

Simulating hypothetical language stages: A new method for testing hypotheses in diachronic linguistics

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This paper presents a systematic method for testing hypotheses about phonological changes and their potential interdependencies in diachronic linguistics. Specifically, we are creating hypothetical language stages, whereby we are simulating the effects of changes which created sub-optimal linguistic outputs regarding universal or language specific constraints on corpus data. In a next step, this hypothetical language stage is compared to the actually attested language in order to identify potential therapeutic responses to such changes. In particular, we operationalise suboptimality and compare estimated suboptimality scores in both stages in order to detect statistically significant improvements.

We demonstrate our method exemplarily by illustrating the influence of Middle English schwa loss on the domain of word-final consonant cluster phonotactics. Schwa loss produced a multitude of clusters in final position, which is problematic (or suboptimal) in two respects: (a) coda-clusters are dispreferred in terms of articulation and perception (cf e.g. Maddieson 2013, Clements & Keyser 1983), and (b) formerly distinct sequences merged into one single cluster, which created ambiguities in the phonotactic representation of morphological word structures (1).

- (1) Lexical /ndə/ → /nd/: honde ‘hand’ /hɔndə/ → /hɔnd/
 Past tense/participle /nəd(ə)/ → /nd/: brenede ‘burnt’ /brɛnnədə/ → /brɛnd/

Coda clusters might be tolerated, however, if they fulfil morphological signalling functions, such as /md/ in *seemed*, which occurs exclusively in complex forms (Dressler & Dziubalska-Kořaczyk 2006). To increase the signalling function of ambiguous clusters such as /nd/ in (1), they propose that clusters spanning a morpheme boundary will behave differently from morpheme-internal ones in diachronic developments. Considering the examples in (1) we would expect selective repair processes either in (a) complex items to increase their signalling function, or (b) lexical items (e.g. deletion of final consonants).

To test whether these hypothetical repair processes have actually been effected, we conducted a study using the Penn-Helsinki Parsed Corpora of Middle and Early Modern English (Kroch et al. 2000, 2004). We applied our method to monosyllabic¹ items ending in sequences of sonorant + dental stop, including schwas in final or syllable-internal position (e.g. /nd/, /lɛd/, /rtə/) (Table 1).

Table 1: Comparing hypothetical to actual language stages.

| Item as spelt in corpus | Hypothetical stage (simulation of schwa loss) | Actual stage | Potential repair process |
|-------------------------------|--|--------------|--------------------------|
| <i>wilde</i> ‘wild’ | /wi:ld/ | /wi:ld/ | - |
| <i>dwellidde</i> ‘dwell.PAST’ | /dwɛld/ | /dwɛlt/ | Final devoicing |
| <i>lɛrned</i> ‘learn.PAST’ | /lɛrnd/ | /lɛrnt/ | Final devoicing |
| <i>honde</i> ‘hand’ | /hɔnd/ | /hɔnd/ | - |

¹ Monosyllabic after schwa loss.

The results show that for most clusters, the actual language stage is significantly less ambiguous than the hypothetical stage after schwa loss (confidence-interval comparison of estimated ϕ - coefficients). Morphologically complex past tense and participle items in the actual language stage were significantly stronger effected by final devoicing than lexical items, which resulted in a higher signalling function for these items. Final devoicing of /d/ 1 /t/ might therefore represent a therapeutic repair process, in that it established a new form-function correlation: final sonorant + /t/ sequences signal complexity, while final sonorant + /d/ sequences signal lexicality. The results therefore not only corroborate our hypotheses but also prove the successful implementation of our theory.

References

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