

Process Theorizing: Too Important to Ignore in a Kaleidic World

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Both Professors Donaldson (2002) and Watson (this issue) highlight the important role that theory plays in management education, but limit their discussion to *variance theory*—one of two fundamental types of theory in social science research (Mohr, 1982). Given that variance theory has long been the dominant paradigm held by scientists and philosophers as well as the general public (Mohr, 1982), it isn't surprising that both professors emphasize this orientation. By doing so, however, they neglect the other fundamental type of theory: *process theory*. By treating "explained-variance-as-the-only-form-of-theory," neither professor is able to address the complex dynamics of a variety of fundamental organizational processes including adaptation, coevolution, improvisation, selection, and self-organization, illustrating how a favored paradigm holds powerful sway over what we can and cannot see (Kuhn, 1996).¹

Variance theory explains the variation in a dependent variable as a result of the variation in an independent variable(s) [Mohr, 1982]. More generally, this approach attempts to explain a phenom-

enon using a small set of well-developed *variables*, embedded in a nomological net, tested with statistical techniques, and suited to predicting specific outcomes that are unaffected by the temporal ordering of the independent variables (Hayek, 1967; Mohr, 1982). Alternatively, process theory develops a causal explanation of a sequence of *events* over time by telling a story about how and why a phenomenon evolved as a result of the temporal ordering and probabilistic interaction of numerous events (Mohr, 1982). Because process models usually address multiple levels and units of analysis and utilize qualitative (as well as quantitative) analysis techniques to make sense of time-ordered data, they tend to be rich in context, high in complexity, and dynamic in character (Langley, 1999).

Indeed, there is more than one form of good theory (DiMaggio, 1995; Ofori-Dankwa & Julian, 2001; Weick, 1995). The variance theoretic approach, rooted in mechanics and logical positivism, is appropriate for developing and testing falsifiable theories about simple phenomena, but less suitable for theorizing about path-dependent, nonlinear, organic processes in which myriad interactions give rise to complex social phenomena (Hayek, 1967; Ofori-Dankwa & Julian, 2001). Modeling such complex phenomena calls for process theories situated at a higher level of abstraction and oriented toward prediction of how general patterns of change unfold. Such theories are inherently less able to be falsified and more difficult to verify with statistical techniques (Hayek, 1967; Ofori-Dankwa & Julian, 2001). As Nobel Laureate Friedrich Hayek notes, "This is the price we have to pay for an advance into the field of complex phenomena" (1967: 29). He goes on to assert: "Predictions of a pattern are nevertheless both testable and valuable. Since the theory tells us under which general conditions a pattern of this sort will form itself, it will enable us to create such conditions and to

¹ While Donaldson explicitly features variance theoretic models (2002: 103–104) and Watson (this issue) makes them the centerpiece of his response, neither considers process theory. However, Donaldson reveals a strong interest in processes when discussing such topics as organizational adaptation over time, the rise and fall of management fads and fashions over time, decision-making processes, rivalrous processes involving temporary competitive advantage, and managerial action (2002: 102, 104). Watson does likewise when discussing how educators will be called upon by students and stakeholders "to explain events in the business world" (p. 286) such as "the actions of [corrupt Wall Street] analysts" (this issue, p. 286, emphasis added). This disconnect between their espoused view of theory (explanation of variance) and what their discourse often revealed to be important (explanation of process) is noteworthy on at least two counts. First, it creates some degree of confusion by indiscriminately mixing variance and process theoretic ideas (Mohr, 1982). Second, it demonstrates a natural tendency to interpret reality using "process-theoretic machinery"—that is, "by elaborating the flow of events, telling how something happens" (Mohr, 1982: 214).

observe whether a pattern of the kind predicted will appear" (1967: 36).

Although a number of notable studies have employed process theory in organizational decision making (Cohen, March, & Olsen, 1972), strategy making (Mintzberg & Waters, 1985), and growth stages (Greiner, 1972), among others, the use of variance theory has historically far outweighed process theory in the management literature. More recently, however, widespread perception that businesses are increasingly buffeted by more rapid, unexpected, and incessant change has stimulated, as Ann Langley observes, "a surge of interest among organizational researchers in process theory and dynamic phenomena" (1999: 691). Nonetheless, most process theories in the management literature suggest a simple, linear progression through distinct phases leading to a precise outcome (Langley, 1999: 692) or give privileged status to stability, routine, and equilibrium while treating disequilibrating change as an exceptional occurrence rather than a natural, ongoing one (Tsoukas & Chia, 2002: 567).

To better understand many organizational phenomena of interest to management scholars and practitioners such as continuous learning, new venture formation, and competitive dynamics, we need to move beyond models with such simplistic assumptions. "Until our assumptions square with reality," notes Donald Hambrick, "we have little chance to influence managerial practice" (1990: 251). But which way forward to better connect theory and practice?

One answer offered by process theorists is to embrace an even more "complex" and "radical" process theoretic approach, one that accommodates the nonlinear interaction of creative, purposeful individuals possessing limited, local knowledge who unintentionally bring about a far-from-equilibrium, system-level order as a result of learning to continually adapt to new knowledge obtained through recursive feedback loops (Langley, 1999; Tsoukas & Chia, 2002). As many readers will recognize, this approach describes complexity theory—"a science of process rather than state, of becoming rather than being" (Gleick, 1987: 5). In an important essay, Howard Stevenson and Susan Harmeling (1990) argue persuasively that management educators must embrace such an approach if management theory is to be useful to individuals attempting to understand and manage change in a world characterized by creative human action, nonlinear interactions, and the absence of long-run equilibrium in society.

Proponents of complexity theory in particular and process theory in general suggest an ap-

proach to management that emphasizes the ability to recognize general patterns of change, to create conditions for human action and experimentation, and to influence processes at certain times in some generally desired direction (Hayek, 1967, 1988; Langley, 1999). Here managers serve as stewards of self-organizing processes (Anderson, 1999). Alternatively, proponents of variance theory suggest an approach to management that stresses predetermined plans, centralized control, and the ability to predict specific outcomes (Hayek, 1967, 1988; Mohr, 1982). In this case, managers function as engineers of specific behaviors and outcomes (Anderson, 1999).

Complexity theory, in the context of Kenneth Boulding's (1956) hierarchy of system complexity, affords explanation of higher level phenomena such as the social organization of human agents (Ofori-Dankwa & Julian, 2001). However, most of our formal (variance) models of social organizations are situated at lower levels in Boulding's hierarchy, affording explanation of static properties, clockwork arrangements, and control systems (Pondy & Mitroff, 1979). Although variance theoretic models may be preferred by managers who want to manipulate some aspects of the material world (Ofori-Dankwa & Julian, 2001), process models of the complexity theory type will be required to help them negotiate many aspects of the social world, especially those dealing with creative, open-ended, disequilibrating change (Lachmann, 1976).

Traditional teaching cases that illuminate organizational processes in general and complexity theoretic processes in particular are, to my knowledge, in short supply. Indeed, at the annual Academy meeting last year, one member of a distinguished panel of strategy process scholars lamented that Harvard-style cases failed to address strategic processes, focusing instead on content issues. Fortunately, some very good materials (most of them having appeared recently) are available to management educators wishing to illustrate the concepts of complexity theory with real world examples of organizational behavior, structure, strategy, innovation, and change. For example, Richard Pascale's (1984) classic article provides an excellent case on the path-dependent processes, nonlinear interactions, and nonpredictable outcomes in Honda's entry into the U.S. motorcycle market. Gareth Morgan (1993) illustrates a variety of complexity theoretic concepts, including the creation of internal environments that support action, experimentation, and self-reinforcing processes, in three case vignettes in his "strategic termites" chapter. Mohanbir Sawhney and Emanuela Prandelli's (2000) prize-winning article in the

California Management Review examines the management of innovation in turbulent environments using Sun Microsystem's Jini project as a detailed case illustration of emergent, self-organizing communities of creation. Thomas Hench (1999) offers a remarkably fine-grained case history of the emergent, self-organizing processes that unfolded at furniture maker Herman Miller, Inc. Benjamin Lichtenstein's (2000) award-winning article in the *Academy of Management Executive* investigates three cases in which entrepreneurs navigated self-organized transitions in the formation of new ventures. And Eric Dent and Cameron Holt (2001) explore the U.S. Air Force during war as a complex adaptive system with illustrations of nonlinearity, holism, mutual causality, self-organization, and individual interpretations as sources of novelty and diversity. Such materials should prove invaluable to managers navigating complex, dynamic organizational settings, and to management educators preparing them for the journey.

Professors Donaldson and Watson provide a thoughtful treatment of the role of variance theory in management education, but neglect process theory.

In conclusion, variance and process theorizing offer very different explanations of organizational behavior (Mohr, 1982). They provide educators two very different ways of training managers, and offer managers two very different ways of making sense of the world. Both theoretical orientations must figure into our scholarly conversation about the role of theory in management education. Professors Donaldson and Watson provide a thoughtful treatment of the role of variance theory in management education, but neglect process theory. By overlooking process theory, we risk sending managers into the workforce ill-prepared to handle the kaleidic reality that awaits them in the new world of business (Arthur, 1996; Lachmann, 1976).

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