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CHAPTER 11

BEYOND ENDS-BASED RATIONALITY: A QUAD-CONCEPTUAL VIEW OF STRATEGIC REASONING FOR PROFESSIONAL MILITARY EDUCATION

Christopher R. Papparone

The ends-based, rationalist model of strategy has dominated institutions of professional military education to the point it has become an ideology that limits the education of the professional military strategist. This chapter proposes a quad-conceptual framework that permits educators and practitioners of military strategy to contemplate simultaneous forms of reasoning beyond the ends-based rational model. This broadened perspective advocates a patterned view of strategic reasoning.

INTRODUCTION

The world is full of intractable situations and fraught with ambiguity. Some say that it has become increasingly so, but this has actually been the case all along and educators and practitioners of strategy just have the luxury of viewing the past through the lens of causal certainty, a lens that does not work when looking toward the future.¹ Their retrospective sense of certainty epitomizes the fallacy of the proverbial Monday-morning quarterback. Only through the study of history do they know how things ended up. Knowing how the story ended, institutions can attribute causal relationships that reinforce beliefs that such ends can be rationally achieved through purposeful strategies toward the future. Indeed, this knowledge of the past reinforces an ideological bent

toward ends-based rationality; hence, provides the historic context for the objectification of an imagined future.² The inculcated belief is that the art and science of the military professional is to first understand undesirable situations as problems and then address them with envisioned clarity. Only now are the most reflective professional military education (PME) institutions discovering this rationalistic values system is losing relevance as practitioners continue to face highly intractable and ambiguous situations.

The military profession has relied too much on the expectations envisioned by the limited philosophy of ends-based, rationalistic models of strategy. As the profession struggles with making sense of complex, ambiguous world events, the end game view has produced false expectations. The hope of ends-based rationalism—to create effective strategies, plans, and decisions to reach a desired future end state—has been confounding. Yet, our PME institutions continue to teach this Weberian *Zweckrationalität* (sociologist Max Weber's term, meaning "ends-rationality") version of strategic thinking, assuming that practitioners can decide ahead of time how to employ resources in ways to achieve the ends we have in mind. The current PME system, that includes war colleges and staff colleges, is so infused with ends-based rationalism as to have unfortunately created a relatively closed ideology rather than a more open philosophy of reasoning. This chapter asserts that the institutionalization of ends-based rationalistic ideology has crippled the ability to educate practitioners who are neither exposed nor required to consider other philosophical forms of strategic reasoning. The idea here is not to disparage ends-based rationality by itself, but to subordinate this unitary form of reasoning to a more holistic view.

The purpose of this chapter is to challenge the prevailing PME unitary reasoning of ends-based rationality by exposing the practitioner to alternative views. In that regard, this chapter presents a meta-framework that subordinates the idea of ends-based rationality and claims that view must compete with other forms of reasoning contingent upon the degrees of tractability and ambiguity in the situation. This idea of quad-conceptual reasoning (thinking in fours) provides a diagnostic tool for practicing strategists to better make sense of situations through the lenses of other worldviews rather than just that of the ends-based rational model.³ The challenge is to create a framework that enables practitioners to contemplate four forms of reasonableness—here strategy is defined as the development of theories of action through multifaceted contextualizations and recontextualizations of situations. In that regard, precursors to theories of action should be viable theories of reasoning (i.e., how we contextualize situations); hence, this is the primary argument of this chapter.

The proposed model of reasoning recognizes that there are varying degrees of tractability (tameless or manageability) present in the situations that practitioners face. The framework also considers levels of ambiguity (from purely objective accounts of reality to the most subjective ones). When these continua are crossed (tractable-unambiguous, and intractable-ambiguous), the resultant four sources of strategic reasoning: *programmatically* (appropriate for most tractable and least ambiguous situations); *planning* (for less tractable and lesser ambiguous situations); *participative* (for the more tractable, yet more ambiguous situations); and, *reflective* (for the least tractable and most ambiguous situations). The sections

that follow will highlight these theories of reasoning, provide examples for each theory, and then discuss implications they each have for PME development (see Figure 1).

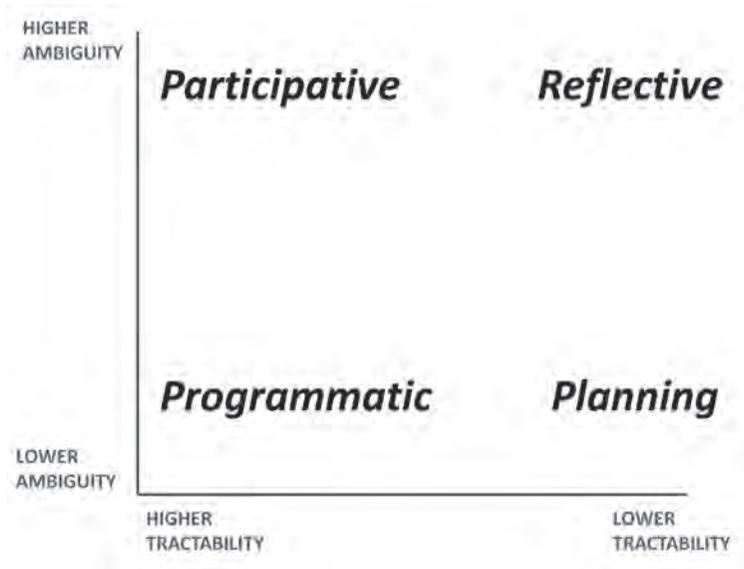


Figure 1. The Author's Model of a Quad-Conceptual View of Strategic Reasoning.

With this proposed framework, defining strategy is revealed as an appreciative challenge. Each form of reasoning contemplates strategy with its own sense of reality.

STRATEGIC REASONING THROUGH PROGRAMMATICS

Theory of Reasoning.

For situations diagnosed as “tractable-objective,” strategy is the best served with a programmatic logic. Here, practitioners view strategy as the structured process of employing technology to solve recurrent problems.⁴ Another name for this form of ends-based reasoning is using “technical rationality” (i.e., strategies are pre-engineered solutions or technologies). Here, strategic problems are recognized with respect to what is known about solutions to recurrent problems; that is, there is a tight coupling between the process of problem identification and the solutions that already exist. This is the most extreme form of ends-based rationality because it assumes solutions are technically available (i.e., situations that draw attention become problems only when strategists see them as amenable to well-defined solutions).⁵ Reasoning is a recognition and matching process.

As such, programmatic competence depends on technical rationality, defined as “the application of theories and techniques derived from systemic, preferably scientific research to the solution of the instrumental problems.”⁶ The strength of this form of reasoning is that education can be oriented on the known-knowns. Strategists can call upon technical expertise found in the hard science disciplines such as physics, systems engineering, operations research, computer science, and so on. Reasoning becomes a pairing process where situations are broken down into tractable problems which can be addressed with these proven techniques; hence, the problems are actually defined by the solutions. Programmatic strategic-

reasoning requires an objective-view of reality, like considering the physical positioning of forces.

Indeed, a prime example of a programmatic strategy is that the United States has historically employed a *force-projection strategy*. The problem is objectively framed by the solution—when policymakers demand, the United States must be able to send and support forces over oceans (the solution is a force deployed through a transportation system). In order to move X amount of forces, we need Y number of trains, trucks, ships, airplanes calculated with respect to space and time. The underlying logic is technique based in mathematical models of space and time, hypothesis testing, breaking down and isolating variables (simplification), and so on. Factors of time, distance, tonnage, supply chains, and similar aspects for which the engineering sciences have an objective, cause-and-effect character about which the practitioner can be precise. In this sense, the field of military logistics is conceptually inseparable from the idea of military strategy (e.g., strategy is programmed with the creation, movement, and sustainment of forces along strategic lines of communication) (see Figure 2).

This diagram was created by the author to depict the phases of a force projection strategy, composed of a series of operations and activities that are pre-engineered for success. Here, the force projection process is a strategically reasoned technology.

For strategic weapons, like intercontinental ballistic missiles, the more the technological solution can stand off (in this case, there is no need for overseas land bases), the more the weapon system can be defined as strategic. In the 1950s, push-button warfare was the characterization of reasoning through programmatic. The dominant metaphor for this type of reasoning is indeed the machine.



Figure 2. Strategic Reasoning Through Programmatic.

IMPLICATIONS FOR PME

There are important PME considerations in developing programmatic thinkers. Educating toward programmatic reasoning is supported by *assimilative knowledge*, or the science of attaching technical solutions to recurrent problems.⁷ Assimilative knowledge can take the form of organizations (i.e., packages of technology) charged with building and performing machine-like recurring tasks, routines, standing operating procedures, doctrine, records, rules, tactics and procedures, textbook solutions, approved lessons learned, programs of instruction, hardware, and other established, by the book structures.

Educating future strategists in this paradigm would involve implementing the following sorts of practices. Engage practitioners in investigating organizational capacities and abilities to train and perform well-defined roles, missions, and pre-defined tasks (e.g., studying military technical capabilities, applying the Joint Chiefs of Staff Manual [CJCSM], *Universal Joint Task List* [CJSCM 3500.04], and so on). Educators also involve practitioners in processing historic case studies to determine the causes of successes and failures of past strategies. Curricula are designed to have students look for logical match-ups between roles and tasks and the effectiveness of these *cogs* in the *engine* of change: doctrine, training, materiel, leadership, personnel systems, facilities, etc. The idea behind programmatic strategy is to then routinize those causes (institutionally labeled “lessons learned”) by institutionalizing them into machine-like routines that will be called upon later.

STRATEGIC REASONING THROUGH PLANNING

Theory of Reasoning.

Another ends-based rational approach involves planning, or “formalized procedure to produce an articulated result, in the form of an integrated system of decisions” that are interpreted by policymakers as being important to future success.⁸ Planning is associated with convergent knowledge in that it involves a reasoned approach to excluding other possible courses of action. Planning addresses more intractable situations where known technologies are inadequate to define the problem and where

convergent knowledge (i.e., discovery of viable courses of action by synthesizing known-knowns and excluding alternatives) is prevalent. The degree of complexity of the situation is aligned with an equal complexity of solutions (see Figure 3).

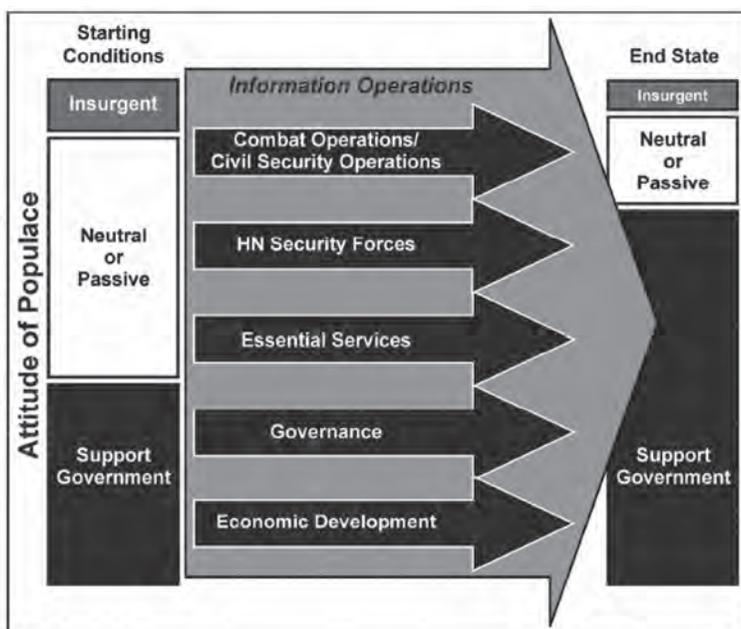


Figure 3. A Graphic Example Of Strategic Reasoning Through Planning.

Strategy is depicted as “logical lines of operations for a counterinsurgency” on page 5-3 of the U.S. Army Field Manual (FM) 3-24/Marine Corps Warfighting Publication 3-33.5, *Counterinsurgency*. Note that both analysis (conditions, lines of operation, end state, etc.) and synthesis (the government activities are blended to affect the *attitude of populace*) can be detected from this diagram.⁹ Success (defined by the end state) is attributed to these logical lines retrospectively.

This view of strategy assumes more complexity than the programmatic view, yet still relies much on determinism.

Like programmatic reasoning, reasoning-through-planning involves understanding historic precedent. In addition, planning requires modifications to precedent based on the degree of intractability of the situation. Defining the problem cannot be clearly or simply linked to a known technology. The strategic planner looks for new ways to combine technologies over time. Hence the situation becomes a problem when the strategist sees it as amenable to his composition of selected solutions over time. The complexity of the problem becomes more definitive with the creation of blended-solutions. The technological emphasis shifts from matching (the emphasis in strategic programming) to “bricolating,” where the latter involves the more inventive processes of kluging solutions.¹⁰ Because there is an inherent risk involved in kluging solutions (i.e., the uncertainty as to whether the concoction will work), the planner takes precautions through the creation of contingency plans. A useful metaphor to understand reasoning-through-planning are the techniques and aesthetics of composers of orchestra music. Of all the possible combinations and permutations of musical notes, the composer converges on relatively few; they sound good, they resonate, and are aesthetically pleasing.

A recent example of strategic planning that worked is the 1990-1991 Gulf War.¹¹ By the end of the 1980s, the United States had nearly perfected its programmatic strategy (the orchestration of doctrine, organization, training, transportation system, and so forth) and then bricolaged its forces with an array of international forces to remove Iraqi forces occupying Kuwait. The *orchestration* (the dominant metaphor for this example) required to *conduct* the campaign was accomplished

through detailed planning, in which the ends were conveniently articulated clearly by the policymakers. The military strategists could “bricolate forces” and *harmonize* them with other *instruments* of power to accomplish them (all activities were *played* on the same *sheet of music*).

Implications For PME.

Insofar as PME andragogy is concerned, educators seek to educate practitioners from the point of view of the planning strategy paradigm, relying upon convergent knowledge, where abstract concepts are transformed into probabilistic, realizable goals and objectives that can lead to technical comprehension (i.e., knowledge that is preparatory to getting to the desired tractability and clarity afforded by more programmatic strategies). Convergent knowledge in this form of reasoning tends to be an institutionalized process of ends-based rational decisionmaking (e.g., the Joint Strategic Planning System). Educators under the planning paradigm (associated with convergent knowledge) would involve practitioners with variations on the following generic process steps: (1) *Initiate*—Receive and understand the policy decision; (2) *Estimate*—Refine the problem definition, define tasks and set objectives; then search for organizational courses of action (the plan “converges”) to accomplish tasks and meet objectives; (3) *Select*—choose the best course of action; and, *Implement, Evaluate, Terminate*—tasked organizations execute until missions are complete and objectives are met.¹²

Variations to this deliberation include adding substeps and parallel steps that can create very sophisticated planning repertoires.¹³ In that regard, military planners in particular have recognized that

refining the problem definition can be done in more complicated sets or ranges of problems (e.g., combat + instability + humanitarian crises, and so on) that can address tasks that may involve a wide variety of kluging organizations and activities (service + joint + interagency + international + nongovernmental, and so on). This paradigm overlaps with the programmatic paradigm in that regard, and separate organization routines can be designed with modularity, capable of adapting organizational building blocks toward matching the complexity of the solution with the complexity of the defined problem.¹⁴ Instruction methods can range from practicing planning with respect to well-developed scenarios to reviewing historic case studies where burgeoning strategic planners can compare planned events with implementation, revealing aspects failure, success, and best practices of risk mitigation to counter the uncertainty involved.

STRATEGIC REASONING THROUGH PARTICIPATION

Theory of Reasoning.

Participative forms of strategic reasoning rely on the relatively unstructured process of accommodating multiple ways of contextualizing situations. Methods of strategy here represent the antithesis of programmatic or planning ways of thinking. In this paradigm, meaning is negotiated through interpretation and social interactions. Because the situation is highly ambiguous (i.e., there are multiple interpretations of what is going on and what to do about it), participative reasoning requires the understanding of multiple viewpoints and trying to shape them into a consensus or at least appreciate the intractability of reaching

consensus. This may involve lengthy dialogue, diplomacy, deception, coalition-building, negotiating, use of propaganda, confrontation, and other forms of participative decisionmaking.

Both here and with the reflective paradigm (addressed next), there “is no such thing as a logical method of having new ideas” or agreeing to them.¹⁵ In the process of negotiating shared meaning, the participative paradigm may shift to one or more of the other three types of reasoning (see Figure 4). The dominant metaphor for this mode of reasoning is the pluralistic form of politics, emphasizing these concepts: sense of community; sense of common interests and problems; the paradox of cooperation and competition; groups and organizations are “building blocks;” “information is interpretive, incomplete, and strategic;” and, where the “laws of passion” may trump the laws of physics.¹⁶

	<i>Agreement on Means/Ways</i>	<i>Disagreement on Means/Ways</i>
<i>Agreement on Ends</i>	Move to Programmatic mode If causality is certain, or to Planning if uncertain	Stay in Participative Mode
<i>Disagreement on Ends</i>	Move to Planning mode (Does it really matter? Just do it!)	If no agreement in sight consider that you may be “stuck” in the Reflective mode

Figure 4. Diagnosing Accommodation.

Multiple interpretations of what is going on and what needs to be done define the ambiguous nature of strategy under the participative paradigm (in other words, “politics”). The strategist is best served by diagnosing progress by discerning which form of reasoning seems to be more applicable to approach accommodation. This is not to say that randomness, hidden-agendas, guile, and other “Machiavellian” aspects of negotiating a strategy do not come into play; so, “ends-based rationality” may still play a deceptive premise for preset agendas and decisionmaking.¹⁷

A classic example of a pluralistically reasoned strategy that eventually worked was documented by British Field Marshal (then Lieutenant General) William Slim. In his book, *Defeat into Victory*, Slim wrote about how he managed to successfully win in the China-Burma-India Theater during World War II, after the Japanese soundly defeated his coalitional Burma Corps. He reflected on the ambiguity of the 1942-Allied retreat into India:

To me, thinking it all over, the most distressing aspect of the whole disastrous campaign had been the contrast between our generalship and the enemy's. The Japanese leadership was confident, bold to the point of foolhardiness, and so aggressive that never for one day did they lose the initiative. True, they had a perfect instrument [an army highly trained and equipped for joint jungle warfare] for the type of operation they intended, but their use of it was unhesitating and accurate. Their object, clear and definite, was the destruction of our forces: ours a rather nebulous idea of retaining territory. This led to the initial dispersion of our forces over wide areas, an error which we continued to commit, and worse it led to a defensive attitude of mind...it was painfully obvious that the lack of a definite, realistic directive

from above made it impossible for our immediate commanders to define our object with the clarity essential...we had been weakened by this lack of a clear object.¹⁸

Later in the book, Slim made this paradoxical statement about a strategy-of-not-discussing-strategy (exemplifying the political logic of participative mode of reasoning):

... Admiral Mountbatten's staff... realized clearly that Stilwell was very much the senior American general . . . suddenly . . . Stilwell astonished everyone by saying, "I am prepared to come under General Slim's operational control. . . . [This] created an even more illogical situation. Luckily he and I were determined on the same things—to get more Chinese divisions for the Ledo force, to push hard for Myitkyina, and to use Wingate's Chindits to aid that push. . . . Tactically we were in agreement, wisely, we avoided strategic discussion.¹⁹

Implications for PME.

The participative mode is most linked to accommodative knowledge that requires flexibility of thought (e.g., temporarily suspending disbelief in other ways to frame or describe the situation at hand) while accepting more unstructured and intangible ways of negotiation.²⁰ Unstructured strategy making may be defined as "decision processes that have not been encountered in quite the same form and which no predetermined and explicit set of ordered responses exists in the organization" or among the institutions represented.²¹ This sort of unstructured strategy making then is a groping or muddling through, messy, and recursive process that requires a certain patience

for participative forms of reasoning and a tolerance for building accommodation. Instead of a comprehensive approach to strategy, the resulting strategy becomes a series of successive limited comparisons. For very novel situations (such as those uniquely encountered in countering insurgencies) the strategic reasoning method is “muddling through”—an ill-structured series of incremental recontextualizations.²² In other words we act, assess, react, and so forth, comparing the situation now to what it previously was to look for “improvements.” Whether these comparisons reflect improvement is a socially negotiated consensus process.

Educating strategists under this paradigm involves appreciating conflicting values and the associated variety of individual, group, and societal emotions, cultural proclivities, ethical positions, aesthetic feelings, and religious beliefs, as well as the interpretations that stem from them. Making situations seem more tractable may include treating social groups and nations as if they were unitary actors—attributing individual human-like motivations and decisionmaking capacities to groups, organizations and nations. Methods of student inquiry should include hermeneutics—a kind of historic accounting that uses the humanities versus the natural sciences’ or positivist approach. This view requires educators to help practitioners critically examine human communications in the search of deeper understanding. For example, hermeneutics would demand not just regurgitating what another person or group expresses, but also an attempt to interpret the thinking behind it, perhaps framed from an entirely different worldview.²³

Hermeneutics is related to the idea of interactive learning, which explores how human actors improve

and create shared meaning through social relations. Here, strategy making is assumed to be a relatively free-flowing, socially interactive process. The exploration of that unstructured process requires methods that are “flexible, imaginative, creative, and free to take new directions.”²⁴ Philosophical sociologist Herbert Blumer describes methods to study social interactions as antithetical to natural scientific methods.²⁵ This qualitative method of critical inquiry involves the practitioner in being alert to the need of testing and revising images, beliefs, and conceptions that would otherwise distort understanding. Like an ethnographer, being able to *richly describe* what is interesting (even if confusing at the time) is important to the practice “even if its relevance is not immediately clear.”²⁶

Exercising these interpretive, critical, and imaginative skills involves the practitioner in exploring deliberate attempts to change other actor’s thinking and behavior through political guile or sanctions: inducements (incentives and penalties); rules (mandates); facts (informing and persuading); rights (and duties); and powers (authority) where “. . . ‘new policies’ are really somebody’s next move.”²⁷ The practice of political decisionmaking is so nuanced and unstructured as to better be developed in actual situations than in the classroom.²⁸ Based on research in adult experiential learning, educating the practitioner involves field work, perhaps through apprenticeships and practicum with the other agencies, international exchange programs, or the like.²⁹ There is no substitute for on-the-scene experience; albeit, such experience may not be transferable to other situations. The real value of the “real world” immersion is that the practitioner may become more comfortable in the unstructured reasoning processes within the uniqueness of each condition at hand.

STRATEGIC REASONING THROUGH REFLECTION

Theory of Reasoning.

Strategic reasoning under conditions of high ambiguity and intractability (also characterized as “messes” or “wicked problems”) is characterized by the relatively unstructured process of practitioner sensemaking while being mindful of his own limitations.³⁰ In strategic reflection, *divergent knowledge* is required as practitioners come to a realization that they face large-scale, complex, or chaotic situations where institutionalized knowledge is insufficient or nonexistent. Such reasoning becomes the unstructured process of sensemaking, through abductive reasoning, in highly complex and subjective situations, while reflecting critically on an opaque awareness that there are many “unknown unknowns.”³¹

Indications that reflexive forms of reasoning should prevail occur when there is the realization that situations are more than complicated and complex than “problems”; are highly ambiguous; contain considerable uncertainty—even as to what the conditions are, let alone what the appropriate actions might be; are tightly interconnected—economically, socially, politically, and technologically—and, appear paradoxical.³² Here there is no chance of routine application of professional knowledge because practical knowledge will have to be invented as we go (i.e., divergent forms of knowledge are required). New rules to govern inquiry have to be created in the face of anarchical situations and then those too will have to be also questioned as to whether the

new way of reasoning seems to be working. For the reflective practitioner, these novel situations reveal “indeterminate zones of practice” (also known as artistry).³³ The dominant metaphor for reflective reasoning is the “improvisational art;” hence, whereas planning is associated with orchestration, reflection may be better associated with improvisational jazz.

It is difficult to find historic examples of strategizing under these conditions because, in retrospect, we now know how things turned out (so the “wickedness” of the milieu experienced then is difficult to articulate now). Perhaps the ongoing example of how the United States and the North Atlantic Treaty Organization (NATO) have adapted their strategy since 2001 in Afghanistan presents a worthy case because the wickedness seems even more prevalent presently than it was in the early years of the U.S. invasion. Conceptualizations of ends, ways, and means seem in continual states of flux and transformation. While it seems as though the problem has been the lack of a thoughtful and workable ends-based strategy, reflection involves questioning ways of reasoning about the situation that do not seem to work and developing ways to reframe.

Implications for PME.

Under these sorts of highly intractable and ambiguous conditions, the educator’s role is to convince practitioners that they would benefit from Donald Schön’s concept of *reflective practice*—treating the seminar or small group learning forum as a “design studio,” as a class in “musical conservatory,” or as “counseling-in-action.” The critical function of reflection-in-action, according to Schön, is “questioning the assumptional structure of

knowing-in-action.”³⁴ That assumptional structure is called “framing.” Indeed, Schön substantiates that educating practitioners to be reflective requires that the student, “. . . think critically about the thinking that got us into this fix or this opportunity; and we may, in the process, restructure strategies of action, understandings of phenomena, or ways of framing. . . .”³⁵ This restructuring of sensemaking reflects the creative essence of divergent knowledge and has improvisational qualities not associated with ends-based rationality.³⁶ Indeed, situations that are not conducive to strategy may require an ongoing process of inventiveness.³⁷ Such messes require constant *resolutions* (i.e., more analogous to managing symptoms of a chronic illness, like AIDS, than attempts to cure the patient).³⁸ Practitioners must become good at reflective reasoning while actions are underway (i.e., they must reflect-in-action).

The artful framing and reframing of situations is inherently important to the creative and recursive design of strategy-as-we-go. Here, students are engaged in the reflective practice of strategic design, uniquely, and continuously crafted “within the context and tailored to fit some conception of the situation.”³⁹ Strategists realize that strategic activities are not just a result of a political process, but interactively cause politics – that is, the concept of *mutual causality* applies.⁴⁰ This perspective complexifies the Clausewitzian principle that asserts war is policy by other means and recognizes that activities in war may cause policy changes (as we have witnessed in Afghanistan and, more recently, reframed as the Afghanistan-Pakistan area of concern).⁴¹

Furthermore, educators must tap into practitioner appreciations of complexity science, chaos theory,

and “simulation of poorly understood systems”).⁴³ As the Taliban inflicted violence goes up, the perceived effectiveness of Afghan security forces goes down. As numbers of NATO security forces increases, Taliban sources of violence may go down, but so may the positive perception of Afghan security forces . . . and so on. Looking at all of these interacting variables and noting that there may be delayed feedback loops, one can only appreciate (not fully understand) the idea of “nonlinear” or “dynamic” feedback.⁴⁴ The idea of side effects or unintended consequences is more appreciable, yet still unpredictable.

Chaos theory would suggest that manipulating one or more variables may unpredictably amplify significant changes within the system (i.e., the butterfly effect). In view of the complexity and chaotic nature of social systems, social construction theory provides explanations as to how social groups interact to invent sources of meaning where objective explanations are not plausible.⁴⁵ In that regard, designing strategy postulates that “there is no answer that should be considered ‘true’ for all times and places, but that through discourse a more limited and contingent type of truth may emerge” (hence the proverb, “the truth changes”).⁴⁶ Therefore, dialogue, collaborative inquiry, and action research become the tools that PME educators must stress with practitioners. These tools enable them to collectively make better sense of otherwise intractable and ambiguous situations. This sensemaking *is* strategic reasoning (and sensemaking is a contextual precursor to strategy making).

SPECULATIONS AND CONCLUSION

This chapter has asserted that four kinds of reasoning (programmatic, planning, participative, and reflective) have to be considered simultaneously—a talent at being quad-conceptual (that is, the capacity and ability to think in patterns). With the proposed multifaceted framework for appreciating the difficulties of educating future strategists in the midst of social messes and wicked problems (such as famine, war, poverty, failed economies, and so on), it is hoped that educators can at least help practitioners of strategy to appreciate the simultaneity of these four perspectives on strategic reasoning (and perhaps contemplate additional paradigms as they further inquire). Each type provides a unique and valuable perspective on the nature of reality and the type of knowledge constructions that go with those reasoning skills. Rather than display these as irreconcilable paradigms, the framework presented in this chapter seeks to transcend the otherwise incommensurability of opposites. For example, here are four patterned archetypes that reflect the author's interpretation of the simultaneity of degrees of tractability and ambiguity of situations that were used as examples in this chapter (see Figure 6). While there may be an overall or predominant perspective on reasoning (indicated by the tail of the kite in the patterns) there are some aspects of the other types concurrently in use.

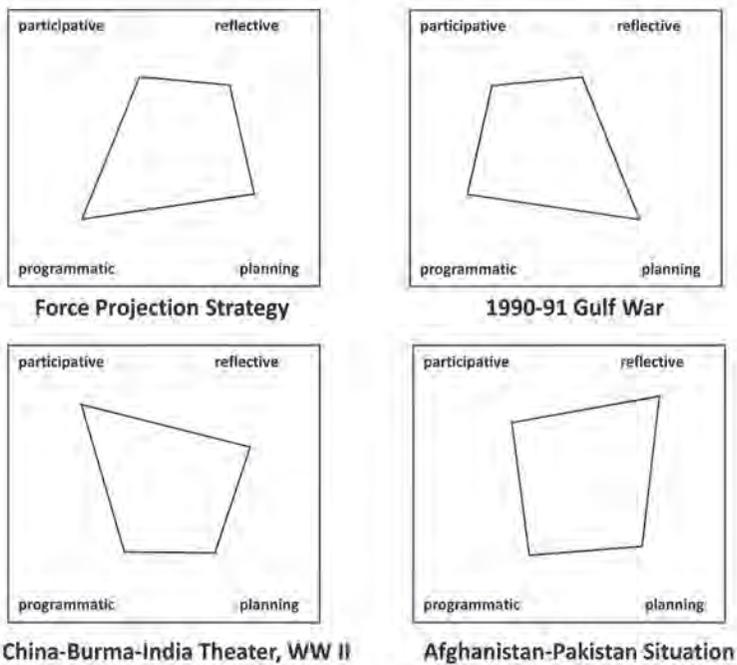


Figure 6. Quad-Conceptualizations of Strategic Reasoning.

Using example situations explained earlier in the chapter, the author suggests that patterns reveal that all four forms of reasoning can be at work simultaneously. These patterns of strategic thinking reflect a snapshot-in-time, demonstrating some aspect of each paradigm is present all of the time. Patterns will shift unpredictably and (like snowflakes) no two patterns will be the same.⁴⁷ Some situations are interpreted as less ambiguous than others because we can reason them primarily through programmatic and planning processes (lower quadrants). Other situations are more associated with high ambiguity (upper quadrants). Dominance in the programmatic and

planning quadrants reflect more ends-based rational forms of reasoning associated with less ambiguous circumstances, while dominance in the participative and reflective quadrants indicate situations that are not as amenable to ends-based rationality and require ongoing negotiation, collaboration, critical reflection, and a highly improvisational mindset.

Based on experience as a faculty member at the USAWC and the U.S. Army Command and General Staff College, the author speculates that staff and war college curricula today are overly geared to ends-based rationality. The ideology of ends-based rationality must be subordinated to a more comprehensive model of reasoning – inclusive of the underemphasized ideas of participative and reflective thinking. Practitioners may have to design accommodative and divergent forms of knowledge to frame, reframe, make sense, negotiate realities about novel, highly complex, and ambiguous situations, and reflect-in-action.

Finally, how would one design curricula for strategic reasoning using the quad-conceptual model? How should we prepare faculty to facilitate the curriculum? Traditional curricula overemphasize the development of reasoning for programmatic and planning strategies. One reason may be that these forms of reasoning can be readily engineered into curricula based in known-knowns (such as military capabilities) and by exercising rational decision and planning processes. Participative and reflective forms of reasoning are best developed through real world experience because it is implausible or impossible to replicate novel, volatile, uncertain, complex, and ambiguous situations in the classroom where the stakes are not high. Practicum and apprenticeships offer the best approach to andragogy, where the faculty is developed

to serve as coach and mentor, helping the apprentice shape these unstructured reasoning skills in tandem with the leadership in those agencies that provide opportunities for practicum and apprenticeship. Formalizing practicum and apprenticeships in PME and in the defense, interagency, intergovernmental, and multinational communities may take major reform efforts.

ENDNOTES - CHAPTER 11

1. Nicholas Rescher, *Luck: The Brilliant Randomness of Everyday Life*, Pittsburgh, PA: University of Pittsburgh, 1995. Rescher's central thesis is that projecting future events is impossible because of the interactions of chance, chaos, and choice.

2. This argument about actuality with respect to historicity is well documented by Alfred Schutz in his *Collected Papers*, Vol. II, *Studies in Social Theory*, The Czech Republic: The Hague: Martinus Nijhoff, 1964, pp. 56-57.

3. The idea of "quad-conceptual" (*thinking-in-fours*) comes from the work by Sabrina Brahms, *Systemic Narrative Inquiry (SNI) Method: Theory Presentation and Application within the Israeli-Palestinian Conflict*, Proceedings of the 47th Annual Meeting of the International Society for the Systems Sciences at Hersonissos, Crete, July 6-11, 2003, available from systemicbusiness.org/digests/iss2003/2003_ISSS_47th_079_Brahms.pdf, p. 3.

4. For this chapter, technology is defined as: ". . . all the [assimilative] knowledge, information, material resources, techniques, and procedures that a work unit uses to convert system inputs into outputs—that is to conduct work." Rupert F. Chisholm, "Introducing Advanced Information Technology into Public Organizations," *Public Productivity Review*, Vol. 11, No. 4, 1988, pp. 39-56.

5. Deborah Stone, *Policy Paradox: The Art of Political Decisionmaking*, 2d Ed., New York: W. W. Norton & Company, 1997. Stone euphemistically calls this reasoned approach the

“rationality project,” p. 6. In PME institutions, the ends-based rationality is called “instrumental rationality,” where *instruments of power* (diplomatic, informational, military, economic, etc.) are arrayed toward ends.

6. Donald A. Schön, *Educating the Reflective Practitioner*, San Francisco: Jossey-Bass, 1987, p. 33.

7. See Christopher R. Paparone and George E. Reed, “The Reflective Military Practitioner: How Military Professionals Think in Action,” *Military Review*, Vol. 88, No. 2, 2008, pp. 66-76. The authors discuss the relationship between these Kolbian knowledge types (assimilative, convergent, accommodative, and divergent) and how the professional knowledge process works. Kolb’s multiple epistemological views are remarkably close to the arguments made in the present paper, so it should not be surprising that these types match quite well to the four quadrants presented. Given all the knowledge types, the authors argue that *reflective practice* is a superior approach to the more traditional search for *best practice*. In the context of this chapter, the quest for best practice is stuck in the programmatic and planning paradigms.

8. Henry Mintzberg, *The Rise and Fall of Strategic Planning: Reconceiving Roles for Planning, Plans, Planners*, New York: Free Press, 1994, p. 12.

9. See also the recently released *Field Manual (FM) 3-07, Stability Operations*, October 6, 2008, which appears to be an attempt at “whole government” doctrine. The FM defines whole government as “an approach that integrates the collaborative efforts of the departments and agencies of the United States Government to achieve unity of effort toward a shared goal,” p. 1-4. Nevertheless, to this writer, “whole government” is a misleading term in that the important legislative branch is not included. In a partisan system of government, will there ever be a “whole government” approach? The author doubts such an approach is possible or even desirable in the dynamic politics of a republican democracy.

10. The term “bricolage” was coined with this meaning by Claude Lévi-Strauss in his book, *La Pensee Sauvage, The Savage*

Mind. Bricolage emphasizes resilience by forming new ways to accomplish things through the creative use of existing knowledge. Paradoxically, the improvised use of assimilated knowledge (called convergent knowledge) can be quite creative and result in a new knowledge creation in itself. See Karl E. Weick, "Improvisation as a Mindset for Organizational Analysis," *Organization Science*, Vol. 9, No. 5, 1998, pp. 543-555.

11. The types presented are ideal, so it is difficult to find pure examples. In reality, all forms of strategic reasoning are required. It is a matter of degree. Gulf War history demonstrates aspects of the other three types of reasoning as well; yet, *planning* appeared to be the preeminent form of reasoning for action.

12. Peter DeLeon, "The Stages Approach to the Policy Process," in Paul A. Sabatier, ed., *Theories of the Policy Process: Theoretical Lenses on Public Policy*, Boulder, CO: Westview, 1999, pp. 19-22.

13. Note, when hyphenated, the word "de-liberation" means literally to take away freedom of action; and, in this case, to focus resources on a single course of action, that trumps all others.

14. See Melissa Schilling and Christopher R. Paparone, "Modularity: An Application of General Systems Theory to Military Force Development," *Acquisition Review Journal*, Vol. 12, 2005, pp. 279-293.

15. This is an adaptation of Karl Popper's argument in his book, *The Logic of Scientific Discovery*, London, UK: Routledge, 2002 (first published in 1935), p. 8. The present author extends this argument to achieving negotiated agreements, i.e., a very creative process that relies on experiential learning.

16. Stone, p. 32.

17. This chart was adapted by the author from the ideas of James D. Thompson and Arthur Tuden, "Strategies, Structures, and Processes of Organizational Decision," in J. Thompson, ed., *Comparative Studies in Administration*, New York: Garland, 1987, pp. 195-216. (Original work published in 1959.)

18. Field Marshal The Viscount Slim, *Defeat Into Victory*, New York: David McKay Company, 1961, pp. 95-96.

19. Slim, pp. 179-180.

20. The Greek term for this suspension of disbelief is *epochè*.

21. Henry Mintzberg, Duru Raisinghani, and Andre Theoret, "The Structure of 'Unstructured' Decision Processes," *Administrative Science Quarterly*, Vol. 21, 1976, p. 246.

22. Charles E. Lindblom, "The Science of Muddling Through," *Public Administration Review*, Vol. 19, No. 2, Spring, 1959, pp. 79-88.

23. Michael D. Pearlman, *Warmaking and American Democracy: The Struggle over Military Strategy 1700 to the Present*, Lawrence: University Press of Kansas, 1999.

24. Herbert Blumer, *Symbolic Interactionism: Perspective and Method*, Berkeley: University of California, 1969, p. 44.

25. *Ibid.* Traditional scientific methods are considered by Blumer to operate "unwittingly with false premises, erroneous problems, distorted data, spurious relations, inaccurate concepts, and unverified interpretations," p. 29.

26. *Ibid.*, p. 42. Also see Karl E. Weick, "The Generative Properties of Richness," *Academy of Management Journal*, 2007, Vol. 50, No. 1, pp. 14-19. Weick states that the argument for better rich description "is an argument for detail, for thoroughness, for prototypical narratives, and an argument against formulations that strip out most of what matters. It is an argument that the power of richness lies in the fact that it feeds on itself in ways that enlarge our understanding of the human condition," p. 19.

27. Stone, 1997, pp. 13, 259. Furthermore, Stone defines policy as the "rational attempt to attain objectives . . . by interpreting, through political reasoning, the criteria for choice," pp. 37-38. She argues those criteria (justifications for policy or values) fall into four major value categories: equity, liberty, efficiency, and security, p. 37.

28. Perhaps this explains why the State Department does not invest in professional schools for its foreign service officers as does the DoD for its officers' "professional military education."

29. For example, see David A. Kolb, *Experiential Learning: Experience as the Source of Learning and Development*, Englewood Cliffs, NJ: Prentice-Hall, 1984.

30. For "messes," see Russell L. Ackoff, *Ackoff's Best: His Classic Writings on Management*, New York: Wiley, 1999. Ackoff defines messes as "systems of problems, [where] they lose their essential properties when they are taken apart," p. 117. For wicked problems, see Horst W. Rittel, H. and Melvin M. Webber, "Dilemmas in a General Theory of Planning," *Policy Sciences*, Vol. 4, 1973, pp. 155-169. Wicked problems are at the other end of the spectrum from tame problems, hence, better characterize problems of government policy. According to Rittel and Webber, wicked problems are "incurable" that "defy efforts to delineate their boundaries and to identify their causes, and thus to expose their problematic nature," p. 167.

31. Atocha Aliseda, *Abductive Reasoning: Logical Investigations into Discovery and explanation*, Dordrecht, The Netherlands: Springer, 2006. According to Aliseda, abductive reasoning involves the discovery of tentative inferences and search strategies for possible explanations. The viability of these explanations is affected by luck, persistence, and superior heuristics (the latter stemming from past experience, imagination, metaphors, and other forms of analogical reasoning). Surprise is the trigger of abductive reasoning; hence, goes hand-in-hand with doubt and the impetus to change a belief system. The motivation for discovery is to sooth (as in soothsaying/fortune-telling) and to create suggestions that must be bested before converting into belief.

32. Adapted from Robert E. Horn, "Knowledge Mapping for Complex Social Messes," A presentation to the "Foundations in the Knowledge Economy," the David and Lucile Packard Foundation, July 16, 2001, May 22, 2006, available from www.stanford.edu/~rhorn/images/SpchPackard/spchKnwldgPACKARD.pdf. Horn was interpreting the work of Russell Ackoff and came up

with the idea of creating graphic views of messes through cross-boundary causality maps.

33. Schön, p. 39.

34. *Ibid.*, p. 28.

35. *Ibid.*

36. Weick, pp. 543-555. Qualities of improvisation include dealing with the unforeseen and unexpected that may include "flexible treatment of preplanned material." Other qualities include playing extemporaneously, making a difference with ongoing action, spontaneity, novel activities, creation of something while it is being performed, is linked to intuitive processes, requires a "disciplined practitioner," p. 544. "Wade in and see what happens," p. 548. "Composing on spur of the moment," p. 548.

37. Ackoff, p. 115.

38. *Ibid.*

39. Anne Larason Schneider and Helen Ingram, *Policy Design for Democracy*, Lawrence: University of Kansas, 1997, p. 69.

40. *Ibid.*, p. 74.

41. Alan Beyerchen, "Clausewitz, Nonlinearity, and the Unpredictability of War," *International Security*, Vol. 17, No. 3, Winter 1992-93, pp. 59-90.

42. Robert L. Flood and Norma R.A. Romm, eds., *Critical Systems Thinking: Current Research and Practice*, New York: Plenum Press, 1996. Also see Peter L. Berger and Thomas Luckmann, *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*, New York: Anchor, 1967.

43. Herbert A. Simon, *The Sciences of the Artificial*, 3d Ed., Cambridge, MA: MIT, 2001, p. 5.

44. Peter Senge maintains that causal loop diagrams allow us to see "the 'structures' that underlie complex situations, and

for discerning high from low leverage change. That is by seeing wholes we learn how to foster [system] health." Peter Senge, *The Fifth Discipline: The Art and Practice of the Learning Organization*, New York: Doubleday Currency, 1990, p. 69. In complex systems, "doing the obvious thing does not produce the obvious, desired outcome," emphasis in original, p. 71. Also see Geoff Coyle, *Qualitative Modeling in System Dynamics or What are the wise limits of quantification?* A Keynote Address to the Conference of the System Dynamics Society, Wellington, New Zealand, May 1999, available from www.systemdynamics.org/conferences/1999/PAPERS/KEYNOTE1.PDF; and Edward G. Anderson Jr., "A Proof-of-Concept Model for Evaluating Insurgency Management Policies Using the System Dynamics Methodology," *Strategic Insights*, Volume VI, Issue 5, August 2007, available from www.nps.edu/Academics/centers/ccp/publications/OnlineJournal/2007/Aug/andersonAug07.pdf.

45. One of the ways social groups "invent" these meanings is to *borrow* meaning from other knowledge disciplines: natural sciences, social sciences, and the humanities. For a treatise on this subject, see Christopher R. Paparone, "Metaphors We are Led By," *Military Review*, November-December 2008, pp. 55-64.

46. Schneider and Ingram, p. 62.

47. Simon, 2001, p. 33.

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