

Does coarticulation play a role at the end of a sound change? A real-time acoustic-phonetic study of historical Polish *l*-vocalisation

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Several theoretical works have linked the origins of many segmental changes to coarticulatory patterns, whereby articulatory overlap between adjacent sounds introduces systematic acoustic variation into the speech signal (Ohala 1993, Garrett & Johnson 2023). The key empirical expectation of these models is that *real-time* data (Labov 1994) should reveal an early concentration of the change in specific promoting contexts, followed by its gradual spread and levelling across initially non-promoting contexts. This pattern has indeed been observed in changes at their early stage, such as *l*-darkening in Glaswegian English (Macdonald & Stuart-Smith 2024). The current study presents real-time acoustic-dynamic evidence that, at its very late stage and across different sociolinguistic contexts, a similar change appears to no longer be guided by coarticulatory factors.

We investigate the completion of [l] > [w] shift in Polish, which began in the 16th century (Klemensiewicz 1980) and whose final stronghold was in normative speech employing the so-called “stage [l]” (Kochański *et al.* 1969), at a time when [w] had already dominated spontaneous Polish for several decades (Dłuska 1950). Drawing on a 150,000-token dataset encompassing 20 speakers from the official newsreels of the Polish People’s Republic (PKF), we examined /l/ perceptually coded as [l], [L], or [w] in three syllabic positions: postconsonantal onset (CV), intervocalic onset (VCV), and postvocalic coda (VC), across three diachronic periods (1944–1959, 1960–1979, and 1980–1994). We transcribed as [L] an acoustically intermediate, labialised variant between [l] and [w], characterised by reduced apical contact (Benni 1917). F2–F1 trajectories were measured as a proxy for acoustic “darkness” (Sproat & Fujimura 1993) and modelled using Generalised Additive Mixed Models (e.g. Macdonald & Stuart-Smith 2024, Kirkham *et al.* 2019) as a function of time, perceptual classification, preceding and following segmental context, lexical stress, sequence duration, and lexical frequency, with random effects for lemma and speaker.

The GAMM results reveal a diachronic shift from the [l, L, w] system to [w] via a reduced [L, w] system, with positional asymmetries: as expected, the change progressed fastest in VC position, was intermediate in VCV, and slowest in CV position (e.g. Recasens 2012). Across all positions, darker variants were more likely to occur adjacent to /ɔ, u/ and to labial or velar consonants. Crucially, these coarticulatory effects remained stable over time. This extends the predictions of widely discussed early-stage sound change models, which anticipate strong contextual effects at the onset of change that subsequently weaken as the innovation spreads to other environments.

Instead, our findings underscore the importance of extra-linguistic dynamics, notably the decline of a long-standing prestige [l]-pronunciation norm across three aforementioned diachronic periods. The velarised lateral continued to be explicitly taught in diction manuals and in acting schools until the late 1960s (Kochański *et al.* 1969), yet within roughly two decades its social meaning in Polish had shifted to “unnatural” and “exotic” (Świdziński 1988). These re-evaluations coincided with the end of the ‘mature’ political phase of the Polish People’s Republic (Dudek 1997) and the onset of the major socio-cultural transformations of the 1980s, which destabilised established cultural hierarchies and facilitated the abandonment of an outdated stage pronunciation norm (Nowakowski 1997).

Ultimately, the vocalisation of *l* in our data appears to mirror with striking precision the timeline of changes in the narrative line of propaganda under the Polish communist regime (Kowalska 2022, Hendrykowski 2018).