



Cadet Angel Santiago (with the ball) led the Army football team to a 28 to 12 victory over visiting Morgan State under the lights at Michie Stadium, West Point, New York, 30 August 2014. Football provides an ideal example of how the logico-scientific paradigm and the interpretive paradigm are employed in a complementary manner by viewers as they interpret the game.

(Photo by John Pellino, Directorate of Plans, Training, Mobilization, and Security)

# Two Faces of Critical Thinking for the Reflective Military Practitioner

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...an object, event, or situation in human experience does not carry its own meaning; the meaning is conferred on it.

—Herbert Blumer

The quest to educate our military toward the goal of fostering critical thinkers is an obvious part of the dominant narrative in U.S. military circles today. *Critical thinking* has become quite the catchphrase. Yet, there is little published in military circles demonstrating a philosophical examination of what critical thinking means; hence, my intent here is to start that conversation.<sup>1</sup> My argument calls upon *two faces* of critical thinking—a metaphor that conveys a dualistic approach toward a more reflective military practice.

A decade ago, I was on faculty at the U.S. Army War College where the curriculum employed a blue booklet on critical thinking authored by Richard W. Paul and Linda Elder.<sup>2</sup> Later, as a faculty member of the Command and General Staff College, I likewise was directed to have our students read and apply the booklet, presumably to assure they were able to critically reason. In the booklet, Paul and Elder present what they claim to be “universal intellectual standards:” clarity, accuracy, precision, relevance, depth, breadth, logic, significance, and fairness. Indeed, the Paul and Elder text seemed to help students detect logical fallacies. That is, Paul and Elder, employing the *logico-scientific paradigm*, present critical thinking as a deductive-inductive reasoning process necessary to uncover flaws in logic much as one would in evaluating mathematical proofs and physics experiments.<sup>3</sup>

Many of my students and I were left unsatisfied with this logico-scientific approach as it did not seem to address novelty, or what Donald A. Schön described as *indeterminate zones of practice*—conditions of complexity, uncertainty, and value conflict—which my student-officers had experienced.<sup>4</sup> A search for meaning in these situations had little to do with identifying logical fallacies as prescribed by Paul and Elder. The complexities they experienced were uniquely “observer dependent,” and the observer’s sense of complexity was limited by the available language or institutionalized doctrines to interpret what it was that was complex.<sup>5</sup> Meeting Paul and Elder’s standard that requires bringing intellectual order to such chaos would be a misstep. Because such an uncritical practice could dangerously

lead to an illusion of understanding, I began the search for another paradigm associated with critical thinking. My intent here is to describe an alternative—the *interpretive paradigm*—and present this basis for critical reasoning as a complementary world view. I say complementary, as I argue that both paradigms are essential to make sense of complex unfolding events. In doing so, I will address each by section as follows: I will explain the sociological concept of paradigms; present an American football allegory to illustrate how two paradigms work in tandem; discuss how they critically relate to each other; and, at the end, offer a critical approach to indeterminate zones of professional practice, called *action learning*, that applies both faces of critical thinking.

## Two Paradigms for Sensemaking

A paradigm is the way a particular community of practice makes sense of the world.<sup>6</sup> As such, there are at least three interlaced philosophical systems of inquiry and analysis that underly the logic of paradigms—*ontology*, *epistemology*, and *methodology*. I will compare and explain each of these to help differentiate the logico-scientific from the interpretive paradigm.

The first ingredient to a paradigm is ontology, or an underlying sense of being. Ontology attempts to answer the question, “What is real?” It may be construed along a continuum between beliefs of a purely objective world (involving a concrete sense of reality, or objectivism) and subjective world (the social construction of reality, or subjectivism). Objectivism is the ontological essence of the logico-scientific paradigm. Objectivists are closely aligned with the physical sciences in that reality may be proven to exist independent of mankind’s often flawed perceptions of it (i.e., what would constitute logical fallacies according to Paul and Elder).

In contrast, a subjectivist, at the other end of the ontological spectrum, argues that mankind has symbolically created reality, where reality only exists in context. To the subjectivist, reality is dependent on sociological processes—the hallmark of the interpretive paradigm.

The second ingredient of a paradigm is epistemology—the ensuing belief about what legitimates understanding in light of ontological assumptions. Epistemology answers the question, “What constitutes our knowledge for professional practice?” For example,

to understand the physical world, the logico-scientific knowledge structure is often judged objectively by its orderliness, coherency of theory, rationalized categories and taxonomies, analytic theories of causality, and so forth. To objective purists such as Paul and Elder, emotions and intuitive processes are not only invalid ways to judge knowledge, but they reflect biases that must be overcome. To an interpretivist, epistemology is recognized to be tentative knowledge representing man-made, flexible conceptualizations of reality. Here, epistemology is necessarily an unsettled, Heraclitean process of “never stepping into the same river twice.”<sup>7</sup> Beyond cognitions, interpretations are narratives that also spawn feelings such as surprise, irony, déjà vu, paradox, tragedy, artfulness, excitement, creativity, comedy, and so on. Intuition and emotions are intertwined to constitute a subjective epistemology; hence, judgment of interpretive forms of knowledge cannot be divorced from either of them.

The third ingredient of a paradigm, methodology, involves how knowledge is legitimized. The logico-scientific paradigm would include the objectivist’s employment of the scientific method, where, typically, the steps are—define the problem based in a coherent theory, search for possible answers, test them objectively for generalizability, and apply the best answer which feeds back into a nomothetic (lawful) knowledge structure, traditionally known as science. From the world view of the subjectivist, the interpretivist employs *idiographic* methods—such as the use of metaphors, hermeneutics, rich description, or creation of neologisms—for the purpose of deep, situationally specific learning. The idea is to develop distinctive meanings in appreciation of the complex experiences at hand.<sup>8</sup> Note that the logico-scientific paradigm seeks context-free methods designed around *sameness* while the interpretive seeks context-specific methods designed around *uniqueness*.

## **American Football: An Allegory for Military Operations**

As social beings, we are not stuck in a single paradigm; we experience the world seamlessly between logico-scientific and interpretive ontological assumptions. We can note that what makes professional football interesting is that no two plays, games, or seasons are alike—uniqueness being a key feature of

idiographic-based knowledge. Yet, there are logico-scientific repetitions offering a generalizable sameness as well. When we watch a football game, we enjoy it because we have learned to understand the relatively consistent rule structure (*sameness*) and appreciate that those rules interact with the playing of the game at hand (*uniqueness*). We know that the rules (a key feature of football epistemology) are a subjective creation because we notice the league changes them as conditions change. We observe how the rules are enforced—in the most unbiased way possible—followed by methodical, physical hand-and-arm signals by well-experienced, objective referees. We also couple those observations with our *subjective* interpretations of what just happened—our agreement or disagreement with the assessment of penalties—and may actually disagree with the supposedly *objective* play-review video system.

While we observe and analyze the physical prowess of the individual players and their integration of their positional tasks into a team effort—using objective measurements such as yards gained and passes completed—we interpret individual and team performance from an emotional basis as well (e.g., we become fans). We also are intrigued by how the coaches and quarterback seem to subjectively know when to run, pass, or even intentionally ground the football. We listen to the commentators judge what play should be run and how they criticize plays that did not work as planned. We watch the dynamic physical interactions of the opposing teams while reflecting how both sides can surprise each other. In our own minds, surprise (an emotion) seems a very subjectively interpreted experience as a surprising play is only a shock to the other team, the announcers, and the audience. Sometimes even the team making an unexpected play seems to surprise itself as to the degree of its success or failure, particularly if the play did not unfold as practiced.

In football we reflect on the passage of minutes and seconds—both subjective measures invented by humans and, yet, measures that have become socially *objectified* as we equate time with physical events. We notice time is controlled by seemingly objective categories: starts, timeouts, halftimes, resets, two-minute warnings, overtimes, and finishes. The subjectivist in us, however, recognizes that these times may vary among college or high-school football conferences when

compared to those at the paid-professional level, again indicating time is a human invention. Also of note to the interpretivist is that there is a certain irony that an hour of official play time often involves more than three hours for a single game.

Football statistics give us the impression of objective fact; hence, predictability. Predictability is the quintessential goal of the logico-scientific paradigm. Measures of player and team performance may give clues as to which teams will make the playoffs. Measures of effectiveness, such as scores at the end of a quarter, half, or game are partially reliable predictors of an overall season victor. However, we cannot imagine looking only at a computer screen with ongoing statistics to fully appreciate what is happening a game. We want to appreciate and emotionally involve ourselves in what is happening on the ground. When viewing the game, we interpret how it is going and realize that strictly monitoring “objective” statistics is not satisfactory. We celebrate (with emotion) when underdogs surprise us by winning games that probability and statistics would deny—and we experience heightened morale (also an emotional state) when the winning team surges.

We are aware, outside the conduct of a game, of ongoing, behind-the-scenes, complex emotional tensions among the players, managers, and owners of the teams. These require subjective judgments as to whether the players will be fined, go on strike, be provided disability pensions, be recruited, or be traded to other teams. We interpret how outside interactions might affect the game at hand and the season ahead. Finally, taking ourselves outside our comfort zone, the interpretivist in us contemplates why culture in the United States has created a very different epistemology of football from most of the rest of the world, whose game we Americans call soccer. We should critically wonder why we call our game *football* at all. Objectively, the ball is kicked far less than it is carried or thrown.

With this short allegory, we demonstrate that the reality of professional football may simultaneously be ontologically objective and subjective, that the epistemologies (knowledge structures) of football vary along the logico-scientific—interpretive continuum, and that methods of meaning legitimation in the sport are heterogeneous. Making sense of football strictly from the logico-scientific paradigm would certainly constrain our overall interpretations of its complexity,

highlighting the need to derive an aesthetic-subjective appreciation of the game. We learn from this allegory that with complexity there must be a great deal of room for interpretation, a respect for other knowledge forms, and other methods of knowledge formation that are equally important to produce richness in our sense-makings about what we are observing.

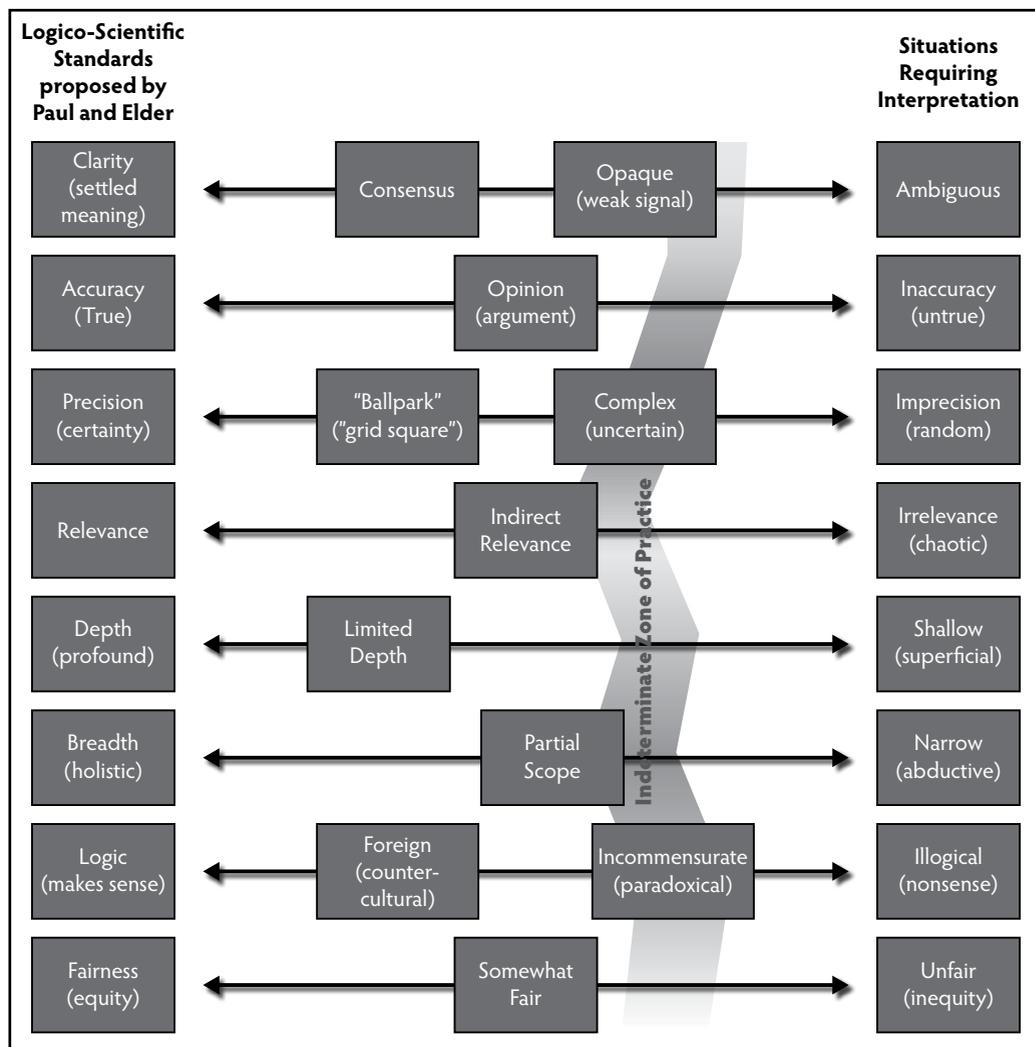
Indeed, our military sensemakings would become disabling if we were to employ only the logico-scientific paradigm to study the complexity of our recent experiences in Afghanistan, observing the messiness of Syria and Iraq, and in the wake of Russian involvement in the Ukraine. Obviously, such complexity demands even more concoctions of ontological, epistemological, and methodological ingredients than would football.

### Dual Paradigms Offer Complementary, Critical Perspectives

Logico-scientists criticize interpretivists as too speculative, violating such notions as Paul’s and Elder’s “universal intellectual standards” which offer the promise of removing ambiguity and imprecision. These standards suggest only the logico-scientific paradigm provides a legitimate basis for critical reasoning. That is, the military practitioner should seek to remove all subjectivity about the situation at hand; apply a generalizable epistemology of proven tactics, techniques, and procedures expected to work again and again; and use scientific methods to further legitimate those tactics, techniques, and procedures and add new ones (*deducing* the rigorous application of authoritative practice and *inducing* so-called lessons learned and best practices into those doctrines).

Conversely, interpretivism provides a vehicle to criticize logico-scientism. The interpretive purist sees logico-scientism as a collection of socially constructed objectifications that habitually distort reality.<sup>9</sup> As veterans of recent military operations will appreciate, to remove subjectivity, using the intellectual standards suggested by Paul and Elder is inadequate when dealing with befuddling complex situations where subjective appraisals are vitally important. Such confounding situations tend to present themselves at the opposite end of the continua—infusing us with senses of ambiguity, inaccuracy, or imprecision. Equipped only with logico-scientific epistemology, we will hopelessly try

to detect logical fallacies when the uniqueness of situations require observer-specific narrative interpretations. Indeed, such sensemaking situations may be mapped better along continua, rather than according universal categories, as depicted by my rendition of Schön's indeterminate zones of practice (see figure). Here, reflective practice requires that the observer, "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 ..."<sup>10</sup>



### Affiliation Network (Observed Drug Use)

Finding meaning in the situation while acknowledging that indeterminate zones of practice exist will always fall somewhere along the continua between the poles of pure logico-scientism and pure interpretivism. This is not a Paul and Elder fallacy, as we teach our officers at our war colleges and staff schools; rather, the situation is too complex to exclusively employ one paradigmatic pole or the other. Hence, the proposed paradigmatic duality provides an important complementary, more fluid, and continuous sense of knowledge creation and destruction. In short, critical inquiry demands oscillating between both paradigms.

Having both paradigms at our service, we may achieve richer forms of professional practice as we may use each polar view to critically reflect on the other. The logico-scientific paradigm seeks to settle on

authoritative, institutionally coded understandings that we call military doctrine. Our doctrinal functions such as intelligence, maneuver, and sustainment enable us to develop repeatable practices (such as tasks, conditions, and standards), and expect *sameness* in future practice (generalizability for training and equipping purposes). At the same time, the interpretivist in us remains *critical* of any claims to objectivity and suspicious of over-reliance on epistemological reference to generic lessons learned, best practices, or other such doctrines. Our interpretivist view is doubtful of claims of prediction associated with such categorical thinking. Professor Karl E. Weick explains concisely why both paradigms have to work together in professional practice:

[As] complexity increases, people shift from perceptually-based [interpretive] knowing

to categorically-based [logico-scientific] knowing in the interest of coordination. As demands for coordination increases, people begin to perceive one another in terms of roles and stereotypes, distributed cognition becomes more category-based in order to reduce differences and gain agreement, concepts become simpler and more general in the interest of transmission, and there is a greater aversion to inconsistency between interpersonal attraction and beliefs. While all of these changes facilitate coordination, they do so at the potential cost of greater intellectual and emotional distance from the details picked up by direct perception.<sup>11</sup>

## Indeterminate Zones of Practice and Action Learning

Professional military practice should advocate the paradigmatic duality of critical reflection while engaged in *action learning*—an incremental approach to dealing with complexity.<sup>12</sup> Here, ambiguous and emergent tasks become vehicles for learning while acting. Dealing with these indeterminate zones of practice, practitioners try to figure things out as their actions are interactive with a milieu of incongruous actors and activities, such as we witness today, for example, in Syria and Iraq.

Indeterminate zones of practice emerge in settings that are interdependent and dynamic and where institutionalized forms of knowledge are inadequate to frame what is happening or not happening. Action learning includes critical thinking associated with balancing between the paradigms.

While highlighting expected surprises as complex and chaotic situations unfold, the proposed dualistic approach to critical reasoning acknowledges both the need for technical knowledge (e.g., the science of maneuvering on a fortified position) and knowledge that must be crafted in action, while in the midst of novelty (e.g., the immediacy of interpreting why and how to spare a nearby mosque at this particular time and place). In her 2010 monograph, anthropologist Anna Simons exposes the institutional failures associated with not appreciating the value of immersive learning and intuitive forms of knowing needed to interpret situations. Simons deftly critiques those

who seek only logico-scientific solutions, referring to our institutional—

propensity to turn unduplicable lessons into generic principles as if anyone should be able to apply them ... [T]he penchant to genericize in and of itself teaches the wrong lesson. It implies that once the right lessons have been taught and trained, anyone should be able to apply them. Yet, history suggests this is hardly the case. More to the point, those who orchestrated successful campaigns in the past invariably broke new ground. That is *why* their campaigns succeeded. This was usually in the wake of something old and tried, which means such individuals came to the situation able to read and analyze it differently than their predecessors, or they saw different possibilities, or both.<sup>13</sup>

Like exercising a dualistic world view with the American football allegory, one has to know the rules (institutional doctrines, best practices, and lessons learned) and have the interpretative sensibility of when to break free of them. The logico-scientific paradigm deals with a dominant assumption about causality—that history is useful as a storehouse of proven knowledge for future use. The interpretive paradigm assumes historically situated uniqueness—that the use of history is reserved primarily as a valuable source of heuristics (rules of thumb) that may serve to help interpret (not prescribe) in the here and now.

Both world views require complementary forms of creativity in the face of novelty. A different source of artfulness is implied for each sense of reality. Logico-scientism calls on an established vocabulary that has a historic track record in applying proven principles and cause-and-effect relationships. Here, artfulness is about linking the present situation to the appropriate knowledge base before taking action (e.g., a planning approach)—where, ideally, the risk of surprise is minimized.

Interpretivism, on the other hand, relies on the awareness of both our inadequate linguistic structures and the potential for institutionalized group think among practitioners; hence, surprise is considered a normal feeling. Action learning demands

the testing of institutionalized knowledge and the creation of knowledge-while-practicing, disconfirming old and inventing new meanings in the process of reflecting in and on action.

## Conclusion

Though our institution expects military practitioners and their organizations to routinely face novel situations vested in highly complex environments, our traditional military institutional approaches to training and education lean too heavily on the logico-scientific paradigm. Training and education should spur reflective practice with the outcome of *learning to learn* more effectively while acting. Balanced with the

logico-scientific paradigm (e.g., task-based learning), professional development must better incorporate the interpretive paradigm.

In that regard, the concept of action learning is supportive of the U.S. military's current themes of *mission command* and *adaptive leadership*.<sup>14</sup> The need to exercise disciplined initiative and critical thinking when faced with indeterminate zones of practice can be addressed through these ideals.<sup>15</sup> To that purpose, this essay has proposed that both faces of critical thinking are required for the betterment of the reflective military practitioner who should strive to oscillate comfortably between the logico-scientific and interpretive paradigms. ■

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## Notes

**Epigraph.** Herbert Blumer, *Symbolic Interactionism: Perspective and Method* (Berkeley: University of California, 1969), 134.

1. Notwithstanding, the Army has developed an exceptional capability to address both faces of critical thinking in its University of Foreign Military and Cultural Studies, located at Fort Leavenworth, KS. However, the philosophy and remarkable practices espoused by this unique organization do not reflect the norm in the Army.

2. Richard W. Paul and Linda Elder, *The Miniature Guide to Critical Thinking*, 4th Edition (Tomales, CA: Foundation for Critical Thinking, 2004), [http://www.criticalthinking.org/files/Concepts\\_Tools.pdf](http://www.criticalthinking.org/files/Concepts_Tools.pdf).

3. Haridimos Tsoukas and Mary Jo Hatch, "Complex Thinking, Complex Practice: The Case for a Narrative Approach to Organizational Complexity," *Human Relations*, 54(8)(2001): 979-1013. I must give credit here that the Tsoukas and Hatch article inspired me to write this article.

4. Donald A. Schön, *Educating the Reflective Practitioner: Toward a New Design for Teaching and Learning in Professions* (San Francisco: Jossey-Bass, 1987), 39.

5. *Ibid.*, 986.

6. Thomas S. Kuhn, *The Structure of Scientific Revolutions*, 3rd ed. (Chicago: University of Chicago, 1996), 175. I restated from Kuhn's longer definition where paradigm "stands for the entire constellation of beliefs, values, techniques, and so on, shared by members of a given community."

7. Heraclitus was a "Greek philosopher who maintained that strife and change are the natural conditions of the universe." The American Heritage Dictionary of the English Language, Fourth Edition, 2009 available online at <http://www.thefreedictionary.com/Heraclitean>.

8. Gibson Burrell and Gareth Morgan, *Sociological Paradigms and Organizational Analysis: Elements of the Sociology of Corporate Life* (Portsmouth, NH: Heinemann, 1979).

9. Peter L. Berger and Thomas Luckmann, *The Social Construction of Reality: A Treatise in the Sociology of Knowledge* (New York: Anchor, 1967).

10. Schön, 28.

11. Karl E. Weick, "Rethinking Organizational Design," in Richard J. Boland and Fred Collopy, *Managing as Designing* (Stanford, CA: Stanford Business Books, 2004): 42.

12. Craig Johnson and David P. Spicer, "A Case Study of Action Learning in an MBA Program," *Education & Training*, 48(1), 2006: 39-54.

13. Anna Simons, *Got Vision? Unity of Vision in Policy and Strategy: What It Is, and Why We Need It* (Carlisle, PA: U.S. Army Strategic Studies Institute, 2010), 21-22.

14. These desired aspects of leadership are described in the *Army Leader Development Strategy 2013*, <http://usacac.army.mil/cac2/CAL/repository/ALDS5June%202013Record.pdf>.

15. Chairman of the Joint Chiefs of Staff, *Mission Command White Paper*, Washington, DC, 3 April 2012, [http://www.dtic.mil/doctrine/concepts/white\\_papers/cjcs\\_wp\\_missioncommand.pdf](http://www.dtic.mil/doctrine/concepts/white_papers/cjcs_wp_missioncommand.pdf).