Preference for locality is affected by the prefix/suffix asymmetry

PREFERENCE FOR LOCALITY IS AFFECTED BY THE PREFIX/SUFFIX ASYMMETRY: EVIDENCE FROM ARTIFICIAL LANGUAGE LEARNING

James White, UCL
René Kager, Utrecht University
Tal Linzen, LSCP/IJN/ENS/EHESS/CNRS
Giorgos Markopoulos, Aristotle U. of Thessaloniki
Alexander Martin, LSCP/DEC/ENS
Andrew Nevins, UCL
Sharon Peperkamp, LSCP/ENS/EHESS/CNRS
Krisztina Polgárdi, Hungarian Ac. of Sciences
Nina Topintzi, Aristotle U. of Thessaloniki
Ruben van de Vijver, Düsseldorf University

Previous work suggests that learners have a strong locality bias when learning co-occurrence restrictions (e.g., harmony systems), even when learning consonant harmony, which is often non-local in natural languages (Finley 2011, McMullin 2016). However, studies have also found that non-local co-occurrence restrictions are easier to learn when the relevant units are at prominent edges, such as the beginning and end of a word, presumably due to processing factors (Endress & Mehler 2010).

In this study, we investigate how affix type (prefix or suffix) and stress location affect the preference for locality when learning vowel co-occurrence restrictions in an artificial language. Participants were exposed to data that were ambiguous between a local harmony pattern and a non-local vowel co-occurrence restriction; they were then tested on disambiguating items to determine which kind of pattern they had learned. Schematically, provided only ambiguous input demonstrating A-AA and B-BB, participants were required to choose between A-AB (local vowel harmony) and B-AB (agreement with non-local vowel at the word edge).

Previous researchers have argued for a prosodic structure in which suffixes are more closely integrated with stems than prefixes are (Nespor & Vogel 1986, Peperkamp 1997). For instance, in Samoan root+suffix forms mostly behave like monomorphemic words in terms of basic foot assignment and diphthong creation, but prefix+root forms behave as if there is an intervening prosodic boundary (Zuraw et al. 2014). In the case of vowel harmony, we find cross-linguistically that suffixes are more likely to participate in harmony than prefixes. A possible explanation for this asymmetry is that the domain including the root and suffixes (to the exclusion of prefixes) is the preferential domain for vowel harmony (e.g. see Hyman 2002). Therefore, we predict a stronger locality bias between stem and suffix vowels than between stem and prefix vowels.

In terms of stress, prosodically strong vowels are thought to be better triggers of vowel harmony compared to prosidically weak vowels (Hyman 2002). Moreover, metaphony-type systems involve a co-occurrence restriction between a stressed vowel and a following vowel (often a suffix), which in some cases can even be non-local (Walker 2004). Therefore, we predict a stronger locality preference when the local vowel is also stressed, and a weaker locality preference when the local vowel is unstressed, all else being equal.

Method: Participants were trained on auditorily presented nonce CVCV stems paired with corresponding affixed forms (CV-CVCV or CVCV-CV). Training stems always followed front/back harmony (front vowels: [i,e], back vowels: [u,o]). There were two affixes, a high vowel affix [fi]~[fu] and a mid vowel affix [be]~[bo]; affix vowels alternated depending on the stem vowels. The training data were thus ambiguous: all training stems were harmonic so participants had no explicit information about whether the local or non-local stem vowel triggered the alternations. After training, participants completed a brief forced-choice verification test with new harmonic stems; they were required to cycle through the training and verification phases until they had learned to choose the correct affix vowels for harmonic stems (80% criterion). After reaching criterion on harmonic stems, participants were tested on disharmonic stems, where they were forced to choose between matching the affix vowel to the local stem vowel or to the non-local stem vowel (e.g. for stem [pudi], choosing between [pudi-be] or [pudi-bo]). Affix Type (prefix vs. suffix) and Stress Location (local stem vowel or non-local stem vowel) were manipulated between-subjects. We measured how often participants chose agreement with the local vowel of the disharmonic stems.

Results: This work is part of an ongoing project for which the same experiment will be conducted across labs in six countries, with native speakers of six different languages (Dutch, English, French, German, Greek, and Hungarian). At present, we report data from 33 English

speakers and 54 German speakers, but data collection is ongoing. The results were analysed using mixed effects logistic regression models. We found a significant effect of Affix Type for speakers of both languages (Fig. 1, left). Participants in the suffix group tended to choose harmony with the local vowel of the stem (English: 70% local harmony; German: 79%) whereas participants in the prefix group did not have an overall preference for local harmony (English: 42% local harmony; German 56%). The near-chance means in the prefix group were not due to participants failing to learn any pattern at all; rather, the distributions show that individual participants in the prefix group were often consistent in their choice of vowel. However, they were more likely than those in the suffix condition to choose the non-local vowel as the trigger of the alternations. There was no significant effect of Stress Location in these data (Fig. 1, right), but we plan to look at this issue in greater detail once we have data from speakers of all six languages.

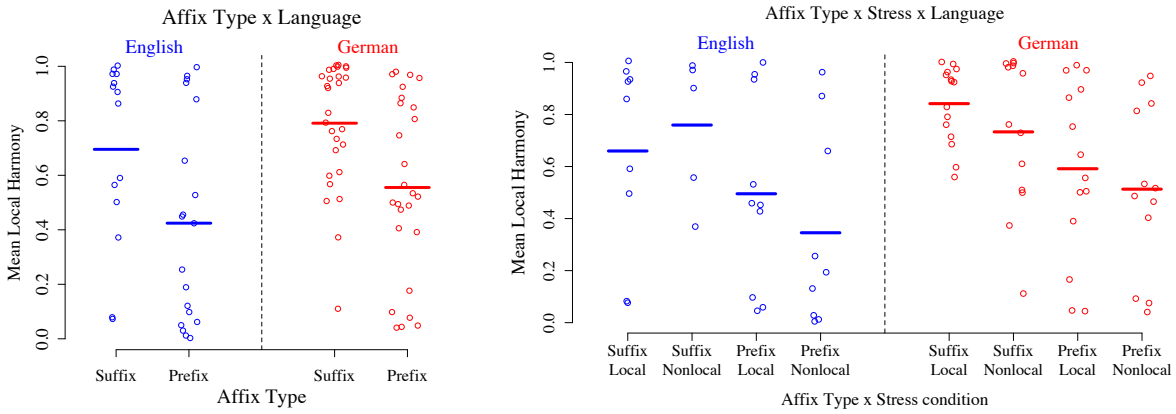

Figure 1. Results according to Affix Type and Language (left) and Affix Type by Stress Location by Language (right). Circles show individual means; bars show aggregate means.

Discussion: The asymmetry in locality preference between prefixes and suffixes in the experiment is consistent with the view that prefixes and suffixes are structured differently with respect to the root (Nespor & Vogel 1986, Peperkamp 1997). Specifically, we argue that suffixes are more closely integrated with the root, and that the root+suffix domain is a preferred domain for the application of local harmony. In contrast, prefixes are less closely integrated with the root, which resulted in a larger trade-off between the influence of locality and word edge effects when participants learned the vowel co-occurrences in the experiment. The existence of prefix-suffix asymmetries in dominant-recessive harmony systems is well documented, and dovetails with work by Finley & Badecker (2009), who experimentally showed that prefixes were dispreferred relative to suffixes as triggers in affix-controlled harmony systems. Here, we show that the same asymmetry holds experimentally for stem-controlled systems. This asymmetry could play a role in explaining why prefixes are less likely to participate in vowel harmony cross-linguistically.

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