

Language in Populations: The Interaction Between Learning & Change

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In this talk, I will investigate the interaction between individual-level language learning and population-level language change. We can view language as a mental trait individuals of a population must learn and then successfully transmit to other population members via the noisy medium of the observable spoken language. The linguistic system has components that are argued to alter only during the early stages of life, so any *change* to these components in an individual can only occur during this time. Thus, population-level changes over time for these components are believed to be driven very strongly by the individual learning mechanism in operation during this early time. Specifically, the learning mechanism must allow for some small amount of “mis-learning” that is compounded in an exponentially growing population over time (Lightfoot, 1991). The population’s linguistic composition over time is thereby keyed to the instantiation of individual learning.

The model presented in this talk is empirically grounded at both the individual level (realistic data distributions for learners, representation of the early learning period, discrete representations of the linguistic system, probabilistic learning) and the population level (population growth rate, population size, time period of change, rate of change). I focus on one instantiation of the individual learning mechanism that requires the learner to use only the subset of the available linguistic input that is perceived as easier to extract the linguistic system from. An immediate problem with data restriction is data sparseness: if we restrict the learner’s intake to only “clean” data, will there be any data left to learn from?

Surprisingly, I find that not only are the proposed data intake restrictions feasible to implement, but they are sufficient and in fact *necessary* to achieve the correct rate of language change in the population. This is a striking example of how individual-level learning constraints can markedly influence population-level behavior.