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# Chaos, Complexity, and Creative Behavior

**Stephen J. Guastello**[1]**,** *Marquette University, Milwaukee, WI*
**M. Jayne Fleener,** *North Carolina State University, Raleigh, NC*

The element of surprise and the suddenness of insight make the study of creative behavior a prime candidate for concepts and methods from nonlinear dynamical systems (NDS) theory. The first contribution in this area, as nearly as we can discern, was chance-configuration theory (Simonton, 1988), which explained how random flows of idea elements self-organize into the core of a solution to a problem. Further developments in NDS theory and supporting empirical studies expanded to other aspects of the individual and group problem solving processes (Guastello, 2002). Not surprisingly, the flows of ideas that were initially thought to be random were often chaotic, and thus more structured than first appearances might suggest.

Creativity phenomena are often parsed into the 4 Ps: person, process, product, and press. Person variables include cognitive abilities, cognitive style, personality, and other individual differences involved in creative behaviors. Process variables include brainstorming and other group or social dynamics. Product variables are usually features of the artwork or invention. Press refers to the manner in which the new idea or innovation spreads. This special issue of *NDPLS* contains the latest wave of findings that span all four facets of creative behavior.

We have three new contributions in the category of person issues. Stamovlasis examines the insight process among chemistry students as they progress from simple to more complex challenges, and the roles of field dependence-independence and cognitive complexity. Hristovski, Davids, Araujo, and Passos examine the origins of creative ideas in sports movements, which is a new realm of study for creative behavior. Creative professionals have elevated incidence rates of substance abuse and mental illness; Zausner considers from an artist's perspective the interplay between the underlying disorder and the generation of original creative imagery.

In the category of process topics, Wisdom and Goldstone explore the human version of collective intelligence in group creativity. In doing so, they expand the principles of collective intelligence that were identified from studies of social insects (Sulis, 1997, 2009). Leadership also plays a role in bringing

[1] Correspondence address: Stephen J. Guastello, Professor of Psychology, Marquette University, Post Office Box 1881, Milwaukee, WI 53201-1881. E-mail: stephen.guastello@marquette.edu

creative problem solving groups to life. Here we should mention a recent article on leadership emergence in engineering teams (Guastello, 2011) that was part of a series of leadership studies that crosses paths with the studies of creative behavior in this issue.

We have two new contributions in the category of product topics. Boon, Casti, and Taylor examined the fractal structures of visual art and baroque music and found some interesting similarities that could possibly extend to other art forms and genres. Katerndahl investigated productivity trends in medical research on family practice topics, and unraveled some enigmatic observations that others reported. The question is now open as to whether the same catastrophic dynamics persist in other areas of medical and other academic research,

Finally, in the category of press topics, we have two new contributions on the diffusion of innovation. Skiadas and Skiadas pursued an avenue that explored the similarities between models for the dynamics of innovation diffusion and the logistic map for population dynamics. Jacobsen and Guastello started with Rogers' (1962) infamous S-curve, and explored its connection to the dynamics of catastrophe, networks, geographic boundaries, and other sources. Their article culminates with some open questions about what innovation diffusion dynamics are going to look like in the near future.

As is the case with other special issues of *NDPLS*, one of the goals of the issue is to encourage further contributions on the topic. Thus we hope the work on creative behavior here will facilitate more creative behavior about creative behavior.

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