Accessing prosodic structure through indirect evidence:
The L2 acquisition of high vowel deletion in Québec French
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Research in prosodic phonology has shown that languages organize segmental material into prosodic domains, which are identified on the basis of the application of phonological processes (e.g., Nespor & Vogel 1986). Across languages, stress is computed in the phonological word (PWd) and realized in the foot (Ft). English has this profile: $[(_ˌævə)_{Ft}(ˈkɑː)_{Ft}doʊ]_{PWd}$ 'avocado' (Liberman & Prince 1977; Hayes 1995). In contrast, in French, including Québec French (QF), the variety on which we focus, the existence of the foot is disputed, given that the only obligatory position of prominence is at the right edge of a higher prosodic domain, the phonological phrase (PPh), regardless of how many lexical words it contains: $[lə mɔvɛz avɔˈka]_{PPh}$ *le mauvais avocat* 'the bad avocado' (Dell 1984; Thibault & Ouellet 1996; Jun & Fougeron 2000).

However, examination of the patterns of a variable segmental process, namely high vowel deletion (HVD), suggests the existence of iterative iambic footing in QF: HVD is preferred in even-numbered syllables from the right edge of the word, i.e., in dependent positions within weight-insensitive iambic feet (Garcia, Goad and Guzzo, to appear; see also Verluyten 1982, cf. Cedergren 1986).

English-speaking learners of QF thus need to understand that HVD is conditioned by foot structure, even though footing is not signalled through stress on the surface. In addition, English-speaking learners need to adjust their L1 foot structure (iterative weight-sensitive trochees, with extrametricality in nouns) to the L2 foot structure (iterative weight-insensitive iambs). Because the typical signatures for footing are absent in QF and because HVD applies variably, we hypothesize that learners will not understand the prosodic constraints that govern HVD.

To test this hypothesis, we conducted a judgement task in which participants (n = 10 English-speaking learners, intermediate proficiency; n = 10 native speakers of QF) rated how natural 3-6 syllables words sounded on a 5-point scale when pronounced with deletion or non-deletion of [i] in various non-final positions within the word (n = 275 stimuli, plus fillers). Target words had no schwas, and the target vowels never followed branching onsets or preceded codas.

The data were modelled with a hierarchical ordinal regression, with by-speaker and by-item random intercepts. The results show that, overall, non-deletion is preferred over deletion ($\hat{\beta}$=1.55, p=0.00001). Learners' preferences mirror those of native speakers ($\hat{\beta}$=-0.11, p=0.85), which contradicts our hypothesis. For both groups, HVD is preferred in even-numbered syllables from the right edge ($\hat{\beta} = 0.29$, $p = 0.01$); in addition, while syllables 2 and 4 are equally preferred, syllables 3 and 5 are equally dispreferred. Learners thus understand that QF builds iterative iambic feet from the right word edge, and that HVD is preferred in foot-dependent positions.

Both groups of speakers disprefer HVD when the resulting consonantal cluster mirrors a well-formed branching onset in QF ($\hat{\beta}$=-0.72, p=0.0002). This means that HVD in items such as [supØre] (from *supirer* 'to sigh'; [pr] is a well-formed onset cluster) is dispreferred relative to HVD in items such as [rɔbØnɛ] (from *robinet* 'faucet'; *[bn] is an ill-formed onset cluster). This shows that learners are sensitive to the need for inputs to be recoverable in the same way that native speakers are: [rɔbØnɛ] can only be reconstructed as /rɔ.bV.nɛ/, whereas [supØre] can be reconstructed as /su.pre/ or /su.pV.re/. This result also indicates that syllabification and therefore footing remain intact after vowel deletion, for both groups of participants.

In summary, our results show that learners can acquire variable processes in an L2, even when the structure that underlies them is not reliably signalled in output strings. Further, in the case under study, transfer is not a likely source for learners' target-like behaviour, given that English and French have distinct prominence systems.

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