

Complexity

Michael Agar
Presentation #3
UCSB Theme Course
PRELIMINARY VERSION

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A Noisy Concept

- Much pop and fluff
- Arrogance, like “new kind of science”
- Everyday terms “complexity” and “chaos”
- Waning trend? Political implications
- Even insiders complain, “theory” of complexity?
- But then what is a theory?

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The Systems/Cybernetics Ghost

- Bateson’s Naven and the Macy conference
- But functional, controlled and equilibrium maintenance
- Differential equations at system level
- This is NOT complexity

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A “Science?”

- Newtonian tradition
- Linear causal equilibrium prototype
- Humanities trend in ethnography
- But complexity critiques traditional science as well

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How The World Works

- Complexity a lens that better corresponds to much of how our world seems to work
- And the way it works is different from social science assumptions of how to model it
- A complexity joke
- The student diagram
- Curves, normal, S, U and power law

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Recognizing Complexity

- Connectivity--networks
- Interdependence--causal arrows everywhere
- Feedback--sensitivity to initial conditions
- Emergence--structure/agency

Familiar from systems theory

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Systems Plus

- Far from equilibrium--edge of chaos
- Co-evolution--location, location, location
- Path-dependence--contingencies
- Space of possibilities--unpredictable, sort of
- Self-organization--learning and change normal
- Historicity and time--can't go home again

Featured in complexity

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Old Ethno News

- Compatible with holistic emergent tradition
- Articulates tacit knowledge a la Mead
- Rhetorical value, not "journalism"
- Political value, marginal to cutting edge
- Intellectual value, add human dimension to natural science roots

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Compatible With the Old *and* the New

Social Construction

Structure/agency

Narrative of contingencies and connections

Ecological approaches

But does it teach us anything about ethnography as LC2 acquisition and translation as the goal?

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The Front End of an S Curve?

- The Ecology and Semiotics of Language Learning, Leo van Lier, Kluwer 2004
- Language Learners as Ethnographers, Celia Roberts, Michael Byram, Anó Barro, Shirley Jordan, and Brian Street. Multilingual Matters, 2001.
- Chaos/Complexity Science and Second Language Acquisition, Diane-Larsen Freeman, Applied Linguistics 18:141-165, 1997

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per-tur-ba-tion n

1. the act of being disturbed and troubled, or a disturbed and troubled state
2. something causing disruption, trouble, or disorder
3. a slight disturbance of a system by a secondary influence within it
4. a deviation in an astronomical body's orbit or path caused by the gravitational attraction of another astronomical body

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A Difference or Perturbation

- Begins with a change in learner ecology
 - Affordance
 - Contingency
 - Entfremdungseffekt
 - Rich point
- The perturbation is relational and emergent, not inherent in an object and predictable with context-independent laws
- All subject to the parameters of the ethnographic/LC2 learner run

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Uptake?

- Uptake of a perturbation for a particular embodied human complex system unpredictable
- Sensitivity to initial conditions
- *Massive* impacts force uptake
- *Massive* impacts social as well as natural

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Examples of Selective Uptake

- Van Lier's Singapore story
- The Stanford ethno-rama
- Nevada City waitpersons
- The functional immigrant
- The deficit theory "number one" type

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per-co-late v

1. vt to make a liquid or gas pass through a filter or porous substance, or filter through in this way
2. vi to pass slowly through something or spread throughout a place
3. vt to prepare coffee in a percolator, or undergo preparation in a percolator
4. vi to be lively, active, or energetic (informal)

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Impact?

Impact of perturbation, if taken up, will vary:

- Percolation at level of noticing
 - Probably a power law, lot of little rich points and a few major ones
- Percolation that scales
 - Impact at multiple levels

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Level?

- What is a "level?"--Trifocal vision
- Two kinds of percolation related to difference between traditional ethnography and current global/local

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The Ethno/Learner

- High percolation at level of noticing that also scales--nuclear energy compared to a lot of little campfires
- Most difficult to learn or teach
- Phase transition vs. slight adjustment
- Radical epiphany more like it?

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Examples

- Differences that percolate at level of noticing and that scale resulting in unpredicted effects and a phase transition
 - The Letter
 - Going to cop
 - Schmah
 - The lease in Ted's interview
 - Driving to the govt office in Mexico

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Don't Little Perturbations Count?

- Lower impact perturbations will always go on and continue for life and change things, in a life and in the world
- But the phase transitions are more interesting to me, and now more continual, and therefore important to understand.
- Plus they suggest something about LC2 learning

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Phase Transitions for Ethno/LC2

- The high impact perturbations, percolating to different levels of scale, are the major boundary in learning LC2 or anything else
- Call it *The Wall*, with apologies to Pink Floyd and marathon runners everywhere

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The Interlanguage Wall

- Interlanguage and many other process models of LC2 learning
- We know that LC1 is bound up with identity and everyday practices
- When LC2 rich point causes high impact perturbations in LC1 calling for identity and practice re-organization then it's a Wall in the Interlanguage process

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Over the Wall

- What does it take to get over that wall?
- Now we're back to IRA and C/M, the "process/context/meaning" theme that also defines ethnographic space
- Process filled with uncertainty and surprise, not all of them pleasant, most of them threatening to identity and competence
- Remember the pics in the ethno presentation?

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LC2 Learning--The Wall



How much is enough?
What else needs to be changed?

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LC2 Learning--The Other Side



New concepts, new patterns

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frac-tal n

an irregular or fragmented geometric shape that can be repeatedly subdivided into parts, each of which is a smaller copy of the whole. Fractals are used in computer modelling of natural structures that do not have simple geometric shapes, for example, clouds, mountainous landscapes, and coastlines.

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High Impact Learning

- We ask the LC2 learner/ethnographer to re-organize patterns across levels
- Patterns that make up identity and practice
- The re-organization begins at the level of noticing and percolates
- It impacts at higher and lower levels
- The fractal metaphor

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Beyond the Learner

- We've focused on a person here
- What about other levels of scale?
- Nested ecologies
- Bar Yam at policy and classroom level
- <http://www.complexsys.org/pdf/ComplexityScienceSurvey.pdf>
- The power issue

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What's Power Got To Do With It?

- Hierarchy
- Standardization
- Constraints
- Energy (i.e. resource) control

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A Way to Think About Power

- In nature a fractal begins somewhere, a local event sensitive to initial conditions
- As patterns reproduce across levels of scale they further constrain patterns to come
- In society, where did the fractal pattern start? Those are the power spots
- Agency re-shapes them, but what are the limits?
- Fractal origins explain pattern at level of noticing
- This is "critical" analysis

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What Do We Get From Complexity?

- An interdisciplinary science compatible with IRA and C/M, with translation, and with LC2 learning
- In this presentation, an idea about how interlanguage is a landscape with a few sheer walls
- A meta-language to show link of ethno and LC2 translation and learning, and a link of them with a recent transdisciplinary theory
- Some suggestions about how to link person with nested systems and show how power works in distributed and diffuse ways

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In the Words of an Old Teacher of Mine...

- Studying culture today is like studying snow in the middle of an avalanche
- Continual interacting changes at all levels of scale, some sought, some imposed
- Research and intervention in *continual* re-organization at all levels

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Are We Up To The Task

- Intellectually, yes
- Bundle of ethno, languaculture and complexity powerful mutually-reinforcing set of lenses that add magnification, resolution and depth of field to our view of social dynamics
- Politically? That's another question
- The bundle also moderates central authority and control. The HBR articles

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End of Presentations

Question of what is an ethnography answered with constrained space of possibilities rather than a point

Question of what kind of language models make sense answered with LC2 acquisition and translation

Question of an interdisciplinary epistemology and theory as anchor answered with complexity

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But “answer” is just one turn in a conversation with a long history and an open future.

My thanks for the turn.



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