To voice or not to voice: cross-linguistic effects on phonological representations

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For learners of a second language (L2), a foreign accent is one of the most difficult aspects to overcome (Flege, 1995). Adult learners often have trouble distinguishing two sounds in the target language when that contrast does not exist in their first language (L1) (Best & McRoberts, 2003). For example, Danish and Swedish learners of English find it difficult to perceive and produce the voicing contrast between [s] and [z] in English, as it is not used in their L1 (Bohn & Ellegaard, 2019; Flege & Hillenbrand, 1986). Research conducted with monolinguals has demonstrated asymmetries in the perception of certain phonological features, suggesting that some features are underspecified in phonological representations (Lahiri & Reetz, 2010). These asymmetries can vary depending on the language: while there is evidence that [+VOICE] is an underspecified feature in English (Hestvik & Durvasula, 2016), [-VOICE] has been found to be underspecified in Japanese (Hestvik et al., 2020) and in Danish (Højlund et al., 2019). An opposite asymmetry for the [VOICE] feature is therefore expected in L1 English and L1 Norwegian speakers. There are also reasons to believe that this opposite asymmetry might affect the perception of a [VOICE] contrast in L2 English for native speakers of Norwegian. Yet, no research has examined perceptual asymmetries in bilinguals, especially when these asymmetries occur in contrasting directions in their two languages.

In this study, 36 Norwegian-English late bilinguals completed a series of perception experiment: an ABX categorisation task, a lexical decision task (LDT), and an MMN task using a standard oddball paradigm with several standards. Two contrasts were included: /t/ vs /d/, which exists in both languages but could lead to a different pattern of language-specific asymmetries, and /s/ vs /z/, a contrast which does not exist in Norwegian.

Preliminary results show that while participants were able to acoustically distinguish between the two contrasts in the categorisation task, they performed better with the similar /t-d/ contrast in the categorization task and LDT. Their performance was worst when having to reject /z/ nonwords, i.e., nonwords created by replacing /z/ with /s/ (e.g., /ˈpɔɪsn/ for '*poison*').

MMN analyses (see Figure 1) at FCz in a 125-225 ms time window after the onset of the consonant (Kappenman et al., 2021) showed only a marginal MMN for the /s-z/ contrast (β = -0.57, *SE* = 0.29, *df* = 51, *t* = -1.94, *p* = .057), and no asymmetry between the two consonants. Analyses for /t-d/ revealed a marginal Condition × Phoneme interaction (β = 1.19, SE = 0.61, *df* = 51, *t* = 1.97, *p* = .05) due to an asymmetry, with a marginal MMN for /t/ only (β = -0.78, *SE* = 0.43, *df* = 51, *t* = -1.82, *p* = .075).

These MMN results are in line with the results found for Danish speakers by Højlund et al. (2019) but not those found for English speakers by Hestvik & Durvasula (2016). This suggests that even though they have good English proficiency, our participants rely on their L1 Norwegian representations, with an underspecified [VOICE] feature, when processing this similar /t-d/ contrast.

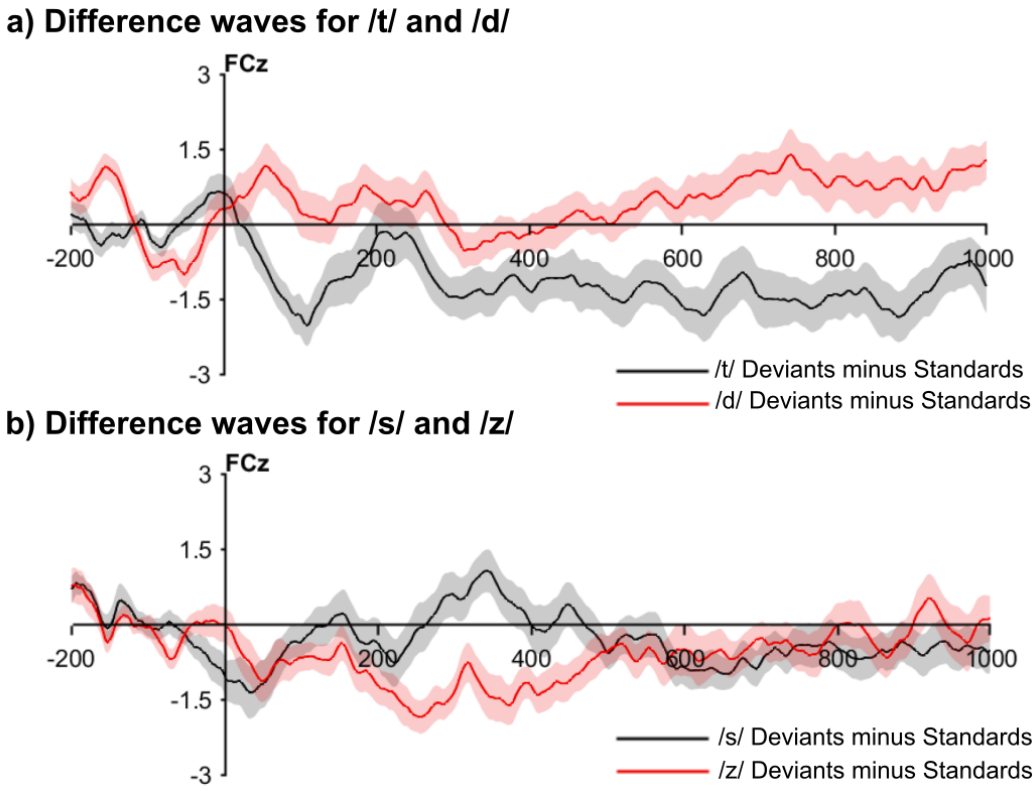

Figure 1. **Difference waves for each phoneme at FCz**

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