

Listener-Driven Sound Change in Exemplar Theory

This paper derives innovations in Late Common Slavic (LCS) *i and *u in Exemplar Theory (ET). In the context of labials, high vowels can assimilate, e.g. *životъ 'life' > S&E Bulgarian [ʒivòt] (Alexander & Zhobov 2016, c.f. Standard Bulgarian [ʒivòt] 'life') and dissimilate, e.g. Polabian *lupiti 'to skin' > *lipikē > [laipaike] (Polański & Sehnert 1967, c.f. Polish [wupite]). Following Ohala (1989) and Dimov et al. (2012), Burns (2022) attributes the divergent outcomes in the same context to differences in listener attentiveness: listeners who fail to notice co-articulation exhibit assimilation (S&E Bulgarian) but those who are overly sensitive exhibit dissimilation (Polabian). Although Burns' (2022) Harmonic Grammar (HG, Flemming 2001, Burns 2021) derives vowel movement, her model does not capture phonemic reassignment.

I combine Burns' (2022) HG model of listener-driven sound change with ET (Pierrehumbert 2001) to test how listener attentiveness relates to phoneme reassignment. I demonstrate that while distinct allophones can develop in cases where speaker-listener expectations of co-articulation are matched, misalignment in speaker-listener expectations are more likely to result in categorical change. As in Burns (2022), the speaker's HG constraints are always the same to demonstrate the effects of listener attentiveness. Speakers have a weight of 1 for Ident-V and a weight of 2 for Labialize(F2), which enforces labial co-articulation.

Four different communities were created according to the input specifications in (2).

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| (2) | S&E Bulgarian | /i/: {[i]: 3500 hz, [ip]: 3500 hz} and /u/: {[u]: 800 hz} |
| | Standard Bulgarian | /i/: {[i]: 3500 hz, [ip]: 3500 hz} and /u/: {[u]: 800 hz} |
| | Polabian | /i/: {[i]: 3500 hz} and /u/: {[u]: 800 hz, [up]: 800 hz} |
| | Polish | /i/: {[i]: 3500 hz} and /u/: {[u]: 800 hz, [up]: 800 hz} |

Following Pierrehumbert (2001), each phonetic target was seeded by a single token and more tokens were built over 10,000 trials. In each trial, a speaker would first select a random exemplar and build a novel production target. If the vowel is contextually labial, the HG adds co-articulation.

The listener then receives the signal and removes production effects including using the HG to remove labialization. Communities differ in terms of their expectations of co-articulation. In the Standard Bulgarian and Polish models, listeners correctly assume the degree of labialization (weight = 2). However, listeners in the S&E Bulgarian model underestimate the degree of labialization (weight=1) and listeners in the Polabian model overestimate the degree of labialization (weight=4). After filtering the signal, the listener classifies the new token as an exemplar of either /i/ or /u/.

The simulations show that while allophones develop when speaker-listener expectations align (as in Standard Bulgarian and Polish), these allophones lie close to their non-labialized counterparts and fail to undergo reclassification (i.e. Standard Bulgarian [ip] is always /i/ and Polish [up] is always /u/). When speaker-listener expectations do not align, the allophones often undergo re-classification. In the case of S&E Bulgarian, [ip] is initially classified as /i/ but shifts away from its non-labialized counterparts and is eventually recategorized as /u/. A similar outcome is observed in Polabian. Initially [up] is classified as /u/, but shifts away from the non-labialized counterparts and is eventually recategorized as /i/. The outcome of these models supports the view that listener errors contribute to changes in both production and phonemic categorization.

References

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