

Diachronic evidence for phonological reanalysis in New Zealand English [u]-fronting  
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[u]-fronting has been observed in several dialects of English (Hall-Lew 2011, Hughes et al. 2013, Hay et al. 2006). This phenomenon is often attributed to co-articulation with preceding coronals (Hall-Lew 2011), and with [j] in particular (Harrington et al. 2008). In this paper, we present new evidence on the phonological motivations of [u]-fronting from large-scale vowel extraction of the Origins of New Zealand English (ONZE) corpora (Gordon et al. 2007). We claim that for New Zealand English, the diachronic trajectory of [u] fronting indicates a shift from phonetic [j]-coarticulation to phonological reanalysis of the [u] vowel.

Phonetically-driven and phonologically-motivated sound changes may have similar outcomes, but are predicted to follow different trajectories (Fruehwald 2013). In a sound change driven by undercompensation for phonetic co-articulation, the two variants of a phoneme in different phonological contexts (e.g., [u] and post-[j] [u]) should have parallel diachronic trajectories: both realizations come from a single phonological target, but one is altered by a constant coarticulatory effect.

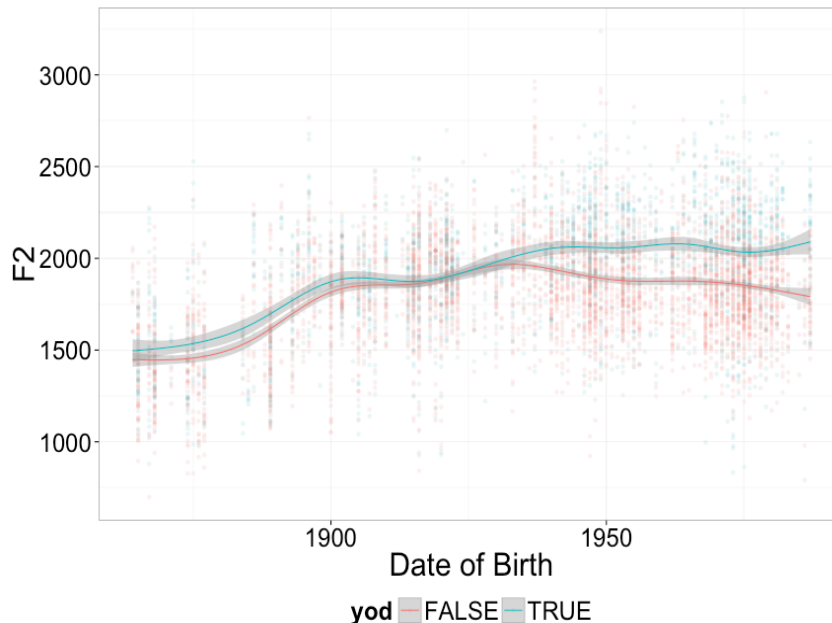
Conversely, in a change caused by phonological reanalysis (e.g., a rule such as [u → y / j \_\_]), the two contextual variants are likely to diverge over time, because the two realizations originate from two different phonological targets (e.g., /ay/ raising in Philadelphia, Fruehwald 2012). That is, for /u/ following a /j/, the phonology passes a [y] to the phonetic system, while for any other /u/ the phonology passes a [u] to the phonetic system.

To evaluate the time-course of [u]-fronting in New Zealand English, we extracted speaker-normalized formant measurements for [u] from content words in the ONZE corpora using the FAVE toolkit (Rosenfelder et al. 2012). Tokens preceding /l/ and nasals were excluded. Outliers were excluded on the basis of per-speaker formant distributions, vowel duration, speech rate, and formant bandwidth; this left about 6500 tokens from over 450 speakers born between 1860 and 1980.

The rates of change for [u] and post-[j] [u] were found to be parallel for speakers born before the 1940s, but rapidly diverged beginning with speakers born around the 1940s (Figure 1). A maximal mixed-effects model of F2 values confirmed a significant interaction between the two parameters of [u] context and year of birth. Duration and speech rate control variables did not account for this effect, nor did interaction parameters between these and context.

We argue that this data shows a transition from a phonetically-driven to a phonologically-motivated change in the 1940s. Before this point, [u]-fronting was driven by coarticulation with preceding [j]. Beginning in the 1940s, post-[j] [u] was reanalyzed as a distinct phonological target. The trajectories of the two variants support a model of sudden rather than incremental phonological reanalysis (Janda and Joseph 2003).

**Figure 1:** F2 of [u] by presence or absence of [j]



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