

**ENTREPRENEURIAL IMPLICATIONS ARISING
FROM COMPLEXITY THEORIES' FUNDAMENTAL ASSUMPTIONS**

INTRODUCTION

- Complexity Theory Implications for Leadership, Organizing, Generating Change, Using Sensemaking, and Influencing External Perceptions**

ARTICLES

- 1 Rediscovering Entrepreneurship in a Complex World: A Nonlinear Framework for Organizing.**
- 27 A Dynamic Model of Non-Linearity in Entrepreneurship**
- 45 Paleontology, Feedforward, and the Airline Industry: Applying Paleontological Punctuated Equilibrium to Entrepreneurial Efforts**
- 61 The Central Role of Sensemaking for Managing Small Business as a Complex Adaptive System**
- 77 Is Nike Roadrunner or Wile E. Coyote? A Postmodern Organization Analysis of Double Logic**
- 111 Book Review of Hurst, 1995. *Crisis & Renewal: Meeting the Challenge of Organizational Change***

Notes from The Special Issue Editor

ENTREPRENEURIAL IMPLICATIONS ARISING FROM COMPLEXITY THEORIES' FUNDAMENTAL ASSUMPTIONS

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REVISITING LEADERSHIP, ORGANIZING, GENERATING CHANGE, USING SENSEMAKING, AND INFLUENCING EXTERNAL PERCEPTIONS

The call for this special issue arose from the Sun-Break '98 Conference on Organizations held in February 1998 in Las Cruces, NM. The topic of the conference was to address issues of non-linearity in organization research and teaching. During the conference we discussed a wide range of topics which ended up centering on complexity theory as a way to understand the non-linear issues we are faced with in doing organizational research. This special issue represents some of the participants' thought along with others who responded to the special issue call. The thoughts were directed to the impact of non-linearity and complexity theories on entrepreneurship and our concept of entrepreneurship. Just as there are multiple perspectives in traditional entrepreneurship literature (as well as a wide range of theories grouped under the title of complexity theory), this collection of articles has a wide range of orientations. You will find some common themes of complex adaptive systems and how such systems impact their environment and organize/act to respond to that environment. Here is a taste of what you have in store as you go through the special issue.

Hench

Hench's article makes a fine initial piece. The reader is provided with a short history of one of the complexity theories, non-linear dynamical complex adaptive systems (ND/CA systems). It compares the Newtonian-mechanical perspective with the assumptions found in ND/CA systems. Hench includes examples of the metaphors found in each orientation. He presents several very useful tables. He does find distinct differences between the two sets of assumptions yet when the ND/CA system assumptions are compared to the description of entrepreneurs and their behavior, there is much more agreement than between entrepreneurs and the assumptions of the Newtonian-mechanical perspective. From this Hench continues on to note the implications for Management's actions given each set of assumptions. He concludes that the ND/CA assumptions imply that managers should experiment rather than only plan, should serve rather than lead, encourage and facilitate self-organization rather than organize, and support learning rather than providing control. He fruitfully argues that entrepreneurial behavior is closer aligned to the managerial actions implied from

ND/CA system assumptions.

Noting that one of the efforts researchers use to bridge the gap between theory and practice is the use of metaphors, Hench next examines the metaphors associated with each perspective. He demonstrates again that entrepreneurial researchers' descriptive metaphors line up more closely with ND/CA system researchers. Hench thus concludes that ND/CA system theory can provide a theoretical basis for entrepreneurial research. He suggests that some new areas to explore include examining the self-organizing processes of perpetual novelty and the creating and dissolving of patterns in the marketplace. He also acknowledges the need for developing new tools to examine the propositions that may arise from NA/CA system assumptions.

Bergmann-Lichtenstein

The next article in the special issue, Bergmann-Lichtenstein, gets down to the nitty gritty of examining how entrepreneurs facilitate the emergence of new businesses. Bergmann-Lichtenstein uses the branch of complexity theory that addresses self-organization as his theoretical lens for this rich empirical case study. He provides a nice linkage between the existing literatures in entrepreneurship and organizational life cycle with those found in complexity theories. He also links to complex adaptive systems theory and thermodynamics. He finishes his theoretical foundations by examining the emergence of self-order within systems.

Bergmann-Lichtenstein applies this understanding to new ventures and moves into his case study. He links the acquisition of negentropy to the Weickian sense of organizing and emergence of a configuration of resources and processes. Bergmann-Lichtenstein provides a series of implications arising from self-organized change. Among these implications were: 1) the recognition that self-organized change will build on the firm's existing resource base, 2) the need for a clear understanding of what the firm really is, 3) recognition and continued support of the emerging new organizational structure and 4) that increased performance is related more closely to an increase organizing capacity than to traditional measures of growth and development. Traditional measures include structural complexity and larger numbers of employees which is very different than having higher levels of an organizing competency. This argues that entrepreneurs who focus on developing an organizing capacity in their firms may be more successful in handling the change between initial startup and growth.

Sherman

The third article by Sherman takes the complexity theory based concept of feedforward and in conjunction with an understanding of a paleontological punctuated equilibrium creates a perspective of change with some interesting implications. Sherman begins with an overview of paleontological punctuated equilibrium. This original perspective highlights a system where environmental punctuations create not new species but changes the definition of the conditions of what constitutes

dominance in an environment. Both dominant and recessive forms co-exist on both sides of the punctuation. It is just that after the punctuation the conditions now favor the recessive form versus the dominant form. Before the punctuation, the recessive forms occupied relatively resource constrained niches. When a change in the environment occurs that enlarges those niches, the recessive form is better fit to survive and thrive than the dominant form.

Sherman contrasts that view with the dominant use of punctuated equilibrium in organization science. He concludes that organization scientists use punctuated equilibrium in such a way as to describe macro-mutations and not the interplay between dominant and recessive forms. Sherman recommends that using the paleontological version may be useful for researchers studying entrepreneurship. Sherman suggests that researchers can help entrepreneurs' chances in creating viable new firms by looking for sympatric or allopatric barriers. Sympatric barriers are those that help species members adapt to varying niches within an environment. Allopatric barriers are those that isolate species members to allow the emergence of types that would normally be overwhelmed by the dominant species. Sherman notes that entrepreneurial niches seeking and creating barriers to entry align with sympatric barriers. He notes that allopatric barriers include geographical remoteness, as well as, isolation brought about by governmental regulation. From this initial application, Sherman notes the importance of experience in coping with environmental interactions. He addresses the concept of "feedforward" and provides implications for understanding shifts in the system from initially small maneuvering of peripheral entrepreneurs. Sherman proceeds to illustrate his points with action from the airline industry.

Sherman is careful to point out that he uses paleontological punctuated equilibrium as a metaphor and in such usage the inclusion of feedforward appears logical. He also notes that using it implies that 1) firms can not directly control the results of their feedforward efforts and 2) entrepreneurial leadership may be vital for organizations to handle these effects. He also suggests that previous efforts at parsimony over simplified systems and limited our understanding of complex systems. He suggests that we are now developing methods to address these more complex systems while still retaining the goal of being parsimonious.

In closing, Sherman presents two implicit propositions. He acknowledges both the importance of testing them and the difficulty in doing so. Nevertheless, even in its metaphorical use, there are implications and insights for managers, as well as, researchers. One relevant insight was mentioned earlier, the feedforward aspects of recessive firms operating at the periphery of the environment. Their actions may have ramifications out of proportion with their market share. Such firms are typically new ventures and small businesses. Sherman implies that such firms may provide the triggering elements that will cause all firms in an industry to have to rethink their positions.

Duchon and Ashmos

Duchon and Ashmos, in the fourth article, pick up on this concept of continuing need to make sense of the environment. They also base their paper in complex adaptive systems and examine how that orientation helps them to explain why successful businesses' perspective on their environment and their attempts to make sense of that environment change as they continually strive to engage in concurrent sensemaking (versus retrospective sensemaking).

Duchon and Ashmos provide a succinct review of the shift in focus from Newtonian influences to those from Complexity Theory. They key in on the shift from understanding a 'thing' to understanding instead the 'thing's relationships' in a system. They note that for organizations the 'things' many times are people with all the inherent qualities of people. Such qualities almost assure that non-linear relationships between things are present. Hence complexity theory with its assumption of non-linearity is a more natural assumption.

Their explanation of the emergence of coherence in a system is helpful in understanding the relationship between small businesses and complexity theory. Duchon and Ashmos again provide compelling logic for the transference to complexity theories as a base for understanding entrepreneurs and small business operations. They argue that a critical activity during the emergence of coherence is sensemaking.

Duchon and Ashmos then present how Weick's seven sensemaking properties can be used to create a profile of sensemaking activities. Such a profile changes as entrepreneurs do their concurrent sensemaking over time. The seven properties; identity construction, retrospection, enactment, cue calling, social process, ongoing and plausible storytelling are all defined and examples are provided. From this base, they proceed to develop the concept of profiles and by linking those profiles to the life cycle of an organization attempt to provide a way to formally conceptualize small businesses as complex adaptive systems.

Using Churchhill and Lewis' stages of small business growth: Existence, Survival, Success, Take-off and Maturity, they argue for certain sensemaking profiles to be present during specific stages. They provide both their logic for the specific linkages and examples demonstrating their logical profile. Complexity theory is also utilized to suggest long run implications of remaining permanently fixed in any of the dominant configurations.

Duchon and Ashmos indicate how using the complex adaptive system lens helps in understanding both the choices firms face and the potential ramification of those choices. This sensemaking organizing framework highlights the importance of making sense of the environment and focusing on the relationships between actors to do so.

Boje

Boje's paper expands upon the concept of both making sense of the environment and the attempts of organizations to influence the perceptions of other organizations. Boje, coming from the postmodern school of thought, expands upon

the holistic nature of complex systems and also deconstructs the whole (environment-organization relationships) into the separate parts. His thought piece raises points regarding our field of study that are useful to be taken out and examined periodically.

He makes the point that traditional definitions of entrepreneurs and the touting of any one particular entrepreneur may result in the overlooking of other entrepreneurial experiences that are just as valid as the traditional one. Using the critiquing perspective of postmodern discourse, Boje highlights the perceptual orientations and positional stances of Nike and anti-Nike activists. To help in this discourse, the Roadrunner-Wile E. Coyote metaphor is used.

Boje argues that favoring Philip Knight's story over the story of the activists may be reflective of embedded assumptions in our (the entrepreneurial researcher's) reference system. He notes how each side paints stories in terms favorable to their perspective and detrimental to the 'other side's' view. Boje then moves on to explicitly include the analysis of power relationships from critical theory. He provides a discourse on how Nike's efforts can be construed as empowering knight (and the traditional perspective) while 'de-privileging' Asian workers. He brings in an analysis of Nike's promotional and ad campaigns to illustrate how Nike is using them to construct a version of reality that features positive cultural good as arising from Nike's efforts here in the U.S. while not addressing their overseas operations. This analysis of Nike continues on as Boje evaluates Nike as a 'storytelling organization.' He notes that Nike is indeed a 'storytelling organization.' So too are the activists as they collectively comprise a "virtual storytelling organization." Because both factions utilize the use of stories, both see each other's use as fiction and their own as truth.

Boje then suggests that each set of activities has an underlying organizing logic (a use of a complexity theory attribute). Because of Nike's legitimated position in the business community, he suggests that Nike's logic is one of deviation-counteraction. The activists on the other hand have a storytelling logic of deviation-amplification. Boje proceeds to support this suggestion by first defining activities associated with each logic and illustrating his deduction with a series of unfolding stories. He links it back to some of the system attributes of complex theories (in particular chaotic systems).

Boje then proceeds to explain how these two very different types of entrepreneurs use various entrepreneurial adventures as they create and recreate their stories reflecting their enactment of reality. These adventures are micro-storytelling, macro-storytelling, and the use of spectacles or spectacular events. He again illustrates the use of these techniques from the saga of Nike and the activists. The rich set of information and the focusing in-depth on this one company and the accompanying activists provides for insight not found if a series of examples from differing firms was used.

Boje concludes by noting that activists while truly engaging in entrepreneurial activities rarely get recognized for their entrepreneurial efforts. He also observes that those with stronger power relationships will be those that influence the perceptions of others the most. This observation doesn't appear to take into account complex

system theories' assertion that even small events can cause major disturbances in a system. However, Boje does demonstrate that combining postmodernism, storytelling, critical theory and complexity theories may be a way to engage in self-reflective critiques while also examining the system wide impacts of such efforts. Certainly the need for entrepreneurs and researchers to re-examine their biases and assumptions is an important element. This is made even more important when we acknowledge an ever changing system.

Smith

The final section in this special issue is that of the book review. Smith reviewed a book by Hurst, *Crises & Renewal: Meeting the Challenge of Organizational Change*. His presentation of the general concepts of the book and linking them to the relevant literatures is well done. I encourage you to read the book review and then to check the book out for yourself. The author uses some very interesting and non-typical examples that make for a fascinating read. Some elements relating to Chaos Theory are included as are elements from Population Ecology, both theoretical orientations were also covered in articles in this special issue.

Conclusion

Taken as a whole this special issue raises the points that the assumptions of complexity theories are more in line with the realities we face either as researchers or as entrepreneurs and owners and managers of small businesses. Furthermore, because of this closer tie, we may want to revisit our own sets of assumptions and reevaluate the theory bases we operate from. While not needing to throw out previous conclusions entirely, complexity theories help us to understand why some previous work failed to help us understand our topics. In addition, some earlier theoretical orientations can be fruitfully paired with complexity theories. Such linkages help us to winnow through previous work and find connections that were overlooked and explore those as well as eliminate those which may no longer be valid or interesting.

Hench suggests we need to rethink the defining tasks of management and to use instead the concepts of experimentation, serving, self-organizing and learning. Bergmann-Lichtenstein highlights the importance of studying the self-organizing aspects of change at the firm level and in particular the timing and occurrence of triggering events. Sherman steps out to the industry level and suggests that the roots or seeds of a new order may be found in those organizations operating in niches at the edges of the normally defined industry. Duchon and Ashmos note that with the changing environment an organizational capability of sensemaking may be more critical than ever before. They suggest that the profile of sensemaking will be related to the life stage of an organization and that there may be detriments to hanging on to a profile after a life stage has passed. Boje notes that entrepreneurial efforts extend beyond the traditional entrepreneurial heroes and that organizations of all sizes and virtual or not may be using story telling or persuasive enacting in attempts to influence and shape others' perspectives. He provides us with the admonition to re-examine


all our assumptions and to especially critically evaluate our reifying actions.

Entrepreneurs and small business managers can take heart in that having chaotic or complex environments (not to mention organizations) does not mean that there won't be patterns that emerge or processes to handle the increasing amounts of complexity and ambiguity (Hench, Bergmann-Lichtenstein, Duchon and Ashmos). There are places to look for hints on new patterns (Sherman) and for suggestions on enduring patterns (Boje). The first four articles offer a basic primer in some of the major aspects of complexity theory which the practitioner and researcher may both find useful.

As I began this introduction by acknowledging the source of the call for papers, I thought it worthwhile to conclude it with the announcement of our next Sun-Break Conference on Organizations. Our next conference will be held in February, 2000, in Las Cruces, NM. The topic will be: Dynamism: The Roles of Intention, Time and Timing, and Action in Organizations. We are calling for finished papers, working papers and nominations for keynote speakers. You are welcome to contact me for further information.

I had a great time interacting with each author's concepts and I hope that you, too, will find this examination of the implications of complexity theories on entrepreneurship and our traditional assumptions just as interesting.

Enjoy!!!!


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