

The loss and variable realization of /r/ in a rhotic language: Evidence from post-pubescent exposure to non-rhoticity

Rhotic sounds are known to exhibit great variation both across languages as well as within languages. For example, due to its vowel-like properties, English coda-/r/ has been described as inherently very weak (Lutz 1994). Indeed, coda-/r/ in English shows variable degrees of realization (full, semi- and non-rhoticity), both synchronically and diachronically.

Particularly, the presence of semi-rhotic varieties with variable realizations of /r/ give reason to hypothesize that the development and loss of the postvocalic /r/ may be subject to a set of constraints, which are understudied. Here we investigate variation and change in rhoticity from the perspective of adjustments in an individual's native language (L1) due to long-term exposure to a second language (e.g. Mennen 2004). Although the degree of adaptation of L2 speech patterns into the L1 has been shown to be constrained by various contextual and sociolinguistic factors such as language prestige and language dominance (e.g. Lev-Ari et al. 2014), whether this mirrors timeless laws of sound change and developmental hierarchies in phonological change remains unknown.

Concerning rhoticity, it has been shown that long-term exposure to a rhotic L2 can trigger the introduction of postvocalic /r/s in an otherwise non-rhotic (i.e., /r/-dropping) L1 (Ulbrich and Ordin 2014). This effect, however, is only visible in certain contexts, while phonological factors such as stress and syllable structure remain unexplored. Furthermore, we know very little about the directionality of change in rhoticity: Can systematic occurrence of /r/-dropping in the L2 exert an influence on L1 rhoticity? Since rhotic sounds typologically show considerable qualitative differences, we also expect to find variable phonetic realizations of /r/ (in lieu of its complete loss) in the L1 due to L2 non-rhoticity.

In this study, we test whether the lack of postvocalic /r/ in the L2 can trigger the loss of rhoticity in the L1. In particular, we investigate which environments favor the deletion of postvocalic /r/ and the phonetic quality of /r/ in the L1 (American English) after long-term exposure to a non-rhotic L2 (German). While many American English varieties are rhotic, German varieties are largely non-rhotic. Based on observations on postvocalic /r/ in synchronic and diachronic varieties of English, we hypothesize that /r/ is more likely to undergo reduction in the unstressed condition than in the stressed condition. In stressed syllables, the salient rhoticized vowel [ɜ] in American English should be more resistant to rhotic variability than other /r/-colored vowels. Following previous results (e.g. Feagin 1990), we also expect complexity of the syllable coda (simple vs complex) to influence rhoticity. Finally, as rhoticity is acoustically characterized by a lowered F3 value, we also expect bilinguals to produce potentially rhotic sequences with a higher F3 than monolinguals.

In our experiments, 12 American English – German late bilinguals residing in Germany (LOR=25 years) performed a variety of speech elicitation tasks in both their L1 and L2. The test items used in our controlled tasks are mono-morphemic words with the coda-/r/ occurring either after a stressed or unstressed vowel. We further control for other phonological variables such as syllable complexity and consonantal contact (homomorphemic vs heteromorphemic contexts). Auditory coding into binary categories (rhotic/non-rhotic) was

used to analyze presence and absence of rhoticity. Additionally, we measured F3 values of the [Vr] sequences.

Our results showed that, as compared to monolinguals, the realization of /r/ by bilinguals exhibits a high degree of variability, which is constrained by various factors. The preceding vowel environment impacted the rhoticity of the syllable, with stressed [ɚ] strongly favoring the retention of rhoticity and unstressed [ə] strongly disfavoring rhoticity. This yields a vowel hierarchy of resistance to the loss of rhoticity: Group 1 ([ɚ]), Group 2 (stressed vowels except [ɚ]) and Group 3 ([ə]). While phonological and morphological complexity of the syllable did not impact production, the following environment (consonant vs. pause)

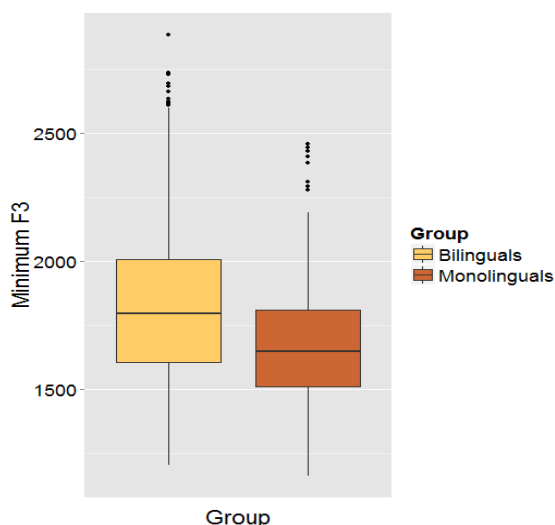


Figure 1: Minimum F3 in Hz in American English Monolinguals vs. German-American English bilinguals

constituted a significant factor. Additionally, we observed task effects: As opposed to speech elicited by more controlled tasks, casual speech increased variability and hence less monolingual-like behavior. Finally, we found that bilinguals produced the [Vr] sequences with significantly higher F3 values (Figure 1), suggesting the presence of a lesser degree of constriction during rhotic articulation.

We take our results to show that non-rhoticity in the L2 influences rhoticity in the L1 both in terms of the emergence of post-vocalic r-deletion, as well as changes in the acoustic quality of [Vr] sequences. We will suggest that the variable adaptation of rhoticity within an individual’s lifespan mirrors diachronic and synchronic patterns commonly observed in English varieties, as well as the timeless laws of phonetics.

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