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Issues in Applied Linguistics

Title

Complex Systems and Applied Linguistics by Diane Larsen-Freeman and Lynne Cameron. Oxford: Oxford University Press, 2008, 287 pp.

Permalink

<https://escholarship.org/uc/item/0t29b2km>

Journal

Issues in Applied Linguistics, 16(2)

ISSN

1050-4273

Author

Ellis, Brian

Publication Date

2008-12-30

DOI

10.5070/L4162005101

Peer reviewed

Complex Systems and Applied Linguistics by Diane Larsen-Freeman and Lynne Cameron. Oxford: Oxford University Press, 2008, 287 pp.

Review by Brian Ellis
University of California, Los Angeles

In their book *Complex Systems and Applied Linguistics*, Diane Larsen-Freeman and Lynne Cameron argue that language is a complex adaptive system. As they describe, complex adaptive systems of all types share several features in common. They are made up of aggregates of diverse elements or agents that interact locally and which may form interconnected subsystems. They are dynamic, in a constant state of change. Their processes are non-linear, sensitive to initial conditions, controlled from the bottom up, and abide by a predictable unpredictability (sometimes referred to as chaos). They are open, not closed systems, which means their complexity is sustained far from equilibrium by input (of energy or information) into that system. They adapt in response to changes in their environment. Finally, this environment or context is not separate from the system but part of it. In all of these ways, language is a complex adaptive system, but this book goes a great deal beyond simply making that point. First, the authors develop complexity theory as a metaphor for language. They then address each of the main topics of research in applied linguistics through the lens of this metaphor. Along the way, they exemplify the practical use of the complexity metaphor by re-analyzing empirical data from past research.

The first three chapters review complexity theory and form a road map for applying complexity theory as a metaphor in language research. The remaining chapters then put this framework to use by reinterpreting data from research in all the core areas of applied linguistics - language acquisition, second language learning, language testing and foreign language instruction. Furthermore, the authors do a tremendous job relating complexity theory to numerous other fields of research, from formal linguistics to conversation analysis, synthesizing their own coherent view in the process. Without presenting themselves as overtly critical of alternative perspectives, the authors strongly favor a discourse-centered approach that utilizes complexity theory to better understand and model language dynamics.

Chapter 1 introduces the reader to a complexity perspective. The main idea is that the world is not composed of 'things' but of perceived stabilities that emerge from complex system dynamics. From this perspective, language is an open, continually evolving complex system. Chapter 2 summarizes the defining characteristics of complex systems, while chapter 3 identifies types and trajectories of change that occur in them (covering such oddities as strange attractors). For language scholars unfamiliar with but interested in learning more about complexity theory, this book

is worth reading for these two chapters alone. If the reader already knows some basic information about complexity theory, then the most useful parts of these two chapters are the last sections on “complexity thought modeling”. There the authors develop non-mathematical procedures for approaching problems in applied linguistics from a complexity theory perspective.

The remaining chapters apply complexity theory to issues in applied linguistics. Chapter 4 is a review of a variety of discourse-centered approaches to the study of language and a reanalysis of those approaches from a complexity perspective. This chapter develops in depth the metaphor of complex systems and will be particularly interesting to readers who may not consider themselves applied linguists but come from other areas of language research. Chapter 5 reinterprets qualitative and quantitative data on first and second language acquisition from a complexity perspective. And chapter 6 is devoted to demonstrating how discourse analysis and complexity theory are complementary - both view language as the product of interaction and discourse, not of individual speakers. Chapter 7 then brings the reader into the classroom for a lesson in complexity teaching. It is refreshing that the authors do not attempt to offer another one-size-fits-all teaching method. Highlighting the fact that “teaching is managing the dynamics of learning” (p. 199), they encourage teachers to monitor the class-as-complex-system for ineffective or detrimental attractor states (stabilized patterns of a system’s behavior) and take advantage of variability at the edges of these states to perturb the system, throwing it into a different, more effective pattern. In the final chapter, the authors discuss epistemological differences between their complexity perspective and traditional research perspectives, and then conclude with a generalized program of methodological principles for language research in applied linguistics.

In sum, this book is an interdisciplinary mix of theoretical and practical recommendations regarding complexity theory for applied linguistics. It is also an instruction manual for a hybrid discourse-complexity centered approach to applied linguistics research. While their metaphor for language as a complex system is finely crafted, by comparison, the authors’ use of this metaphor with real data was at times less sophisticated. In addition, the text does not develop complexity science methods (e.g. mathematical modeling) for applied linguistics; however, this is not what the authors set out to do. The procedures they have outlined for thought modeling and dynamical interpretation reveal that complexity theory is more than *just* a metaphor. In fact, complexity theory can change the way we conceive of language and therefore fundamentally alter how applied linguists may approach their research.