An Iterated Learning Experiment of Morphonotactic Consonant Clusters

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We report an artificial language learning experiment that explores the stability of coda consonant clusters depending on their position within morphemes and across morpheme boundaries.

Coda consonant clusters count as highly marked due to their prosodically weak position and a preference for CV syllable structures (see e.g. already Clements & Keyser 1983; also in OT e.g. Prince & Smolensky 2004; and more recently in Natural Linguistic Theory e.g. Dziubalska-Kołaczyk 2019). They are typologically comparatively rare and historically unstable (e.g. Maddieson 1999, 2013; Lutz 1988). However, if they span a morpheme boundary, as the final /md/ in English *seem+ed*, they appear to be less dispreferred, and it has been proposed that this is because they reliably signal morphological complexity (Dressler & Dziubalska-Kołaczyk 2006).

An implication of this hypothesis is that cross-boundary clusters with morpheme internal homophones – such as English /nd/, which occurs both in inflected forms like *sinn+ed* and in simple items like *wind* – should fail to be stabilized by their potential signalling function, because they are in fact ambiguous and may actually impede processing (Post et al. 2008). On the other hand, however, it has also been hypothesized that cross-boundary clusters may actually increase the stability of morpheme internal homophones through analogy, explaining, for example, why English has lost stem final /ng/ (as in /sɪŋ/ *sing*) and /mb/ (as in /klaɪm/ *climb*) but not /nd/ (Hogg & McCully 1987). Support for both positions has been found in processing studies as well as in diachronic research from multiple languages (e.g. Celata et al. 2015; Baumann et al. 2016, 2019). Our project addresses the question in terms of an artificial language learning experiment, where a miniature language is tailored to study the phenomenon in a controlled lab environment.

Specifically, our experiment employs the iterated-learning paradigm (cf. Kirby, Cornish & Smith 2008): Participants learn singular and plural nouns from an artificial mini-language, in which some words end in highly marked plosive+/k/ clusters. Then, participants are asked to reproduce the word forms from memory, and the output of one participant serves as learning input to the next one. The process is repeated for a couple of 'generations', thereby simulating language transmission and change. To address our specific problem, we set up three experimental conditions. In condition (i), obstruent+/k/ clusters appear at the end of suffixless singulars (e.g. /zʊtk/ 'mouse'), in (ii) the same clusters are produced when a plural suffix {-/k/} is added to stems that end in plosives (e.g. /zʊt/+/k/ 'mice'), and in (iii) the clusters are found both in singulars and across {stem}+{PL} boundaries.

Our results showed that final clusters were transmitted stably only in condition (ii), where they resulted exclusively from /k/-suffixation. When they occurred both across {stem}-{PL} boundaries and morpheme-internally (condition (iii)) they were lost as rapidly as in condition (i), where they were always morpheme-internal. In our presentation we report our results in detail and interpret them as evidence that the stability of cross-boundary clusters is indeed reduced when they have morpheme internal homophones. Whether our results also show that cross-boundary clusters are unlikely to spawn and stabilize morpheme-internal homophones remains an open question, however, since such processes may be more typical of first language acquisition by children than of adult language learning (as in our experiment).

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