

# **The Dothraki Experiment: network topology and the linguistic niche hypothesis**

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## **1. Introduction and Methods**

Here we present a two-part experimental study to investigate the impact of language proficiency and social network structure on language change. The Linguistic Niche Hypothesis suggests that diversity among the world's languages is based mechanisms of social dynamics under cognitive constraints (Lupyan & Dale, 2010). For instance, morphological complexity has been suggested to be contingent on the size of an ethnolinguistic community, and the proportion of adult second language learners (i.e., L2 speakers, Clahsen et al., 2010; Silva & Clahsen, 2008). L2 speakers are assumed to speak a morphologically-simplified version of highly inflected languages. If the relative proportion of L2 speakers is large, the reduced form can propagate and simplify the morphology of the language (Atkinson et al., 2018; Dale & Lupyan, 2012; Lupyan & Dale, 2010, 2016). However, despite the significant growth of new evidence, the field struggles to overcome a considerable number of contradicting results (e.g., Atkinson et al., 2015; Koplenig, 2019; Raviv et al., 2020; Shcherbakova et al., 2023; Sinnemäki & Di Garbo, 2018).

We suggest that a key to advancing our understanding of the impact of social structure on linguistic structure is to more carefully consider the underlying social mechanisms. In particular, we argue that it is not enough to know the proportion of low-proficient speakers in a society to predict patterns of language change. Another critical factor is the frequency by which L2 speakers interact with proficient L1 speakers of the same group. We predict that a high proportion of L2 speakers in combination with more fragmented social networks yields higher

probabilities of morpho-syntactic reduction, since L2 speakers' learning are not sufficiently scaffolded by interactions with high proficiency speakers. We test these predictions in a game-like experiment where participants communicate in *Dothraki* (a constructed language from the TV series "Game of Thrones"). The experiment consists of two phases: i) a learning phase, and ii) a communication game. In phase 1, participants are divided into a high and low proficiency group and learn how to write sentences in Dothraki. The high-proficiency group gets more training trials and is taught a morphologically more complex variant of Dothraki (with analytic case-marking and syntactic redundancy), while the low-proficiency group are taught a simplified synthetic variant through fewer training trials. In phase 2, participants are paired with other participants from a 'micro-society' consisting of five individuals and take turns in describing simple scenes in Dothraki using a chat interface. The partner has to guess what scene is being described and they both receive feedback. They regularly switch partners within the society. The micro-societies belong to four conditions combining two experimental factors: They can have a high or low proportion of low-proficiency speakers, and be either densely connected (everyone communicates with everyone) or sparsely connected (participants only communicate with their close neighbors).

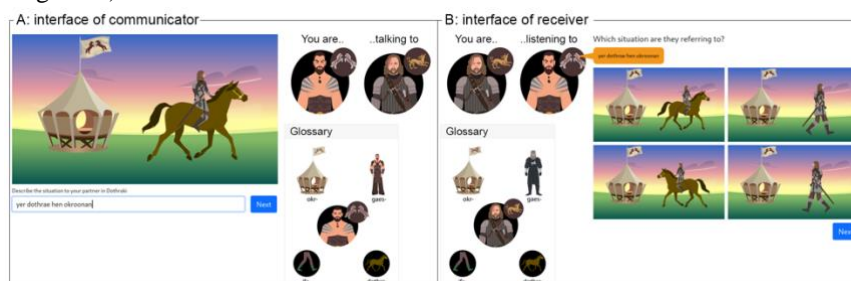


Figure 1: Illustration of the communication game interface

The outcome of interest is the Dothraki sentences participants send to each other. We analyze how the morphosyntax evolves through rounds of communication as a function of the proportion of low proficiency speakers and the network topology. In particular, we investigate the extent to which the simplified variants are adopted over time also by L1 speakers of Dothraki contingent on the conditions. Pilot data show interesting trends indicating that proficiency and social network topology interact to promote morphological reduction spreading also to high proficiency speakers of Dothraki through the course of the experiment.

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