What Brain Sciences Reveal About Integrating Theory and Practice

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Abstract

Theory and practice are integrated in the human brain. Situation recognition and response are key to this integration. Scholars of decision making and expertise have found that people with great expertise are more adept at situational recognition and intentional about their decision-making processes. Several interdisciplinary fields of inquiry provide insights into how we manage situation recognition in the face of complexity. Classic works on bounded rationality and *satisficing*, contingency theory, cognitive science, and decision sciences have been identifying how the brain processes information through conceptual screens to facilitate cutting through the messy, confusing, overwhelming chaos of the real world so that we can avoid analysis paralysis. This article presents six conceptual screens that, in combination, constitute a theory to practice situation recognition framework: (1) intended users' contingencies; (2) nature of the evaluand; (3) evaluation purpose: findings use options; (4) process options; (5) context & situational contingencies; and (6) evaluator characteristics.

Keywords

theory, practice, situation recognition, utilization

In her keynote at the Eastern Evaluation Research Society's 2012 annual conference, Eleanor Chelimsky posed the challenge of "Balancing Theory and Practice in the Real World." In so doing, she explained the relationship between theory and practice:

> [E]valuation theory and practice are interdependent: each one learns from the other and, in that learning process, both are inspired to stretch, to bend a little, and to grow. (Chelimsky, 2013, p. 91)

Chelimsky went on to define theory and practice and insightfully reviewed how early evaluators *expected* them to interact. Thomas Schwandt, in the Forum article accompanying this one, has further explored the relationship between practice and theory in evaluation. I concur with the thoughtful analyses, premises, and insights of these colleagues. While they have focused on the "real world" integration of theory and practice, I intend to explore *the inner world* where theory

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and practice are actually integrated: the human brain. Just as context for the musings that follow, consider these "fun facts:"

- There are about 100 billion neurons in the human brain, the same number of stars in our galaxy.
- 100,000 miles of blood vessels, capillaries, and other transport systems in the brain
- 1 Quadrillion connections in the adult brain
- 750–1,000 ml of blood flow through the brain every minute or about three full soda cans.
- More electrical impulses are generated in 1 day by a single human brain than by all the telephones in the world.
- The human brain "thinks" 70,000 thoughts on an average day. (Fun facts, 2012)
- Oh, and one final fun fact: The human brain is where theory and practice are integrated.

The Challenge of Making Sense of and Taking Action in a Complex World

Despite all that brain power, the complexity of the real world remains daunting. How complicated can it be to design an evaluation to fit the program's situation? I ruminated on this challenge in a whole chapter of *Utilization-Focused Evaluation* (Patton, 2008, chap. 6) using playing chess as a comparison. There are some 85 billion ways of playing just the first 4 moves in a game of chess. Deciding what moves to make requires both strategy and tactics grounded in an analysis of the situation presented by a particular game and opponent within an overall framework of fundamental chess ideas and concepts, understanding what the different pieces do, how they can be moved, and how they relate to each other. Once the game starts, subsequent moves are contingent on and must be adapted to what one's opponent does.

So let us undertake a thought experiment in playing the game of evaluation. In an influential book reporting research on evaluation use, Marv Alkin (1985) identified some 50 factors associated with use. As elements of a comprehensive theory of evaluation use, we face the practical, real-world problem of taking into account those 50 factors in designing an evaluation. How do we do that? *We don't and we can't.* Those who study decision making say it cannot be done.

Imagine 20 situational variables that can affect how an evaluation is designed and conducted, things like number of stakeholders to be dealt with, the evaluation's purpose, staff attitudes toward evaluation, the budget and timeline for evaluation, and the program's prior experience with evaluation. (For a list of 20 common situational factors, see Patton, 2008, exhibit 6.1, pp. 204–205.) Most of these factors could be broken down into several additional dimensions. If we conceive of 5 points (or situations) on each of these dimensions, the potential combinations yield 3,200,000 potentially different situations.

How our Brains Handle Complexity

Of course, one could make the same analysis for virtually any area of decision making. Life is complex, so what is new? First, let us look at what is old. The evidence from social and behavioral science is that in other areas of decision making, when faced with complex choices and multiple situations, we fall back on a set of rules and standard operating procedures that predetermine what we will do, that effectively short-circuit situational adaptability. The evidence is that we are running most of the time on preprogrammed tapes. That has always been the function of rules of thumb and scientific paradigms. Faced with a new situation, the evaluation researcher turns to old and comfortable patterns (sometimes consciously, sometimes unconsciously). This may help explain why so many evaluators who have rhetorically embraced the philosophy of situational evaluation find that the approaches in which they are trained and with which they are most comfortable *just happen* to be particularly appropriate in each new evaluation situation they confront—time after time after

time. How, then, can evaluators prepare themselves to deal with a lot of different people and a huge variety of situations?

Several interdisciplinary fields of inquiry have provided insights into how we manage situation recognition in the face of complexity. Simon's (1957, 1978) classic works on bounded rationality and *satisficing* reveal how we reduce complexity to a manageable few adequate possibilities. Contingency theory, from organizational sociology, emphasizes how organizational decision making in complex open systems requires ongoing adaptation; there can be no one best practice because what is appropriate is contingent on the kinds of tasks being done and the volatility and dynamism of the environment in which adaptive and contingent decisions are made (Morgan, 2006, pp. 42–45). The field of cognitive science is investigating *neuro-network learning algorithms* that constitute shortcuts for making sense of complexity. Decision sciences have been identifying decision heuristics that cut through the messy, confusing, overwhelming chaos of the real world so that we can avoid analysis paralysis and take action. We rely on routine "heuristics"—rules of thumb, standard operating procedures, practiced behaviors, and selective perception (Kahneman & Tversky, 2000).

The *confidence heuristic:* The *amount* of information we obtain increases our confidence in our judgments, regardless of the accuracy or redundancy of the information.

The *representativeness heuristic* guides our sense making in new situations by focusing our attention on those aspects of the situation that are most familiar and similar to our previous experiences. We make a new problem or situation *representative* of things we already know, selectively ignoring information and evidence that is unfamiliar or that does not fit our preconceptions developed through past experiences.

The *availability heuristic* operates to make sense of new situations by bringing readily to mind things that happened to us recently or information that we come across frequently.

What intersecting and overlapping fields of research on decision making and brain functioning reveal is that we cannot systematically consider every possible variable in a situation, or even 50 variables, or even 20 variables. Findings from cognitive science, decision science, and contingency theory triangulate to reveal that what makes thought and action possible is viewing the real world through some kind of framework for making sense of situations, a framework that tells us what factors deserve priority in our sense making. This already and inevitably happens unconsciously. It is how our brains work. The issue is whether we can become more consciously and intentionally deliberative about how we engage in sense making and situation recognition.

Enhancing Situation Recognition and Adaptive, Contingency-Based Decision Making

Scholars of decision making and expertise have found that what distinguishes people with great expertise is not that they have more answers than others, but they are more adept at situational recognition and more intentional about their decision-making processes (Klein, 1999). We can, in fact, come to recognize our heuristic tendencies and learn to identify the heuristic processes that determine our impressions, and to make appropriate allowances for the biases to which our thought processes make us liable (Tversky & Kahneman, 1974, pp. 1124–1125). We can do this through ongoing and in-depth reflective practice to become *reflective theory-based practitioners* (Schön, 1983, 1987). We can do this by systematically evaluating our evaluation work, engaging in case learning (Patrizi & Patton, 2005), and deconstructing our design tendencies and methodological decision making.

Let me reiterate the overall point here. We are already integrating theory and practice in our brains because to practice (or act) at all we make sense of what to do by interpreting the evaluation situations

we face through some set of theoretical screens and constructs that operate through decision heuristics, cognitive algorithms, paradigm parameters, and contingency-based, satisficing, and bounded rationality shortcuts. The issue, then, is not whether we integrate theory and practice in our brains. The issue is whether we become more intentional and deliberative about how we do so. Toward that end, I want to share the results of my own journey toward such greater intentionality and deliberativeness in integrating theory and practice in my own evaluation situation recognition and decision-making processes.

Utilization Heuristic

Basically, the *utilization heuristic* for managing situational complexity in utilization-focused evaluation is to *stay focused on use*. For every issue that surfaces in evaluation negotiations, for every design decision, for every budget allocation, and for every choice among alternatives, keep asking, "How will this affect use in this situation?" But upon further reflection, I have discovered that I apply the utilization heuristic through six conceptual screens that guide and inform my situation recognition about what to do.

Framework for Integrating Utilization-Focused Evaluation Theory and Practice

Figure 1 presents the six conceptual screens which, in combination, as near as I can tell, constitute my theory to practice situation recognition framework: (1) Intended users' contingencies; (2) Nature of the evaluand; (3) Evaluation purpose: findings use options; (4) Process options; (5) Context and situational contingencies; and (6) Evaluator characteristics.

I hasten to add that I offer this scheme as an example of what a theory–practice framework might look like and to encourage evaluators to become intentional, explicit, and deliberate about their theory-to-practice algorithms and heuristics. I am not suggesting that others adopt the framework in Figure 1. For the purposes of the Eastern Evaluation Research Society Chelimsky Forum, it was (and is) meant to stimulate reflection and discussion, not pose as a prescriptive framework for adoption.

Given limitations of space, I can only briefly discuss each one and illustrate them with some of my favorite Eleanor Chelimsky insights about how to adapt to diverse evaluation situation and challenges.

1. Intended users' contingencies

Situation analysis starts for me in identifying and engaging primary intended users of the evaluation: their perspectives, commitment, capacity, interest, and power, all personal factor considerations (Patton, 2012, pp. 61–85). As Chelimsky (1983) has observed, "The concept of usefulness. depends upon the perspective and values of the observer. This means that one person's usefulness may be another person's waste" (p. 155).

2. Nature of the evaluand

What is being evaluated? A beginning point for situation recognition in contingency theory is the extent to which the evaluand is, or aspires to be, a standardized, high-fidelity, best practice model versus an innovative, adaptive set of principles that are implemented variously depending on context.

As Assistant Comptroller General for Program Evaluation and Methodology at the Government Accountability Office (formerly the General Accounting Office) (GAO), Eleanor Chelimsky

directed scores of evaluations in the highly political environment of the U.S. federal government, goring the oxen of both the executive and the legislative branches, as well as lobbyists and advocates on all sides. Defense weapons systems, Internal Revenue Service processes, and social and education programs constitute different evaluands. Assessing executive policies is different from assessing Congressional legislation. Evaluating long-established and deeply entrenched programs poses challenges different from assessing newer, more innovative initiatives. So, you must understand the evaluand.

3. Evaluation purpose: findings use options

The purpose of an evaluation conditions the use that can be expected of it. Chelimsky (1997)

Chelimsky pioneered the importance of distinguishing evaluation purposes and the implications of different purposes for how an evaluation is conducted. Accountability evaluations serve a purpose quite different from improvement-oriented evaluations. Knowledge generation has emerged as one of the principal purposes of evaluation (Chelimsky, 1997).

Being clear about an evaluation's purpose is central to evaluating the evaluation, the source of our own professional accountability (Patton, 2012, pp. 113–138). Chelimsky has posited that the most important kind of accountability in evaluation is use that comes from "designed tracking and follow up of a predetermined use to predetermined user." She calls this a "closed-looped feedback process" in which "the policy maker wants information, asks for it, and is interested in and informed by the response"(Chelimsky, 1983, p. 160). This perspective solves the problem of defining use, addresses the question of who the evaluation is for, and builds in evaluation accountability since the predetermined use becomes the criterion against which the success of the evaluation can be judged. Such a process has to be planned and evaluated.

4. Process options

How an evaluation is conducted varies along many dimensions, including the extent to which the process is completely independent versus highly interactive.

Interactive, participatory, collaborative, empowerment, and developmental evaluations are heavily relationship based. Evaluators work closely with intended users to build trusting, mutually respectful, and close working relationships (Patton, 2011, 2012, pp. 140–166). In contrast, in her work at GAO, independence and impartiality were primary. The perception of impartiality, she has explained, is at least as important as methodological rigor in highly political environments.

Credibility, and therefore utility, are affected by "the steps we take to make and explain our evaluative decisions, [and] also intellectually, in the effort we put forth to look at all sides and all stakeholders of an evaluation. (Chelimsky, 1995, p. 219)

In her 2006 plenary address at the American Evaluation Association annual conference, Chelimsky regaled the audience with stories of dealing with political machinations in getting the U.S. Congress to pay attention to important evaluation findings. She titled her presentation:"A Clash of Cultures: Improving the Fit Between Evaluative Independence and the Political Requirements of a Democratic Society"—and that nicely captures the challenge.

5. Context and situational contingencies

The theme of the 2009 annual conference of the American Evaluation Association (AEA) was "Context and Evaluation." AEA President Debra Rog articulated the challenge of taking context seriously.

> Context has multiple layers and is dynamic, changing over time. Increasingly, we are aware of the need to shape our methods and overall approach to the context. Each of the dimensions within the context of an evaluation influences the approaches and methods that are possible, appropriate, and likely to produce actionable evidence. (Rog, 2009)

In understanding context to inform situation analysis, I have been finding it helpful to distinguish simple, complication, and complex situations (Patton, 2011, chap. 4; 2012, pp. 253–258). Simple, complicated, and complex is not a taxonomy of operationally distinct, mutually exclusive and exhaustive categories. Rather, the distinctions constitute a typological continuum. In working with clients on these distinctions, it is illuminating to engage them in the discussion about what aspects of what they do are *relatively* simple, *relatively* complicated, and *relatively* complex. First, staff do not typically agree about which is which, so that discussion itself is illuminating. And there are clear evaluation implications for aspects of interventions that are simple, complicated, and complex.

Different kinds of evaluation designs are called for under different conditions and in varying contexts. Understanding this, Chelimsky was creatively but bluntly critical in reacting to the U.S. Institute of Education's advocacy of experimentation as the gold standard. She welcomed the commitment to rigorous evaluations but expressed concern about the policy's rigidity and lack of situational adaptability and contextual responsiveness:

> It is as if the Department of Defense were to choose a weapon system without regard for the kind of war being fought; the character, history, and technological advancement of the enemy; or the strategic and tactical givens of the military campaign. (Chelimsky, 2007, p. 14)

Chelimsky has argued insightfully that the strength of an evaluation is context dependent. The judgment that an evaluation is "strong" can only be made within some context where the kind of strength manifest is *appropriate to the situation*. The strength of an evaluation has to be judged within the context of the question, the time and cost constraints, the design, the technical adequacy of the data collection and analysis, and the presentation of the findings. A strong study is technically adequate and useful.

6. Evaluator characteristics

Know thyself (γνῶθι σεαυτόν in Greek)
  Inscription in ancient Temple of Apollo at Delphi

My final theory-to-practice screen involves thinking about how well my approach would fit with the context, intended users, evaluation findings, process options, and nature of the evaluand. Does the evaluation interest me? Would I learn from it? Would it engage my capacities? I recently took on a major meta-evaluation of the Evaluation of the Paris Declaration primarily because the nature, scope, and challenges would expand my horizons (Patton, 2013). The capacity to reflect on our practice and on the underlying theories that inform our practice—and taking the time to do so—is a critical characteristic on which evaluators vary.

The term *reflexivity* has entered the evaluation lexicon as a way of emphasizing the importance of deep introspection, political consciousness, cultural awareness, and ownership of one's perspective. Reflexivity calls on us to think about how we think and inquire into our thinking patterns even as we

apply thinking to making sense of the patterns we observe around us. Being reflexive involves self-questioning and self-understanding including "critical self-reflection on one's bases, theoretical predispositions, preferences, and so forth" (Schwandt, 2007, p. 260). Reflexivity reminds us as evaluators to be attentive to and conscious of the cultural, political, social, linguistic, and economic origins of our own perspective and voice as well as the perspective and voices of those with whom we engage.

To excel in integrating theory with practice requires astute self-awareness. It turns out that people who excel in all kinds of endeavors share the quality of being self-aware and using that awareness to adapt to whatever presents itself in the course of taking action (Sweeney & Gosfield, 2013). This article is meant to be an invitation to be reflexive about theory-practice integration. I reiterate that I am offering my own reflections on the contingency theory that undergirds, guides, and informs my practice as, I hope, a stimulus to examine and make more explicit your own mind-meanderings, whether they be mindful at this point or not.

Interacting and Interdependent Theory-to-Practice Dimensions

In science generally, a reflexive relationship is bidirectionally interactive and interdependent. Cause and effect are circular, interconnected, and mutually influencing. The six conceptual screens I have discussed are not a linear checklist but rather an interacting, integrated, and mutually reinforcing system of interrelated concepts.

To close, and by way of summary of how to integrate theory and practice in the real world, I quote that great philosopher of science, George Harrison, he also of Beatles fame, who observed: "It's all in the mind."

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References

Alkin, M.C. (1985). *A guide for evaluation decision makers*. Beverly Hills, CA: Sage.

Chelimsky, E. (1983). Improving the cost effectiveness of evaluation. In M. C. Alkin & L. C. Solomon (Eds.), *The costs of evaluation* (pp. 149–170). Beverly Hills, CA: Sage.

Chelimsky, E. (1995). The political environment of evaluation and what it means for the development of the field. American Evaluation Association Presidential Address, November, Vancouver. *Evaluation Practice*, *16*, 215–225.

Chelimsky, E. (1997). The coming transformations in evaluation. In E. Chelimsky & W. Shadish (Eds.), *Evaluation for the 21st century* (pp. 1–26). Thousand Oaks, CA: Sage.

Chelimsky, E. (2007). Factors influencing the choice of methods in federal evaluation practice. *New Directions for Program Evaluation*, *113*, 13–33.

Chelimsky, E. (2013). Balancing evaluation theory and practice in the real world. *American Journal of Evaluation*, *34*, 91–98.

Fun Facts. (2012). Fun facts about the brain. Retrieved from http://www.brainhealthandpuzzles.com/fun_facts_about_the_brain.html

Kahneman, D., & Tversky, A. (Eds.). (2000). *Choices, values, and frames*. Boston, MA: Cambridge University Press.

Klein, G. (1999). *Sources of power: How people make decisions*. Cambridge, MA: MIT Press.

Morgan, G. (2006). *Images of organization*. Thousand Oaks, CA: Sage.

Patrizi, P., & Patton, M. Q. (Eds.). (2005). *Teaching Evaluation Using the Case Method: New Directions for Evaluation, Number 105.* Hoboken, NJ: Wiley.

Patton, M. Q. (2008). *Utilization-focused evaluation* (4th ed.). Thousand Oaks, CA: Sage.

Patton, M. Q. (2011). *Developmental evaluation: Applying complexity concepts to enhance innovation and use*. New York, NY: Guilford.

Patton, M. Q. (2012). *Essentials of utilization-focused evaluation* (4th ed.). Thousand Oaks, CA: Sage.

Patton, M. Q. (2013). Metaevaluation: Evaluating the evaluation of the Paris declaration. *Canadian Journal of Program Evaluation*, *27*, 147–171.

Rog, D. (2009). *Context and evaluation*. Presidential explanation of the American Evaluation Association annual meeting theme. Retrieved from: http://archive.eval.org/search09/search.asp

Schön, Donald A. (1983). *The reflective practitioner: How professionals think in action*. New York, NY: Basic Books.

Schön, Donald A. (1987). *Educating the reflective practitioner*. San Francisco, CA: Jossey-Bass.

Schwandt, T. (2007). *The Sage dictionary of qualitative inquiry* (3rd ed.). Thousand Oaks, CA: Sage.

Simon, H. (1957). *Administrative behavior*. New York, NY: Macmillan.

Simon, H. (1978). On how we decide what to do. *Bell Journal of Economics*, *9*, 494–507.

Sweeney, C., & Gosfield, J. (2013). *The art of doing: How superachievers do what they do and how they do it so well*. New York, NY: Penguin.

Tversky, A., & Kahneman, D. (1974). Judgments under uncertainty: Heuristics and biases. *Science. 185*, 1124–1125.

Generative Insights From the Eleanor Chelimsky Forum on Evaluation Theory and Practice

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Abstract

Both speakers at the Eleanor Chelimsky Forum on Theory and Practice in Evaluation pointed out the complexity and messiness of evaluation practice, and thus potential limits on theory and generalizable knowledge. The concept of reflective practice offers one way forward to build evaluation theory.   Building generalizable knowledge about practice depends on the ability of expert

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