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RISK MANAGEMENT AND RISK AVERSION IN THE CF: WHY RISK AVERSE LEADERS MAKE POOR LEADERS

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ABSTRACT

Despite incredible progress to harness and deliver mass information to military leaders, it remains impossible to predict the effects of their decisions with 100 percent certainty – this was true yesterday, is true today, and will be true tomorrow. As long as uncertainty persists, so will risk. A primary factor explaining the leader's decision path is how he perceives and quantifies risk with the desired outcome. This perception versus desired outcome is greatly influenced by the norms of his organization – risk aversion is a learned behaviour reinforced by organizational culture. A clear tension exists between the desire to eliminate risk when lives hang in the balance and the need to encourage risk-taking in day-to-day routines. However, the literature is quite clear that a critical link exists between encouraging risk-taking and fostering innovation and creativity. In short, risk averse organizations lack the innovation and creativity needed to remain viable in the face of a changing environment. The CF is a risk averse culture that will fail in its present quest for transformation unless its leaders learn to delegate risk acceptance and abandon their zero defect expectations.

INTRODUCTION

Creativity, innovation, leadership, and fear are all linked by one common element – risk. Whether risk is equated with progress and change or danger and fear is a direct result of organizational culture; how that culture perceives risk will determine how well the organization is able to adapt itself to a constantly changing environment. When risk is equated to an irrational fear of the unknown and therefore a threat to one's hierarchical standing, there will be a tendency to minimize risk-taking. Risk averse organizations value predictability and cautious change; unfortunately, creativity, innovation and adaptability are the casualties of risk aversion. The Canadian Forces (CF) have not been immune to these pressures. Its risk-averse culture results in 'micro-management,' lost opportunities to develop future leaders and will, ultimately, impede its ability to successfully transform into an adaptable, information-driven culture.

This paper will provide a basic understanding of risk theory and utility expectation in assuming risk. With this base knowledge it will be shown how certain organizational behaviour creates a culture of risk aversion and what this means when forced to make substantive changes. Next, the relationship between risk, creativity and innovation will be discussed. Once this key relationship is understood, the paper will provide a brief case study to illustrate how risk aversion impedes progress. The paper will then provide evidence, both external and internal, demonstrating that CF culture is very much affected by risk aversion and how this bodes ill for its transformation efforts.

RISK THEORY

Offered the following pairs of possible choices what decision would you make: a certain payout of *100* or a potential payout of *100/r* where the probability of occurrence is equal to *r*? Chances are you picked the certain payout – most people do. Now what would you do if the same options were given, but the certain choice was a loss of 100? In this case, the majority of us would opt for the possibility of reducing the loss by choosing *-100/r*.[1] In fact, since the probability of *r* being equal to 1 is 1, in other words certain, by choosing the optional *100/r* in both cases there is nothing to be gained or lost either way! It is the expectation of gain and the perception of an acceptable risk level to achieve the gain that determines risk acceptance versus risk aversion.

To put the concept of risk aversion into a military context we can turn to the historic Battle of Marathon. At this time ancient Greece's blossoming democracy had spread to include their army; ten generals (the strategoi)[2] were expected to achieve consensus before committing to battle. In the event of a strategoi tie, an eleventh general, the Polemarch, would cast the deciding vote. This is exactly what happened at Marathon.

Vastly outnumbered by the Persians at Marathon in 490 BC, the ten-general strategoi found themselves evenly divided on whether to risk an attack against the Medes 'horde' or to delay in hope of reinforcements.[3] At Marathon, one of the deadlocked ten, General Miltiades, convinced the Polemarch to vote for battle; a brilliant battle was fought and the Persian invaders were routed. A brief analysis of this risk-accepting decision will help explain the theory of expected utility

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[1] James G March, "Learning to Be Risk Averse," *Psychological Review* 103, no. 2 (1996): 310.

[2] Nicholas Sekunda, *Marathon 490 BC: The First Persian Invasion of Greece* (Oxford: Osprey, 2002), 41.

[3] *Ibid.*, 41.

Under the circumstances, the strategoi had three options: victory, defeat with no quarter, or merciful capitulation.[4] Clearly, the generals held different views on the utility of the outcome at Marathon, for example:

> If they valued success sufficiently, they would have been willing to take large risks to achieve it. If victory were not that much of an improvement over, for instance, a merciful capitulation or some other intermediate alternative, then they would have been rather cautious in the face of a risky choice.[5]

In this analysis, it is assumed that all ten Greek generals valued victory above capitulation and capitulation above defeat. This ranking provides for a numerical 'utility' factor to be assigned to two of the three options - the utility of victory equals 1 and that for defeat 0 (all prefer victory, but none desire defeat). We do not know what the utility of mercy was to each general. Clearly the chance of victory against the Medes was less than 1 (100%) and somewhat greater than .2 (20%). Assuming the strategoi believed the chance of victory was 0.6 (60%); the risk of merciless defeat therefore becomes 0.4 (40%). We now have the needed reference for our analysis of risk aversion.

For the general that individually rated merciful capitulation with a utility of 0.6 we find risk neutrality – the chance for victory equalled his desire for mercy and this general would not favour one action over the other. Another general might have rated the utility of mercy at 0.5. This general would prefer to risk defeat in fighting to the certainty of mercy through surrender – he was risk-acceptant. Finally, the risk-averse general who rated mercy at 0.7 would opt for capitulation and mercy over the risk of defeat in battle. Five of the strategoi fell into this category.

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[4] Persian General Datis offered to forgive the Greeks for 'occupying' the land of his nation's founder, Medos, if they surrendered. If they fought and lost, Athens would be sacked. See *Marathon 490 BC*, 41.

[5] Bruce Bueno de Mesquita, *Principles of International Politics; People's Power, Preferences, and Perceptions.* (Washington: CQ Press, 2003), 302-305.

The Marathon discussion is an illustration of the Expected Utility Theory of risk acceptance and aversion, which is graphically depicted in chart 1:

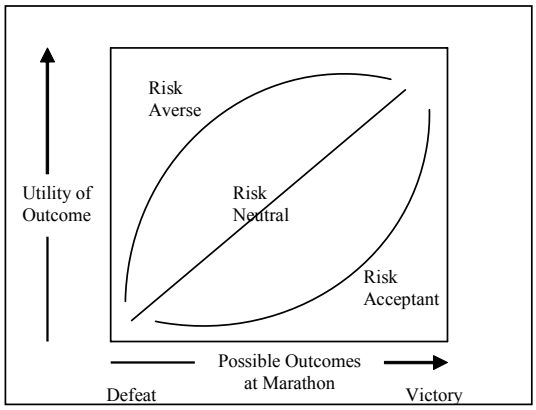


Chart 1 - Expected Utility Theory

Source: de Mesquita, *Principles of International Politics*, 304

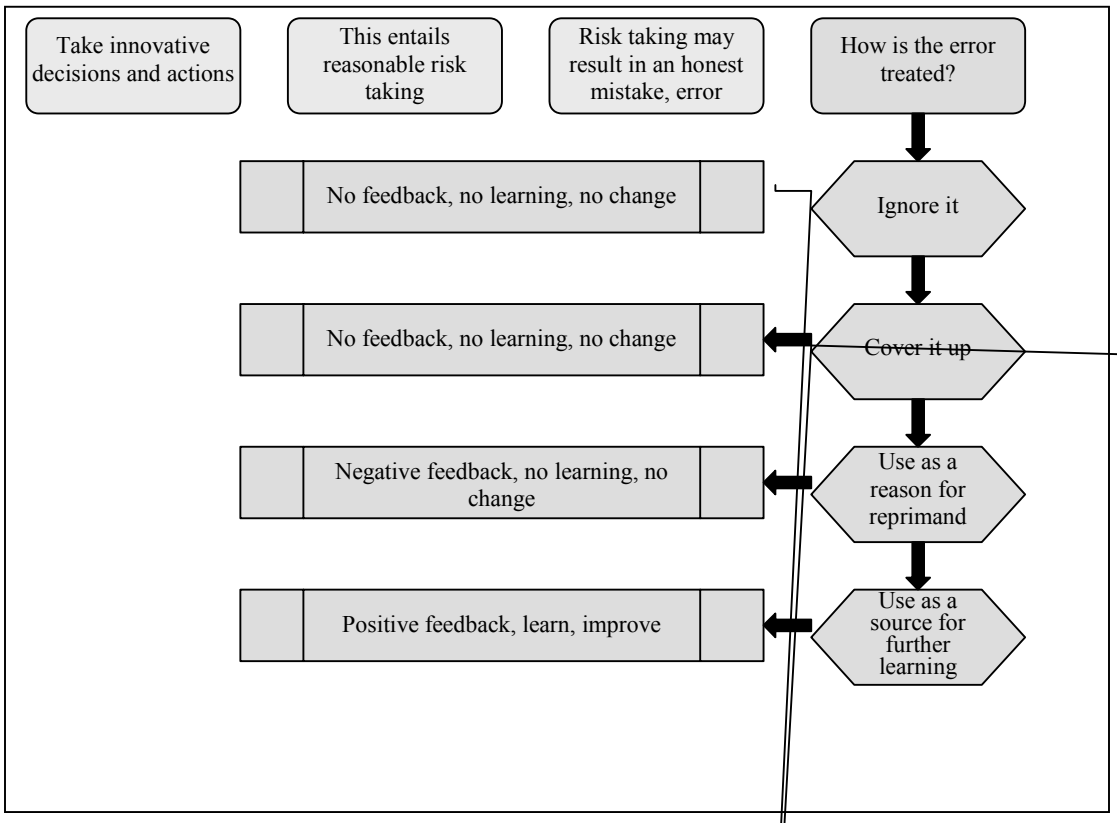
What is important to note from both chart 1 and the Marathon example is that decision makers evaluate risks differently. Who knows what historical course, if any, democracy would have followed had but one more general been as risk-averse as the other five! Clearly, risk-aversion is a serious topic that must be fully understood by the present day strategoi charged with protecting Canada's democracy. In order to better understand the cause of risk-aversion, we now turn our attention to organizational behaviour and the role it plays in creating risk-averse leaders. To do so we start with the federal government.

ORGANIZATIONAL BEHAVIOUR

The Auditor General of Canada's 1997 report articulated a very fundamental problem that leaders face: what to do when errors are made or "…efforts that, despite the best of intentions, fall short of expectations."[6] Not a rhetorical question, the report

[6] Office of the Auditor General of Canada, "Maintaining a Competent and Efficient Public Service" in *1997 Report to Parliament*, para 1.86.

suggests that these circumstances provide leaders an opportunity to "… understand what the shortcomings were, and adjust their operations, taking this new knowledge into account."[7] As shown by the Marathon example, when a leader is faced with uncertainty about an outcome he will only assume risk based on his expected utility of one outcome over another. How the leader arrives at his utility weighting, whether consciously or not, is influenced by the organization he belongs to. As the Auditor General alludes, how the organization deals with failure has a major influence on the customs or culture of the organization and therefore the decision process its leaders will take. The following chart illustrates the possible organizational responses and the effect each could have:[8]



As the author of the above chart notes:

> This chain of events can result in either vicious or a virtuous cycles [sic]. In the case of negative feedback, when even honest errors based on reasonable risk-taking result in reprimand, innovation is suppressed in favour of "going by the book'. In the case of positive feedback, innovation, risk-taking and learning are enhanced, improved and made more sophisticated.[9]

The theory presented in Chart 2 can be found in practical cases. Companies such as 3M, BOC and DuPont all have policies to, "…encourage risk-taking and accept failures."[10] Hershey Foods has an "Exulted Order of the Extended Neck" award; at Delta Airlines "…if you make a mistake and you recognize it and something positive comes out of that, that's a positive for the company."[11] These companies have set the expected utility threshold tot a level that accommodates risk taking. But why all the focus on encouraging risk? Isn't risk bad – even dangerous?

There is a training exercise delivered early in the Canadian Forces Staff College (CSC) curriculum that is designed to teach and encourage students to be creative and to 'think outside the box.'[12] During this event students are encouraged to provide answers to problems related to their profession – not just safe, predictable answers, but innovative, even completely unrealistic solutions. If another student laughs or belittles a suggestion in any way, he must stand up and apologize. With encouragement and an adjustment to the new 'rules' there is a marked increase in participation and innovative solutions. The CSC experiment provides a practical example of the Brodtrick's 'virtuous cycle.'

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[9] Otto Brodtrick, "Risk, Innovation and Values: Examining the Tensions" (report for the Treasury Board of Canada Secretariat 1999) 20.

[10] Michael L. Tushman and Charles A. O'Reilly III, *Winning Through Innovation: A Practical Guide to Leading Organizational Change and Renewal*, (Boston: Harvard Business School Press, 1997), 113.

[11] *Ibid*., 115.

[12] Canadian Forces College, "Lateral Thinking Techniques" (Command and Staff Course 31 Activity Package C/OF/CMR-304/TU-3, 2004).

Conversely, when an unsuccessful attempt to fix a problem through assumed risk leads to no (or negative) feedback, innovation is stifled, not encouraged. Without this encouragement employees learn to behave in a manner that will preserve their status:

> When we operate out of fear, we become guarded. We are careful what we disclose, what we share, what we reveal, what we attempt. We don't want to be labelled. We want to stay on safe ground. We become tentative, and our capacities stay buried beneath what might have been or could have been.[13]

These types of organizations create risk averse cultures. For example, when a section head falls short of expectations or steps outside the accepted norms and is consequently sanctioned (or worse fired) coworkers quickly learn what they need to do to avoid similar consequences. Eager to preserve the status quo, employees become risk averse and, as shown in the discussion on risk theory, will hold on to small gains (the sure bet) while taking unreasonable risks to reduce any losses. In order to further preserve his status, the section head imposes close control (micromanagement) of subordinates and ensures their behaviour is closely aligned with corporate expectations. In these organizations, stories of failure and the subsequent consequences exist for many years in company folklore[14] – this is how new employees learn the organization's culture.[15] The expected utility of risk taking in these organizations is at a threshold too low to encourage risk.

The benefit to organizations such as that described above is that their culture is carefully controlled and will produce a homogeneous workforce with closely aligned norms (not unlike that of military forces).[16] The 'win or lose' type of atmosphere that

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[13] Blaine Lee, *The Power Principle: Influence with Honor* (New York: Simon & Schuster, 1997), 57.

[14] *Ibid*., 56.

[15] Stephen P. Robbins, *Organizational Behaviour,* 5th ed. (Englewood Cliffs: Prentice Hall, 1991), 584.

[16] John Van Maanen. "People Processing: Strategies of Organizational Socialization," *Organizational Dynamics* 7, no. 1 (Summer 1978), 21-25.

non-supportive organizations employ is called 'tournament socialization.'[17] Tournament socialization produces employees who are "…insecure [and] obsequious to authority…."[18] The price of safeguarding traditions and customs is an organization capable of only slow, incremental changes to its culture and way of doing business.[19]

Certainly, there is certainly a case that can be made for maintaining military traditions and encouraging risk-free progression via slow, incremental changes. The Canadian Forces (CF) is a proud institution with a rich history that cannot afford to jump at every business fad currently in favour. But what about when capability must transform from that of Cold War deterrence to asymmetric warfare and expeditionary engagement? What happens when technology, or decades of chronic under-funding, demand wholescale changes in doctrine? Perhaps the argument for closely aligned norms and closed, linear thinking, crumbled with the Berlin Wall.

INNOVATION, CREATIVITY AND RISK

Innovation and creativity are not the same. Creativity is the ability to solve problems and create solutions, either theoretically or practically, through new inventions. Innovation is the ability to successfully exploit new ideas.[20]

Risk-taking is at the heart of creativity, a fact recognized by Canada's Auditor General:

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[17] John Van Maanen. "People Processing: Strategies of Organizational Socialization," in *Organizational Dynamics* 7, no. 1 (Summer 1978), 29-30.

[18] *Ibid*., 31.

[19] Stephen P. Robbins, *Organizational Behaviour,* 5th ed. (Englewood Cliffs: Prentice Hall, 1991), 584.

[20] United Kingdom, Department of Trade and Industry, *Competing in the Global Economy: the Innovation Challenge*; available from http://www.dti.gov.uk/innovationreport/innovation-report-full.pdf; Internet; accessed 20 April 2005.

> Public servants need the space to do their jobs—and to take reasonable, well-considered risks and to be creative—or they will become risk-averse and their creativity will be stifled, to the detriment of Canadians.[21]

In order to create new products or find solutions to difficult problems, unknown variables will be encountered and outcomes unpredictable. For example, the key part of 3M's 'Post-it Notes' was actually discovered as a result of a failed attempt to create a new super-strong adhesive. Rather than discard the weak glue and dismiss the wasted effort outright, 3M's corporate culture was structured in such a way that this 'failure' was used by another group as the perfect solution for the immensely popular Post-it Notes.[22] Such creative thinking is needed to solve problems and leverage unexpected results.

Creativity, however, is but one piece of the puzzle. Inventions and ideas mean nothing if not introduced to and accepted by society; an invention left on the workbench does little to improve humanity.[23] Innovators are those people capable of 'selling' an idea or invention and seeing it implemented. One can be creative without being innovative – or vice versa. Innovation is the key to unlocking the potential that creative minds have produced. Where would electricity be without Edison, or internal combustion without Ford?

The examples of electricity and the automobile clearly demonstrate that technology can change the way we live, work and fight. The technology cycle is also getting progressively faster – imagine the progress from the bulky Texas Instrument calculator of thirty years ago to the complex handheld BlackBerry of today! It requires

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[21] Auditor General of Canada, Matters of Special Importance," in *2004 Report of the Auditor General to the House of Commons* (Ottawa: Public Works and Government Services Canada, 2004), para 31.

[22] Brodtrick, "Risk, Innovation and Values…" 6.

[23] Auditor General of Canada, "An Innovative Society and the Role of Government," in *1994 Report of the Auditor General to the House of Commons* (Ottawa: Public Works and Government Services Canada, 1994), para 5.19.

innovation to take advantage of the technology cycle and those with the better innovation capability are best able to keep up with and 'successfully exploit' these changes:

> First, ideas have become the engine of productivity and the currency of global success. Innovation determines the wealth of nations and their capacity to provide a high quality of life for their citizens.[24]

This relationship between creativity (ideas) and innovation as the driving force behind progress can be demonstrated through an educational case study provided by Admiral Sir Percy Scott and Lieutenant Edward Sims.

Until the late 1800's, naval gunfire was a very inexact 'art' blending basic mechanical movements with a gunner's skill at timing the shot with the ship's motion. Admiral Scott would revolutionize the 'art' in the Royal Navy (RN). In the day, guns were mounted in the ship in a relatively fixed manner (although not so limited as the earlier cannons were on the sailing ships). Gears were used to traverse the gun horizontally onto target and a second set of gears was used to set the required elevation for the target's estimated range. The gunner would then time his shot with the rolling of the deck – firing just a split second before the pitching movement brought his iron sights onto target. As a result, accuracy was somewhat limited and therefore reliance on the guns, and in turn the gunner's status, was less than pivotal in battle. One account has five ships of the 1899 North Atlantic Squadron firing in turn for five minutes at a target ship 1600 yards away. After the 25 minutes only two rounds had found their mark.[25]

Scott, who in 1898 was captain of H.M.S. Scylla, was very much interested in improving his ship's gunnery. During one particular training session, he noticed that one

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[24] Department of Foreign Affairs and International Trade, *A Role of Pride and Influence in the World*; available from http://www.international.gc.ca; Internet; accessed 24 April 2005.

[25] Outliers Forum for the Unconventional Thinker, "Gunfire at Sea: A Case Study of Innovation," from Elting E. Morison, *Men, Machines, and Modern Times*, (Cambridge: The MIT Press, 1966), 17-44. http://www.cee.nps.navy.mil/NewSite/outliers/Gunfire.html; Internet; accessed 5 March 2005.

gunner had much better results than the others. After scrutinizing this individual's actions, he noticed that, unconsciously, the gunner was using the gun's elevation gears to compensate for the ship's rolling moment. Scott immediately grasped the potential of the gunner's unconscious actions. He devised a means to modify the ship's guns with more favourable gear ratios and then trained the crews for 'continuous-aim gunfire.'[26] Within a year, the Scylla was establishing new gunfire records; naval gunfire began the transformation from an art to a science! Scott had been unable to figure out the solution to better accuracy on his own (creativity), but he was able to recognize the possibility of an observed action and to exploit the idea into reality (innovation). While the Royal Navy immediately began benefiting from Scott's continuous-aim fire, bringing it into the United States Navy (USN) was more problematic.

Lieutenant Edward Sims, a junior officer aboard the US Battleship Kentucky, met Scott in 1900 and from him "…learned all there was to know about continuous-aim firing."[27] After modifying Kentucky's guns, Sims' innovative personality next turned to introducing this new technology to the USN. Official reports with "…extensive data on its [the new gun system] efficiency and accuracy"[28] were submitted to the Bureau of Ordnance in Washington. Sims' reports were ignored – how could a lieutenant know more about gunnery than more senior ordnance experts? Escalating his efforts Sims began to circulate his reports throughout the USN – to anyone who would listen; his efforts were in vain. The USN actively began to discredit Sims with a campaign of its own. If accuracy was a problem, the Bureau reasoned, it was certainly not due to inferior technology: "If there was a problem, it was with the gunners and their training, not with

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[26] Gunfire at Sea…17-44. .
[27] *Ibid*.
[28] Michael Tushman, *Winning Through Innovation…,* 5.

the equipment."[29] Besides, reasoned the Bureau, the Spanish-American war was won using present gunnery tactics.[30] Frustrated by the navy's intransigence, but unwilling to give up, Sims sent a documented report of the case to President Roosevelt, an ex-Secretary of the Navy:

> Violating navy practice and usurping the entire hierarchy, he brought Sims to Washington and made him inspector of target practice. Roosevelt mandated the use of continuous aim gunfire throughout the navy and charged Sims with ensuring that his order was accomplished.[31]

A number of lessons can be drawn from Sims' efforts. Although the basic gunnery technology existed and was not changed, it took innovation to successfully exploit one gunner's creativity. The 'warrior' nature of the expeditionary RN permitted an innovative culture willing to adapt in order to maintain their military advantage. The same cannot be said about the more isolationist nature of the USN.[32] Interestingly, USN resistance to change came directly from those who were in the best position to understand the benefits, but were unable to accept innovation from someone outside their area of expertise. One observer categorized this resistance as being the result of identifying too closely with the individual systems (guns) instead of with the bigger whole (navy) and the obvious benefits for the entire organization.[33] This is not unlike the parochial interests of individual branches/trades of the CF.

Less obvious in the example is a reluctance to accept cultural change that the prospect of improved gunnery threatened to effect. Improved gunnery would mean an entire shift in naval tactics and a heightened importance for the gunners themselves. In 1906, one of the great naval theorists, Alfred Thayer Mahan, demonstrated exactly this mentality with his opposition to construction of the modern battleship with its single-calibre main batteries because "…such vessels would fight only at great ranges. These

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[29] Michael Tushman, *Winning Through Innovation…,* 5.
[30] Gunfire at Sea…, Internet; accessed 5 March 2005.
[31] Michael Tushman, *Winning Through Innovation…,* 6.
[32] Department of the Navy, "A History of the U.S. Navy," http://www.history.navy.mil/history/history3.htm; Internet; accessed 27 April 2005. the 1898 Spanish-American War was the turning point when the USN began to expand beyond mostly commercial interests to protecting the nation.
[33] Gunfire at Sea…, Internet; accessed 5 March 2005.

ranges would create in the sailor what Mahan felicitously called 'the indisposition to close.' They would thus undermine the physical and moral courage of a commander."[34]

Finally, it took intervention from an outsider to break through the bureaucracy and 'stove pipe' mentality to impose the innovation. The CF has already experienced attempts at outside intervention from the Auditor General, the Somalia Inquiry and the creation of the CF ombudsman.

Although the events surrounding continuous-aim gunfire took place in the early twentieth century, Michael Tushman contends that the tensions explained above are very much in existence today:

> We have discussed Sims's story with managers from Asia, Europe, and the Americas and found that the same dynamics occur in organizations today. The challenge has not changed. Unfortunately, neither has the response of many organizations.[35]

With a better understanding of the relationship between risk, creativity and innovation, we now turn to strictly military implications.

CANADIAN FORCES CULTURE

In his 2002/2003 annual report, *A Time for Transformation*, the Chief of the Defence Staff (CDS) warned of impending organizational changes and urged no delay implementing them. In this report, General Henault recognized that transformation goes beyond weapons systems spanning the breadth of what defines the military: "…transformation itself is not only about technology. It is about changing human, organizational and warfighting behaviour."[36] By targeting human and organizational

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[34] Gunfire at Sea…, Internet; accessed 5 March 2005.
[35] Michael Tushman, *Winning Through Innovation…,* 6-7.
[36] Department of National Defence. *2002-03 Annual Report of the CDS: A Time for Transformation*. (Ottawa: DND, 2003), ii.

behaviour, Henault, whether consciously or not, is really talking innovation, creativity and risk-aversion:

> [The CF must] [t]ransform its management structures and decision-making processes: We must evolve to a much more adaptive and flexible organization."[37]

From the case study on naval gunfire, we can recognize the essential ingredients of innovation and creativity (ability to adapt); from the theory discussion we recognize the need for more risk-tolerance (flexibility). Henault was not alone in recognizing CF deficiency in these areas, although the VCDS was much blunter and to the point:

> More importantly, the institutional cultures of the CF must shift toward greater creativity and flexibility and away from a debilitating degree of risk aversion. This will have far-ranging effects on development, promotion, and education of future commanders. The Canadian Forces College has a particularly vital role in this process.[38]

Including the Canadian Forces College in the effort to eliminate risk-aversion is a solid first step, but other than the creative thinking exercise discussed above, little else has been introduced on the subject at the staff college level. Implementing the VCDS's direction to change CF culture and organizational structure will require the very skills that he has found wanting – creativity and innovation. As shown in the case study, outside intervention will likely be required – a path that the former CF Ombudsman, Mr. Marin, might argue almost impossible:

> …an ombudsman's office will not achieve its full potential or make its optimum contribution as long as there are pockets of resistance within the military. Attitudes must change in the interests of the institution.[39]

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[37] Department of National Defence. *2002-03 Annual Report of the CDS: A Time for Transformation*. (Ottawa: DND, 2003), iii.

[38] Department of National Defence. *Capability Outlook 2002-2012*. (Ottawa:DND, July 2002), 7.

[39] National Defence and Canadian Forces, *Overhauling Oversight: Ombudsman White Paper*. (Ottawa: DND, March 2005), 1.

Changing CF attitudes and culture is not going to be an easy task, but it is vital to long term survival. The culture of the officer corps is the place to start, a fact recognized in present strategic guidance;[40] sadly, progress thus far has not been stellar:

> *Organizations can learn as much from failure as from success* [emphasis in original]. The CF does not yet fully appreciate the benefits of this approach and tends to resist acknowledging failure or to react negatively and punish failure.[41]

From this observation we now recognize that Brodtrick's 'vicious cycle' of negative feedback exists in the CF. Fortunately, armed with an understanding of risk theory, and how risk aversion, creativity, and innovation are interrelated, we can begin to excavate concrete examples and propose solutions.

In discussing the way ahead, we must first identify the linkage between risk acceptance in operations and that in the day-to-day CF functioning. The Joint Doctrine Manual *Risk Management for CF Operations* provides doctrinal guidance for operations. Unfortunately, words without the accompanying organizational framework to support them are hollow concepts. Would the manual have helped Lt. Sims and the USN with the implementation of continuous aiming gunfire? Let us explore this question with a very possible CF situation: an Air Force (CAF) squadron commander (CO) that is selected as a task force commander (TFC) or air component commander for a deployed DCDS operation.

Risk Management for CF Operations provides the TFC with very progressive guidance on risk management. For example, commanders are warned to not institute a 'zero defects' expectation. Additionally, very detailed guidance on responsibilities is

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[40] Department of National Defence. *Canadian Officership in the 21st Century (Officership 2020)* (Ottawa: DND, 2001), 10-11.

[41] Department of National Defence. *Canadian Officership in the 21st Century: Detailed Analysis and Strategy for Launching Implementation (Officership 2020)* (Ottawa:DND, March 2001), I-15.

listed, including how "[c]ommanders establish a command climate favourable for risk management …."[42] One of the responsibilities elucidated within is germane to our discussion and bears repeating here:

> Risk decisions are frequently required by, and dependent on, the immediate situation. Judgment is required; a formula, rule or checklist, by itself, is not appropriate under such circumstances. An effective commander's approach to managing risk is to empower leaders by pushing risk decisions as far down the chain of command as feasible within the next higher commander's guidance.[43]

Unfortunately, if this recommended practise of delegating risk acceptance is not part of the CO's domestic day-to-day responsibility he will never be given the exposure and mentoring required to gain enough confidence to delegate low-risk decisions to subordinate leaders. Today this is precisely the situation for the TFC. As CO he is not delegated the authority to extend, by even one day, any of the multitude of flying currencies required by his personnel! This risk acceptance threshold has been moved up to his Wing Commander; beyond thirty days and approval authority moves even further upward to Commander 1 Canadian Air Division (1 Cdn Air Div).[44] Understandably, the new TFC may well be reluctant to delegate, thus continuing Brodtrick's 'vicious cycle' of building a risk averse culture. In other words, the future TFC will never master the expected utility of risk-taking; therefore placing him in the strategoi group that would have traded democracy for guaranteed safety at Marathon.

One could argue that such a cautious approach to risk management is necessary to ensure strict control of the dwindling resources. Another argument might be found in the

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[42] Department of National Defence. B-GJ-005-502/FP-000 *Risk Management for CF Operations* (Ottawa: DND Canada, 2002), 4-2.

[43] *Ibid*., 4-3.

[44] Department of National Defence. 1 CAD Flying Orders Volume 5, 5-501 (Ottawa: DND Canada).

aftermath of the Somalia Affair and the resulting decline of the CF in public opinion. In an attempt to recover the CAF's (an CF) image, much effort was expended on public affairs and 'openness'. Perhaps the drive to repair its public credibility resulted in the mentality that senior leadership must strictly control and limit any risk. The problem, however, seems to be more systemic than conscious:

> Further, the tolerance for risk throughout Defence appears low. This is exemplified by a 'one size fits all' approach in the capital expenditure approval process, and the organization's tendency to manage by committee. Unfortunately, low risk tolerance runs counter to transformation and can stymie innovation, suppress creativity and initiative, and elevate decisions to levels above which they should be made. It is also a contributor to the consensus-based decision-making culture that permeates NDHQ.[45]

A more plausible explanation can be found in the conclusions drawn from the naval gunfire case study.

The CAF, like the USN of the early 1900s, is largely a peacetime force that has had only limited warfighting experience since 1945.[46] Since its inception the CAF has had to justify its existence. Initially perceived as an extension of the Army and artillery, airmen had to fight hard to get airpower's full potential realized.[47] Interestingly, the government's perception of the RCAF was such that its post World War I existence was assured only by devoting most of its resources to civilian work:

> The upkeep of large Air Force establishments for purely Naval and Military duties in time of Peace will be expensive and a constant object of criticism. It should therefore be advantageous to the country generally to

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[45] Department of National Defence, Advisory Committee on Administrative Efficiency, *Achieving Administrative Efficiency: Report to the Minister of National Defence* (Ottawa: DND, 2003), iv.

[46] The relative stability of the Cold War precludes it from being considered warfighting.

[47] Airpower zealots, such as Billy Mitchell, Giulio Douhet and Hugh Trenchard, reasoned that airpower's ability to strike and devastate civilians directly would make it untenable for a nation to continue fighting.

> encourage and assist the civil development of Aeronautics in every way…[48]

This 'civilianized' RCAF continued until just before World War II when airpower's potential was finally acknowledged. Although the RCAF was certainly given its due during the 1950s and 1960s, since then years of continued financial pressure, the 'civilianized' heritage and only very limited warfighting have all influenced the CAF's culture.[49] Although used over Kosovo in 1999, recent overseas operations, including heavy Canadian involvement in Afghanistan, have not included the CAF's fighter aircraft; it remains an open question whether the catalyst for cultural change will be the defence review. For now, we return to specific examples of risk aversion in the CAF.

Indicative of the prevailing inability of the CAF to delegate risk decisions to appropriate levels is the airworthiness program.[50] If one accepts flexibility, synergy and centralized control as fundamental tenets enabling the best use of airpower, it should not be too difficult to identify problems with this program.[51] In a bizarre attempt to separate the technical and operational aspects of airworthiness, the program has instituted two completely separate and parallel paths of control and approval resulting in a cumbersome and painfully slow process. The following chart illustrates the division of authority and inevitable overlap of responsibility within the airworthiness program:

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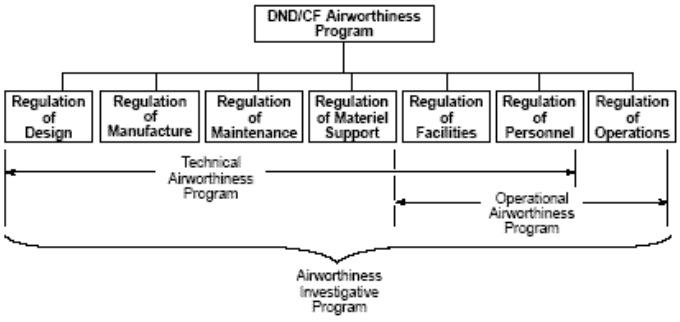
[48] James Eayrs, *In Defence of Canada, vol 1, From the Great War to the Great Depression*, (Toronto: University of Toronto Press, n.d.): 187.

[49] Following WWII the Canada gave up its bomber force and has only conducted 'warfighting' with its CF18s twice – 1991 and 1999.

[50] It is recognized that there are statutory obligations to be met by the Minister of National Defence (MND) and the CDS to ensure military aircraft achieve an acceptable level of aviation safety; the need for an airworthiness program is not questioned. The Aeronautics Act provides for a division of responsibility between the Transport and Defence ministers where military aircraft and personnel are concerned. The act can be viewed at http://www.tc.gc.ca/acts-regulations/GENERAL/A/aa/act/menu.html; Internet; accessed 11 March 2005. The need for an airworthiness program is not questioned.

[51] For a discussion on the tenets of airpower see Air Force Basic Doctrine AFDD 1, 2003, 19-33.



DND/CF Airworthiness Program – Regulates aspects of aviation activities, facilities and services to ensure and maintain the airworthiness of military aeronautical products and provide for the safe operation of those products.

Technical Airworthiness Program – Regulates technical aspects of military aviation safety and provides an acceptable level of safety for aeronautical products in compliance with the applicable design, manufacturing, maintenance and materiel support rules and standards.

Operational Airworthiness Program – Regulates operational aspects of military aviation safety and provides an acceptable level of safety for the operation of aeronautical products in compliance with the applicable rules and standards.

Airworthiness Investigative Program – Regulates the airworthiness aspects of the Flight Safety Program, monitors the Technical and Operational Airworthiness Programs for deficiencies and investigates airworthiness-related occurrences and issues.

Chart 3 - CF Airworthiness Program

Source: C-05-0050001/AG-001 Technical Airworthiness Manual 1-1-1-3

With the concurrence of the MND, the CDS delegates the Chief of the Air Staff as the Airworthiness Authority (AA), the Commander 1 Cdn Air Div as the Operational Airworthiness Authority (OAA) and the Director of Technical Airworthiness as the Technical Airworthiness Authority (TAA). Under the TAA side of the program there is a comprehensive *Technical Airworthiness Manual* (TAM), which provides detailed instructions and provisions for the further delegation of technical approval authority:

> An essential ingredient of the technical airworthiness risk management process is that technical airworthiness risk be accepted by the appropriate management level within the organizational structure as depicted in Figure 5.1.1.2 [depicted below], with due consideration for competence which includes experience, judgement and qualifications.[52]

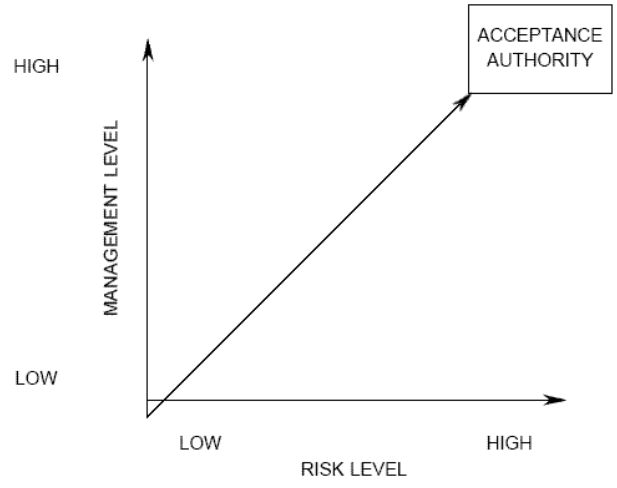


Chart 4 - Technical Airworthiness Risk Levels

Source: C-05-005-001/AG-001 Technical Airworthiness Manual, 5-1-1-3

By striving to find the right balance between too high and too low an approval level, the TAA recognizes the importance of permitting the best and right people to accept risk within their area of expertise. The same cannot be said on the OAA side where there is no comparable manual. The governing OAA document is 1 CAD Order Volume 1, 1-623. This order is far less clear on risk delegation:

> Responsibility for specific OA issues shall be assigned by name only to those individuals deemed competent by the OAA to assess the impact of the change or revision on the airworthiness of the aeronautical product.[53]

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[52] Department of National Defence. C-05-005-001/AG-001 *Technical Airworthiness Manual* Ch. 2 (Ottawa: DND Canada, 2003), 5-1-1-2.

[53] Department of National Defence. 1 CAD Flying Orders Volume 1, 1-623 (Ottawa: DND Canada).

Arguably, this is not necessarily a bad thing; after all, it is the safety of aircrew and resources at stake – to a degree. Not every airworthiness issue carries dire risk, for example, the type of glove or flashlight to be used. Unlike the TAA, OAA delegation is done by risk level vice personnel expertise.[54] In any event, delegation for risk acceptance does not extend below the A3 section head (e.g. A3 FG for air mobility) at the rank of colonel. While there is no concrete explanation for the difference in risk acceptance threshold between the technical and operational sides, one can infer a lack of trust in subordinates shown by the OAA. Perhaps as telling, the TAA is a civilian who is outside the military cultural restraints discussed previously.

A relatively simple example of how OAA risk aversion inhibits the Air Force's functioning can be found when changes are made to aircraft operating procedures. Using the air mobility fleet (AMF) as an example, the Transport Rescue Standards Evaluation Team (TRSET) will staff proposed changes. Resident in TRSET are experienced subject matter experts charged with ensuring 1 Cdn Air Div (Division) guidance and standards are met by the various AMF flying units. After ensuring the proposed change is in line with technical limitations and Division guidance, the change is affected user input is sought at the annual standards conference. Next, the final draft is approved by the CO TRSET (Lieutenant Colonel) who forwards it to Division. While at Division, it is further reviewed by the A3 staff, which may or may not have actual on-type experience. Once the staff is satisfied with it, the change proposal is forwarded to A3 FG (Colonel) who grants OAA approval. Finally, it is sent back to CO TRSET for final staffing and distribution.

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[54] Department of National Defence. 1 CAD Flying Orders Volume 1, 1-623 (Ottawa: DND Canada), Annex F.

This example provides an illustration of the CAF's risk aversion to a process that presents a perfect opportunity for low-risk decision making to be taken at more appropriate levels. The CAF's risk aversion is even more apparent when considering the separation in operational and technical approval paths. Espousing the air tenet of centralized control, it is hard to understand these parallel paths; surely it is within the CAF's capability to have one person oversee both sides. While an argument for the status quo might be made due to the breadth of expertise needed, the point of contention is not a question of knowledge as much as it is having the right mix of engineers and operators working in concert. The program would benefit greatly from horizontal integration where both authorities are subordinated under one leader and one process. This appears to be a clear case of stovepipe mentality compounded by OAA risk aversion.

Stovepipes might have been workable during the Cold War, however, in its new International Policy Statement, Canada has rediscovered the military as vital to regain its voice on the international stage; stovepipes will thwart the innovation and creativity required for the CF to fulfill the government's expectations:

> The Canadian military's nuanced understanding of conflict environments and ability to seamlessly transition from combat to stabilization is a widely recognized comparative advantage. This is why our men and women in uniform are in such demand overseas. To retain this standing, and to fulfill the tasks required to protect Canadians and build global security, the Canadian Forces must embrace new technologies, concepts and doctrines.[55]

Admittedly, the above example could be seen to oversimplify a complex airworthiness process involving much broader issues. However, it should be apparent that the technical

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[55] Department of Foreign Affairs and International Trade, *A Role of Pride and Influence in the World* (Ottawa: n.p., 2005), 14.

side of airworthiness is usually more complicated than the operational and yet the TAA is able to effectively delegate risk acceptance to an appropriate level. The Airworthiness Authority must examine this disparity and endeavour to accept cultural change by doing the same. An excellent starting point to effect this change would be to lower the expected utility threshold to a level that enables a CO to grant thirty-day extensions, waivers to Wing Commanders and OAA approval on low risk items, such as aircraft operating instruction amendments to the appropriate level. Further efforts to integrate the technical and operational process could safely be made at the various operational test and evaluation flights. Finally, horizontal integration of the airworthiness process must be undertaken.

To move now from the operational to the strategic level we can find signs of risk aversion from even the highest levels. Without apology, *Duty With Honour*, recognizes that a soldier may have to die while carrying out his duties:

> "…all members accept and understand that they are subject to being lawfully ordered into harm's way under conditions that could lead to the loss of their lives."[56]

When a soldier is killed during deployment it is certainly a tragic event that deserves full recognition from the government. Moments of silence in the House of Commons and half-mast flags on Parliament Hill are fitting recognition of the country's appreciation. When the Prime Minister meets a fallen soldier upon repatriation and even attends funeral services, we are moved by his compassion. However, due to the visible impact that these deaths have at the strategic level, the terrible truth is that these personal

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[56] Department of National Defence, A-PA-005-000/AP-001 *Duty With Honour: The Profession Of Arms In Canada*, (Ottawa: DND Canada, 2003), 26.

appearances actually increase risk aversion.[57] Commander's at all levels, including our hypothetical TFC, are keenly aware of the scrutiny that they will come under for any mishap (witness the fallout from the tragic HMCS Chicoutimi fire). It is a certainty that when the Victoria class submarines sail again the captains (and Navy) will be most anxious to avoid the headlines.

CONCLUSION

This paper has taken a look at risk aversion and its implication on organizational behaviour. From a basic discussion on risk theory to utility expectation on the ancient battlefields of Greece it has exposed how creativity, innovation, and fear are all linked by one common element – risk. It was shown, through the example of how continuous aiming gunfire was introduced in the RN and USN, that creativity and innovation are not the same, but that both will be stifled when organizational culture is unwilling to accept even low threshold levels of risk. Using the former CDS, General Henault, a link was made between CF transformation and the need for innovation and creativity to accomplish the goal of creating a more flexible and adaptive organization. A look at Canadian *Officership in the 21st Century* revealed that the CF has much work to do on this front. Finally, the paper provided some concrete examples of how risk aversion can, and does, impede daily operations in the CAF. Some practical suggestions on how to begin moving toward a culture better able to trust subordinates, and accept risk in the process, were provided.

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[57] The special apolitical status of the Governor General as symbolic commander-in-chief permits this office to participate in such events without causing the same perception of strategic level pressure for 'casualty aversion.'

From the tactical to strategic level it was shown that a risk averse culture exists in the CF, which, according to the theories presented here, if not changed will seriously impede successful transformation. Risk averse leaders breed risk averse leaders in a vicious cycle that must be acknowledged and stopped. The time for acting is now, transformation is now, and yet risk aversion persists.

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