

chaos in call — a model?

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*you see things; and you say 'why?' but i dream
things that never were; and i say 'why not?'*

g b shaw, r f kennedy, d johnston

why not chaos?

? in language learning ?

? in student modeling ?

assumptions

- § if call is to support any form of individualized learning, student modeling is essential.
- § student models are of a higher quality, if they generate new information about the learner and do not only accumulate and cluster information about learners.
- § useful new information would be a prediction of effective future learning steps, suitable learning objects, contextualized feedback and scaffolding, . . .
- § language learning is a dynamic, nonlinear, nonperiodic process – a social interaction in variable-rich contexts.

outline

- dynamic systems theory
- modeling learner text over time



dynamic systems

- dynamic: language changes over time, speakers change language — language learning changes over time, language learning changes variables of the learning environment
- nonlinear (bifurcations, spurts, fossilization, slips, ...)
- non-periodic, but perhaps fractal
- importance of initial conditions, multiple (small) variables which are weak predictors by themselves, but strong in combination
- simple (iterative) functions often result in complex, chaotic graphs → creating chaos with simple equations is not difficult → deconstructed chaos to find the simple formulae?

multiple dimensions

- plotting each variable over time?
 - identifying and measuring them would be difficult
 - each variable adds a dimension
- the mathematics become impossible
- use one variable – **text** – as a window into the process
 - collapsing the higher dimensional models into a lower (two) dimensional model assumes that all variables are inherent in text
- study text as a variable over time

measuring learner texts as conflated variables

- determining numerical values for plotting: use unique identifiers which can be deconstructed later (addition of binary numbers, multiplication of prime numbers, and lists thereof)
- units of analysis: words, phrases, sentences, texts
- **word:** complexity of morphological categories and/or of lexical networks with multiple inheritance; n-grams of lexical items
- **phrase and sentence:** hpsg phrase descriptors (heift) and/or selected values of the hpsg feature structure
- **text:** discourse complexity of interlanguage texts (skehan)

plotting language learning on graphs

- determining the nature of the stage $n+1$ (similar to ZPD)
- strange attractors and repellents
- personae as a (fuzzy) pattern match?
- formulae to describe the different graphs or parts thereof?
- open learner models (bull)?
- finding out a little more about second language acquisition

thank you

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