Klaas Seinhorst, Tamás Biró (University of Amsterdam)[1] — **Simulating the acquisition of Dutch word-initial consonant clusters with $q$-HG**

Early stages of linguistic development are characterized by an array of simplification phenomena. In phonology, Dutch children often omit one or more segments in word-initial consonant clusters. For instance, they may produce the word *bloem* 'flower' as *boem*, or *slapen* 'to sleep' as *lapen*, before mastering the target form. Within an Optimality-Theoretic framework this phenomenon is usually explained as the result of constraint reranking: the child gradually learns that faithful production of the target form is more important than the markedness of phonological complexity.

We take an alternative stance and posit instead that the child acquires the correct knowledge without delay, but is not yet able to compute the target form correctly. We present the preliminary results of computer simulations of child language corpus data. Our simulations aim at reproducing the distinct learning curves of four different types of word-initial consonant clusters. We approximate OT with Harmonic Grammar with weights that are powers of a base $q$ (a $q$-HG grammar), and postulate that $q$ increases as a function of age. This way, the grammar comes to behave as an OT grammar by a certain age: with low values of $q$, the grammar produces the simplified form, whereas with high values of $q$, it produces the adult form.

In order to better reproduce the different learning curves, we also experimented with probabilistic variants of OT, such as Boersma's Stochastic OT and Biró's Simulated Annealing. We found the most promising results with Simulated Annealing and a restricted topology.

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