An experimental study of the learnability advantage of agglutinative over fusional morphology

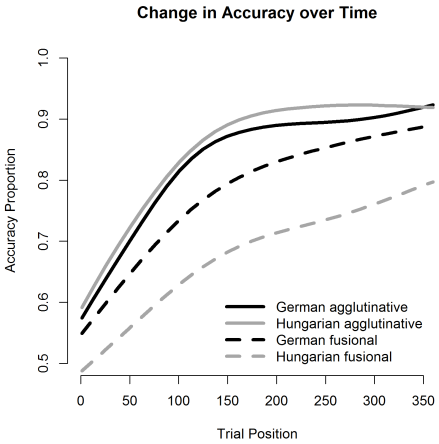
The trade-off between fusional and agglutinative morphological systems is viewed in terms of learnability: it should be easier to acquire transparent agglutinative morphology than opaque fusional morphology (e.g., Pinker 1996; Zuidema 2003; Neeleman & Szendrői 2005; Fasanella 2014). Our study directly compares the learnability of fusional and agglutinative systems in an artificial language learning task (Reber 1967). In addition, we assess the influence of the native morphological system of the learners, and show that it affects learning rate and outcome.

20 speakers of German and 20 of Hungarian (typical fusional and agglutinative languages) participated in the study. Each participant was randomly assigned to either the agglutinative or the fusional condition. The artificial languages were made up of morphologically complex nonwords, consisting of bisyllabic stems marked with prefixes that indicate number (singular, dual, plural) and gender (specifically, semantically-based noun classes: objects, foods, and animals; cf. Corbett 1991 for their characterization as "genders"). This grammatical system is typologically attested, being loosely patterned after that of Swahili and related Bantu languages. In the fusional condition (a), stems have a single prefix that indicates a specific number-gender combination; while in the agglutinative condition (b) there are two separate prefixes.

a.	bo:–ki:tɛp	(fusional)	b.	vu:–zy:–ki:tɛp	(agglutinative)
	sg+class3–cookie	'one cookie'		sg–class3–cookie	'one cookie'

In contrast to classic artificial language learning paradigms with separate training and test phases, we employed a novel paradigm of concurrent training and testing. Participants were exposed to 360 trials. In each trial, an inflected word was presented auditorily along with two images on the screen: the target and the distractor, which differed from the target in number, gender, or both. Participants had to identify the image matching the word. They received feedback after each response. By design, it was impossible to learn the stems: To improve their performance during the experiment, participants had to acquire the morphology.

Data were analyzed using Generalized Additive Mixed Models (van Rij et al. 2015) to model non-linear effects over time. Learning takes place in all groups, and accuracy plateaus around 80 to 90 percent. Learning rate and ultimate attainment are highest for the agglutinative system, with no difference between German and Hungarian participants (z = 0.94, p = .35, n.s.). But while the agglutinative system was learned equally well by both groups of speakers, German speakers scored higher than Hungarians in learning the fusional system (from trial 77 onwards; z>1.96, p<.05). This indicates that acquisition of the fusional system, being harder, benefits more from native language experience.



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