

**Tel-Aviv University  
The School of Philosophy, Linguistics and Science Studies  
Department of Linguistics**

**THURSDAY INTERDISCIPLINARY COLLOQUIUM**

**Thursday 24.12.2020  
16:15-17:45**

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**Evolution of Phonological Typology: an Iterated Learning Model of the Emergence of  
Phonological Patterns**

Phonological typology is highly skewed. For example, while final devoicing of obstruents occurs in many languages, Lezgian is the single documented case that has been argued to possess the opposite pattern of final voicing (Yu, 2004). Theories such as Optimality Theory (OT; Prince and Smolensky, 1993) often attribute this kind of asymmetry to an **analytic bias**, cognitive biases which ease the learning of some phonological patterns over others, while theories such as Evolutionary Phonology (EP; Blevins, 2004) claim that the source of the asymmetry is **channel bias** -- recurring systematic errors which push languages towards one pattern and away from its opposite pattern.

The division of labor between analytic and channel bias is an empirical question. In my work I present a model for channel bias which can help us to reason about this division of labor by examining whether typological asymmetries in phonology can emerge as a result of transmission of phonological knowledge between generations, using the asymmetry between final voicing and devoicing as a case study. My model, which builds on the Iterated Learning Model of language transmission (ILM; Kirby 2001, 2002), includes corruption of the data by applying noise which models the channel bias described by Blevins (2004). The learning agent in my model is Rasin et al.'s (2018; 2020) Minimum Description Length (MDL; Rissanen, 1978) learner which I modified so it can handle some amounts of such noise. I show how this model succeeds in simulating the emergence of final (de-)voicing asymmetry from a (de-)voicing neutral starting point. I also show the model can simulate a decay of final voicing which addresses Kiparsky's (2006) response to EP that final voicing is expected to be a more common sound pattern if there were no innate constraints against it. The success of the model to simulate the emergence of this phonological asymmetry opens the door to theories that attribute less of the typology to analytic bias and more of it to channel bias.

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