

## **Phonetic invariance in L2 modulates allophonic realizations in L1: Evidence from bilingual production of laterals**

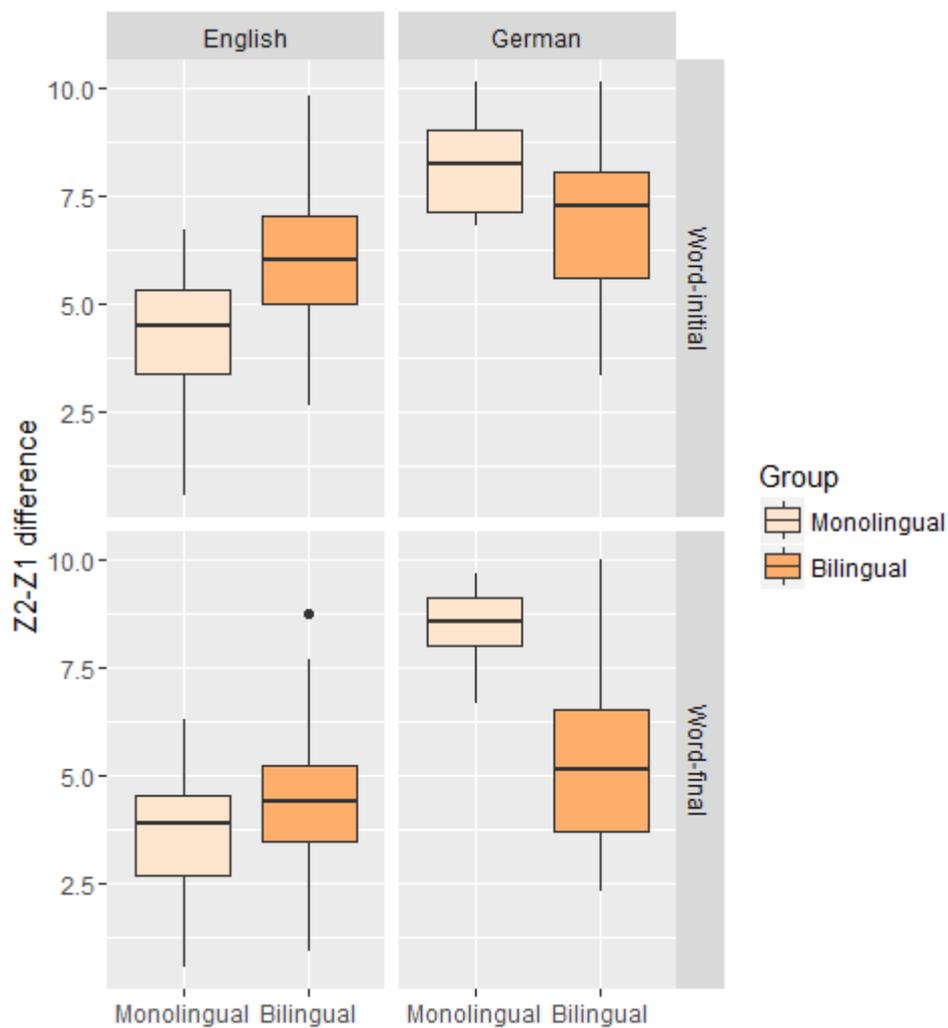
Language-specific variation of laterals has been shown to have consequences for bilinguals if their respective languages employ distinct realizations. For example, Barlow (2014) shows that Spanish learners successfully adapt to the allophonic patterns of English albeit diverging from the native English speakers in their production of laterals. Importantly, the allophonic pattern acquired in their L2 also influenced their L1 Spanish, as shown by the phonetic properties of their Spanish laterals. In particular, the bilinguals produced word-final laterals with a lower  $F2$  than word-initial laterals. As in many other studies on L1 phonological attrition, however, the directionality of cross-linguistic influence largely remains understudied in the realization of laterals in bilinguals.

Here, we address this gap by exploring the reverse situation, that is, the consequence of having acquired an L2 that shows no variation in the realization of the lateral phoneme for the L1 that exhibits variable realization of the same category. In particular, we investigated 1) whether the L1 allophonic distribution can be suppressed in the acquisition of an L2 lateral phoneme that does not show an allophonic split, 2) whether the pattern acquired in the L2 has an effect on the allophonic realization of the L1 lateral, and 3) whether bilinguals' productions of laterals in both of the languages in question are phonetically different from monolinguals.

In a production experiment, we tested onset and coda laterals in twelve American-German late bilinguals (mean LoR=25 years) who performed a reading task in English and in German. Additionally, American English monolingual and German monolingual control groups performed the same task. While many varieties of German feature a clear /l/ in all positions, English is generally considered to feature a clear variant in onset position, and a dark variant in coda position. This distinction is rather unclear for American English although it has been claimed that the precise realization of /l/ is gradiently modulated by syllable position (e.g. Hayes, 2000), displaying an allophonic pattern. Thus, our test items differed 1) in the position of the lateral (initial/final) and 2) the vowel environment, both of which are known to correlate with  $F2$  values in English. We measured  $F1$  and  $F2$  at multiple time points as well as the  $F2$  minima and maxima within the laterals in the experimental tokens and modeled potential differences between groups by converting raw Hertz values to Bark and fitting linear mixed effect models.

Preliminary results of a Z2-Z1 comparison for our monolingual participants suggest that German monolinguals produce laterals with identical qualities regardless of position in the syllable and vowel environment, confirming previous observations of the invariant nature of the German lateral. As expected, American monolinguals are sensitive to position as well as vowel environment, producing final laterals with a lower Z2-Z1 difference in coda position. The same comparisons for the bilingual participants reveal that they are sensitive to the position of the lateral in both of their languages, producing final laterals with a significantly lower Z2-Z1 distance than initial laterals just like their monolingual American English counterparts, albeit with significantly different values in word-initial position. Their German productions however differ significantly from German monolinguals in the final position but not in the initial position (see Figure 1).

We take our results to show that both the acquisition of novel phonetic realizations of existing phonemic categories as well as the precise phonetic realizations of the same categories in the L1 are vulnerable in bilinguals. In contrast, we find no evidence for transfer of the allophonic rule. Thus, cross-language influence in the phonetics of laterals appears to be bidirectional, whereas rule transfer of allophonic patterns is uni-directional.



**Figure 1:**

*Boxplot of the Z2-Z1 difference between the bilinguals and the monolingual groups for word-initial and word-final laterals.*

## References

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