



Administrative Science Quarterly
2022, Vol. 67(2)NP15–NP17
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DOI: 10.1177/00018392211070231
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Daniel A. Levinthal. *Evolutionary Processes & Organizational Adaptation: A Mendelian Perspective on Strategic Management*. Oxford: Oxford University Press, 2021. 145 pp. \$30.00, hardcover.

Over the last couple of decades, evolutionary theories have offered the tantalizing prospect of integrating diverse perspectives on management and organizations into a common framework. In broad strokes, the evolutionary approaches take a generalized Darwinian form, in which features of organizations (e.g., routines, rules, ideas, personnel) or organizations and organizational populations themselves are subject to the forces of variation, selection, and retention (VSR) (Aldrich, Ruef, and Lippmann, 2020). Differences among evolutionary frameworks are a function of both the specific mechanisms of VSR that they choose to emphasize and the classic organizational theories that they seek to engage with.

Drawing from his extensive scholarship on organizational learning and corporate strategy, Levinthal's book offers an insightful contribution to evolutionary theories of organizations. It takes the behavioral (i.e., Carnegie School) approach of Richard Cyert, James March, and Herbert Simon as its foundation, arguing that we should pay particular attention to the "artificial" selection environment that executives and managers put into place to guide the allocation of people and resources. Rather than try to micro-manage—that is, to directly control individual outcomes—organizational leaders create a durable environment that rewards some ideas and initiatives while penalizing others. Levinthal's conception of organizational evolution builds on two assumptions: first, as long as organizations are hierarchical, "selection criteria will tend to reflect the beliefs of those at the apex of the hierarchy" (p. 5), and second, organizational behavior is path-dependent, constrained by behaviors and environments that have been enacted in the past.

As an aspect of organizational design, the idea of an artificial selection environment enjoys support in an extensive line of research on artificial intelligence (AI) and machine learning. In training AI systems to learn complex games, computer scientists have long faced the challenge of assigning credit to the discrete actions that will ultimately accumulate to produce wins or losses. Similarly, few organizational leaders can anticipate how specific ideas or initiatives will accumulate to produce profits in the short run, much less organizational viability in the long run. Rather than link differential selection to ultimate goals, Levinthal's "Mendelian" executive creates an environment that rewards intermediate stages of experimentation and eschews the simple binary of success and failure.

Levinthal's book addresses a number of challenges that have bedeviled evolutionary perspectives in economics and organizational sociology. While early evolutionary-ecological frameworks, such as those offered by Nelson and

Winter (1982) and Hannan and Freeman (1977), looked for a formal analogue to genes within organizations (i.e., routines and blueprints, respectively), Levinthal acknowledges that these analogies are now viewed as dubious. He argues instead for an evolutionary conception in which path dependence restricts the set of routines or strategies that a firm can pursue at any given time. Levinthal's approach also recognizes that it is non-trivial to identify the artificial selection environment that is most likely to lead to good performance given that firms are also subject to survival pressures, which may be only loosely correlated with performance.

Perhaps the most apt evaluation of any evolutionary perspective is whether it adds insight beyond the classic organizational theories on which it is built. It is telling, therefore, that Levinthal's account of organizational learning and strategy deviates in imaginative ways from that of other neo-Carnegie scholars. Conventional perspectives on the exploration–exploitation tradeoff argue that firms ought to engage in exploration at early stages (to learn about potential opportunities) before transitioning to exploitation. Yet given an environment in which acute survival threats challenge the mere existence of startups, Levinthal posits that exploration strategies may be more appropriately suited to large enterprises, which have the resource slack to engage in research and development. Startups may be best served by exploiting the existing capabilities of their founders. Moreover, if we recognize that exploitation strategies are oriented toward payoffs along established dimensions of performance, while exploration strategies are oriented toward payoffs along novel dimensions of performance, then it is possible for small exploratory shifts in routines or structures to generate large improvements in performance, assuming that it is measured in novel ways.

Like other recent evolutionary perspectives, Levinthal's view of the Mendelian executive is heuristic rather than propositional or descriptive. Organizational scholars and practitioners who gravitate toward testable management theory or rich depictions as to what "real managers do" may be disappointed. However, Levinthal's evolutionary framework does offer heuristic guidance as to how organizational leaders can nurture their organizations. Executives play a key role in understanding how much an organization can adapt its structure and strategies given its path-dependent history. They can encourage agnostic selection within an organization, which advocates for humility as to the criteria of success and openness as to the beliefs of rank-and-file members. And, at least in some respects, they can influence the context in which the organization itself is subject to selection pressures—its choice of market niche, its stakeholders, and its broader regulatory and technological environment. In an uncertain world, Levinthal's book thus offers a middle ground for managerial strategy, somewhere between the mythical, all-knowing executive who makes an appearance in MBA courses on corporate strategy and the incompetent, lucky, or faddish executive who sometimes resides in sociological imagination.

Martin Ruef

Department of Sociology
Duke University
Durham, NC 27708
martin.ruef@duke.edu

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