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Introduction to the Special Issue on Nonlinear Organizational Dynamics

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It has been twenty-five years since organization scholars began to investigate how chaos theory and nonlinear dynamics could be used to explain change in human organizations (Loye & Eisler, 1987), and in particular, business corporations (Nonaka, 1988). While many were first introduced to organizational dynamics through chaos theory, organizational scholars quickly fanned out over the theoretical and methodological landscape of complexity science, examining concepts such as chaos and catastrophe theories (Guastello, 1995), scale-free dynamics (Andriani & McKelvey, 2009), self-organization (Kiel, 1994; Walker & Dooley, 1999) game theory (Guastello & Guastello, 1998) and agent-based modeling (North & Macal, 2007) to understand change at individual, team, organizational, and market levels.

We see these same theories underlying the papers in this special issue. We have ordered the papers per their scope, from the individual to the team and organizational to the market level, and indeed the theoretical perspectives are similar within each of the three scales, but somewhat dissimilar between. Navarro et al. demonstrate that dynamics occur in micro-level work motivation regardless of task content, i.e. dynamics are inherent in the process of work, independent of content. Guastello et al. show that these micro-level dynamics have significant, nonlinear impact on task performance, driven by task difficulty and flexibility. Both studies demonstrate the inherent dynamical aspect of work at a micro-level and its impact on work outcomes. As a type of human behavior, work has dynamical properties independent of the content of the work, which portends that practices that are effective at managing work at micro-levels may be employable across many contexts.

The four team and organizational level papers in this issue (Backstrom et al., Frantz & Carley; Salem; Stevens et al.) portray the scaling aspect of organizational systems—that micro-level communication, especially during high stress comments, leads to macro-level change. The "bottoms-up" model of organizational change is a theoretical interpretation of Prigogine's (1984) model of self-organizing systems, whereby a system re-organizes its component parts and

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connections in order to dissipate absorbed energy. Dynamical explanations of organizational change have been concurrent with other trends in business and management theory that have identified micro-level conversation as key to understanding and improving organizations (McPhee, Corman & Dooley, 2002).

The two market-level papers (Cabo & Gimeno; Pathak et al.) examine the dynamics of competitive markets, using game theoretic models to portray how the actions of one agent in a complex system impacts the actions of others, and visa versa. In a break from classical economics that models market level dynamics as independent of individual firm actions, these studies connect the dynamical aspect of the markets to a firm's strategic positioning.

This collection of papers shows the richness and state of rigor that research in organizational dynamics has matured to. As our physical, social, and economic worlds change more rapidly, theoretical understanding of organizational dynamics will be critical to engage in description and prescription.

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