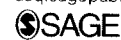




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John F. Padgett and Walter W. Powell: *The Emergence of Organizations and Markets*. Princeton, NJ: Princeton University Press, 2012. 583 pp. \$45.00 / £30.95, paper; \$120.00 / £82.50, cloth.

For over a decade, John Padgett and Woody Powell organized a workshop, most often housed at the Santa Fe Institute, that focused (if such a word is appropriate given the scope of the undertaking) on evolution, history, and novelty. The product of those interactions, *The Emergence of Organizations and Markets*, edited and largely written by Padgett and Powell, might be best characterized as monumental, paradigm shifting, sprawling, and obsessed with detail. How else to describe a 600-page book with 22 contributors that sets out to explain how new firms, organizations, and institutions come to be, as well as why some organizations fail and others succeed, that also happens to include two separate 30-page primers on autocatalysis, as well as multi-chapter detailed analyses of state formation, communist transitions, and the biotech industry?

We're not talking about a light read. What was ten years in the making may well prove a semester in the reading. The volume overwhelms both in scope—with topics ranging from Bismarck to Gorbachev to the Dole-Bayh act—and depth, what with all the analytic chemistry and nearly 100 figures, graphs, and gorgeous pictures of networks. Yet for all this complexity, the book proceeds from a rather simple premise: in the short run, actors make relations, but in the long run, those relations create the opportunities, or niches, that in turn produce the actors. And herein lies the possibility for good social science: by examining the relational networks that emerge from the purposeful actions of agents one can begin to understand how novelty arises and how history unfolds.

Given this agenda, one might expect that Padgett and Powell would lean on ideas and models from ecology in which species interact through a nexus of connections. Though Darwin makes an early appearance, Padgett and Powell instead construct a foundation based on chemistry, specifically on autocatalysis—a topic unfamiliar to most social scientists (unless of course you failed to get into medical school and organizational studies was a fallback). For this reason, Padgett and Powell devote part 1 of the book to explaining autocatalysis to the non-specialist. These chapters can be tough going. They're necessarily brimming with scientific jargon and causal arrows showing reactions. One can begin to feel as though one's preparing for a chemistry preliminary exam rather than laying the foundations for a new organizational theory.

The payoff, though, is worthwhile. In an autocatalytic set, the reactions produce outcomes that catalyze, that is, regenerate the set. In other words, the circle of life. But it's nice to be able to see this as more than metaphor, to

understand how the parts add up. Like any model, autocatalysis won't apply to every situation, but it does encompass things such as an economy, even though an economy relies on constant feeding from nonrenewable resources, and social systems: Florentine financiers can be absorbed into the elite class, producing a new generation of wealthy elites. But social systems also keep changing, and, ironically (given the focus on autocatalysis), it's those changes that the book sets out to understand.

The approach relies on a standard micro to macro to micro format that lies at the core of complex systems thinking. Individuals take actions, in this case they form connections, and those produce aggregate-level patterns, in this case a network of interactions. That network then becomes the context in which future actors take actions, hence the relations produce the actors.

As I mentioned, however, these networks are not static. Over time, a network adds links, folds over on itself, tears itself apart, and then, perhaps, recombines. Those transformations arise through the purposive actions of interest parties and take many forms. Padgett and Powell place them in categories with names like "anchoring diversity," in which, say, a large dedicated biotech firm encourages diverse collaboration, and "robust action and multivocality," in which practices carried out by leaders such as Cosimo de' Medici and Deng Xiaoping hold together distinct groups of supporters by allowing multiple interpretations of actions and statements.

To put the argument in simplest terms, the autocatalytic structures combine with these various types of network restructurings to produce the spaces within which novelty arises. As stand-alone theory, it's provocative and fertile. Lesser scholars might have stopped there—with the big idea—but then the project might well be dismissed as a bunch of mathematical ramblings. To their great credit, the big think comprises the smallest portion of the book. Many readers may therefore skim all the math and chemistry and concentrate their attention on the applied research that comprises that latter three parts of the book. That would be a shame because the theory offers up ample grist for the organizational theorist's mill.

The book's empirical parts could each be taught as a case study of the theory in isolation, but the whole is more than the parts, as we see strategies skip from the Florentines to Silicon Valley. Part 2, "Early Capitalism and State Formation," focuses on Florence, the Netherlands, and Germany. Part 3, "Communist Transitions," begins with the broad topic of economic reform in Russia and China and drills down to telecom markets. Part 4, "Contemporary Capitalism and Science," focuses primarily on the biotechnology industry.

The empirical chapters merit praise for their attention to detail. This is particularly true of Padgett's analysis of the Medici and Powell's use of data on patents to analyze the biotech industry. To give just two examples, in the chapter "Why the Valley Went First?" Flemming and coauthors use individual-level collaboration data to show that Stanford graduates stayed in Silicon Valley while MIT graduates tended to become more far flung after graduation. Staying geographically close to Stanford offered more than good weather. It enabled researchers to create and benefit from the intellectual openness that was promoted by IBM's Almaden Valley Labs. This openness drove much of the valley's growth. Relatedly, in "An Open Elite," Powell and Owen-Smith show how one can use a network-based analysis of collaborations between firms to determine which are insulated from change as well as which have the most

adaptive capacity. One walks away with an understanding that organizational and regional success requires pushing outward—so that you're fostering new idea generation—and pulling back in—so that you're connected to as many people as possible and not left out on the fringe and exposing yourself to the forces of network disruption.

Overall, one cannot but be amazed and, in places, awed at the undertaking. It's a weighty accomplishment. The authors and their collaborators ask interesting questions, they introduce new tools and mechanisms drawn from a variety of disciplines to the study of organization, and they collect novel data sets and present them evocatively to explicate their ideas. As proof of the concept, the book's an unmitigated success.

Does the book have shortcomings? Absolutely. Many will feel that the authors failed to leave enough breadcrumbs for others to follow in their path. Others will question the lack of formal hypotheses, especially those of the alternative sort. Still others will want a deeper theoretical unpacking of the relationships between network structure and the emergence of novel organizational forms. All these criticisms hold water, but the core contribution remains: Padgett and Powell have put forth a framework for thinking about how organizational novelty arises, and they've supported it through careful readings of history and with detailed analysis of network evolution. It merits a careful read.

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