Decision-Making under Uncertainty: Using Case Studies for Teaching Strategy in Complex Environments

Dr. Volker Franke, Program Director, Ph.D. in International Conflict Management, Associate Professor of Conflict Management, Department of Political Science and International Affairs, Kennesaw State University

We must use what has been called 'smart power': the full range of tools at our disposal – diplomatic, economic, military, political, legal, and cultural – picking the right tool, or combination of tools, for each situation.

Secretary of State Hillary Clinton, 2009[1]

Introduction

Today's strategic environment is increasingly characterized by threats that "are both diffuse and uncertain, where conflict is inherently unpredictable, and where our capability to defend and promote our national interests may be restricted by political, diplomatic, informational and economic constraints. In short, it is an environment marked by volatility, uncertainty, complexity, and ambiguity (VUCA)."[2] Decision-makers, both civilian and military, who want to operate effectively in this environment

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[1] Quoted in Derek S. Reveron and James L. Cook, "Developing Strategists: Translating National Strategy into Theater Strategy," *Joint Forces Quarterly*, Vol. 55 (4), p. 22.

[2] Stephen A. Shambach, *Strategic Leadership Primer*, 2nd ed., Carlisle Barracks, PA: U.S. Army War College, 2004, p. 1.

must consider a wide range of social, political and cultural factors and demonstrate cognitive flexibility, adaptability and the ability to make decisions "on the fly."

Decision-making under conditions of risk and uncertainty necessitates strategic leadership competencies that can help to make sense of the fluid strategic environment. As the U.S. Army's stability operations field manual states, "military success alone will not be sufficient to prevail in this environment."[3] Instead of the hierarchically focused, linear strategic thinking that has dominated traditional military decision-making, the turbulent VUCA environment requires non-linear cognitive competencies characterized by the "ability to recognize changes in the environment; to determine what is new…and what must be learned to be effective."[4] In this environment, effective strategic leaders must recognize which decision factors are most important in relation to the big picture, must be able to identify and prioritize alternatives, integrate information from a variety of sources, and detect trends, associations and cause-effect relationships.

While the U.S. military excels in preparing its soldiers and officers for the operational demands and tactical requirements of a wide array of increasingly complex contingency missions, a number of observers have pointed to the need for teaching strategy more effectively as part of professional military education (PME).[5] Former Commandant of the U.S. Army War College, Maj. Gen. Robert H. Scales argued:

> Today's conflicts demand officers who can lead indirectly and perform in an uncertain, ambiguous, complex, chaotic and inherently unpredictable environment. Our educational system needs to produce more men and women who can anticipate conditions that do not yet exist. They must be capable of dealing with unfamiliar cultures and an enemy who is unconstrained by Western values and methods of warfare.[6]

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[3] Headquarters, Department of the Army, "Stability Operations," Field Manual No. 3-07, foreword, Washington, DC, 6 October 2008, at http://www.fas.org/irp/doddir/army/fm3-07.pdf, accessed 05/19/11.

[4] William Steele and Robert Walters, "21st Century Leadership Competencies: Three Yards in a Cloud of Dust or the Forward Pass?" *Army Magazine*, August 2001, p. 31, quoted in Wong et al., "Strategic Leadership Competencies," p. 6.

[5] See for instance Gabriel Marcella and Stephen O. Fought, "Teaching Strategy in the 21st Century," *Joint Forces Quarterly*, Issue 52 (1), 2009, pp. 56-60.

[6] Robert Scales, "Return of the Jedi," *Armed Forces Journal*, October 2009, pp. 22.

How can the U.S. military develop strategic thinkers who can operate effectively in the complex and uncertain contemporary security environment? While certainly not the only educational tool, some experts have argued that the use of case studies may provide invaluable pedagogical benefits in preparing strategic decision-makers for complex decision-contexts.[7]

The purpose of this article is to examine the extent to which the case study method can provide an effective vehicle for teaching strategy and strategic decision-making to military professionals. Specifically, I examine some of the cognitive frames that inform strategic decision-making, discuss the importance of heuristic shortcuts as cognitive decision-guides, and compare the rational actor decision model that has traditionally informed linear strategic decision-making in the military with a sense-making framework more suitable to complex strategic environments. Finally, I provide a brief introduction to the case study method and illustrate how case studies can be employed effectively to teach strategic thinking using the sense-making framework in civilian and military educational settings.

Strategic Thinking

Strategy, according to Harry Yarger's recent *Little Book on Big Strategy*, "provides a coherent blueprint to bridge the gap between the realities of today and a desired future. It is the disciplined calculation of overarching objectives, concepts, and resources within acceptable bounds of risk to create more favorable future outcomes than might otherwise exist if left to chance or the hands of others."[8] Strategy emerges

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[7] See Ibid.; see also Volker Franke, "Making Sense of Chaos: Teaching Strategy Using Case Studies," in Gabriel Marcella (ed.), *Teaching Strategy: Challenge and Response*, Carlisle, PA: Strategic Studies Institute, U.S. Army War College, 2010, pp. 241-274; Jeanne M. Leidtka and John W. Rosenblum, "Teaching Strategy as Design: A Report from the Field," in *Journal of Management Education*, Vol. 22, No.3, June 1998, pp. 285-303; Vicky Golich, Mark Boyer, Patrice Franko and Steve Lamy, "The ABCs of Case Teaching," Pew Case Studies in International Affairs, Institute for the Study of Diplomacy, Edmund A. Walsh School of Foreign Affairs, Georgetown University, Washington, DC, 2000, available at http://www.usc.edu/programs/cet/private/pdfs/abcs.pdf, accessed 01/16/09.

[8] Harry R. Yarger, *Strategic Theory for the 21st Century: The Little Book on Big Strategy*, Carlisle Barracks, PA: U.S. Army War College, February 2006, p. 5, at http://www.strategicstudiesinstitute.army.mil/pubs/display.cfm?pubID=641, accessed 05/22/11.

over time as intentions are adjusted to accommodate changing realities. Strategy also provides rational direction for courses of action intended to maximize desired and minimize undesired outcomes in a given context. For the Department of Defense (DOD), strategy is "the art and science of developing and employing instruments of national power in a synchronized and integrated fashion to achieve theater, national, and/or multinational objectives."[9] More generally, Nickols defines strategy along four dimensions: perspective, position, plan and pattern. It is,

> the bridge between policy or high-order goals on the one hand and tactics or concrete actions on the other. Strategy and tactics together straddle the gap between ends and means. In short, strategy is a term that refers to a complex web of thoughts, ideas, insights, experiences, goals, expertise, memories, perceptions, and expectations that provides general guidance for specific actions in pursuit of particular ends. Strategy is at once the course we chart, the journey we imagine and, at the same time, it is the course we steer, the trip we actually make. Even when we are embarking on a voyage of discovery, with no particular destination in mind, the voyage has a purpose, an outcome, an end to be kept in view.[10]

Strategy does not exist outside the ends being sought. It serves as a general framework providing guidance for actions to be taken and is itself in turn shaped by those actions. Thus, a clear understanding of the purpose and the ends pursued is a necessary precondition of any effective strategy. Strategy determines means and is about the attainment of ends, not their specification. If strategy has any meaning, it is only in relation to the achievement of these ends.

In today's complex security environment, military leaders need to develop and hone strategic talent, learn to conceive, invent, or discover theoretical ideas, and draft and implement well-reasoned plans of action. More than ever before, Gray argues, "all military activity has some net strategic weight that scores for the home team on the

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[9] Joint Publication (JP) 1-02, *DOD Dictionary of Military and Associated Terms*, p. 350, at http://www.fas.org/irp/doddir/dod/jp1_02.pdf, accessed 05/20/11; see also Reveron and Cook, "Developing Strategists."

[10] Fred Nickols, "Strategy: Definitions and Meaning," p. 5. at http://home.att.net/~nickols/strategy_definition.htm, accessed 01/14/09.

course of events. Every corporal is a strategic corporal."[11] Consequently, strategic thinking in complex operational environments at all levels focuses on identifying potential opportunities and developing them in pursuit of a desired end. Generally, strategic objectives are derived from "national policy in pursuit of a predetermined national interest in consideration of issues, trends, risks, threats, challenges, and opportunities that affect those interests."[12]

In the context of military operations, strategists are "charged either, or both, with: (1) guiding and shaping subordinate military operations by major units in campaigns for the purpose of securing military advantage (success or victory); and (2) guiding and shaping the course of military events for the purpose of achieving the polity's political goals."[13]

Conceived this way, strategy becomes part of a rational decision structure: First are the ends to be obtained. Second are the strategies for obtaining them, i.e., the ways in which resources will be allocated. Third are the tactics, i.e., the ways in which resources are actually used. Finally are the resources at our disposal for achieving the desired end(s).[14] And effective strategy, Yarger conjectures, must be proactive. It is

> fundamentally a choice; it reflects a preference for a future state or condition in the strategic environment. It assumes that, while the future cannot be predicted, the strategic environment can be studied and assessed. Trends, issues, opportunities, and threats can be identified with analysis, and influenced and shaped through what the state chooses to do or not do. Thus strategy seeks to influence and shape the future environment as opposed simply to reacting to it.[15]

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[11] Colin S. Gray, "Schools for Strategy: Teaching Strategy for 21st Century Conflict," Strategic Studies Institute, November 2009, p. 14, at
http://www.strategicstudiesinstitute.army.mil/pubs/display.cfm?pubid=947, accessed 05/20/11.

[12] See J. Boone Bartholomees, Jr, (ed.), *U.S. Army War College Guide to National Security Issues*, Carlisle, PA: Strategic Studies Institute, 4th edition, 2010, at
http://www.strategicstudiesinstitute.army.mil/pubs/display.cfm?PubID=1004, accessed 05/20/2011.

[13] Gray, "Schools for Strategy."

[14] Ibid., p. 7.

[15] Yarger, *Strategic Theory for the 21st Century*, p. 65.

The central challenge, Dorff conjectures is "adapting effectively to the new circumstances while simultaneously balancing against the lingering circumstances from the older system."[16]

Traditional military strategic thinking has been characterized largely by a unique professional expertise (in the management of violence),[17] hierarchical organizational decision arrangements, formal positions of authority, and imposed certainty through predetermined standard operating procedures. The sort of traditional planning underlying this conception aims at "reducing uncertainty and risk. It is highly methodical and based on the common belief that if organizations can somehow collect and analyze sufficient data, they can rationally find solutions on their way to a better future" (see Figure 1 below).[18] However, the traditional professional expertise and rigid values that have informed strategic thinking in the military in the past may today be "powerful inhibitors of innovation because of the vested interest they create in the status quo."[19] In fact, Papparone et al. conclude: "In a turbulent environment, the hierarchically focused strategic leadership will suffice less and less because it cannot respond to changing circumstances in a timely manner."[20] The need for strategic decision-making at every turn of an ever-more complex operational environment will require that strategic leadership capabilities, ranging from mental agility and cross-cultural savvy to interpersonal maturity and professional astuteness, will be ingrained into the readily available skill set of military leaders and will become second-nature to their decision-making.[21] In complex and uncertain environments, "detailed, comprehensive long-range plans, created by staff analysts and blessed by senior

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[16] Robert H. Dorff, "A Primer in Strategy Development," in Joseph R. Cerami and James F. Holcomb, Jr. (eds.), *U.S. Army War College Guide to Strategy*, Carlisle Barracks, PA: U.S. Army War College, 2001, p. 14, at http://www.strategicstudiesinstitute.army.mil/pubs/display.cfm?pubID=362, accessed 05/22/11.

[17] See for instance, Samuel Huntingon, *The Soldier and the State: The Theory and Politics of Civil-Military Relations*, Cambridge, MA: Belknap, 1957.

[18] Larry E. Greiner and Thomas G. Cummings, *Dynamic Strategy-Making: A Real-Time Approach for the 21st Century Leader*, San Francisco: Jossey-Bass, 2009, p. 5.

[19] Christopher R. Papparone, Ruth A. Anderson and Reuben R. McDaniel, Jr., "Where Military Professionalism meets Complexity Science," *Armed Forces & Society*, Vol. 34 (3), 2008, p. 445.

[20] Ibid., p. 434.

[21] For a detailed description of the strategic leaders kill sets for officers in the post 9/11-environment, see Leonard Wong, Stephen Gerras, William Kidd, Robert Pricone and Richard Swengros, "Strategic Leadership Competencies," Carlisle, PA: U.S. Army War College, September 2003, at http://www.au.af.mil/au/awc/awcgate/ssi/ldr_comps.pdf, accessed 05/22/11.

management for dissemination to the 'troops' below, are no longer seen as key to success. Instead, the ability to think broadly and opportunistically at all levels in the organization, within the context of the larger corporate vision, is heralded as the key to competitive advantage."[22] How can this kind of complex strategic thinking be inculcated? How can military professionals be trained to become effective strategic leaders in VUCA environments? A brief excursion into the cognitive processes that determine decision-making under conditions of uncertainty might be instructive in this context.

Linear Decision-Making

In an ideal world, theories of classic rationality tell us, we would make decisions based on an ordering of all alternatives and then base our choice in a rational manner on the alternative(s) that maximize expected utility (see Figure 1). The rational actor model is based on three main assumptions, all of which claim universal validity:[23]

(1) Order – there are discoverable underlying cause-effect relationships in human interactions, the understanding of which in past behavior enables us to define "best practice" for the future.

(2) Rational decisions – our choices are rational results of calculations of expected utility based on the desire to maximize pleasure and minimize pain.

(3) Intentional capability – the mere acquisition of capability indicates automatically an intention to use that capability.

Of course, in real life we do not possess perfect information and cannot base our choices on decision strategies reflecting unbounded rationality. Instead, political scientist Herbert Simon convincingly demonstrated that people typically possess uncertain information about all their potential alternative choices and dispose only of

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[22] Liedtka & Rosenblum, "Teaching Strategy as Design," p. 285; see also Harry Mintzberg, "The Rise and Fall of Strategic Planning," *Harvard Business Review*, January-February 1994, pp. 107-114.

[23] For further detail see for instance Cynthia F. Kurtz and David J. Snowden, "The New Dynamics of Strategy: Sense-making in a complex and complicated World," *IBM Systems Journal*, Vol. 42, No. 3, 2003.

limited computational capacity to determine their maximum utility function. To account for those limits of rationality, Simon suggested replacing the aim of maximizing an objective function with the more realistic concept of satisficing.

Satisficing denotes "problem solving and decision making that sets an aspiration level, searches until an alternative is found that is satisfactory by the aspiration level criterion, and selects that alternative."[24] In other words, individuals create a threshold which allows them to demarcate their choices, accepting only alternatives above the threshold. Furthermore, ordering is no longer necessary, since individuals may choose the first alternative above the threshold, as that meets their requirements (which determine the threshold in the first place). But how are these decision thresholds determined? What processes enable individuals to satisfice in the first place?

Figure 1: Rational Actor Decision Model[25]

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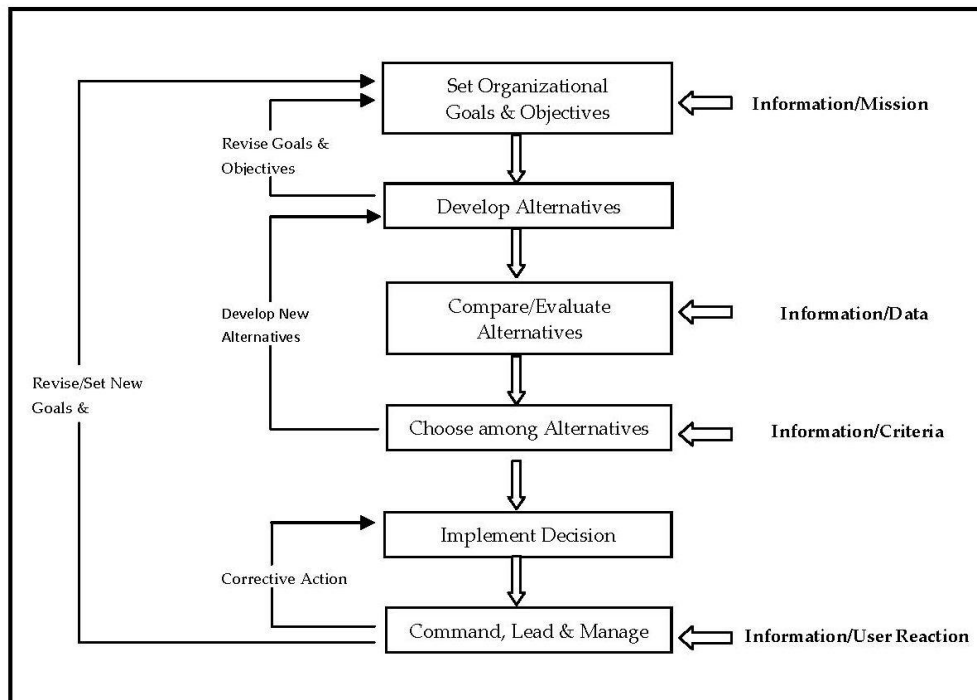
[24] Herbert Simon, *Models of Bounded Rationality*, Cambridge, Mass.: MIT Press, 1982, p. 168.

[25] The figure was adopted from Fred W. Nickols, "Strategic Decision Making: Commitment to Strategic Action," at http://home.att.net/~essays/strategic_decision_making.pdf, accessed 04/08/09. A detailed discussion of the rational actor model can be found in Graham T. Allison and Philip Zelikow, *Essence of Decision: Explaining the Cuban Missile Crisis*, 2nd ed., New York: Longman, 1999.

Decision-Making under Uncertainty

Psychologists have studied the way individuals make decisions in the presence of great uncertainty or incomplete information and have found that they often rely on mental shortcuts – called "heuristics" – to help them "reduce the complex tasks of assessing probabilities and predicting values to simpler judgmental operations."[26] Heuristics can be considered "rules of thumb," educated guesses, intuitive judgments or simply common sense that are learned and honed by experience. More precisely, heuristics reflect strategies using readily accessible, though loosely applicable, information to control problem-solving.[27] Although reliance on heuristics can provide effective rational guidance in most circumstances, in certain cases it may lead to systematic errors or cognitive biases that, in turn, may skew decision-making and undermine operational objectives.

Heuristics relevant to decision-making under conditions of uncertainty (and with relevance to strategic decision-making in VUCA contexts) include:[28]

- *Anchoring and Adjustment*. People start with an implicitly suggested reference point (the "anchor") and adjust their decisions based on that specific data point. However, anchoring may result in a focusing effect in that people place too much importance on one aspect of an event, thereby causing an error in accurately predicting the utility of a future outcome.[29] For instance, during Operation Restore Hope in Somalia in the early 1990s, some soldiers, confused by constantly changing mission objectives, searched for cognitive frames of reference to come to terms with their peacekeeping assignment. A number of U.S. soldiers, for instance, employed a "warrior strategy," generalizing the

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[26] Daniel Kahneman, Paul Slovic and Amos Tversky, 1982. *Judgment under Uncertainty: Heuristics and Biases.* Cambridge, New York, Melbourne, Sidney: Cambridge University Press, 1982, p. 3.

[27] See, for instance, Judea Pearl. *Heuristics: Intelligent Search Strategies for Computer Problem Solving*. New York: Addison-Wesley, 1983, p. vii.

[28] See Kahneman et al., *Judgment under Uncertainty*.

[29] For example, Kahneman et al. demonstrated that when asked to guess the percentage of African nations which are members of the United Nations, people who were first asked "Was it more or less than 45%?" guessed lower values than those who had been asked if it was more or less than 65%. This pattern held in other experiments for a wide variety of different subjects of estimation. See Ibid.

behavior of some local rioters to all Somalis (e.g., stereotyping them as lazy and uncivilized) and treating the entire population as potential enemies.[30]

- *Representativeness.* In many situations, an event A is judged more probable than an event B whenever A appears more representative than B. For instance, large samples are typically judged more representative than small ones, because their "salient features" or "essential properties" are thought to better reflect those of the population. In the Somalia experience above, for instance, the idea that anyone could be an "enemy" was reinforced (i.e., made salient) right at the beginning of the operation. That handbook handed to Canadian peacekeepers prior to deployment stated, "always remember, yesterday's allies can turn on non-vigilant groups if it is in their interest and they can get away with it. This is an unfortunate aspect of trust-building in Somalia."[31] Relying on the representativeness of an event as an indicator of its probability may either give undue influence to variables that affect the representativeness of an event, but not its probability, or it may reduce the importance of variables that are crucial to determining the event's probability, but are unrelated to the event's representativeness.

- *Availability*. Psychological experiments have revealed that whenever some aspect of the environment is made disproportionately salient or available to the perceiver, that aspect is given more weight in causal attribution. In Somalia, the "warrior strategy" mentioned above was adopted most readily by white male soldiers who served in combat units and who had been "trained intensively to operate against a foreign enemy and who did not wish to appear vulnerable to the Somalis."[32] As this example illustrates, stereotypes, can function as simplifying decision-guides to shape reality, since people are typically preoccupied with highly desirable outcomes (e.g. winning the lottery or

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[30] For further detail see Volker Franke, "The Social Identity of Peacekeeping," in Thomas W. Britt and Amy B. Adler (eds.), *The Psychology of the Peacekeeper: Lessons from the Field*, Westport, Conn.: Praeger Publishers, 2003, pp. 31-51; Laura L. Miller and Charles Moskos, "Humanitarians or Warriors? Race, Gender, and Combat Status in Operation Restore Hope," *Armed Forces & Society* 21, pp. 615-637.

[31] Quoted in Donna Winslow, *The Canadian Airborne Regiment in Somalia: A Socio-Cultural Inquiry*, Ottawa: Canadian Government Publishing, 1997, p. 246. See also, Franke, "The Social Identity of Peacekeeping."

[32] Miller & Moskos, "Humanitarians or Warriors?" p. 633.

bolstering their favored self-conception), or with highly undesirable outcomes (e.g. an airplane crash or avoiding an unfavorable self-conception). Kahneman et al. found confirming evidence of a selective observation bias: people tend to perceive support for their initial beliefs, even if the evidence at hand disconfirms these beliefs.

- *Affect*. Under conditions of uncertainty, feelings such as fear or pleasure may solicit an emotional response to the contextual stimulus. Affect enables us to make quick decisions and helps us avoid dangerous situations. However, our use of emotions to make decisions can also easily cloud judgment. For instance, in cases when an emotional reaction like fear is especially strong, it can completely overwhelm our reasoning process. Fear, Al Gore has argued, is the most powerful enemy of reason, citing the fact that almost three-quarters of all Americans were so easily led to believe that Saddam Hussein was personally responsible for the attacks of September 11, 2001, and that many Americans still believe that most of the hijackers on September 11 were Iraqis.[33]Already nearly 200 years ago, Carl von Clausewitz warned: "We must firmly believe in the superior authority of well-tried maxims, and under the dazzling influence of momentary events not forget that their value is of an inferior stamp."[34]

Strategic decision-making in today's complex security environment requires operating effectively under conditions of uncertainty and rapid change. The role of the strategist "is to exercise influence over the volatility, manage the uncertainty, simplify the complexity, and resolve the ambiguity, all in terms favorable to the interests of the state and in compliance with policy guidance."[35] In the absence of easily transferable prior experiences, applicable standard operating procedures, clearly defined rules of engagement, or rational decision calculi, decision-makers will need to rely more or less heavily on heuristic decision-rules. Any curriculum intended to teach strategy and strategic decision-making should not only account for these cognitive short-cuts, it ought to focus on developing those skills that enhance individuals' ability to quickly recall and employ desired heuristic decision patterns. Developing this type of non-

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[33] Al Gore, *The Assault on Reason*, New York: Penguin Press, 2007.

[34] Carl von Clausewitz, *On War*, LeVergne, TN: Wildside Press, 2009, p. 42.

[35] Yarger, Strategic Theory for the 21st Century," p. 18.

linear strategic rationality, where "the strategic actor is a rationally conscious agent cognizant of the local context and the specific situation with all their social and cultural conventions," is at the heart of preparing military leaders for the strategic complexities of the post-9/11 environment.[36]

Making Sense of Complexity

Strategic decision-making in complex environments requires teaching meta-cognitive skills that provide leaders with a "tool-bag" of decision-options to use when confronting novel situations. This also requires the development of innovative and adaptable decision models beyond the linear thinking underlying the rational actor model that has characterized traditional strategic decision-making (see Figure 1). The rational actor model encourages/teaches individuals "to frame problems, formulate alternatives, collect data, and then evaluate options."[37] But the strategic context of complex environments demands creative and flexible decision-making not limited only to the rational application of predetermined rules and learned response patterns.

Strategic decision-making in the future must be proactive and decentralized. Experience alone no longer adequately prepares leaders to be effective strategic decision-makers, as situational awareness, cross-cultural considerations (in terms of organizational as well as international cultures), and trustworthiness are central skills to be applied to rapidly changing and increasingly complex decision contexts.

One example may illustrate the limitations of the rational actor model for strategic decision-making under complexity: In 1995, Lt. Gen. Van Riper took a group of Marines to the New York Mercantile Exchange, "because the jostling, confusing pits reminded him of war rooms during combat. First the Marines tried their hand at trading on simulators, and to no one's surprise, the professionals on the floor wiped

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[36] Ernest R. Alexander, "Rationality Revisited: Planning Paradigms in a Post-Postmodernist Perspective," *Journal of Planning Education and Research*, Vol. 19, 2000, p. 246.

[37] Thomas A. Stewart, "How to think with your Gut," *Business2.0*, November 2002, p. 2, at http://www.cognitive-edge.com/ceresources/articles/49_Thinking_with_your_Gut_(_T_Stewart_article_in_Bus_2).pdf, accessed 05/22/11.

them out. A month or so later, the traders went to the Corps's base in Quantico, Va., where they played war games against the Marines on a mock battlefield. The traders trounced them again – and this time everyone was surprised."[38] Analyzing the humbling results, the Marines concluded that "the traders were simply better gut thinkers….They were far more willing to act decisively on the kind of imperfect and contradictory information that is all you ever get in war."[39] The traders, so Kurtz and Snowden, "were skilled at spotting patterns and intervening to structure those patterns in their favor."[40]

Order and Un-Order:

If gut instinct relies on pattern recognition, then these sorts of intuitive skills can be honed through practice. Given the value of heuristic shortcuts as decision-guides in contexts characterized by uncertainty and risk, training that anchors decisions and makes salient/available desired response patterns can contribute to preparing military leaders for making decisions more quickly and effectively under VUCA conditions. However, as the Marine-trader example illustrates, complex decision contexts do not always lend themselves to patterned behavior, predetermined choices, or predictable outcomes. Ordered contexts allow us to rely on pre-established patterns focusing on efficiency in problem solving. In "un-ordered" contexts, "any act changes the nature of the system."[41] Clausewitz refers to this phenomenon as "friction." Van Riper explains:

> You have the element of friction on the battlefield, for example. You can't account for friction. It just occurs. It's everything from a fuel tank that leaks and causes an airplane or a vehicle not to be able to perform its function, to an accidental discharge that a young soldier makes, to weather conditions. All of these have an interplay that causes the friction that leads to uncertainty.[42]

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[38] Ibid., p. 2.

[39] Ibid., p. 2.

[40] Kurtz and Snowden, "The New Dynamics of Strategy," p. 466.

[41] Ibid., p. 466. In contrast to directed or designed order, Kurtz and Snowden refer to "emergent orders" as un-orders which does not depict a lack of order but rather a substantively different kind of order.

[42] PBS Interview, at http://www.pbs.org/wgbh/nova/wartech/nature.html, accessed 05/22/11.

Kurtz and Snowden illustrate this kind of un-order by comparing it to the evolution of cities, in that "the two primary versions of urban arrangements, the planned and the 'organic,' often exist side-by-side…"[43] In complex decision contexts, formal command structures and standard operating procedures tend to be complemented by informal trust networks and organizational adaptation and evolution. And in some circumstances, "'cultural factors,' 'inspired leadership,' 'gut feel,' and other complex factors are dominant."[44]

Recognizing the complexities of strategic decision contexts, Kurtz and Snowden developed a sense-making framework that captures the nature of a range of strategic decision-situations.[45] Their *Cynefin* framework suggests four basic approaches to strategic decision-making, depending on the level of contextual uncertainty (see Figure 2):

(1) Known (ordered)*:* cause and effect relationships are generally linear, empirical and non-disputable; repeatability generates predictive models; focus is on efficiency and single-point forecasting, field manuals, operational procedures are legitimate and effective; structured techniques are mandatory.

(2) Knowable (ordered)*:* stable cause and effect relationships exist but may not be fully known; at issue is whether time and resources allow a move from knowable to known; decision model senses and analyzes incoming data and responds accordingly; structured techniques are desirable, but assumptions must be open to challenge; entrained patterns are most dangerous since simple error in assumptions may lead to false conclusion.

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[43] "Most historic towns, and virtually all those of metropolitan size, are puzzles of premeditated and spontaneous, segments, variously interlocked or juxtaposed." Quoted in Kurtz and Snowden, "The New Dynamics of Strategy," p. 466.

[44] Ibid., p. 466.

[45] Kurtz and Snowden explain: "The name *Cynefin* is a Welsh word whose literal translation into English as habitat or place fails to do it justice. It is more properly understood as the place of our multiple affiliations, the sense that we all, individually and collectively, have many roots, cultural, religious, geographic, tribal, and so forth. We can never be fully aware of the nature of those affiliations, but they profoundly influence what we are. The name seeks to remind us that all human interactions are strongly influenced and frequently determined by the patterns of our multiple experiences, both through the direct influence of personal experience and through collective experience expressed as stories." Ibid., p. 467.

(3) *Complex* (un-ordered)*:* studies how patterns emerge through interaction of different agents; emergent patterns can be perceived but not necessarily predicted ("retrospective coherence"); decision model creates probes to make patterns of potential patterns more visible prior to taking action; understanding requires gaining multiple perspectives on the situation.

(4) *Chaos* (un-ordered)*:* no visible/perceivable cause-effect relationships; little to no response time; patterned responses may contribute to the chaos; decision-model requires quick and decisive action to reduce the turbulence and then sense immediately the reaction to the intervention and respond accordingly.

Figure 2: The *Cynefin* Framework[46]
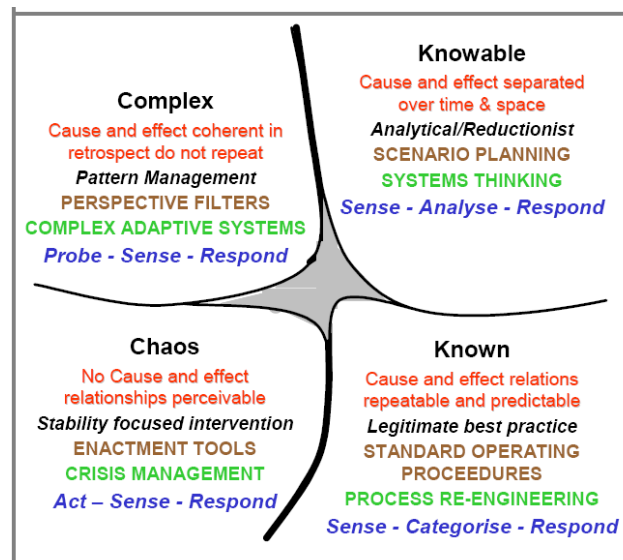
Similar to Kurz and Snowden, Papparone et al. also challenge the applicability of linear, hierarchical strategic leadership for effective decision-making under conditions of complexity and uncertainty. Instead, they suggest considering the military a complex adaptive system (CAS) based on relationship building, sense-making, learning, improvising and emergent thinking. "Members of the CAS operate under a set of rules that changes over time as they gain experience through encounters with the environment and each other. As members interact and their roles evolve, order merges

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[46] Ibid., p. 468. See also Nickols, "Strategic Decision Making."

and patterns of behavior become evident."[47] Papparone et al. distinguish a number of different leadership tasks for complex adaptive systems that promote innovative strategic thinking:

(1) Relationship building. Whereas traditional bureaucratic approaches have treated organizations as collections of roles and focused on role management, CAS leaders promote and assist in building longer-term relationships that enhance operational effectiveness in the field.

(2) Loose coupling. Micro-management and over-supervision can lead to suboptimal performance. Instead of one-stop solutions, decision-making in VUCA environments benefits from parallel searches for diverse solutions and their adaptive consideration as decision factors.

(3) Sense-making. Deriving as a shared understanding of the organizational purpose and one's place therein, members can begin to create shared meaning which, in turn, can serve as a normative and heuristic decision-guide.

(4) Learning. Adaptive organizations are learning organizations that create opportunities for knowledge sharing and norm creation.

(5) Improvising. "Improvisation is a necessary condition when the unfolding of the world is full of VUCA and the organization must have the capacity to respond to unanticipated circumstances… As in a jazz band, improvisation happens when individuals play off the strengths of the others."[48]

(6) Emergent thinking. Under VUCA conditions, forecasting and formal planning is less than useful. Instead, thinking about the future in new ways is called for. Developing skills at *bricolage*, "the ability to create what is needed at the moment out of whatever materials are at hand" creates a climate or shapes a culture "in which people think about what they can do

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[47] Papperone, Anderson & McDaniel, "Where Military Professionalism meets Complexity Science," p. 439.
[48] Ibid., p. 444.

with what they have rather than what they might do if they only had something else."[49]

The greatest benefit of the sense-making frameworks lie undoubtedly in the fact that they enable decision-makers to move beyond the linear, hierarchical and rational decision models designed for success in more or less well-ordered strategic environments. The primary challenge in applying a non-linear framework to complex and uncertain decision contexts will be to teach strategic decision-makers – or teach them to discover – recognizable patterns (although their details may remain unpredictable), "stabilize or disrupt them depending on their desirability, and seed desirable patterns by creating attraction points."[50] After all, in complex and chaotic contexts, even recognizing what we don't know, might help us search for patterns and respond to them. Using case studies and strategic planning exercises can aid this process and sharpen the cognitive skills to make sense of complex or chaotic decision contexts.

Enter Case Studies

When the Harvard Business School was started, it became apparent almost instantaneously that there were no textbooks suitable to graduate studies in business. Faculty members quickly set out to remedy this shortcoming by interviewing leading business people and writing detailed accounts of what they were doing. Of course, these first case studies could not yet reflect practices to be emulated, because there had not been any established criteria for determining success, effectiveness or lessons learned. So the professors instructed their students to read the cases, to come to class prepared to discuss them and to offer recommendations for appropriate courses of action. The case study method was born.[51]

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[49] Ibid., p. 445.

[50] Kurtz and Snowden, "The new Dynamics of Strategy," p. 481.

[51] The Harvard Business School began using case studies in its instruction in 1925. Detailed information on the program can be found at http://harvardbusinessonline.hbsp.harvard.edu/hbsp/case_studies.jsp, accessed 05/22/11. For case studies specifically related to U.S. national security issues see also the National Security Studies program at Syracuse University's Maxwell School of Citizenship and Public

Cases and exercises used to teach decision-making differ markedly from event-based traditional historical case studies, in that they place students at the center of difficult decisions, force them to wrestle with the complexities, ambiguities and uncertainties confronted by the real or fictional decision-makers, and illustrate to them how theory can be useful in addressing real world policy/decision dilemmas. More specifically, decision cases compel students to:

- distinguish pertinent from peripheral information,

- identify problems, dilemmas, decision parameters and alternative courses of action,

- determine possible solutions,

- formulate strategies and policy recommendations, and

- recognize and confront obstacles to their implementation.[52]

Cases can be historical or retrospective, fictional or decision-forcing. Retrospective cases present a comprehensive account of a problem in history, specifying the actors involved with a particular focus on their positions and contending interests, the cycle of events, and the real outcome. Students are typically asked to analyze why certain decisions were taken and the observed result(s) obtained and identify alternative options that may have lead to a different outcome.

Decision-forcing cases stop short of revealing the actual outcome. Instead, they force students to get inside the heads of the decision-makers – or the story's protagonist(s) and antagonist(s) –, wrestle with their decision choices and assess the utility of possible options for action. Decision-forcing cases may include an "epilogue" that tells "the rest of the story," i.e., what happened after the decision point with which the case leaves the reader. Students, again, analyze why what happened happened and, in doing so, begin to discover and develop common cognitive patterns.

Affairs at http://www.maxwell.syr.edu/exed/sites/nss/Overview_of_NSS_Case_Studies/, accessed 05/22/11.

[52] Detailed information on the case methodology and its use in the classroom can be found in Golich et al., "The ABCs of Case Teaching."

Effective decision cases do not provide specific policy recommendations or definite answers for how to resolve the presented dilemmas. Quite the contrary, they present evidence in support of both (or more) sides of a policy argument and will often leave readers with some discomfort in terms of how dilemmas should be resolved. The purpose of using case studies in the classroom is to engage students in active learning and enable them to recognize the importance of the issues at hand as well as their greater policy implications. In relating each case to other course materials, discussions or educational or professional experiences, students begin to discern lessons that apply to the broader strategic context and help them establish cognitive patterns for how problems could be avoided, challenges met and dilemmas solved in similar circumstances in the future. The more leaders are able to develop heuristic shortcuts that make desirable, effective response patterns salient, the better prepared they will be to effectively navigate the complexities of today's strategic environment. Case studies can play a central role in honing those skills.

Conclusion: Teaching Strategy Using Cases

Apart from the traditional use of case studies – namely providing a pedagogical tool for illustrating dilemmas and have students wrestle with their solution – I argue in this article for the use of the case method for honing cognitive decision-making skills based on pattern recognition and the development of effective heuristic shortcuts that enhance the ability of strategic leaders to operate effectively under conditions of ambiguity, uncertainty and risk. The use of case studies and decision exercises has proven a valuable tool for teaching the known and analyzing the knowable. Yet, applying rigid, linear, rational actor-type decision rules under conditions of great uncertainty will likely render suboptimal results. Instead, strategic decision-making in complex operations will call on individuals to rely on a combination of experience, skill, speed, creativity, adaptability, and intuition. No two situations are exactly alike. To make sense of novel situations, we rely on mental shortcuts established through previous experiences. Continuous exposure to new situations – real or simulated – will hone important heuristic skills.

Conceiving of the classroom as a learning laboratory where we attempt to approximate complex realities using case studies and decision exercises promotes social interaction, relationship building, coordinated planning, shared sense-making and intuitive thinking. In doing so, we supply not only the simulated decision context but also – oftentimes unintended – assist in creating heuristic frames within which dilemma solutions may be derived. The specific course content – topics, readings, prior discussions, etc. – increases the salience of certain issues (availability bias), thereby providing an indirect frame steering the discussion and solutions in a particular direction.[53] Unfortunately, the complexities of the contemporary strategic environment cannot be addressed by a (or a few) class(es). Strategic decision-making does not happen in 90-minute sessions on Tuesdays and Thursdays.

Instead of teaching strategy in one or a series of dedicated classes, professional military education curricula ought to be interfused with diverse and challenging strategic decision-choices. In addition to learning how the military develops strategy and derives at strategic decisions (using the rational actor model), the curriculum ought to also stimulate non-linear reasoning and intuitive skills, through learning to recognize/perceive emergent patterns, respond to them and quickly assess, and if necessary correct, the appropriate course(s) of action. Using case studies – and simulation exercises – frequently will help hone these skills. Adopting case studies on non-military topics illustrating dilemmas with little or no connection to national security – e.g., management, trade, development, public policy or business related cases – will force students to step out of their professional comfort zone and challenge them to move away from predetermined thresholds, look for emerging patterns, and reflect on the implications of alternative decision choices.

Teaching strategy effectively means stimulating students continuously to "get inside the heads" of case protagonists with widely differing cultural backgrounds, professional experiences, individual and organizational interests – e.g., by identifying with the contextual demands placed on different government agencies, foreign leaders, NGO representatives, rebel force commanders, civic leaders. In addition, selecting case

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[53] For instance, in my Introduction to Political Science course, I assign William Golding's *Lord of the Flies*. Most students have read this book in English class in high school. In my class, however, the reading of the book is preceded by readings by Aristotle, Hobbes and Marx. The entire frame with which students read or reread a well-known story changes to reflections about governance and human nature.

studies that expose students repeatedly to uncertainty and un-order will effectively challenge them to choose between "allowing the entrained patterns of past experience to facilitate fast and effective pattern application and gaining a new perspective because the old patterns may no longer apply."[54]

Strategy in the traditional sense is about control: control over means and ends and over the resources to achieve them. In the military, strategy has been aimed at controlling VUCA. But our inherent desire for control fails in decision contexts characterized by uncertainty and great complexity. Teaching strategy under conditions of complexity means fostering and encouraging continuous learning and innovation by internalizing a process of sense-making through pattern recognition and instinctive, adaptive responses. Consequently, teaching strategy must be more than simply training decision-makers in the science of calculating "objectives, concepts, and resources within acceptable bounds of risk to create more favorable outcomes than might otherwise exist by chance or at the hands of others."[55] It must also be about the art of understanding complexity and recognizing the value and interaction of order and un-order. Teaching strategy is about effectively using heuristic decision devices to make sense of new situations and recognize the possibilities for shaping them in a desired direction. This means, honing the skills necessary for making sense of chaos, including the recall of heuristics that worked well in the past. Exactly herein lies the central benefit of the case method for teaching strategy and strategic decision-making and for preparing practitioners for the complexities of contemporary peace and stability operations.

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[54] Kurtz and Snowden, "The new Dynamics of Strategy," p. 467.
[55] Yarger, *Strategic Theory for the 21st Century*, p. 1.