Learning from (and about) March

John F. Padgett


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disruption and malfunctioning into which it had fallen. It is tempting to ironize on this score, but in my opinion that would be a mistake, as well as a cheap shot. The fact that the Soviet-type economies have succumbed to their assorted ills obviously does not mean that those of the First World are exempt from any problems and dysfunctions. It is more intelligent to continue to scrutinize these problems than to sport triumphalist airs.

Nevertheless, with the wisdom of hindsight, it seems to me that Lane’s book is a bit more vulnerable to criticism and irony than it need be. The bulk of the book was obviously written when the two superpowers and their economic systems were facing each other, and it was only natural to think of each system as a well-defined, fairly unitary whole: the Market or the Plan. I do not say that only under the conditions of the Cold War would social scientists resort to such binary oppositions, but these conditions certainly made it particularly tempting to reify the Market and the Market Experience.

Today the intellectual atmosphere is rapidly changing. The disintegration of “really existing socialism” is already having an interesting effect on the analysis of market systems; suddenly it is easier to perceive the many and deep differences between them. In France a book by Michel Albert with the title Capitalisme contre capitalisme is having considerable success; at the same time, a group of English and German sociologists are teaming up to investigate the “varieties of capitalism,” contrasting the German-Japanese to the U.S.-English variety. It is indeed obvious that in reality there is not just one market experience; surely there are a number of quite different such experiences, if only because the institutions of the market are necessarily embedded, as Granovetter has reminded us, in very different national and local institutions, traditions, and values.

Thus, Lane’s book is just the beginning—a most valuable one—of our knowledge about market experiences. We must now inquire to what extent his findings are applicable in different environments, in “really existing” market systems.

References


Learning from (and about) March

Jim March is to organization theory what Miles Davis was to jazz. March was present virtually at the founding of modern organization theory. And notwithstanding the “Carnegie School” moniker, March’s influence cannot be contained within any school. As table 1 remarkably reveals, March’s influence, unlike that of any of his peers, is not limited to any possible subset of the social science disciplines; it is pervasive. To be sure, bounded rationality has been a constant note throughout his career, but around this he has spun off complex style after style—information processing, coalitions, organized anarchy, new institutionalism, organizational learning, even five volumes of poetry. Systematizers from numerous disciplines have

\footnote{The narrowness (and datedness) of this label, pervasive in otherwise excellent textbooks, says more about the imperatives of textbooks than it does about Jim March.}
always followed in March’s multiple trails, colonizing his ideas, sometimes recasting them in frameworks foreign to his worldview. Not to worry: Jim March, like Miles Davis, revels as a chameleon. As soon as his style settles into popular, classifiable orthodoxy, he discards it to move on to something new. A mischievous wink always peers through the logic of his writing, sometimes hidden, sometimes not.

Thus it is with considerable biographical interest that we turn to the latest phase of Jim March’s bountiful career—organizational learning. The papers collected in these two issues of *Organization Science* constitute the first festschrift volume, presented by his students and colleagues, in honor of Jim March’s career. The papers derive from a ritual, tributary conference organized by the editors at Carnegie-Mellon, the site of Jim’s first work. But it is a tribute both to the labor of the editors, Michael Cohen and Lee Sproull, and to their decision to go through peer review that this volume has the high quality and the thematic unity that it does. Of course this unity was possible in the first place because Jim March’s spirit infuses all the contributions. It is a good occasion, therefore, to take stock of the current state of this relatively new subfield of organizational learning.

An overview of unifying assumptions is ably provided in Levitt and March (1988). As noted there, “Organizational learning is viewed as routine-based, history-dependent, and target-oriented. Organizations are seen as learning by encoding inferences from history into routines that guide behavior” (p. 319). The focus is on understanding the conditions under which boundedly rational actors in interaction evolve intelligent (i.e., adaptive and creative) collective behaviors in spite of their inevitably backward-looking and path-dependent tunnel visions. The focus is also on the conditions under which seemingly intelligent learning can lead astray. “Superstitious learning” and “competency traps” are examples of the latter.

While all papers in this volume agree on these axioms, the collection reveals the subfield to be cleaved along the following axes, one substantive, one theoretical: (a) the prime focus on learning by individuals within organizations versus learning by the organizational network of interactions, and (b) the prime focus on adaptation or on learning, the distinction being whether modifications of routines are thought to occur directly, via trial, error, and selection, or to be mediated through cognitive representations of experience. Each of these two bifurcations defines a cutting-edge question for the subfield: (a) How should we conceive of multilevel adaptation or learning, in which learning at one level shapes learning at another? And (b) is the pervasive human tendency to interpret and to frame history to be construed as constitutive or as epiphenomenal?

The first axis is where progress is currently

<table>
<thead>
<tr>
<th>Journals by Discipline</th>
<th>James March</th>
<th>John Meyer</th>
<th>Michael Hannan</th>
<th>Arthur Stinchcombe</th>
<th>Jeffrey Pfeffer</th>
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*Source: Social Sciences Citation Index, 1985 and 1990 annuals.*

*Note.* Totals do not add because I could not code some citations.

*Unlike the disciplinary classifications, "Organizations" refers to specialty journals within the subfield: Administrative Science Quarterly; Accounting, Organizations, and Society; Journal of Organizational Behavior; Organizational Studies; etc.*
being made, mostly by simplifying away complexities on the second axis. Karl Weick asks the right opening question: Why is organization theory picking up the analysis of learning just as psychology seems to have laid B. F. Skinner permanently to rest? The answer, given by March in his “Exploitation versus Exploration in Organizational Learning,” is the same as that given in psychology’s neural net and connectionist research: Bush-Mosteller behavioral equations (the foundations of learning theory) become far more interesting when linked into interactive ecologies of learning than they are when analyzed as monads.

March’s paper provides counterintuitive results, based on simulation, that illustrate his point: Interacting collections of smart learners, he finds, frequently underperform interactions of smart and dumb. Why? (A) Fast learners overspecialize into competency traps. Slow learners preserve collective wisdom. (B) Smart learners respond quickly to noise as well as to true data. They reinforce self-confidence in collective delusions. (C) Homogeneity in “smart” worldview limits the genetic variability necessary for future exploration. (D) Personnel turnover of dumb for smart is good up to a point, as long as others in the organization learn about whom to attend to when. (This last result is reinforced in this volume by the simulations of Kathleen Carley, who emphasizes managerial attention focus.) These results are founded on the realistic multilevel assumption that institutionalized knowledge both is the depository of and feeds back into learning individuals, both smart and dumb.

Bush-Mosteller equations emphasize exploitation of “black box” behaviorist theory at the cost of exploring the micromechanisms that underlie learning. At the individual level of analysis, the second-axis consciousness complications of such exploration can best be highlighted by juxtaposing the papers of Michael Cohen and Herbert Simon. Cohen makes a strong case for “procedural memory,” or craft-based learning, in which organizational members display far more skill in their hands-on behavior than they can verbalize or explain. Brown and Duguid add that such “localized knowledge” in experienced employees often resides outside the bounds of officially sanctioned procedures. In contrast, Simon emphasizes, as he has throughout his career, the importance of organizational “problem representation” in shaping individuals’ perceptions and intentional search. Virany, Tushman, and Romanelli conclude that executive succession is consequential for empowering organizations to change.

From this fork in the road, different organization theories are implied. Cohen’s branch leads to genetic-evolutionary models of adaptation, like the innovative work of John Holland (1975). Here loosely coupled clusters of routines recombine and selectively reproduce in accord with dimly perceived and highly contextual “rugged landscapes.” Culture is not worldview but a style or bricolage set of practices, a view recently espoused in the sociology of culture by Swidler (1986). Simon’s branch leads toward the (socially embedded) study of cognition, perhaps with the aid of the naturalized models of artificial intelligence he has pioneered. Mental classifications, institutionalized or not, are the sine qua non before search and action can proceed.

Where is March on this axis? In what will be the most cited paper in this collection, “Learning from Samples of One or Fewer,” March, Sproull, and Tamuz adopt a multivocal stance. Seemingly aligned with Simon, they argue that a central activity in organizations is interpreting history—that is, collectively constructing causal stories or accounts which retrospectively “explain” the firm’s pattern of past success or failure. But unlike Simon, March speaks with a voice of irony: Learning about oneself, instead of about externalized objects, is as deeply problematic for organizations as it is for individuals.

The reasons are three: (A) Perforce, stories often must be constructed out of only a few nonrepeatable, but extremely salient episodes. Constructing sample frames of “comparable episodes” is deep account dependent. (B) Reasonable efforts to expand the learning base (through simulations, the study of competitors, or the study of one’s own “near misses”) still are beset with interpretative ambiguities: whether to attribute causality to self or to “context” and whether, given attribution to self, to attribute failure to stupid policy or to insufficiently pursued smart policy. And (C) linkage between historical accounting and action is loose: Sometimes historical reinterpretation is prelude for experimentation; but sometimes, because of learning ambiguities, it degenerates into post-hoc
accounting, which confirms original self-image and action.

For March, none of these pitfalls justify despair. His pragmatic recommendations are two: (a) Within a given causal paradigm, experiment with only one dimension at a time. And (b) within the organization as a whole, employ multiple paradigms to provide competing perspectives. His general principles are these: don’t overspecialize in a Holy Grail search for optimality; hill climbing is good enough; wisdom is not the same as smarts. Certainly, sensible first-order advice. But I fear March’s irony is not quite deep enough. Applying March’s own logic to multilevel learning reveals that even this satisficing pragmatism often may lead wildly astray.

The problem with the first recommendation is the story of the economics discipline. Clearly the way to structure the world so that implications for model improvement become clear is rigidly to fix first principles and then systematically to derive implications piece by piece. The problem is negative feedback between learning at the level of model modifications and learning at the level of first principles: The more criticism and disconfirming data are “successfully” incorporated into model extensions, the more confidence is ascribed to dubious assumptions, in part because they become nonfalsifiable.

One organizational example is that of nuclear bombs (Sagan forthcoming). Believing in redundant fail-safe procedures, the military systematically piles on backup system after backup system in response to accidents, even when unanticipated interactions between backup systems cause the accidents (as in Chernobyl). The more ruthlessly they pursue testing, the more narrowly focused on nonfalsifiable worldviews they become (see Kuhn 1962; Padgett 1986). A second example comes from Attewell’s study of the computer industry in this volume. IBM got into trouble because of competency traps, not because it failed to learn. It had a frame of “personalized service” through which it perceived customer needs. Given the socially channeled information flows set up by that frame, IBM learned superbly. But it also constructed a narrow cognitive image of “customer.” This is what happens to a Simon-style learner.

But March’s other hat—a humanistic vision of plural perspectives within organizations—also has its problems. Cacophony, of course, would be the most likely result of implementing March’s second recommendation. But even presuming infinite patience, intelligence, and good faith by all participants, communication among radically disparate worldviews can only converge (if convergence is sought) on a deeply contextual and nuanced syncretism, which has no transposability across time and space. This may be in fact one historical route to Cohen’s craft-based contextualism (e.g., through “organic” or matrix or “flexible specialization” organization).

The problem this poses for learning is illustrated by Wittgenstein’s (1958, pp. 88–104) discussion of private language. In a private language intelligible only to locals, participants have no access to a third party view from which to distinguish movements in the world from movements in their own classifications of the world. Objective (i.e., reproducible) knowledge is inherently public. Therefore, the humanist dilemma: Truly empathetic communication between disparate “Others” leads only to the social equation of the world with themselves. Both the world and the selves become disparate moving targets with no equilibrium.

These conundrums define the key issue for determining the potential limits of learning theory: What does “learning” of assumptions mean? The question cannot be answered simply, by applying Bush-Mosteller, Cohen-Holland, or Simon to the next higher level of abstraction, because all the examples imply that perceiving the axiomatic construction of the world is reciprocally tied to the constitution of the observer (a point with which March would hardly disagree). More positively, however, the examples also reveal the object about which learning theory should theorize next—the collectively constructed frame or “membrane” through which information and rewards are assembled and received.

Once again, there are two possible theoretical roads learning theory could take—adaptation or cognition. Levinthal makes a plausible case for the compatibility of natural selection with learning. This marriage holds promise for analyzing multilevel learning conundrums, I would respond, only if our conception of selection is up-to-date. As Buss (1987) makes clear, the “modern synthesis”
of Darwinian competition with Mendelian genetics elided a crucial middle step—the developmental autonomy of organisms. For organisms (or organizations) to reproduce successfully, constitutive organism membranes, constructed by suborganisms for the purpose of suborganism reproduction, must channel suborganism interactions with external suborganisms, thereby regulating the reproduction, and molding the character, of suborganisms in the process. “Environment” is not a reified functional mapping of rewards and punishments onto behaviors (a view presupposing external observers). It is instead a hierarchically nested and mutually constitutive network of reductive synergies among organisms themselves.

Paradoxically, this “postmodern” natural selection extension seems more compatible with Simon-style cognitivist micromechanism than with Cohen (cf. Simon 1969). The reason is the importance of the concept of boundary in both views: Buss’s “membranes” equate with Simon’s classificatory worldviews. March’s competency traps, in this fusion, play the role of Buss’s top-down regulatory control. The key to success in the marriage is whether “fitness” can be endogenously generated within the network. 2 Models of symbiosis, commensalism, and parasitism seem a more useful way to start than models of competition, since reinforcing compatibility among distinct worldviews, not consensus about niche, is the interesting network question. But problems with biologists’ models of ecological communities counsel caution. 3

The converse of cognitive individuals and adaptive collectivities is adaptive individuals and cognitive collectivities. The excellent case study by Hutchins of a ship navigation crisis illustrates what this means: Purely individualized trial-and-error experimentation locks in to stable Cohen-style routines when communications become modularized into interpretable signals. Self-awareness resides not in the doing but in the talk. And doing routines becomes structured in set comple-

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2 This downgrades the fitness concept’s causal status from the explanation of structure to the explanation of reproduction, given structure. It also leaves hanging the subsequent explanation of path-dependent “punctuated equilibrium,” where all the causal action resides.

3 Work by Fontana (1991) may help.

References


Global Markets and Competition

One of the most interesting books on organizational ecology to appear in the last decade has been produced by a Harvard Business School professor of strategy who never cites—and has almost certainly never read—any of the voluminous ecological literature and who never uses the term “ecology.” Michael Porter is the author of two extremely influential books on business strategy, Competitive Strategy (1980) and Competitive Advantage (1985), which build on the analytical concepts of the economics of industrial organization to analyze the characteristics of industries and the business strategies that fit certain industry environments. Invited in the mid-1980s to join President Reagan’s Commission on Industrial Competitiveness, Porter turned his attention to the problems of defining, measuring, and improving competitiveness in an increasingly international market. This book is the product of his comparative project on the relationship between nation and industry, involving study teams from ten countries working with a common research design.

The starting point of his investigation was the general observation that any industry tends to be dominated by firms from only a few countries, firms that move successfully, through export or direct investment, into other countries in competition with local firms and with other international firms. For Porter, the key question is how these competitive populations of firms emerge in a country. He frames this question, at one point, using the biological analogy that lies at the heart of organizational ecology: “In biological terms, some habitats lead to stronger and more resilient species that are able to roam. They prosper in other habitats compared to those species that have evolved there” (p. 174). Like the ecologists, Porter advocates a unit of analysis above the level of the individual organization and below the society as a whole. For Porter, this is the industry. And like the ecologists, Porter sees organizations as in general prone to inertia. However, Porter sees some environments as selecting not for stability but for innovation, and these dynamic environments produce “species” or organizations that can successfully compete with species from other, less dynamic environments.

Porter may be an ecologist in disguise, but he is not a population ecologist. His unit of analysis is the industry, as defined by the United Nations trade statistics, and his basic dependent variable—and his measure of competitiveness—is not the number of firms in the industry but a nation’s share of the world exports in that industry. Sociologists will search in vain for systematic quantitative data on firms, even the names of the top twenty firms worldwide in an industry, for example, or the names of the top twenty firms in the industries analyzed. Instead, for the ten