Teaching & Learning Guide for:
The Emerging Field of Language Dynamics

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Author’s Introduction

The field of language dynamics encompasses the study and modeling of how languages develop (language evolution), change, and interact (language competition). It contrasts with traditional historical linguistics in several ways: the focus is on the world’s linguistic diversity rather than just on specific languages or language families; methods are quantitative rather than qualitative; computer simulations are employed for elucidating situations that are not immediately observable, being too complex or pertaining to prehistory; the data used are systematic ones gathered in large databases rather than data that happen to be available for select languages. A crucial feature of the methodology is the fine-tuning of simulation models through empirical observations of quantitative distributions such as those of speaker populations or of grammatical features shared among languages.

Author Recommends

Among the following papers the two first are recommended because of the great impact on the field of language dynamics that they have had, and the following three are recommended because they provide useful and up-to-date overviews.


A now–classic paper proposing a simple differential equation (macroscopic model) for the competition between two languages. Using the fractions of speakers of the two languages and a prestige measure as the only two variables the authors set up a function that may be fitted to empirical data for the decline of Scottish Gaelic, Quechua, and Welsh.

This paper compares extinction risks and causes for languages and biological species and also compares correlates of linguistic diversity and biodiversity.


Reviews work by physicists on various social phenomena, including languages. It also contains a section describing some social models often used.


A review of studies of language competition with a focus on the agent-based (microscopic) Schulze and Viviane models.


The diffusion of linguistic variants is simulated for four different kinds of networks: regular, small-world, random, and scale-free networks.

**Online Materials**

**The World Atlas of Language Structures Online**

http://wals.info/

This website makes freely available the data and maps from *The World Atlas of Language Structures*, edited by Martin Haspelmath, Matthew S. Dryer, David Gil and Bernard Comrie and published in 2005 by Oxford University Press.

**Languages of the world (Jazyki Mira) database**


A database of typological features for 315 Eurasian languages. It is still mainly in Russian.

**The Automated Similarity Judgment Program**

http://email.eva.mpg.de/~wichmann/ASJPHomePage.htm

A regularly updated webpage devoted to a project of lexical comparison among the world’s languages.
The Typological Database System project
http://languagelink.let.uu.nl/tds/index.html
A system for making queries across several typological databases.

Ethnologue
http://www.ethnologue.com/
A catalogue of the world’s languages.

Language Evolution and Computation Bibliography and Resources
http://www.isrl.uiuc.edu/~amag/langev/
A website privately maintained by Jun Wang that indexes literature on the computational aspects of language dynamics.

Sample Syllabus

Week 1: Language evolution

Week 2: Language competition: macroscopic vs. microscopic models

Weeks 3–4: Social networks
Week 5: The evolution of linguistic diversity


Week 6: Linguistic diversity and geography


Week 7: Demography and language change


Week 8: Discussion of focus questions and exploration of items for future research

**Focus Questions**

1. Find examples in the literature of cases where empirical data and computer simulations together have clarified a question better than either could alone.
2. What do simulation results suggest regarding possible ways of helping to prevent a minority language from going extinct?
3. Describe the parameters of a model that may successfully be used to simulate the evolution that led to the present-day linguistic diversity.
4. Do small languages change faster than large languages? Describe the evidence for the answer to this question and try to explain the result.
5. Different models have been used in the simulation of language evolution and language competition. Make a categorization of the different models and group papers read into the different categories according to the model they are using.