"Free Thinking in a Large Box" or Bound and Determined?:
Senior Officer Decision Making in the Canadian Forces

Prepared for the Canadian Forces Leadership Institute

James O'Brien, MBA
Doctoral Student in Organizational Behaviour
Ivey Business School

Abstract/ Framework

In the call for proposals, the Canadian Forces Leadership Institute's (CFLI) question related to the topic of decision-making was as follows:

> Decision-making: How do senior leaders make decisions? Because decision-making is such a fundamental aspect of leadership, there is a need to better understand decision making within both an organizational setting and while experiencing extreme or adverse circumstances. Explorations could include: strategic decision making; enhancing decision making skills outside the experiential model; generalizability to flag and general officers; implications for group/team decision making; and/or a review of the relevant literatures.

In response, the contribution of the paper will be to consider the problem of senior officer decision-making through multiple lenses of contemporary management literature. This exercise will unfold in three general parts:

> -discussion of the general theoretical progression of decision making thought in the management literature
> -creating a model of CF senior officer decision making, informed by selections from this this theory
> -consideration of managerial implications and suggestions for future research for the CF within this domain

"The fine art of executive decision consists in not deciding questions that are not now pertinent, in not deciding prematurely, in not making decisions that cannot be made effective, and in not making decisions that others should make" (Barnard, 1938:194).

A cautionary note:

The Vietnam Veterans' Memorial in Washington, DC has been described as a monument to managerial hubris. Such an observation is grounded largely in a historical appreciation of the involvement of Secretary of Defense Robert McNamara in the war, who is described as having brought managerial methods to military operations, with disastrous consequences. In this vein, McMaster (1997) describes Alain Enthoven, a McNamara subordinate and appointee:

> His flair for quantitative analysis was exceeded only by his arrogance. Enthoven held military experience in low regard and considered military men intellectually inferior. He likened leaving military decision making to the professional military to allowing welfare workers to develop national welfare programs...he was convinced that 'there was little in the typical officer's early career that qualifies him to be a better strategic planner than…a graduate of the Harvard Business School.'" (McMaster,1997:19).

I offer the following paper in a spirit of respect and admiration for those senior officers of the CF with whom I had the pleasure to serve (JOB).

Introduction: **The management literature on decision making**

In the management literature, the domain of decision-making is complex and highly fragmented. The canonical, process models of decision making are increasingly challenged by the evidence collected under naturalistic enquiries (Klein, 1993, 1999; Lipshitz et al., 2001). Assumptions of rationality in the behaviour of decision makers have been modified and adjusted, to the point where the signal phrase "human behavior is intendedly rational, but only *limitedly* so," (Simon, 1947: xxiiif) is taken almost as an article of faith. In simplest terms, this amounts to a collision between normative and idiographic interest in the subject, or the recognition that, notwithstanding theory, some decision makers and systems are somehow more (or less) effective, and that this merits attention.

In strategic decision-making, one moderator of purely rational inclinations has been identified as politics. "Most strategic decision processes are ultimately political in that they involve decisions with uncertain outcomes, actors with conflicting views, and resolution through the exercise of power" (Allison, 1971; cited in Eisenhardt and Bourgeois, 1988: 737). While some might interpret politics as a functional drag on the rationality decision-making, at the level of senior officers in the Canadian Forces (or arguably, any level), it is inescapable.

In many respects, managerial decision-making is an impossibly broad subject. The literature of managerial decision making at all levels – individual, team, and organizational – is voluminous, and its definitive synthesis is a task that has eluded even the most accomplished scholars. Related reviews exist (managerial cognition: Walsh, 1995; organizational decision making theory and practice: Langley et al., 1995; executive leadership: Zaccaro, 2001), but these seem to reinforce the fragmentation and complexity of the domain more than its potential unity or coherence.

Part of this difficulty may inhere in the suggestion that the decision as a unit of analysis and focal object of study lies at the heart of practically every management problem, implying that decision-making is virtually coextensive with the practice of management itself. Thus within management literature, the core disciplinary streams lay claim to interlocking and overlapping aspects of decision-making theory, as suggested in the following table:

Discipline	Decision making topics
Organization Theory	Influences of environment, organization on decision making
Organizational Behaviour	Cognitive biases and heuristics, information processing; judgment
Finance	Decision rules for capital budgeting (Net present value, internal rate of return, etc.)
Management Science	Structured approaches to programmed decisions
Marketing	Consumer behaviour: choice, preference, buying decisions
Strategic Management	Managerial coordination, co-alignment, strategic choice

Table 1: Everyone has a piece of the puzzle: Management disciplinary claims on decision making theory and research

Zaccaro (2001), through his review of executive leadership, offers a useful cross–disciplinary framework, distinguishing conceptual complexity, behavioural complexity, strategic decision making, and visionary and inspirational models of executive leadership. Each of these models has direct implications for practice of executive decision-making, and each enlarges our understanding of the domain, while remaining necessarily incomplete. Zaccaro attempts their integration at the last section of his book, culminating in a "performance requirements model…list of executive leader competencies and tempermental qualities, and …constellation of characteristics contributing to executive flexibility" (314).

At the foundational level, management scholars have made significant and often durable contributions to an overarching "Grand Theory" of management, with corresponding implications for decision making. Taylor, Barnard, Thompson, March, Simon, and Weick, among others, have refined our appreciation of decisions through their work, which might be described in terms of the ongoing assembly of a theory of collective action. A number of these thinkers will re-appear in the paper, as a result of the particular resonance of their contributions for consideration of decision-making in a military context.

Limitations and assumptions

Taken together, these multiple perspectives, including the ongoing co-development of managerial and decision-making theory, and the pervasiveness of decision-making behaviours in managerial practice, account for the breadth and diversity of the domain. This paper will therefore need to clearly state some fundamental assumptions and limitations, to ensure that the aim of the project is upheld.

In summary:

- The paper will collapse the full range of potential senior officer decision types to those particular to this level of leadership, namely what the management literature characterizes as "strategic" decisions. In the management context, "strategic" has a particular meaning and connotations, which will be elaborated within the paper. Readers ought not to be confused by the military sense of this term, in the context of "levels" of war. The paper is not taxonomy of decision problems faced by senior officers in operational and administrative settings, and will focus on strategic decision-making as the "base case."

- The frame of reference for this paper is from the outside, looking in at the Canadian Forces: therefore, the existing operational planning process, and existing or contemplated CF procedures related to command, command and staff, and decision support, will not be explicitly addressed. Other authors (Giffen, 2002) have undertaken methodological critiques of these procedures, and we defer to their expertise (if not their findings).

- While the perspective on senior officer decision making in this paper originates in the management literature, it is not comprehensive or massively integrating of this body of thought, and many potentially intriguing avenues will need to wait for another day, and another paper. The logic guiding the selection of theory is to outline a general framework from the most central literature, and explore some of the most interesting and apt (in the author's judgment) tangents, in recognition of the fact that an exhaustive synthesis is beyond the scope of this project.

- Finally, the author's intent is to develop theoretically a potentially testable model, but not to test it in an empirical sense. First and foremost, this is a theory paper, which makes limited reference to empirical findings, except as they underpin the major theories, at this stage of development.

Christening the ground: Decision-making in the management literature

Orderly, well-defined, and systematic processes of decision-making popular in undergraduate textbooks and procedurally-oriented settings are the intellectual heritage of a prior, idealized conception of decision-making called the rational, classical, or analytical decision making model. Particular manifestations of this model tend to include descriptions of a three-part process of decision-making, encompassing problem identification and definition, consideration of alternatives, and selection and implementation of the most desirable alternative (Jones, 1995).

In a paper reviewing Naturalistic Decision Making, Lipshitz, Klein, Orasanu, and Salas (2001) describe that the

essential characteristics of CDM [Classical Decision Making] were (1) choice (conceptualizing decision making as choosing among concurrently available alternatives…(2) input-output orientation (focussing on predicting which alternative will, or should be, chosen given a decision-maker's preferences…(3) comprehensiveness (…a

deliberate and analytic process that requires a relatively thorough information search…) and (4) formalism (the development of abstract, context-free models amenable to quantitative testing" (333).

Bergstrand (1998) compares analytical and naturalistic modes of decision making in the context of operational planning in the CF, and suggests that "while an excellent theory for deciding on which car to purchase, or where to locate a military unit in peacetime, ADM [Analytical Decision Making] has severe limitation when applied to realistic military situations" (19). He cites Van Creveld (1985), who concisely states the information processing limitation of the classical-rational-analytical mode in the military context:

> In order to attain certainty, one must first of all have all the relevant information. The more the available information, however, the longer time needed to process it, and the greater the danger of failing to distinguish between the relevant and the irrelevant, the important and the unimportant, the reliable and the unreliable, the true and the false. There would appear to be no way out of the self-defeating dilemma except what Napoleon calls "a superior understanding' – one based, to be sure, on training and practice, but ultimately relying no less on intuitive judgment than on rational calculation (1985: 267).

While rationalist models of decision-making are useful pedagogic starting points, they bear practically no relation to the way that decisions are actually made in organizations (March, 1994). Their chief limitation is a reliance on unreasonable assumptions about the availability of information, the ability of managers to correctly use the process, and the purity of participants' motives (Jones, 1995). March offers an interesting reflection on the issue of what amounts to political interactions among participants in an organizational level decision. Inviting us to consider various kinds of these decisions, he argues:

> These occasions are not just occasions for deciding what to do. They are also occasions for talking about what goals the organization should pursue, what makes an argument legitimate, who is a smart analyst, who is tough, who is not, who is sensitive and who is not, who supports whom, how a decision maker talks, thinks, and acts. Understanding a decision and decision process involves seeing how these symbolic meanings pervade decision-making" (1994: 213-14).

These "symbolic meanings" that "pervade decision-making" are precisely the organizational-political contribution that renders the rational model untenable as a description of human strategic decision making behaviour. The role of power and politics in an organizational setting must not be underestimated. Yet many organizations, perhaps most prominently bureaucratic ones, are organized along rational lines, presuming complete availability of information as well as managerial sophistication and perfect alignment of managerial preferences and values with those of the organization. Huber and McDaniel (1986) characterize this line of thought as "the workflow paradigm," connecting it with early efforts to manage increasing levels of complexity in work. This reflects the intellectual heritage of Weber's bureaucracy: a prescription for a rational, task-driven organizational structure controlled by a clearly specified hierarchy and subject to strict formalization. These measures are designed to minimize the potential for role

ambiguity by clarifying accountability within the organization. Both these elements -- hierarchy and formalization -- are deemed to contribute to organizational effectiveness.

A major durable intellectual challenge to the rational-classical-analytical model was mounted by Simon, March, and Cyert, who collectively are sometimes described as "The Carnegie School." Their attack was mounted on two axes: attention as the scarce resource of decision-making, subject to human cognitive limitations, and what Lipshitz et al. (2001) describe as "an attack on the prescriptive validity of the Rational Choice model" (333). In other words, this model simply doesn't account for the behaviour of decision makers, who are necessarily able to find paths to effectiveness in even severely information-constrained decisional settings.

It is important to note an important theoretical trend at this stage, as theorists disavow the normative motive for their inquiries in favour of an emphasis on predicting what actually occurs in "live" organizational settings. Thus the test of a theory, in general terms, is not the extent to which it describes a process -rational method, or upholds our presumptions and preferences for how things ought to work, but rather the power of the theory to explain naturally occurring variation; and to account for patterns in the variance.

The Carnegie School theory was built out of a series of case studies conducted in the 1950s and 60s (Huber and McDaniel, 1986: 578). The model's key assumptions are satisficing (limiting information search and consideration of alternatives), bounded rationality (previously described human cognitive limitations), and organizational coalitions (essentially the groundwork for political considerations in organizational decision making). "The Carnegie model recognizes that decision-making takes place in an uncertain environment where information is often incomplete and ambiguous. It also recognizes that decisions are made by people who are limited by bounded rationality, who satisfice, and who form coalitions to pursue their own interests" (Jones, 463). Simon's contribution to decision-making theory has been positively magisterial: he is practically an obligatory cite for any work in behavioural and organizational decision-making. His specific contributions to the field are informed by an insightful appreciation of the purpose of organizations, which has particular resonance for the study of decision-making.

> It is now clear that the elaborate organizations that human beings have constructed in the modern world to carry out the work of production and government can only be understood as machinery for coping with the limits of man's abilities to comprehend and compute in the face of complexity and uncertainty (Simon, 1979: 501) quoted in Scott, p.158).

A further divergence from the rationalist model is the theory of incrementalism, or "muddling through," based on Lindblom (1959). This model argues that managers make only small adjustments to courses of action as a way of hedging the cost of making a mistake (Jones, 464). Incrementalism, like imitation, seems like a rational approach to uncertainty under certain circumstances. But because it effectively represents more of a model of decision-*avoidance* than decision-*making*, it is not always available in the decision maker's process choice set.

Mintzberg's unstructured model of decision-making blends rationalist and incrementalist models while arguing that decision-makers backtrack to their starting assumptions when they encounter a "roadblock," interrupt, or unanticipated obstacle (Mintzberg, et al., 1976; described in Jones, 465). This model is part of a trend that began with the Carnegie model in acknowledging the increasingly complex and variable nature of decision-making conditions in the organization, while deemphasizing political and social contaminants of the decision making process. This model seems most apt for describing major decisions, under which managers continually seek to incorporate new information while defining (and re-defining) goals and objectives, thereby substantially lengthening the decision making cycle. Organizations in thrall to this model may cede away a potential competitive advantage by implicitly preferring decision quality to speed. Yet the idea of a rationally adaptive decision making process, while intensive, is compelling under the correct circumstances.

Perhaps the epitome of unstructured decision-making is the garbage can model, described in Cohen, March, and Olsen (1976). The signal phrase here is "organized anarchies," which the authors argue are characterized by three general properties: "problematic preferences…unclear technologies…its processes are not understood by its members… [and] fluid participation…participants vary in the amount of time and effort they devote to different domains" (1). In essence, this model argues that some organizations, sensitive to the special resources or capabilities they possess, actually conduct decision-making in reverse, identifying solutions and then devising corresponding problems to match. The garbage can is a metaphor for the creative confusion created by this approach, in which "problems, solutions, and the preferences of different individuals and coalitions all mix together and contend with one another for organizational attention and action" (Jones, 466). March (1994) is careful to equivocate about the implications of the garbage can model, suggesting that new ideas, as well as insights about the decision process generally, might emerge from the garbage can. Also, within the garbage can, problems with no solutions, solutions with no problems, search activity and solutions but no problem, etc. may all flourish.

Leavitt and Nass (1989) found that the textbook publishing industry is a good fit with the garbage can model. There are significant uncertainties surrounding the quality and subsequent market performance of a textbook, and decision-making under these circumstances is described as a mixture of "guesswork, intuition, and opinion."

Cohen at al. suggest that the phrase "organized anarchies" describes practically any organization at selected points of time, with particular applicability to "public, educational, and illegitimate organizations" (1). The culmination of the garbage can paper is its application to the prediction of the effect of adversity on university decision-making. Conceptually, this model is the antithesis of rational-analytical-classical model, and it is hard to imagine proponents of any organization accepting that it applies to a greater or lesser extent to decisions made within their boundaries. But the privileging of ambiguity, opportunity, and what amounts to political processes operating with an organization has an intuitive appeal, and not insignificant explanatory power. "The great advantage of trying to see garbage can phenomena [streams of problems, solutions, participants, and choice opportunities] together as a process is the possibility that the process can be understood, that organizational design can take account of its existence and that, to some extent, it can be managed" (Cohen et al., 1972:17).

Thus far, the procession of models seems to support an increasingly chaotic sense of strategic decision making in organizations. As the models are refined to account for more of the variance in outcomes, they seem increasingly disturbing from a managerial perspective. The theoretical field also seems littered with discarded if not quite fully discredited assumptions, contradictions, and possibilities.

To some extent, a contingency approach to organizational decision making is proffered in Choo (1998). He broadly explores organizations as "sense-making communities, knowledge-creating enterprises, and decision-making systems" (xiii). Choo sees these activities as interconnected, and proposes a structure that acts on linkages among the activities to render the information and knowledge required by the organization to act.

Intriguingly, Choo effectively condenses much of the previous discussion of organizational decision-making models into a 2x2 matrix, which situates various decision-making models as effective contingencies, appropriate under particular combinations of circumstances (essentially varying configurations of uncertainty surrounding means and ends in the decisional setting). This is an insightful and useful idea, which a purely historical consideration of the evolution of the models might tend to overlook

	Goal ambiguity/ conflict	
Technical Uncertainty	Rational	Political
	Process	Anarchic

Table 2: Contingencies of Organizational Decision Making Mode, (from Choo, 1998:171).

Overall, there has been significant and compelling progress in the theoretical appreciation of how decisions are made in organizations. Despite the arguably inappropriate persistence of the rationalist model, increasingly "open" alternatives have emerged, which seem to more closely represent decision-making in organizations operating under conditions of increasing complexity, time pressure, and ambiguity. While there is no single "Grand Theory" of organizational decision-making, our awareness of the benefits and liabilities associated with the various models has been extended. Choo's matrix in particular allows us to see certain models or approaches as contingencies appropriate to particular circumstances. At the same time, an appreciation of the existence of different models and approaches to decision-making forestalls undue reliance on any particular method, supporting organizationally adaptive behaviour and flexibility of response.

Finally, and perhaps most maximally different from the classical-rational-analytical model, the literature reflects an increasing interest in intuition and, more broadly, Naturalistic Decision Making.

Simon (1987) was among the first to formally examine the role of intuition and emotion in managerial decision-making. He evokes the time-honoured appreciation of managerial

judgment, citing time pressure, individual confidence, and the value of experience. Simon distinguishes intuition from analysis by citing cognitive science, and his comments on the intuition of experts, particularly among physicians and chess grandmasters, are an intriguing to the stream of decision-making thought. Simon ultimately blends intuition with analysis, arguing that the intuition of experts is analytical in that it reflects deeply embedded expertise. He also contends that managerial decision-making can be improved, particularly under conditions of stress, by devising and practicing explicit routines and resisting an impulse to look backward and affix blame. Simon reports an intriguing finding: in an experimental setting, experienced managers and students arrived at comparable solutions to a business case problem, but the managers took significantly less time (Simon, 1987). This seems to reinforce the argument of "intuition," or embedded expertise, contributing to decision-making efficacy, through a learning effect.

Consideration of intuition lays the intellectual groundwork is laid for Naturalistic Decision Making (NDM). This model is described in Klein (1999) as the study of "realistic tasks and experienced people working under typical conditions. Features that might help define a naturalistic decision-making setting are time pressure, high stakes, experienced decision makers, inadequate information (information that is missing, ambiguous, or erroneous), ill-defined goals, poorly defined procedures, cue learning, context (e.g. higher-level goals, stress), dynamic conditions, and team coordination" (Orasanu and Connolly, 1993; cited in Klein, 1999:4).

In many respects, NDM is the vanguard of decision-making theory. Klein admits the reliance on case studies and interviews attracts some doubt surrounding the validity of NDM findings, but counters that tightly controlled lab studies are exposed to parallel criticisms of the external validity of their findings (1999:290-292). In context of the novel decision problems facing strategic decision makers, however, NDM's core component Recognition-Primed decision-making (the "one-course," satisficing, no-comparison method) seems of limited value. Indeed, it is possible that strategic decision-makers might deceive themselves into perceiving similarities between problems that do not exist, in order to leverage their experience. Strategic leaders learn from their experience, but not in the same way that firefighters, paramedics, and emergency room physicians might. Thus, notwithstanding the enthusiasm of some officers and researchers for the utility of NDM in military settings, this author is cautious about its generalizability to the senior officer decision-making domain, where familiarity is in scarce(r) supply.

Thus far, the theoretical frame has been primarily in relation to organizational decision-making models, which represent general, macro-level theories to account for how the work of decision making in organizations is carried out. At the mid-range, researchers have been interested in the effects of top management teams on decision making, recognizing that in complex, high velocity managerial environments, the myth of the heroic individual decision-making CEO is virtually unsustainable.

Zaccaro (2001) condenses this literature into two streams: consideration of TMT demography, and its effect on strategic decision making, and "the informational and social processes within the TMT that influence team members' perceptions and interpretations of strategic issues, their selection of strategic choices, and their implementation of strategic plans"

(216). Across multiple studies, trade-offs between high levels or interaction and participation against increased probability of team conflict have been reported. Amason (1996) separated cognitive (task-oriented) and affective conflict, where the former supported team effectiveness while the latter "inhibits decision consensus and impairs decision quality" (Zaccaro, 2001: 218). The bottom line of TMTs in strategic decision-making is that they support effectiveness by acting as information processing and analytical "force multipliers." This applies, however, only when skilful leadership contains associated process costs.

More generally, the literature on teams amplifies this requirement for close coordination, based on the theories of groupthink or collective defensive avoidance (Janis and Mann, 1977), and risky shift (Stoner, 1961), under which groups are more likely to endorse extreme courses of action than under individual decision making. These theories crystallize some of the liabilities associated with collective decision-making, which must be taken into consideration in relation to the strengths of teams.

At the level of individual behaviour, literature on decision-making identifies multiple sources of cognitive bias. Because these characteristics of individual decision-makers and teams can affect organizational decision-making outcomes, it is useful to briefly describe them here. Hammond, Keeney, and Raiffa (1999) discuss the components of the catalogue of individual decision-making biases in detail. They identify "psychological traps," which confound effective decision-making in individuals, including anchoring, over-identification with the status quo, the sunk-cost bias (related to escalation of commitment; Staw, 1976), confirming evidence (seeing only that information that supports our point of view), the framing trap (identifying the wrong problem), overconfidence bias (Lichtenstein, Fischoff, and Phillips (1980)), the recallability trap, and many others (Hammond et al., 1999). Choo consolidates many of these considerations by referring to three main cognitive simplifications, including stereotyping, availability (or an overemphasis on "familiar, recent, and vivid instances" (169)), and anchoring and adjustment. In effect, these biases are the product of bounded rationality, or as Hogarth (1987; cited in Choo) summarizes in the following list of individual decision-making limitations:

- Perception of information is not comprehensive but selective
- People...process information in a predominantly sequential manner
- Operations…simplify judgmental tasks and reduce mental effort; [and]
- People have limited memory capacity

Thus at the organizational, team, and individual levels, the literature of management/ organizational decision making, even when sampled and arranged for maximum coherence, presents a complex and fragmented picture. Thematically, there is some sense of a requisite complexity of decision-making theory, under which neither mechanical nor exaggeratedly complex models fit the data (of strategic decision making practice) best.

Christening the Ground: Decision Making in the Military Setting

The Canadian military exists to conduct operations in support of national objectives. In recent years, these operations have taken on many forms, spanning the operational spectrum, and placing appreciable demands on both force generation and sustainment. Further, this high

operational tempo shows no signs of abatement. What core philosophy guides the institution of the CF in these demanding times? Overall, the Canadian "way of war" (where war may be interpreted in the broad sense, as in warfighting) has been described as a vigorous, decentralized, and decisive mode of operation, encompassing the manoeuvrist approach, disciplined initiative, and mission command ("Canada's Army" refers). It is well-suited to the previously described task environment, while placing appreciable demands on decision makers and planners at all levels.

Under this broad umbrella of Canadian military culture, the lore of decision-making pervades the military life, and "considerable time and resources are expended in the Canadian Forces to develop and teach decision making methods" (Bergstrand, 1998: 1). Many military members will recall the assertions of training staff to the effect that an imperfect decision, swiftly and vigorously executed, is more effective than the perfect decision, "that takes all day." Vigour beats rigour, one might say. A social scientist might label this attitude a bias to action, or at the very least a kind of false dichotomy, but the prevalence of this phrase, and related expressions, is practically incontrovertible. Much of officer training is devoted to what pedagogues might characterize as "problem-based learning," or training based on forcing candidates to make, implement and defend a decision in a realistic setting, where exposure to risk is carefully controlled. Officers learn formal and informal procedures for solving decision-making problems, including the Estimate of the Situation or service paper, which represent kinds of pencil-and-paper decision aids. Taken together, these anecdotes illustrate that concern with decision-making is embedded in military culture, and a prevalent stream in officer professional formation from the outset.

Thus the centrality or importance of decision-making cannot be overstated to a military audience. Officers train explicitly to make decisions in challenging environments, literally from the very first day of basic training. This approach foregrounds the unique qualities of the military decision-making "space" or context to aspiring officers, where time and information are practically always constrained, consequences of error can be extremely high, and decision makers must be conditioned to operate effectively under extreme physiological and psychological duress. As officers progress through the CF hierarchy, however, the nature of the decisions they are required to make changes, often dramatically. The CF training and development system for officers seems to contain an embedded assumption that early-career experience in decision-making is foundational to the corresponding senior officer competency. Above and beyond the explicit separation of performance and potential in the CF performance appraisal system, this is an assumption that deserves to be tested. Specifically, are the decisions that senior officers make fundamentally different from those faced by their subordinates, or are they simply higher-order versions of the same problems? What are the appropriate dimensions of decisions, that might help us approach this problem more systematically?

There is evidence to support an enduring misalignment of formal training and the study of decision-making in the military, with the application of this knowledge in field settings. The former relies on rational-classical-analytical techniques, while in the field setting, more idiosyncratic methods prevail. Bergstrand (1998) cites Falleson (1995) and Halpin (1995), both of whom describe this disjunction in the U.S. Army context. Halpin writes: "Estimate procedures are not closely followed in Army tactical exercises. The primary cause seems to be a

mismatch between the doctrinal procedures and what is possible under time-constrained decisions."

Finally, by way of christening the ground, the management literature addresses an issue that a military audience might find mildly heretical: Do the decisions that senior leaders make really matter? Do they affect the performance of the organization, and if so, do they explain more of outcome variance than the characteristics of the environment or the organization itself? This is precisely the question that was addressed by Salancik and Pfeffer (1977), who assessed the impact of the mayor on the performance of 30 cities over an 18-year period. They found that "after controlling for city and year, mayors explained between 5.6% and 10% of the variance in city income and expenditures" (Zaccaro, 2001: 6). On face, this has been taken as evidence that the contribution of strategic leadership to the performance of large organizations is insubstantial. Within organization theory, this evidence is sometimes construed as consistent with transaction costs theory (Williamson, 1975), population ecology (Hannan and Freeman, 1977) and related theories, which suggest a deterministic interpretation of senior management behaviour. Colloquially expressed, managers don't matter, in comparison with the organization and the environment, because their choices are constrained by large, impersonal forces operating across the multi-organizational field.

Subsequent researchers have suggested that "10% of the variance" is an underestimation or misinterpretation of the data, while Child (1972) and Hambrick and Mason (1984) make convincing arguments to the effect the strategic choice exists and that "managers matter." Ultimately, even 5% of the variance in performance might be the difference between success or failure in operations (in the military or other contexts), suggesting that even at the lower bound of estimation, the contribution of executive leaders is material. If nothing else, Salancik and Pfeffer may have introduced a note of humility into consideration of this subject, and this ought to be welcomed. Their argument at least raises the possibility of fallacies of attribution: good organizations can perform in spite of bad leadership, and vice versa.

A (Provisonal) CF Senior Officer Decision Making Model

As discussed in the assumptions and limitations section, the model of senior officer decision making in the Canadian Forces in this paper will characterize their decisions as "strategic." Mintzberg, Rasinghani, and Theoret (1976: 246) describe a strategic decision as one which is "important, in terms of action taken, the resources committed, or the precedents set." Elsewhere, Thompson (1967) describes the dual executive functions of boundary management and the co-alignment of the organization as a whole with its environment, suggesting that decisions made at the uppermost level of the organization are increasingly subject to uncertainty as a result of heightened exposure to the "open system," lying beyond the boundaries of the organization. In Thompson's terms, at the strategic level, "technical rationality" (or predictability of the outcome of decisions) simply does not apply. This is the essence of the senior leadership problem, and what distinguishes it from leadership at lower levels in a structured organization like the Canadian Forces: consistently high levels of both significance and ambiguity.

The decision-making literature sometimes classifies decisions as programmed (i.e. routine) and non-programmed (Harrison 1999). In this characterization, strategic decisions fall

into the non-programmed classification, as they essentially redirect the energies of the organization towards new or redefined ends (Teale, et al., 2003). Within organizations, rules and procedures are developed for programmed decisions, culminating in routines. Such structure is not feasible for non-programmed decisions, as they tend more towards ambiguity, and are associated with difficulty in predicting the outcome of a given course of action, per Thompson. Thus in the CF senior officer model, decision makers are anticipated to operate predominantly in the non-programmed mode.

But the association of senior officers with strategic decision-making is not absolute. Senior officers frequently make routine decisions, and conversely, under contemporary conceptions of warfare, more junior figures may make decisions that have strategic implications (the "strategic corporal"). But in general, large organizations like the CF tend to deliberately allocate responsibility for strategic decision-making to senior leadership. Thus a hypothetical distribution of senior officer decision-making could reasonably, and should, be expected to favour strategic decisions.

Zaccaro (2001) elaborates the implications of this distribution in his discussion of the nature of the work of an executive leader. "Problem types and decision choices become more ambiguous, less structured, more novel, and more differentiated at higher organizational levels. Thus, the cognitive process of leadership becomes more complex" (24-25). In other words, the cognitive load on senior decision makers is increased, which suggests that simplifications (bias) might be more likely, and that there is an organizational imperative to support decision making at this level. Paradoxically, experience may also be a less reliable guide to decision making, based on the increased novelty of problems.

Notwithstanding the nature of the decisional problems that senior leaders face, they have some freedom of action in terms of process. Building on previously discussed decision making models, research has suggested that problem complexity and political character of the decision (Rowe, 1989) affect the choice of process, particularly in terms of the extent of consultation that is sought. (We can also infer from the literature that such choice is not always a matter of conscious managerial action, and that some processes emerge from particular combinations of circumstances, as described in the Garbage Can model). This finding has important implications for the decision making of senior officers in the CF, by bearing on the extent to which goal congruence is manifest in the context of the decision. Hypothetically, goal congruence might reach a maximum in operational settings, supporting increased process rationality, but the exigencies of politicized decision making certainly merit closer study, even in settings where a compelling collective interest seems to exist.

Langley, Mintzberg, Pitcher, Posada and Saint-Macary (1995) make a significant contribution to what they describe as the "opening up" of organizational decision making. For the purposes of our CF senior officer model, the following ideas are most resonant:

> -adding what they call "insightful man," characterized by flashes of insight and tacit knowledge in strategic decision-making, to the lineage of Simon's administrative man and his antecedent, economic man (these "men" are essentially collections of attributes that describe the actors who populate various decision-making models)

-adjusting our appreciation of decisions from discrete events to streams of issues, considering the organization as a system of decisional processes, or more accurately, of linked issue streams. "We suggest that decisions related to the same issue may "nest," "snowball," or "recur"" (271).

This perspective strongly evokes the interrelationships among multiple decisions in the strategic context, where path dependence and ripple effects condition both the behaviour of decision makers and the set of available options at different stages in the life cycle of an organizational issue. This further complicates the life of the senior officer decision-maker, by enlarging the sphere of information that demands her interest, and foregrounding the idea that strategic decisions are often interrelated, interactive, and must be approached as an ensemble rather than as a series of discrete events.

Eisenhardt (1989) studied decision makers in what she termed "high velocity environments," where speed of decision-making was essential to success. She found that fast decision makers use more information and consider more alternatives, while attending carefully to conflict resolution and integration between the strategic and executional levels. She connected this set of behaviours to superior performance in the microcomputer industry. Her somewhat counterintuitive findings have significant implications for the design of decision support systems, while counterbalancing the urge to (over-) simplify complex decisions.

At the behavioural level, Schwenk (1984) argues that strategic decision makers are susceptible to particular cognitive simplifications. Tversky and Kahneman (1974) characterized the dual nature of information processing operations, stating "in general these heuristics are quite useful, but sometimes they lead to severe and systematic errors" (1125). Such severe and systematic errors are conventionally described as bias, and the practitioner and theoretical literature is a virtual catalogue of various forms or decision making bias (Russo and Schoemaker, 1989; Hammond, Keeney, and Raiffa (1999)).

Schwenk collapses various theories of strategic decision making into a general three-stage model (recalling the rational models discussed earlier), and highlights the particular biases attributable to each stage. The results are summarized in the table below, where biases of particular interest to the CF senior officer model of decision-making are identified in bold type:

Stage	Associated biases
Goal formulation/ problem identification	**Prior hypothesis bias** (a.k..a. disconfirming evidence trap); anchoring and adjustment (adjustments typically insufficient); **escalation of commitment; reasoning by analogy**
Alternatives generation	Single outcome calculation (from problemistic search, Cyert and March (1963); inferences of impossibility; denying value trade-offs (preference for favoured alternative); **problem set** (repeated use of one strategy makes it difficult to use alternatives)
Evaluation and Selection	Representativeness, **illusion of control**; devaluation of partly described alternatives

Table 3: Schwenk (1984) Decision Making Stage and Corresponding Biases Associated with Strategic Decision Making

These "cognitive simplifications" are discussed in detail in Schwenk (1984) as well as in practitioner-oriented literature, and will feature in the companion paper to this document, which is intended for a senior officer audience.

To summarize, the proposed model of senior officer decision making in the Canadian Forces is consolidated into the following general and specific implications:

Dimension	General Implications	Specific Implications
Based on strategic decision making, decisions are:	Significant to the organization in multiple ways, exposed to the environment (uncertain), difficult-to-predict outcomes? context of decisions Ambiguous, non-programmed, more cognitively demanding than lower level decisions	Simultaneously high levels of significance and ambiguity, increased demands on decision maker's attention. Amplify need for decision support
Process models governed by:	Problem complexity Political character of decision Analogy of the issue stream, linked decisions, rather than discrete decision making events "The need for speed" → lots of data, lots of alternatives, good integration across levels. Process intensive.	Must work in non-programmed mode; reliability of experience as a guide to decision making is suspect Decision system speed and capacity requirements more than a matter of "staff duties"

Team settings for decision making	More prevalent	Potential force multipliers, extend bounded rationality, but impose process costs. Must distinguish affective (emotional) from cognitive (task-oriented) conflict
Senior officers as decision makers are subject to particular biases, including (but not limited to):	Prior hypothesis bias Escalation of commitment Reasoning by analogy Problem set Illusion of control	Focal points for self-awareness, self-efficacy, personal development De-biasing techniques?

Table 4: A Model of CF Senior Officer Decision Making

This is a provisional model, but one intended to have a certain applicability to predicting the decision making behaviour of senior officers in CF. It represents a first stage in moving beyond the decision making lore of the CF, and into Staff Colleges, headquarters, CPXs, and other simulations, where these propositions can be tested.

The Revolution in Military Affairs (RMA), an emerging theoretical conception driving the forward development of doctrine and military technology in the United States, has important implications for the CF as well. Specifically, Sloan (2000) suggests that the effect of the RMA on Canadian military organizations will be:

-Smaller, more modular units that can be easily combined and tailored to specific tasks;

-More decentralized decision making as a result of increased situational awareness and battlespace control capabilities at lower echelons than was previously the case; and

-A move towards professional forces and more highly educated service personnel.

In other words, RMA theory suggests the Canadian Forces will be exposed to fundamental organizational pressures, where the accretion of historical practices, informality, and reliance on unsystematic judgment of leaders will be severely tested. As a competency, decision making will become even more critical as specialization increases, information circulates more freely and widely, and the cognitive capacity of the organization expands. Mismatches between theory and practice will grow increasingly unsupportable, lending a note of urgency to the issue of military decision making in general.

Integration: Gaps and inconsistencies as opportunities

To this point in the paper, the general trajectory of decision-making within the management literature has been traced. It seems to culminate in increasingly open-ended, less structured, less process-driven models, which accommodate human information processing limitations, political considerations, and ambiguity of both inputs and outputs at the strategic level. Turning to the CF, based on the stated assumption that senior officers make strategic decisions, a model of CF senior officer decision-making has been developed, resulting in some fairly specific implications. At this stage, the paper will offer some general reflections on the implications of this "findings" for the CF, and briefly suggest some possible research avenues geared to increased organizational and senior officer effectiveness

Managerial implications

1.1 **Simultaneously high levels of significance and ambiguity.** This fundamental implication underlines the importance of senior officer decision-making, and the high analytical demands placed on senior officers. Tolerance for ambiguity is also an intriguing managerial construct (Budner, 1982), which might be specifically incorporated into senior officer selection and development. The simultaneity of these features might also be expected to exacerbate decision maker stress.

1.2 **Increased demands on decision maker's attention.** As the Carnegie school asserts, attention is a scarce resource, and increased demands on a decision maker's attention create opportunities for inappropriate cognitive simplifications (bias). This implication underscores the need for intelligently designed and implemented decision support systems, which allocate information, attention, and decision-making responsibility appropriately within teams.

2.1 **Must work in non-programmed mode.** Stereotypically (but not without basis in fact), the military is a highly formalized organization, replete with rules, procedures, drills, and routines. At the level of what Thompson would describe as the technical core of the organization, this is a highly efficient arrangement. But the utility of formalization for senior officer decision-making is highly suspect, because of the innate novelty associated with each new strategic decision making problem, or, perhaps more accurately, with each successive location in the multiple issue streams that comprise the strategic organizational decision making milieu.

2.2 **Reliability of experience as a guide to decision making is suspect**. This is among the most intriguing and potentially counter-intuitive implications in this paper. Because of the fundamental differences between senior and pre-senior decision making, where the former takes place in a more open system, subject to environmental variability, politics, and multiple levels of ambiguity (influences the organization seeks to shield its internal environment from), learning takes on a potentially deceptive character. Experience has value for senior officer decision makers, but literal reliance on lessons learned, and insistent pattern recognition, are inappropriate approaches to strategic issues, which tend to present uniquely. Might junior officer experience be what has been described in the literature

(Bolton, 2001) as a "sticky prior," or inappropriate cognitive antecedent to senior officer decision making?

2.3 Decision system speed and capacity requirements more than a matter of "staff duties." It sometimes seems that the CF assumes heroic status of its senior officer decision makers, which causes organizational neglect of issues like decision making redundancy (the deputy commander problem), allocation of authority and information in concert, and structuring of data to optimally support individual and group cognition. These matters seem to be governed by "administrative heritage," rather than driven by detailed awareness of the requirements of decision makers. Speed and capacity of the command system, particularly as use of information technology intensifies, will always be constrained by cognitive limitations.

3.1 Teams as potential force multipliers, extend bounded rationality, but impose process costs. As decision settings become increasingly complex, and stakeholders multiply, senior officers are increasingly involved in team decision-making and problem solving. This intensifies ambiguity, has the potential to create multiplicity of objectives, and introduces unique-to-team decision-making biases described in the body of the paper. At the same time, however, the benefits of increased expertise, as well as potential creative or constructively divergent inputs, can be significant. Senior officers must possess the competencies required to marshall these teams as they undertake decision making tasks, particularly in settings where team members may present conflicting goals or interests, different cognitive or communications styles, and varying levels of ability and interest.

3.2 **Must distinguish affective (emotional) from cognitive (task-oriented) conflict.** This is a more specific point related to 3.1. Interestingly, conflict avoidance can debilitate a team, and is part of the rationale for both groupthink and risky shift.

4.1 Biases as focal points for self-awareness, self-efficacy, personal development. The catalogue of biases in decision making at all levels is fairly comprehensive. Yet biases persist, in part because they are related to functional simplifications that enable decision makers to manage potentially overwhelming flows of information. Concrete awareness of biases at an individual and team level can have a dramatic effect on performance. But such awareness is only the product of knowledgeable observation, accurate reporting, mindfulness, and a commitment to continuous self-improvement coupled with sufficient self-confidence to acknowledge that improvements are required. This is made difficult by the dearth of intensive, senior officer focussed behavioural observation during training and operations.

4.2 De-biasing techniques. To the extent that a catalogue of biases exists, there is virtually an equal volume of literature on techniques to increase self-awareness through debiasing of decision-making practice. Again, the practitioner literature is well-developed on this dimension, examples of which have been reported in this paper. Customized reporting on individual senior officer decision making styles, including biases and remediation strategies, seems very much related to the work of the staff colleges, which are arguably deliberate interruptions in an officer's career. Attendance at a staff college course is connected to

movement upwards through the layers of the organization, each of which contains different fundamental assumptions about officer performance and nature of decision making.

Suggestions for future research

To a greater or lesser extent, each of the managerial implications described above suggests potential avenues for research. The potential richness of the CF, and particularly the senior officer corps, as a data source for the investigation of management decision-making cannot be overstated. Taking a leaf out of Industrial/ Organizational research into performance appraisal and selection, policy capturing research on our "best" (accepting the difficulty of assessing a moving criterion, but that is a research issue in itself) senior officer decision makers could be very instructive.

There is already a precedent for ethnographic or case-based research into operational decision making, through the burgeoning interest in capturing lessons learned through post exercise and operational debriefs.

Finally, it would be theoretically useful to assess the generalizability of many of the classical management studies by attempting to replicate them in a military setting. Such an exercise also has the potential to shed light on the material differences between military and managerial settings, both public and private sector.

Conclusion

At the outset, this paper contended that the theoretical domain of decision-making was complex and fragmented. After selectively exploring the literature, and assembling and discussing a provisional model of senior officer decision making in the CF, this contention endures. Like many fundamental issues in management, decision making to some extent resists theorizing, in part because practice aggressively exceeds research and analysis at every stage. But despite the challenge of trying to hit a target of this nature, or perhaps because of it, there is much to be learned in the process.

As a junior academic and former junior officer in the CF, I have vested interests in this domain. If I've learned anything during the investigation, it is this: that the heroic individual decision maker, with acute, infallible judgment, perfect command of the situation and the facts, and a steely mien impervious to the physiological and cognitive demands of senior officer decision making does not exist, nor did he ever have a place among us. Thus the appropriate orientation to these matters is a spirit of humility, mingled with ingenuity, determination, and willingness to learn and take risks.

References

_____, (2000) "Canada's Army." DND publication.

Allison, G.T. (1971). **The Essence of Decision**. Boston: Little Brown.

Amason, A. C. (1996). "Distinguishing the effects of functional and dysfunctional conflict on strategic decision making: Resolving a paradox for top management teams." <u>Academy of Management Journal, 39(1),</u> 123-148.

Barnard, C.I. (1938). **The Functions of the Executive**. Cambridge, MA.: Harvard University Press.

Bergstrand (1998). "Situating the Estimate: Naturalistic Decision Making as an Alternative to Analytical Decision-making in the Canadian Forces. Ex New Horizons paper, 1997-98, published on the War, Peace, and Security WWW Server at the Canadian Forces College.

Bolton, Lisa E. (2003), "Stickier Priors: The Effects of Nonanalytic and Analytic Thinking in NewProduct Forecasting," <u>Journal of Marketing Research</u> (in press).

Budner, S. (1982). "Intolerance of ambiguity as a personality variable." <u>Journal of Personality</u>, 30, 29-50.

Cohen, M.D., March, J.G., Olsen, J.P., (1972). "A Garbage Can Model of Organizational Choice." <u>Administrative Science Quarterly</u>, Vol. 17, No. 1, March

Child, J. (1972). "Organizational Structure, Environment and Performance: The Role of Strategic Choice," <u>Sociology</u> Vol 6, No 1, pp 1-22.

Choo, C.W. (1998). **The Knowing Organization: How Organizations Use Information to Construct Meaning, Create Knowledge, and Make Decisions**. New York: Oxford University Press, Inc.

Cyert, R.M. & March, J.G. (1963**). A Behavioral Theory of the Firm**. Englewood Cliffs, NJ.

Eisenhardt, K. & Bourgeois, L.J. (1988) "Politics of Strategic Decision Making in High-Velocity Environments: Toward a Midrange Theory." <u>Academy of Management Journal</u> Vol. 31 No. 4 pp. 737 – 770.

Eisenhardt, K. & Zbaracki, M. (1992) "Strategic Decision Making." <u>Strategic Management Journal</u> Vol. 13 pp.17-37.

Eisenhardt, K. (1989) "Making Fast Strategic Decisions in High-Velocity Environments." <u>Academy of Management Journal</u> Vol. 32, No. 3, pp 543-576.

Falleson, John. (1995) "Lessons Learned on Tactical Planning: implications for Future Procedures and Training." United States Department of the Army, Centre for Army Lessons Learned (CALL) <u>News from the front</u>. Fort Leavenworth, Kansas: November-December 1995.

Giffen, R. (2002). Naive Inductivism in Command and Control Doctrine: Its Causes, Consequences and Cures. Mss. Proposed to 7th ICCTRS, Quebec City, 2002.

Halpin, Stanley M. (1995). The Human Dimensions of Battle Command: A behavioural Science Perspective on the Art of Battle Command. Unites States Department of the Army, Army Research Institute Battle Commnad Task Force. Fort Leavenworth, Kansas: 1 Feb 1995

Hambrick, D.C. & Mason, P. (1984) "Upper Echelons: The Organization as a Reflection of its Top Managers." Academy of Management Review Vol. 9, pp.193-206.

Hammond, J.S., Keeney, R.L., Raiffa, H. (1999). **Smart Choices: A Practical Guide to Better Decisions.** HBS Press, Boston, MA.

Hannan, M. T. and J. Freeman. (1977). "The Population Ecology of Organizations." American Journal of Sociology (82) 5:929-964.

Harrison, E.F. (1999). **The managerial decision making process.** 5th ed., Houghton-Mifflin: Boston, MA

Hogarth, R.M., **Judgement and Choice: The Psychology of Decision**, Second Edition, Wiley, Chichester, England, 1987.

Huber, G.P. & McDaniel, R. (1986) "The decision making paradigm of organizational design." Management Science, 5 (32) 572-589.

Janis, I. and L. Mann (1977) **Decision Making: A Psychological Analysis of Conflict, Choice and Commitment**. New York: Free Press.

Jones, Gareth. (1995). **Organizational Theory: Text and Cases**. Reading, MA: Addison-Wesley Publishing Company.

Klein, G. A. (1993). "Twenty questions---Suggestions for research in naturalistic decision making." In: Klein, G. A., Orasanu, J., Calderwood, R., and Zsambok, C. E. (Eds.), **Decision making in action: Models and methods**. Norwood, NJ: Ablex.

Klein, G. (1999). **Sources of Power: How People Make Decisions.** MIT Press: Cambridge, MA.

Langley, Mintzberg, Pitcher, Posada and Saint-Macary (1995). "Opening up decision making: The view from the black stool," Organization Science 6(3), 260-279.

Levitt, B. and C. Nass. (1989) The Lid on the Garbage Can: Institutional Constraints on Decision-making in the Technical Core of CollegeText Publishers. Administrative Science Quarterly., 34 (2), pp. 190-207.

Lichtenstein, Fischoff, and Phillips, (1980). "Calibration of Probabilities: The State of the Art to 1980."

Lipshitz, R., Klein, G., Orasanu, J., and Salas, E. (2001). "Focus Article: Taking Stock of Naturalistic Decision Making." Journal of Behavioural Decision Making (14) 331-352.

Lindblom, C. E. (1959) "The science of 'muddling through'." Pub. Admin. Rev. (24), 79-88.

March, James G. (1994). **A Primer on Decision-Making: How Decisions Actually Happen**. New York: The Free Press.

McMaster, H.R. (1997) **Dereliction of Duty.** New York: HarperCollins.

Mintzberg, Henry, Duru Raisinghani, and Andre Theoret. 1976. "The Structure of "Unstructured" Decision Processes." Administrative Science Quarterly 21, no. 2 (June 1976): 246-275.

Orasanu, J., Connolly, T., (1993). "The Reinvention of Decision Making." **Decision Making in Action: Models and Methods**, G.A. Klein & C, Chapter 1.

J. E. Russo and P. J. H. Schoemaker, (1989). **Decision Traps: Ten Barriers to Brilliant Decision-Making and How to Overcome Them**. Simon and Schuster, New York.

Salancik, G.R. and Pfeffer, J. (1977). "Constraints on administrative discretion: The limited influence of mayors on city budgets." **Urban Affairs Quarterly**, 12(4), 475-498.

Schwenk, C.R., (1984). "Cognitive Simplification Processes in Strategic Decision Making," Strategic Management Journal, V.5, 111-128,

Simon, Herbert A., (1947). **Administrative Behavior**. 2nd ed, N.Y.: The Free Press.

Simon, Herbert A. (1987). "Making Management Decisions: The Role of Intuition and Emotion," Academy of Management Executive, 1987(1), pp. 57-64.

Sloan, Elinor. "Canada and the Revolution in Military Affairs: Current Response and Future Opportunities." On line at: http://www.journal.dnd.ca/vol1/no3_e/revolution_e/rev1_e.html, last accessed December 17, 2000

Staw, B.W (1976). "Knee-deep in the big muddy: A study of escalating commitment to chosen course of action." Organizational Behavior & Human Performance,16.

Stoner, J.A.F. (1961). "A comparison of group and individual decisions involving risk. Unpublished master's thesis, School of Industrial Management, Massachusetts Institute of Technology.

Teale, et al., (2003). **Management Decision Making: Towards and Integrative Approach.** Harlow, UK: Prentice-Hall/ FT.

Thompson, J.D., (1967). **Organizations in Action: Social Science Bases of Administrative Theory**, McGraw-Hill, New York..

Tversky, A. & Kahneman, D. (1974). "Judgment under uncertainty: Heuristics and biases." *Science, 185*, 1124-1131.

Van Creveld, Martin, (1985). **Command in War**, Cambridge, MA: Harvard University Press.

Walsh, James P. (1995). "Managerial and Organizational Cognition: notes from a trip down Memory Lane." Organization Science, 6(3), 280-321.

Williamson, Oliver E., (1975) **Markets and Hierarchies: Analysis and Antitrust Implications**, New York: The Free Press.

Zaccaro, Stephen J. **(**2001). **The nature of executive leadership : a conceptual and empirical analysis of success**/.- Washington, D.C. : American Psychological Association.