selections in Translation*, Runciman, W. G Ed, translated by Eric Matthews, Cambridge University Press (Cambridge, 1978), p 7.

⁹³ Gerth, H.H., and C. Wright Mills, *From Max Weber: Essays in Sociology*, Oxford University Press (New Press (New York, 1958), p 55.

⁹⁴ Gerth and Mills, p 52.

The effects that rationalism and charisma have on risk in an institution may be extraordinary. The bureaucratic and deterministic dogma or rationalized structures compete directly with the charisma of leaders. Whichever trait's agency prevails determines the course a risk follows inside an institution.

Weber discusses the issue of class extensively, and his rationality theory is often combined with Marx's class struggle theory. Weber's perspective is that the socialist class struggles described by Marx are merely a special case of a more general trend of bureaucratization and depersonalization.⁹⁵ Moving further, Weber introduces the concept of power by arguing that "bureaucracy is... a power instrument of the first order."⁹⁶ In other words, in the process of rationalization the bureaucracy takes on a position of power or agency. Within the bureaucracy are technical experts that hold specialized knowledge, and that knowledge is their power base. For Weber, a political leader is sometimes powerless to the technical expert in the bureaucracy, and the only offset to this expertise is private economic interests who protect their expertise as a means of economic potential.⁹⁷

Thus, this paper argues that Weber's theories are most relevant to the process of dealing with risk within an organization and in particular a rigid military organization. Weber's theoretical base is the individual, the same individual that identifies risk. This individual's action or thought is motivated by some value or ideal, which may be meaningful or reactive. Working within a rationalized organization, the individual must deal with a structure and also charismatic leaders creating dilemmas. Finally, within the bureaucracy there are bases of power depending on the expertise of the individual or group, and their individual or group goals.

Individual power within an institution is related to leadership. An individual is appointed to a leadership position and first must demonstrate technical competency in that position to assume power. The followers also assign power to the leader by assessing the leader on a broader

⁹⁵ Ibid, p 50.

⁹⁶ Ibid, p 228.

⁹⁷ Ibid, p 235.

set of criteria.⁹⁸ The power of a leader is directly attributable to the recognition from the subordinates that they are competent, and that subordinates are valued and treated fairly.

Group power is related to the individual's relationship with the group. Membership in a group must be seen to have value and be consistent with the individual's morals. But membership in the group also allows access to the resources of the group and individuals weigh the gains and losses of membership.⁹⁹ In this context the group holds competency and legitimacy and thus holds power and the individual must assess its membership within the group.

In the negotiation processes of any organization power struggles, and in particular power asymmetries between individuals and groups become evident. These differences in power, possibly related to the punitive capacity of one individual or group over another, result in an imbalance in negotiations and will result in different perspectives on a risk.¹⁰⁰ An imbalance in negotiations will result in a reduction in trust amongst the participants, particularly if a negotiator has a selfish motive of maximizing their own outcomes. In contrast, an increase in trust can be gained in negotiations where the motives are seen to be maximizing both party's outcomes.¹⁰¹ These scenarios will necessarily influence any risk process and lead to different outcomes depending on this influence.

In summary, power within institutions comes in the form of individual or group power. How this power is perceived in the leader-follower situation is key to any relationship. In the negotiating process, power should be used in a cooperative manner to build trust in the process.

Finally the concept of institutional change must be explored in the context of power. In a risk scenario, the staff officer must envision and then communicate a perceived risk. This necessarily means that the institution does not yet appreciate the risk. In order for the institution to fully understand the risk, the institution must change. The staff officer is therefore the leader of change within an institution, and this leader of change will encounter resistance from the

⁹⁸ *Leadership and Power*, Daan van Knippenberg and Michael A. Hogg Eds., Sage Publications (London, 2003), p 105.

⁹⁹ *Leadership and Power*, p 99-100.

¹⁰⁰ *Ibid*, p 157.

¹⁰¹ *Ibid*, p 159.

institution, and must apply leverage to the institution to attempt change. These resistances can be useful in precipitating change, and therefore institutional understanding of risk.

But resistance can be turned on its head by the authority and power of management. It may be futile to overtly champion change within an institution if the power base of that institution owns that sphere of the risk. In other words, championing change blindly when your boss owns the process is career suicide. In order to initiate change, the staff officer must be creative. The officer must act “within a given structure of power and within a given culture of power” and yet be creatively resistant at the same time.¹⁰² In this creativity, the officer must “give sense to resistance by... [using] external values which are understandable to anybody.”¹⁰³ One means of creativity is “mobilizing and connecting” people within the institution that otherwise would not have a say. It is this connection and mobilization and then subsequent solidarity that produces a social movement and ultimately an “invisible forum overtly contesting the prevalent managerial values” of an institution.¹⁰⁴ In a sense this theoretical construct describes what might be called a grass roots campaign. This grass roots campaign is low-level start point intended to build a bigger support base over time. But any grass roots campaign must have legitimacy and legitimacy is built by knowledge in a knowledge society.

While Weber set an important base for the theoretical sociology, Michael Foucault’s work is an important body in the discussion of power. Foucault’s later work concerned the relationship between power and knowledge. According to McKinlay and Starkey, “To follow Foucault is to look for the roots of knowledge in power relations and for the tactics of power immanent in various forms of discourse.”¹⁰⁵

In a comprehensive review of power, Clegg and Haugaard review Foucault as the “prime rejuvenator of the Machiavellian and Nietzschean view of power as a systematic phenomenon which is constitutive of social reality.”¹⁰⁶ In other words, Foucault synthesized Nietzsche’s

¹⁰² The Sage handbook of Power, p 337-8, 342.

¹⁰³ Ibid, p 343.

¹⁰⁴ Ibid, p 345.

¹⁰⁵ McKinlay, Alan, and Ken Starkey, *Foucault, Management and Organization Theory – From Panopticon to Technologies of Self*, Mckinlay and Starkey eds., Sage Publications (London, 1998), p 1.

¹⁰⁶ Clegg, Stewart. and Mark Haugaard Eds., *the Sage Handbook of Power*, Sage Publications (London, 2009), p 2.

concept of individual will to power, and Machiavelli's hypothesis that political power must be consolidated to be maintained. Foucault's synthesis essentially argues that every individual desires an increase or consolidation of their power, and when individuals are in power, realism dictates that controls such as punishment and reward must be developed to limit the illogical passions of the population, and to maintain political structures. Thus power is axiomatic; it is part of human nature, and organizational processes.

Foucault also adds knowledge to his thoughts on power. Knowledge is "a vital necessity ... as a means of orientation for human beings [and thus is] an integral part of sociology."¹⁰⁷ On the other hand, knowledge is used to differentiate such as in the professions – professionals use their intricate knowledge in specific domains to maintain their status and power in society. This concept of the professional is now applied to the profession of arms. Going further back in time, Taylor uses the concept of knowledge as a differentiator in his scientific management concept where he argues that management must order business properly to gain efficiency, and this ordering requires knowledge/power.¹⁰⁸ In a further refinement of scientific management, knowledge management "is based on *common knowledge* [emphasis in the original] as a prerequisite to the communication of direction and routine" – direction and routine being key efficiency concepts.¹⁰⁹ Thus knowledge is a key requirement for human interaction, and is also a key differentiator in any social milieu. This difference can be a major influence in any risk scenario.

Taylor's philosophy is one of a "consciously designed utilitarian project."¹¹⁰ The knowledge required for science and technology is the basis for his project, and efficiency and rules of order are the normalizing processes. The application to military affairs is striking. In fact, the normalizing behaviour of military drills is a good example of scientific management.

From one perspective in America's modern military history, normalizing scientific management concepts were brought from France to the United States and implanted at the West

¹⁰⁷ Elias, Norbert, *On Civilization, Power and Knowledge: Selected Writings*, Stephen Mennell and Johan Goudsblom Eds, The University of Chicago Press (Chicago, 1998), p 35.

¹⁰⁸ *The Sage Handbook of Power*, p 313.

¹⁰⁹ *Ibid*, p 325.

¹¹⁰ *Ibid*, p 312.

Point Military Academy.¹¹¹ Bousquet goes further and argues without using any state affiliation that there is a profound interrelationship between science and warfare with a genesis in the late 16th century.¹¹² But it is clear that the principles of knowledge/power were introduced to the new world militaries directly from their genesis in the American Revolution. As allied militaries developed through World War 1, knowledge/power took important meanings in the scientific development of operations. Military scientific knowledge was developed further in World War 2 through extensive military scientific enhancements such as Operational Research, and in the development of key enabling technologies, one example being RADAR.¹¹³ Further, in the US during the late 1950's and early 1960's systems analysis became popular, partially due to the Rand Corporation, and partially due to Robert McNamara's appointment to US Secretary of Defence in 1962.¹¹⁴ This scientific backdrop to military operations demands superior technical knowledge from military members, and more importantly from this paper's perspective, its officers. As Taylor and Foucault have demonstrated, with technical knowledge and professional status comes narrower power bases, and with it, narrower thinking and the power to influence outcomes.

In contrast, and somewhat cynically, Heller argues that systems analysis or operational research is the "Everest of management technology", though the manager would be best to simplify any calculation to the back of an envelope.¹¹⁵ Heller's thoughts align with some modern thinkers who lament the RMA, the RMA being a striking example of scientific management based on technical knowledge, though there has been an attempt to introduce extensive thought processes in military operations through the Effects Based Approach to Operations (EBAO) doctrine. But the scientific and professional officer who has a power base according to his or her

¹¹¹ Ibid, p 312.

¹¹² Bousquet, Antoine, *The Scientific Way of War: Order and Chaos on the Battlefields of Modernity*, Columbia University Press (New York, 2009), p 3.

¹¹³ Waddington, C.H., *Operational Research in World War 2, Operational Research Against the U-Boat*, Elek Science (London, 1973)

¹¹⁴ E.S. Quade and W.I. Boucher Eds., *Systems Analysis and Policy Planning: Applications in Defense*, The Rand Corporation, American Elsevier Publishing Company (New York, 1968), Preface.

¹¹⁵ Heller, p 226.

knowledge is the one who envisions risk. If the risk can be properly described and understood, even through all of the framing and rationality issues discussed earlier, there is still the issue of how much risk can be tolerated.

Gerald Wilde's "Risk Homeostasis" theory argues that, no matter what technical or operational things exist or happen, humans will always weigh the cost and benefit of risk and accept only as much risk they feel is appropriate. This theory argues that the levels of risk that a human is willing to accept changes depending on some circumstance. A recent study on technological innovations in the maritime domain bears this out by showing that improvements in safety systems and technology do not in and of themselves improve risk scenarios.¹¹⁶

The Canadian military officer education and training systems have moved from a base in Imperial military tradition towards a parallel of the American system of officer development.¹¹⁷ In a parallel to West Point, the Royal Military College of Canada has taken criticism in the past for its focus on engineering principles and programmes.¹¹⁸ Thus, Canada's modern military officers are embedded with the concept scientific management and knowledge/power from an early stage in their development.

Foucault's knowledge-power and Taylor's scientific management theory further develop Weber's rationalist approach, and in this paper's opinion, provide a solid social theory foundation. This foundation provides the understanding that modern organizations are built on scientific knowledge, and that knowledge provides power bases. These knowledge/power concepts have influence in risk scenarios, and may in fact determine what is perceived as a risk while ignoring unknowns. In a military context, the technological advances made through the last century provide an example of an arc of power/knowledge, from the American Revolution, to the RMA and the CF has followed the American lead in training and educating its officers.

An interesting modern dilemma in this theoretical development of power/knowledge is the philosophical or epistemological concept of "how do we know what we know." EBAO and

¹¹⁶ Baniela, Santiago Iglesias, and Capt. Juan Vinagre Rios, *The Risk Homeostasis Theory*, The Journal of Navigation Vol. 63 (2010), p 626.

¹¹⁷ Coombs, Howard, In search of Minerva's owl : Canada's army and staff education (1946-1995)

¹¹⁸ The report of the Officer Development Board : Maj-Gen Rowley and the education of the Canadian Forces, Government of Canada, Dept. of National Defence, Officer Development Board

RMA have fallen out of favour recently, particularly in Canada, simply because they have not proven that scientific technique can solve problems on the battlefield.^{119,120,121} Therefore, it is demonstrated that the overtly managerial and scientific analysis tools of EBAO and the further RMA supporting it are missing the point. In addition, the power structures that built EBAO and advocate for the RMA have been proven to lack vision and thought.

In another sense, and as Vandergriff argues, the technology of the RMA is not even the key variable – the modern public’s lack of tolerance for casualties is.¹²² The epistemology of these techniques, or the philosophical idea of “how do we know what we know”, is compelling. Taleb argues two things: the fundamental aspect of the unknown is rarely addressed, and the future can never be predicted, otherwise we would have an answer to all risks. Robert Gates puts the idea of military predictions into very clear focus by arguing that “when it comes to predicting the location and nature of our next military engagements, since Vietnam, our record has been perfect. We have never once gotten it right...”¹²³ Putting this idea into a tactical context, Chapter 7 of the report by Lieutenant-Colonel Craig Dalton entitled “Putting Lipstick on a Pig: The Effects Based Approach and Strategic Art”, pulls no punches about military prediction processes. He quotes Dr Tim Challons, who argues:

“The practitioners of EBA [Effects Based Approach, or the process of identifying first, second and possibly third order effects from a military action] profess many assertions and defend their methods at the level of doctrine. However, the deep theory of the effects-based approach rests on several philosophical mistakes – metaphysical, epistemological, and logical mistakes... We should expect mostly

¹¹⁹ Canada’ Air Force, Canadian Forces Air Warfare Centre, Effects Based Approaches to Operations: Canadian Perspectives, http://www.airforce.forces.gc.ca/CFAWC/Contemporary_Studies/2008/2008-Oct/2008-10-14-Effects-Based_Approaches_to_Operations-Canadian_Perspectives_e.asp, accessed 2 November 2010.

¹²⁰ Peters, Ralph, *After the Revolution*, Parameters Vol. XXV, No. 2 (Summer, 1995).

¹²¹ Bousquet, p 232.

¹²² Vandergriff, p 263.

¹²³ Gates’ address to West Point, 25 February, 2011.

mistakes as a result of a practice resting on a mistaken theory, for only by accident and not by design could anything good come out of it.”

In the end, power-knowledge, the exercise of power within and organization, in the context of this paper, relates to a risk an individual or organization has. Embedded in the risk are many technological or scientific issues. Once an officer has identified that risk and attempted organizational change in order to recognize and manage that risk, the officer will encounter the many power issues already discussed. It is normal for the officer to build a strategy to address the various organizational issues. While building this strategy to address these issues, the officer must, out of necessity, also avoid deterministic and managerial assumptions themselves. In addition, the use of discourse as a part of the strategy must be used with caution, and use appropriate language and be aimed at appropriate audiences. In this sense, any strategy’s aim is change, and in change resides ambiguity (which may have positive or negative consequences) and contradiction, especially amongst all levels of an organization.¹²⁴ Once a strategy is outlined, the officer must address the key risk perceptions which in turn address the tolerance of an organization for risk. To address the risk with a technology strategy alone, according to the homeostasis theory, will not improve risk scenarios. The strategy must include a wide array of multi-disciplinary thought, and deal with all types of knowns and unknowns.

The problem with unknowns is that deterministic organizations, organizations built on engineering or scientific management, do not know how to deal with unknowns much like the individual. In particular, military chains of command always want answers, always want plans, and always want solutions. A striking modern example of this type of hubris caused by these social theories’ agency, though actually relating to a civilian, is the case of Paul Bremer, George W. Bush’s appointed civilian administrator in Iraq. Mr Bremer was characterized as a

¹²⁴ McCabe, Darren, Strategy-as-Power: Ambiguity, Contradiction and the Exercise of Power in a UK Building Society, Organization, Volume 17 No. 2 (2009), p 152, 166-7.

“demanding corporate executive, insisting on fast and quantifiable results from his staff, hating surprises or setbacks.”¹²⁵

Another striking example demanding precision and answers is the Canadian Forces Operational Planning Process. This process is designed to produce tightly planned and synchronized military plans in the face of an enemy. The process is well defined and does recognize the many dimensions of the military problem at hand. However, used robotically by the unwise who do not recognize the many unknowns or possible second and third order effects of operations, the process can lead to a commander accepting risks that he or she does not understand. Thus, the staff officer in a military organization must be well versed in his or her business and come prepared. One cannot enter a conversation with a superior in a military organization without answers, but as has been shown throughout history, the unknown is a powerful actor in a military campaign. In this organizational climate, where staunch, upright and crisp decisions are demanded, the military staff officer must deal with the unknown, and must shape his or her thoughts on risk to at least acknowledge the powerful effect of the unknown. The trick is to convince the institution of the power of the unknown.

To continue on the path of the unknown, Holt argues for a different framework when attempting to solve organization risk; He applies Machiavelli and Freud to the problem of “codified, uncoded and uncodifiable” problems. He argues that risk management must “instead see risk management as the integration of countering influences. The emphasis is upon resolution between alternative solutions and the dissolution of confusions, as much as upon the pursuit of optimal solutions.”¹²⁶ Holt’s Machiavellian approach speaks of “sagacity and resolve tempered by appropriate humility in the face of [Machiavelli’s] *Fortuna* and *Necessita*.” Fortune never to be trusted but is always available, and necessity the force that does not change, both being recognized by their inevitability.¹²⁷ Using Machiavelli’s wisdom as a metaphor, Holt’s lament is much like Taleb’s:

¹²⁵ Packer, George, *The assassins’ gate: America in Iraq* (New York: Farrar, Strauss and Giroux, 2005), p 190. Quoted in Nigel Biggar, *Invading Iraq: what are the morals of the story?*, *International Affairs*, Vol. 87, No. 1, (January, 2011), p 30.

¹²⁶ Holt, Robin, *Risk management: The Talking Cure*, *Organization*, Vol. 11, No. 2, (March, 2004), p 252.

¹²⁷ Holt, p 255.

“Risk Management would be better able to absorb ideas of rapid change and uncertainty by supplementing its employment of technical frameworks rooted in the probabilistic reasoning of experts with an awareness of how whim, perception, trickery, vision, and humility affect the future... [in addition] managerial problems persist because managers continue to believe that there are such things as unilateral causation, independent and dependent variables, origins and terminations.”

Holt also uses Freud’s psychoanalysis theories to parallel the analysis of organizational risk management – in essence, he uses Freud to explain an organization that has unconscious actions, and has a history which defines it, like Freud’s individual patient. He also uses Freud to parallel the human discovery of the unconscious within an organization.¹²⁸ Holt’s parallel may even describe the Leviathan, the unseen force, or the unconscious, which is there acting, not in body, but in result. This unconscious also acts and has influence on an organization, much like the more visual knowledge/power theory.

Any discussion of science, power, industrialization and engineering should acknowledge the further development of society. Western society has most certainly moved on from the industrial, but towards what is the question. In general the terms modernism and post-modernism capture this post industrial sentiment. Walter Anderson is an example of a writer who describes these terms well.¹²⁹ Without delving too deeply into this subject, the military officer must be aware of current trends in society and the concepts of modernism, roughly equivalent to a deterministic and scientific view, and post-modernism, which articulates less structured and uncertain concepts. Coates’ review of postmodernism relating to the CF is an important base of

¹²⁸ Holt, p 263.

¹²⁹ Walter Anderson website,

http://www.waltanderson.info/the_truth_about_the_truth_de_confusing_and_re_construcing_the_postmodern_world_32014.htm, accessed 22 November 2010.

knowledge and certainty versus relativism, or scientific management versus the more amorphous military art are some of his themes.¹³⁰

Postmodernism describes a general rejection of the past and its scientific compartmentalization, and an endorsement of the future by using combinations of many contemporary ideas.¹³¹ In popular literature Douglas Coupland, the creator of GenX and other modern forms, is a contemporary of postmodernism.¹³² Jean Francois Lyotard's *The Post Modern Condition* was an influential work that stressed diversity and difference in a critique of the structuralist view of the world. Postmodernists argue that knowledge is "necessarily incomplete and fragmented" and a rational view of the world is not possible.¹³³ In addition, postmodernism is associated with artistic design, consumerism, self awareness, and rapid change – something that GenX'ers can relate to. Copeland, a master at communicating the post-modern sentiment, captures the present and future perceptively in his writing. In one small example of his writing, he coined the word "proceleration", and argues that it describes the "acceleration of acceleration."¹³⁴ As the Greek philosopher Heraclitus argues, change is the only constant.

In summary, the military officer must be aware of the social construct he/she is operating in, and the concepts provided by a discussion of modernism and postmodernism apply. Gone are the comfortable days of checklists, and engineering, and here are the days of uncertainty, mixed multi-media messages, self awareness, connectivity and consumerism. But one thing does not change for the military officer - leadership.

Individuals and Risks

In military circles, leadership is a constant. Militaries are structured as leader/follower institutions, and basic military doctrine rests on this individual leadership model. Dr. Eric Ouellet

¹³⁰ Coates, Brad, *Postmodernism in the CF*, Masters of Defence Studies Thesis, Canadian Forces College, Command and Staff Course 30, April 2004.

¹³¹ Oxford Definition of Postmodernism, <http://www.oxforddictionaries.com/definition/postmodernism?view=uk>, accessed 22 November 2010.

¹³² Douglas Coupland, <http://www.coupland.com/>, accessed 22 November 2010.

¹³³ Turner, p 51.

¹³⁴ Woodside, David, *Douglas Copeland Presents a Radical Pessimist's Guide to the next 10 Years*, The Globe and Mail, Globe Focus section, Print version, Saturday, October 9, 2010, p F 7.

argues that the theories of leadership have adapted over time from class based, to bureaucratic/management based, to further more complex thoughts such as transformational and symbolic leadership schools. In parallel with the leadership theory changes noted by Ouellet, institutions have adapted from class based, to bureaucratic, to power/knowledge based.¹³⁵ While this paper's focus is risk, the military officer's role is leadership, and leadership theoretical bases are core to this paper's theme. Ouellet argues for a more sociological perspective on leadership theory development, as this paper argues for a softer science perspective on risk. Therefore his proposal to view leadership from the three perspectives of grand, institutional and localized symbolic order has meaning in this paper's context.

Dr Ouellet's three frames of grand, institutional and localized symbolic order define the operating space of the leader in nature. The leader, or in this paper's view the military officer, is responsible for "how perceptions and meaning are framed within a human collective."¹³⁶ This human collective is the society the officer is operating in, either "big picture" grand, institutional, or local. He argues that any social construct is "not plastic or easy to change", and thus the leader has three almost mutually exclusive social milieus within which to operate, and none of them are easy to influence.¹³⁷

Complimentary notions to Ouellet's social theories of the individual officer are those of CF Leadership doctrine that describe mission command and systems thinking. Mission command is defined as a leadership philosophy that allows for maximization of freedom of action based on the understanding of a higher commander's intent. This philosophy, the doctrine argues, allows for more rapid decision making in contrast to a rigid procedural structure which may be slower and less effective. Systems' thinking is a way of thinking that "intentionally avoids

¹³⁵ Ouellet, Eric, *Rethinking Military Leadership from a Sociological Perspective*, Canadian Army Journal Vol. 12.1 (Spring, 2009), p 56.

¹³⁶ Shamir, B. and E. Ben-Ari, *Challenges of Military Leadership in Changing Armies*, Journal of Political and Military Sociology 28 (2000) quoted in Ouellet, p 51.

¹³⁷ Ouellet, p 52.

compartmentalized thinking” and its broad aim is to consider wider interactions and effects.¹³⁸ These two broad concepts handily adapt to the risk framework of this paper in that they communicate an organizational intention to allow for the application of thought at lower levels, and they do not apply force, constraints and structure for the sake of structure to the officer. But, these two concepts, though expressed in CF leadership doctrine, are not necessarily rolled out in practice.

The CF officer is a professional.¹³⁹ The wider profession of arms provides baseline normative processes for all officers, but it is natural for an Infantry officer to be normalized differently than a naval officer, though each is a professional combat officer. To be Canadian is also to be unique in the military profession. And to be blunt, officers are members of tribes, and those tribes are often trained and mentored in unique ways that differ from other tribes. But, there are common attributes of military leaders, and an important notion is stoicism.

Stoicism has two definitions: “the endurance of pain or hardship without the display of feelings and without complaint”, and “the school taught that virtue, the highest good, is based on knowledge; the wise live in harmony with the divine Reason (also identified with Fate and Providence) that governs nature, and are indifferent to the vicissitudes of fortune and to pleasure and pain.”¹⁴⁰ These two definitions are extremely important to this paper’s foundation – the military officer, and how the officer interacts with peers, and the organization.

The first definition is the traditional thought – the individual military officer must lead troops in the face of extreme hardship, and therefore must not crack under pressure. The recruitment, basic training and development of the military officer emphasizes, reinforces, and normalizes the simple stoic definition at every turn. This emphasis on personal resilience and

¹³⁸ Government of Canada, Canadian Forces, *Leadership in the Canadian Forces: Conceptual Foundations*, Her Majesty the Queen in Right of Canada, 2005, http://www.cda-acd.forces.gc.ca/cfli-ilfc/doc/DND_Conceptual-eng.pdf, accessed 3 February 2011, Glossary.

¹³⁹ *Leadership in the Canadian Forces: Leading the Institution*, Her Majesty the Queen in Right of Canada, 2007, p 6.

¹⁴⁰ Oxford Dictionaries Online, http://oxforddictionaries.com/search?searchType=dictionary&isWritersAndEditors=true&searchUri=All&q=stoicis m&_searchBtn=Search&contentVersion=WORLD, accessed 1 November 2010.

leadership in the face of extreme hardship is one of the fundamental and universal traits a combat officer must have, or people will die under the officer's command. Hopefully fewer soldiers will die due to the officer's acumen, but maybe the same number will die anyway, just under more heroic circumstances. Nancy Sherman puts it this way; the officer must, simply put and without hubris, have a can-do attitude with a "stiff upper lip", and be able to "suck it up." The stakes could not be higher.¹⁴¹

The second definition of stoicism is much more nuanced, and is based on philosophy. The philosophical development of Greek and Roman Stoic theory is abundant and has application to military thought. As an example of one Stoic notion, decorum builds on simple personal resilience in the face of hardship, to a higher level of virtues such as respect, deference, facial demeanour, tone of voice and so on. Sherman argues that Stoic thought should be applied to the analysis of military character with an appropriate conjugation into more practical terms – ancient Greek and Roman theory can only go so far in explaining modern military character.¹⁴² Thus, in her book *Stoic Warriors*, Sherman develops her broad and deep notion of what a military officer's character should be, a character that is not overtly developed but more sublimely influenced through the officer's training, education, and socialization over a long period of time. In Sherman's words, "military life is not only about the vertical line of command and the buttoned up decorum...of superior and subordinate."¹⁴³ Military life should also include natural forms of respect, deference, and appropriate levels of emotion toward any situation. The more robust notion of Stoicism should include self reliance, but also include the concept of relying on one's closer community, and also a respect and empathy for a more "distant and different" society (be it another tribe within the organization, or another ethnicity entirely).¹⁴⁴ In this final concept of empathy, a full notion of stoic behaviour emerges, where a human goes

¹⁴¹ Sherman, Nancy, *Stoic Warriors: The Ancient Philosophy Behind the Military Mind*, Oxford University Press (New York, 2005), p 1.

¹⁴² Ibid, p 2.

¹⁴³ Ibid, p 63.

¹⁴⁴ Ibid, p 152.

beyond simple traits of “reciting mantras of respect and dignity” to “[doing] the hard work of making respect available in the hardest cases.”¹⁴⁵

The concept of gift giving is central to the stoic Seneca’s *On Favours* writing. Now you may ask, what does gift giving have to do with stoic military demeanour or risk, for that matter? Seneca argues that kindness builds community, and that the great acts appropriate gift giving and the small acts of gestures and facial expressions “weave the fabric of community.”¹⁴⁶ In other words, meaningful social communities are built through kindness, generosity and gift giving of a meaningful sort. And thus, “demeanour and appearance [are] crucial to how we project our good intentions, respect and deference.”¹⁴⁷ In a military context this is hard to imagine, especially within rigid institutional structures such as the chain of command. But these stoic philosophies have much to offer when an officer is attempting to interact with other individuals, and societies. How an officer approaches those interactions matters, and the stoics have some good advice. The officer as an actor in a social organization while communicating risk needs to be effective. The Japanese tradition of small gift giving combined with the Italian tradition of attention to detail in appearance, and the management of facial expression and body language of the Christian religious pastor would serve the military officer well in this frame.

Summarizing this section, this paper reviewed the traditional and one-dimensional notion of the stoic trait of individual military officers. But, a more robust stoicism is presented in classical thought where virtue is built upon true respect, dignity, and empathy for others, not only the narrow stoic definition of self reliance.¹⁴⁸ This further notion of true empathy is the key trait or behaviour for the military officer when dealing with individuals, tribes, other organizations, other agencies, or with other diverse societies in dealing with risk. The officer must truly be able

¹⁴⁵ Ibid, p 172.

¹⁴⁶ Ibid, p 59.

¹⁴⁷ Ibid, p 61.

¹⁴⁸ As a remarkable example of this notion, see *The Fog of War: Eleven Lessons from the Life of Robert S. McNamara*, Sony Pictures, 2003. Lesson number one is “Empathize with your Enemy” from arguably the most important US Defence Secretary of the 20th century. In addition, McNamara’s initial doctrine of scientific management while reforming the US military and his subsequent realization that the moral dilemmas, and possible war crimes, he was complicit with during his tenure parallels this paper’s notion of scientific management as an incomplete tool in the risk manager’s kit.

to empathize with his counterparts, or others. Without this true empathy, true understanding of a risk cannot be achieved across diverse organizations. Finally, the use of gift giving or small acts of kindness has application across societies, where an officer is attempting to interact to gain influence on a matter such as risk.

In a military context, Donald Vandergriff demonstrated that “unit cohesion [based on mutual trust, empathy, common experience, and spirit of self sacrifice] is the single most important determinant of a unit’s performance in combat.”¹⁴⁹ As shown earlier in the review of stoicism, unit performance in combat can be traced to many of the same principles such as empathy and common experience. This principle of cohesion can be, and ought to be, derived and expanded as needed and used by officers when dealing in units, institutions, or across tribes and societies. This paper draws the conclusion that military effectiveness is directly tied to cohesion and the deeper philosophy of stoicism, and the ability of a military (or any organization) to understand its risks and have a common world view is a fundamental feature of military effectiveness.

Moving to psychological theory, Bruner’s *Narrative Construction of Reality* has application in the study of risk. Bruner argues that humans “organize our experiences and our memory of human happenings mainly in the form of a narrative – stories, excuses, myths, reasons...and so on.”¹⁵⁰ His central concern in the development of narrative is not how a narrative is constructed, “but rather how it operates as an instrument of mind in the construction of reality.”¹⁵¹ Bruner offers a narrative analysis methodology based on ten features of a narrative that is useful for our discussion, and these ten features are shown in Table 1 which is adapted from Bruner’s article.

¹⁴⁹ Vandergriff, Donald E., *The Path to Victory: America’s Army and the Revolution in Human Affairs*, Presidio Press (Novato, Ca, 2002), p 269.

¹⁵⁰ Bruner, Jerome, *The Narrative Construction of Reality*, *Critical Inquiry* 18 (Autumn, 1991), p 4.

¹⁵¹ Bruner, p 6.

Feature	Description
Narrative Diachronicity	A mental model whose defining property is its unique pattern of events over time (not necessarily clock time)
Particularity	The particulars of a story matter, but may only be a means to an end, or emblems which make the story more inclusive
Intentional State Entailment	People acting in a situation must be in an intentional state. This state make the story credible, but this intentional state that the narrator puts his objects or characters in does not determine the outcome of the story – the state of the actors or objects is not deterministic of the outcome, or the cause of an event cannot be determined by the initial state of the story.
Hermeneutic composability	“Parts and wholes of stories rely on each other for their viability”
Canonicity and breach	The story must have an initial state of being, and then a breach of that state, warranting the “tellability” of the story. In addition, Bruner argues that this is a simple story, but that in a more complex narrative the writer may use this structure for innovation rather than the simplicity of a basic story.
Referentiality	“Narrative truth is judged by its verisimilitude rather than its verifiability”. In other words, the facts need only be plausible, not verifiable.
Genericness	Kinds, or genres (examples are romance, comedy, tragedy and so on) of narratives provide a guide for the mind and create realities in their plots

Normativeness	A story pivots on a breach in legitimacy, trouble as an imbalance of the five bases for drama: Agent, Act, Scene, Purpose, and Agency. But legitimacy or balance depends on cultural perspective, and that perspective changes.
Context sensitivity and negotiability	There will be competing versions of a story, based on the context of the narrators, and the ability of two differing parties to settle the difference.
Narrative accrual	Stories accrue and accumulate over time to create such things as individual autobiography, institutional traditions, or things such as legal systems. Related to Michael Foucault's Archaeology of Knowledge.

Table 1 – Bruner's Ten Features of a Narrative

The narrative process has application in the way an officer approaches individuals, organizations, and societies. Once the individual identifies a risk, how does the individual effectively communicate the experience, the deep notion of the risk? As this paper has argued before, scientific and Cartesian ways of approaching problems are one way, forming a narrative story of the problem is entirely another. Bruner's features of narratives give clues to a well formed narrative. The features are at times difficult to understand, but deep in meaning. If thought is put into each feature, and the parallels to known stories driven, then the value of these features will be seen. A good narrative has all or many of Bruner's features.

The narrative or story has broad application to the military social, and in the formulation of risk strategies within a society. In simple terms, military members often relate experiences in their careers by way of story telling. The story telling is a normative behaviour in a military environment – everybody does it, and the art of telling a simple story is seen as an indicator of intelligence, wit, and acumen. In an individual military sense, individual reputations are built upon one's ability to tell a rousing story of heroism, humour, or collective misery. But in a

broader sense, narratives can be constructed or used to determine much more important themes, and in fact may contribute to a form of reality and identity. To more broadly develop this idea, there are several religious examples to draw upon in the area of narratives.

In his work on Muslim identity, Tomas Lingren argues that from a psychological perspective “the lack of collective narratives restrains the individual from creating experiences worthy of remembering.”¹⁵² In his study of Muslim prayer, Lingren demonstrated that Muslim identity in fact had much to do with collective narratives that built a religious world view. In another paper from a sociological perspective, David Yamane argues that, though difficult to prove empirically, narratives most likely drive the self transformation process required for religious conversion.¹⁵³ Thus, these examples highlight a need for narrative approaches to institutional or societal understanding of meaning.

In fact, Yamane seems to indicate that narratives have the possibility of converting an individual from one frame of mind to another (or in his area of expertise, conversion of religion). For the military officer attempting to convince an unmoving institution of risk, the building of narratives and working from the individual towards the institution in communicating this narrative is part of the risk approach proposed by this paper. In this conscious construction of narrative, however, lie moral and ethical issues. In attempting to ford the waters of risk, the author of the narrative must ensure the story is based on reasonable arguments, facts if you will. As was shown, narrative covered in myth can create a mystique, a shift from one frame to another in which the receptor does not understand the aim, only the message. This mystique can have serious consequences on an organization – the constructed narrative must have moral and ethical approaches that are clean and well guided. If the narrative is mystic, and clouded in uncertainty, the organization may be indeed change from one frame to another though not necessarily for good. Taleb argues this point with his usual vicissitude – narratives matter. Thus, as with framing, there are moral and ethical dimensions to narratives, and to the higher level risk discourse.

¹⁵² Lingren, Tomas, *The Narrative Construction of Muslim Prayer Experiences*, *The international Journal for the Psychology of Religion*, Vol. 15 No. 2 (2005), p 171.

¹⁵³ Yamane, David, *Narrative and Religious Experience*, *Sociology of Religion* Vol. 60 No. 2, (2000), p 185.

Values, Moral and Ethics

The final section of this paper attempts a treatment of the values, morals and ethics surrounding military risk. As this paper has demonstrated, moral and ethical dimensions are critical in risk approaches. This area of study is complex, as complex as a wicked problem indeed. The value, moral and ethical dimensions of any military decision must be addressed in some way, as the act of war is a moral and ethical act. The just war has been debated for many millennia, but the issue of why humans are war-like creatures is not this paper's focus. The focus, however, is the military officer and the value, moral and ethical operating space in which the officer must exist. The officer must, with all his or her training, education, intuition and reason, and resources, fight wars on behalf of its sponsor, society. The risks the officer encounters can be translated into value judgements of the society that it represents. Thus the officer must be vigilant of the moral and ethical field, the operating space within which to manoeuvre.

The values of a military organization must be somewhat congruent with the society it protects. Internally, the military members come from that society, and therefore the organization must have the same values. In an external sense, the military must be seen as an integrity organization, and show the society that it is worth of their trust.¹⁵⁴ But societal values are not the only driving concept for a military – the military must also have a specific moral and ethical structure.

According to Gabriel, the professional soldier must have a different set of morals and ethics than the society he or she represents.¹⁵⁵ In fact Gabriel argues that “The strong emphasis on individualism evident in modern societies cannot be permitted free rein in a military context.” The structure of military morals and ethics must inherently apply to the role of the soldier – the role being the ordered application of force to achieve an aim, including the killing of other human beings. The soldier, then, has a unique and deadly environment, and Gabriel remarks:

¹⁵⁴ Leadership in the CF, Conceptual Foundations, p 19.

¹⁵⁵ A Warrior's Way: A Treatise on Military Ethics, <http://www.cda.forces.gc.ca/cfli-ilfc/doc/AWarriorsWayE.pdf>

The soldier must strive instead to retain his or her ethical moorings while awash in a sea of blood, fear, and death, to lessen the violence and reduce the killing, to cherish human life when it can be saved, and to stay the hand of death and destruction whenever possible. In order not to make the horror of war worse, the soldier must seek the ethical solution to the terrible dilemmas that soldiers face. The soldier must seek the way of the ethical warrior.

Ignatieff's *The Warrior's Honour* discusses the many moral and ethical arguments surrounding a society's preoccupation with conflict, and a military's conduct in war. From the historical bases of modern thoughts on war, such as the Geneva Conventions, and the genesis of universal human rights, he explores the thought of the unwritten but strong code that binds warriors. In his piece he argues that the warrior's honour code, the code that binds an organized military's conduct in war, is an ethically and morally important code which has spanned the many millennia of human conflict. It is a code of honour that provides a basic respect to opposing warriors. The code also provides for the weak and unfortunate by providing a fundamental right to disconnection from conflict. According to Ignatieff:

Warrior's honour was both a code of belonging and an ethic or responsibility. Wherever the art of war was practiced, warriors distinguished between combatants and non-combatants, legitimate and illegitimate targets, moral and immoral weaponry, civilized and barbarous usage in the treatment of prisoners and of the wounded. Such codes may have been honoured as often in the breach as in the observance, but without them war is not war – it is no more than a slaughter.¹⁵⁶

This code existed long before the modern framework of the laws of war, or the Geneva conventions. In fact, he argues that elements of this code go back to the start of the recorded history of war. But the modern ethic, the modern appearance of war in society's mind has been manufactured from moral and ethical judgements of the state's citizenry due to its ability to now visualize the effects of war. Society can now see the effects of conflict; it is in their living rooms. Ignatieff argues that the more prominent ethical and moral reasoning that is the basis of modern war were born from the first images of the brutality of war brought back to the citizenry. Images of the dead and dying after a battle can be powerful metaphors for the cause of the conflict,

¹⁵⁶ Ignatieff, Michael, *The Warrior's Honour*, Viking (Toronto, 1998), p 117.

remember the image of the burned Vietnamese girl running down a country road naked. And so the warrior's code is in conflict with society's code. Society's code is driven by imagery, driven by universal human rights. A warrior's code is not. A warrior's code is driven by the recognition of war as a necessity, but with basic unwritten rules of combat. A warrior's code is part of total war, a war in which every part of a society is a target, such as the civilian population of Japan for example. In the end, a warrior's code is what brought General Yoshijiro Umezu, Chief of the Army General Staff to sign the Instrument of Surrender on behalf of Japanese Imperial General Headquarters on board the USS *Missouri* on 2 September 1945 in front of General MacArthur and other military representatives of the allied nations, and not Emperor Hirohito in front of the US president.¹⁵⁷ The fundamental idea of war as an extension of a society's values is now open to judgment by everyone in society all the time, not by a warrior's code. Therefore, the warrior, or the staff officer at the operational level who thinks like a warrior must address and acknowledge this disconnect between societal values and the warrior's code. The officer must be finely aware of the probability that a risk will materialize. The 500 civilian deaths in the NATO bombing campaign against Kosovo in 1999 are a testament to risk in military operations.¹⁵⁸

Throughout this paper there have been numerous calls for increased thought, both in the methodical process of risk (analysis, communication, management and decision making), and in the layer or approach this paper has presented that rests above the methodology. From the rigid scientific management processes of the post-industrial culture, to the management of nothing, and the strident calls for examination of the fundamental logic of measurement, there is a flavour, or even so far as an insidious vector of a lack of applied thought to problems. This lack of thought itself could be viewed as a moral or ethical problem. Whether it is rigid management structures, stove piped organizations, or risk adverse bosses, the lack of thought that can be ascribed to many risks, as so pointedly illustrated by Taleb in his book the Black Swan, can be sensed. In the military domain an example of a lack of thought is the RMA that itself

¹⁵⁷ US Navy History Online, Images of Japan's surrender, Photo 80-G-332701 Surrendor of Japan, Tokyo Bay, 2 September 1945, <http://www.history.navy.mil/photos/events/wwii-pac/japansur/js-8.htm>, accessed 2 February 2011.

¹⁵⁸ Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia, International Criminal Tribunal for the Former Yugoslavia, Undated, http://www.icty.org/x/file/About/OTP/otp_report_nato_bombing_en.pdf, accessed 5 April 2011.

demonstrated quite conclusively that its stated technological advances have not delivered military results, yet these advances continue. The descent into insurgency of the American campaign in Iraq is another clear example of a lack of thought. The concept of thought must be introduced to further consolidate a more ethical and moral approach to risk. The multi-disciplinary military officer must be able to think clearly.

A beginning point offered is simply the identification of the type of thinking that is going on. An effort must be made to determine if the foundation for any programme is solid, and the thought put in suitable. Thouless offers an analysis of what he calls “Straight and Crooked Thinking”, where he argues that errors in logic, emotions, tricks of suggestion, pitfalls in analogy, and many other ways of crooked thinking simply ruin foundation of any programme right from the start.¹⁵⁹ Recognizing the time of writing of the book in the 1930’s, his solution of straight thinking, or scientific thought based on clear and objective principles, could be related to a distinct lack of scientific thought in that period. In fact the growth of operational analysis in the military domain during World War 2 may be a reply to Thouless’ call for more straight thinking. But, in line with Taleb’s more modern call for objective thought based on empirical principles, Thouless’ straight thinking is arguably very important now as well. But recognizing the type of thinking that is going on is just a first step. As a risk taking organization a military must reward innovation and thus the required creative thought processes must be learned.

On creativity, Edward de Bono quite bluntly states “Man owes his successes to creativity.”¹⁶⁰ Thus, he argues that a manager must understand the creative process, and as a corollary the human mind, before unlocking a creative process. He describes thinking as either vertical, in other words logical thinking, or lateral, that is to say non-linear, non-closed, or free form thought. Vertical thought is continuous, lateral thought is discontinuous. He argues for a good mix of lateral thought to generate ideas, and a more formal set of vertical thought for the examination of those ideas. The basis for his lateral thinking methodology is the human brain and its pattern recognition attributes. The brain recognizes structure, and thus is more prone to follow structure. de Bono argues that breaking the brain’s pattern recognition software is a good

¹⁵⁹ Thouless, Robert H., *Straight and Crooked Thinking*”, The English Universities Press (London, 1930).

¹⁶⁰ de Bono, Edward, *Lateral Thinking for Management: A Handbook of Creativity*, American Management Association (England, 1971), p 1.

step in creating new patterns, and stimulating new thought. He presents the basic processes of lateral thinking as escape from clichés and fixed patterns, challenge assumptions, generate alternatives, jump to new ideas and see what happens, and find new entry points from which to move forward.¹⁶¹ He argues that once this thinking process is mastered, creativity has a better chance of shining through.

Lateral thinking is one way of unlocking potential, and creating new ideas – the foundation of human success. The issue of the solving of a problem is arguably slightly different. The methods of problem solving available include creativity, but also include the use of all known ideas and objective thought, the recognition that unknowns exist and must be somehow accounted for, and the use of any other processes, knowledge or thought that is available. One way of characterizing a problem solving agenda, that could use these techniques or others, is the heuristic technique.

Polyà describes the heuristic as the “study [of] the methods and rules of discovery and invention.” This technique is generally described as a best or well reasoned guess, or as a process of induction. The inductive process is a process that uses intuition, and prior knowledge as a start point. He argues that “we need heuristic reasoning when we construct a strict proof as we need scaffolding when we erect a building.”¹⁶² Polyà’s techniques centre on the inability to solve the proposed problem, and his writing is a narrative between a teacher and a student of mathematics. He uses various techniques to attack the problem, either directly or indirectly, or in fact by going around the original problem to another. He asks a long series of questions about the problem, all with the aim of varying the problem in order to find an avenue of attack. In his structure of understanding the problem, devising a plan, carrying out the plan, and looking back he asks questions. For example in understanding the problem he asks “what is the unknown?”, “what are the data?”, and “What is the condition?” In the devising a plan stage, he asks questions like “Do you know a related problem?”, “Can you restate the problem?”, “Can you solve part of the problem?” Can you find a more general or more special problem?”

¹⁶¹ de Bono, p 185.

¹⁶² Polyà, G., *How to Solve it: A New Aspect of Mathematical Method*, 2nd Ed. Princeton University Press (Princeton, 1945), p 112.

In this process of asking questions Polyà has described a very general way of attempting to solve complex problems. The heuristic process has emerged and been referenced and used in many different areas such as complex software development and the like. The process has applicability to the solution of complex military problems, as the process of attack allows for wide ranging thought and solidifies the concept of opening the problem up from every possible point of view, decomposed state, or any other way of envisioning it. A general criticism of the heuristic process is the possibility of biased problem solving, where cherished views, organizational inflexibility, and a host of other issues bounds the process and biases the result. No matter what the perspective, there must be a start point for the problem solving process, and whether the start point is from experience or whether a truly creative start point can be found rests with the problem solver's elegance of thought, and agility of mind. But there is another method to solving problems, and that is the Socratic method.

The Socratic Method, if this author can be relatively simple in communicating the idea, is a method of wandering and questioning without any pre-supposed notions. The Classic Socratic Method is a dialogue of questions, answers, rebuttals, and a continuing journey of discovery. Originally a philosophical method, its use in law schools as a pedagogical tool is a good example of the Socratic Method, where the student and teacher engage in a dialogue of questions and answers to eventually bring the student into a process of thought that allows for critical reasoning. Rhee's comparison of the heuristic with the Socratic methods in the study of law is a good reference.¹⁶³ In a further review of the Socratic Method, Areeda's lecture on what the Socratic Method is not is a good response to the method's critics, critics who pan the method as simply time wasting questioning, an opinion survey, or an exercise in question and rote response.¹⁶⁴

To put the problem solving process in focus a current heuristic strategy in a military context is the Operational Test and Evaluation (OT&E) process of complex military systems. In the OT&E process the problem to be solved is the question of whether the complex system at

¹⁶³ Rhee, Robert J., *The Socratic Method and the Mathematical Heuristic of George Polya*, *St. John's Law Review* (Fall, 2007), p 881-898.

¹⁶⁴ Areeda, Phillip E., *The Socratic Method – Lecture at Puget Sound, 1/31/90*, *Harvard Law Review*, Vol. 109, No. 5 (March, 1996), p 911-922.

hand is effective and suitable for operations; effectiveness being whether the system does what it is supposed to do, and suitability being the issue of how robust the system is.¹⁶⁵ This determination of effectiveness and suitability is, in effect, a risk decision. The commander of military forces must have a level of comfort that a system in use, including the people, equipment, software, tactics, procedures and more, will operate as desired in conflict. Often systems, people and doctrine are beyond the commander's control – he or she must use what is given. So, the process of OT&E is simply the creative design of a test plan, the execution of the test plan in a realistic environment, and then the delivery of a report to the commander for decision, that recommends an answer to the question of effectiveness and suitability. The problem is solved in the report reader's mind when a long series of questions is answered by the report writer by an appropriate amount of discourse, data, thought, and any other information is gathered and presented in a logical way for the reader's approval – in essence a heuristic process bounded by some military processes. Thus, OT&E is robustly ethical in that it attempts to answer fundamental questions in a holistic way, and is in itself a value based process supporting a complex risk decision required from a military commander.

But once a good amount of thought has been applied, a heuristic approach considered and the creative process conducted, the vertical thought applied to assess the reasonableness of the approach, the officer must be able to communicate to the organization of the merits of his or her thought, another entirely different problem requiring thought and problem solving.

Approach

This paper has attempted to give the reader some additional knowledge and tools, a layer and approach resting above the simple methodology of risk management. This paper's focus was the military staff officer as the key player in the identification, analysis, management, communication and decision making processes involving risk. The paper's aim was to provide this officer with a robust, multi-disciplinary framework for dealing with risk. While there are

¹⁶⁵ For a complete description of the OT&E process along with a tangible example of its application see Bowen, Chris, *An AIS Strategy: System Changes, And Trust Through Operational Testing*, thesis submitted for the partial fulfillment of the degree of Masters of Science in Navigation Technology, the University of Nottingham, UK, March, 2009.

many risk models, processes and procedures that describe, simplify, analyse and claim to deal with risk, this paper's focus was the development of a more qualitative approach based on the softer sciences. This paper argued that a scientific approach is too limited, and the art of dealing with risk must be explored.

This paper's exploration of basic risk concepts and models provided a launching point into the treatment of selected theory. The theoretical foundations were selected from the softer sciences specifically to enhance the military officer's portfolio of education and knowledge. This method was designed to unlock a broader multi-disciplinary approach to risk within a large institution – a key element of any staff officer's responsibilities. But, in the end, there must exist a structure within which to apply the theoretical issues discussed above. It is no use to understand why a human processes information unless there is at least some structure to operate within. And so this paper's approach acknowledges the five processes of risk: identification, analysis, management, communication and decision making. Robust treatment of each process requires the ability to understand and use the fundamental concepts presented in this paper.

The most logical way of presenting an approach is to structure it in line with common risk management methodologies. There is a risk – even in this paper, that by structuring this paper's approach in this way it becomes more of a model, more prescriptive, and an automatic checklist function. That is not the point of this paper. The point is to think, iterate and apply heuristic techniques, think creatively, understand the operating environment, understand the individual and organizational milieu, and communicate always – possibly using scientific techniques and models built elsewhere, but always recognizing the art of dealing with risk. As Ladkin argues, there are two principles of risk assessment: know, and consult. In his extensive research on the subject he finds “two principles...uniformly [addressed] on risk assessment are: know everything, and ask everyone.”¹⁶⁶ In addition, Vose advocates for repeated iterations of the plan, a continuous review assuming changes have occurred.¹⁶⁷

¹⁶⁶ Ladkin, p 17.

¹⁶⁷ Vose, p 36.

The basis for the framework or methodology that follows is applied from Radford's book *Complex Decision Problems: An Integrated Strategy for Resolution*¹⁶⁸. This framework is used as a structure on which to layer the higher level approach proposed by this paper. The themes of this paper may apply at times to all five processes, or not at all, depending on the circumstances of the risk. And so if the following summary seems prescriptive, it is not.

The process of identification is continuous. A military officer's collective abilities and awareness will lead to the identification of risks. This is the first step in the discovery, or identification of risk scenarios – the identification of known risks that have potential for bad, or risks that need to be taken to secure an objective. But, there are many unknowns and the acknowledgement of the known unknowns, and unknown unknowns must be addressed.

The human traits of limited cognition, the tendency to be influenced by framing, and the tendency to lend weight to scientific arguments while ignoring the possibility of the unknown make the identification process unique. The limitations of the human to understand the entire operating space, and thus better understand any presence of risk must be addressed in this stage. Thus, whether the identification stage is active, such as in the CFOPP, or more passive during routine operations, the officer must recognize his or her limitations and expand the scope of discovery.

In the identification stage the officer must also be aware of his or her limitations when making decisions under risk. The objects that we see in the world (the visible risks), and the determinism that we strive to achieve are flawed when under pressure or risk. When accounting for unknowns, and acknowledging the unknown unknown, the officer must recognize that the decision space is even more flawed.

In the analysis stage the officer must formulate a deep understanding (in military parlance, second and third order effects) of any risk scenario. Some of the current robust analysis methodologies used in larger organizations are excellent methodologies. However, the start point of any analysis must be well thought out. Measurements taken must also be fundamentally

¹⁶⁸ Radford, K.J., *Complex Decision Problems: An Integrated Strategy, for Resolution*, Reston Publishing Company (Reston, 1977).

relevant to the risk scenario, otherwise the analysis of flawed measurements, or the measurement of nothing scenarios may emerge.

The issue of worth and any further complexity, ambiguity and uncertainty must also be addressed. Scientific analysis that frames a risk scenario in a narrow way, ignore unknowns and caters to our human limitations must be recognized. Any predictions that follow from an analysis must be tempered by all of these conditions to be more encompassing of a risk scenario. Finally the organization must decide whether it is a risk averse or risk taking culture. The process of analysis must address these cultures differently. The avoidance of risk in a health care scenario is much different than an innovative approach to risk taking in a military operation is something completely different.

The analysis phase will also be influenced by social interactions within the risk scenario – rarely are scenarios analysed in isolation. Weber’s concept of deterministic structuralism is relevant in the analysis phase, as this theory states that the human’s social interactions are necessarily structured. This structure lends itself to a more rigid analysis phase, and elements of organizations will naturally flow towards more rigid and narrow scientific evaluations. But, Weber also argues that charismatic leaders are also present, and the analysis phase is where they may emerge to counter bureaucratic and scientific power.

Continuing to layer this paper’s approach on top of the risk methodology and framework, the next phase of the process is management. In this phase the officer must truly engage the entire organization, and so must recognize the underlying theory of individual and institutional behaviour and use a Sociological based perspective. The first concept the officer must address is power, both individual power and group power within the organization. The officer must then use these power concepts, recognize the tribes and cultures that have power bases, and be the agent for institutional change to address organizational resistance.

In the management phase the development of alternative perspectives based on all of the stakeholders present in the risk scenario will build trust by balancing any negotiations within an organization. One possible model to use to build a management strategy is Renn’s matrix of factors influencing the perception of risk.¹⁶⁹ But alternative perspectives are hard to build by one

¹⁶⁹ Wilson and Crouch, p 114.

person with only one perspective. The officer must recognize the need for discourse, a narrative, and a culturally aware mindset. In other words, be flexible when alternative views arise, and be prepared to use alternative views, or even dissent, for action. “Successful organizations must build dissent into their practices, even as it may challenge the core values of the organization.”¹⁷⁰

In the management phase, McKinlay and Starkey have some excellent advice:

“Practicing power in such a context thus becomes a case of listening acutely, to hear silences and ellipses, as well as what is evident; of seeking to draw others and oneself into discursive dissonance in order to find that which all agree as the basis for action so that none can deny consultation as to its wisdom; of building an organization environment of alliances, networks, and overlapping conduits of interest. Such *realpolitik* of power, one submits, will open the door to postmodern organization futures made more reflexive by less hierarchical distortion of power and more capable of learning from the potential voices for their conversation”¹⁷¹

The communication portion of the overall risk methodology is simple and yet complex. On the one hand once identification and analysis are complete, all the officer has to do is develop a delivery method. Some excellent examples of communications frameworks can be found from the US Environmental Protection Agency, and the US National Research Council.^{172,173} But the leader is responsible for formulating a strategy that works across an institution and ensuring that the rigid organization has the capability to understand the message being sent.

¹⁷⁰ McKinlay and Starkey, p 46.

¹⁷¹ Ibid, p 46.

¹⁷² Government of the United States of America, Environmental Protection Agency, Seven Cardinal Rules of Risk Communication, www.epa.gov/pubinvol/pdf/risk.pdf, accessed 14 Oct 2010.

¹⁷³ *Improving Risk Communication*, Committee on Risk Perception and Communication, Commission on Behavioral and Social Sciences and Education Commission on Physical Sciences, mathematics, and Resources, National Research Council, National Academy Press (Washington, DC, 1989), http://www.nap.edu/openbook.php?record_id=1189&page=R1, accessed 29 November 2010.

The officer as a transformational leader is a key concept in communication. To be a transformational leader the officer must have a broad perspective using such tools as systems thinking, but also have a deep character such as described by Nancy Sherman in *Stoic Warriors*.¹⁷⁴ One tool that could be used to develop a deeper character in the eyes of the institution is Bruner's narrative methodology. But this narrative methodology in itself contains value judgements and moral acts. The influence on the human or the group can be important, depending in this narrative. The risk must be expressed as many different ways as possible, to as many individuals and groups within the organization as possible, ensuring it is framed and bounded properly and the narrative does not lead to ethical or value problems.¹⁷⁵

Finally, the organization must decide how to deal with a risk. In a military context, normally the Commander decides. However, in a sufficiently large and complex organization Commanders are often not aware of lower level decisions or the staff processes that produced individual results. While each commander and each staff are different, there are some fundamental processes that can help the decision making process.

The first process that can assist an individual Commander or a staff in decision making is thought. There are many ways to characterise thought processes, but there are fundamentally only two ways of thinking – straight, or vertical and structured scientific thought, and lateral thinking which attempts to break the human tendency to apply pattern. Straight thinking is important in that the methodical processing of all knowns must be conducted. Operational analysis is an example of thorough straight thinking. Lateral thinking is more creative and seeks to find additional ways of viewing or solving problems.

The use of the heuristic technique is also arguably very important in a decision process. The process of a well reasoned guess, or process started by inductions characterize this technique. The heuristic technique involves asking a series of questions and attacking the decision for many different angles, much like what a Commander does when presented a decision brief for instance. But the heuristic technique is only one tool, another is the Socratic method.

¹⁷⁴ Sherman, p 1.

¹⁷⁵ Wilson and Crouch, p 125.

The Socratic method is a method of wandering and questioning without any pre-supposed notions. This method is used in Law schools, for instance, to bring the student through a critical reasoning process. The combination of heuristics and the less structured Socratic method have potential to increase the capability to think in the face of complex problems and the resulting decisions that are required.

In summary, this paper proposed a new higher layer of thought on top of current risk management methodologies. The theories used are based on the softer sciences and include a more qualitative approach to risk. This new approach proposed should give the military officer a new and deeper perspective on risk.

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