

**‘/t,d/ Deletion’: Articulatory Gradience in Variable Phonology**  
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‘/t,d/ Deletion’, the perceived deletion of word-final coronal stops in consonant clusters, is one of the most studied phenomena in variable phonology, first recognized by Labov and Cohen (1967). Traditionally, research on /t,d/ Deletion has tended to take for granted that the process exists as categorical deletion, but until now there has been no articulatory evidence that such a phenomenon exists. Indeed, Browman and Goldstein (1990) have long suspected that deletion cannot exist as a categorical process, and there is a debate in current literature about the factors and processes involved (e.g. Fruehwald, (2012); Tamminga, 2014). Our study draws on Electromagnetic Articulography data from the ESPF DoubleTalk corpus (Geng et al., 2013; Scobbie et al., 2013), to explore the articulation of such word-final stops in Southern British and Scottish English. In order to analyze tongue tip movement attributable to coronal stops, we have isolated those contexts where the preceding and following segments are [-coronal]. A total of 289 usable tokens that adhere to these restrictions can be found in the DoubleTalk corpus: 110 monomorphemes (e.g., *soft*), 159 simple past forms (e.g., *picked*), and 20 semiweak past forms (e.g., *kept*).

In our data, we identified tongue tip tangential velocity minima on either side of a supposed /t/ or /d/ segment, and interpreted these as reflexes of preceding and following segmental targets. We then measured the tongue tip height at a tangential velocity minimum (the /t/ or /d/ target) between these targets. In the two cases where no /t/ or /d/ target tangential velocity minimum could be found, spectrographic cues were used to estimate its location.

Our evidence shows that categorical deletion does exist, but it is extremely rare (9 tokens of 289, 3%) and is not exhibited by all speakers. Figure 1 shows one such example of categorical deletion, where the tongue tip is lowered at the point a coronal stop is expected.

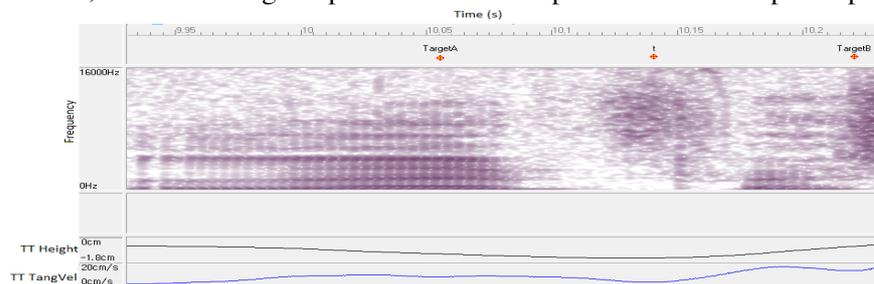


Fig 1: “Lived with” [lɪvɪwɪθ]. Tongue tip height (black) and tangential (blue).

There are also 25 examples of residual tongue tip raising in contexts where there is no audible /t/ or /d/. These cases are often overlapped by the movements of other articulators, and some just involve undershoot of the tongue tip movement, cf. Temple (2009). Figure 2 shows an example where a tongue tip raising movement is masked at its onset by labial movement, at its release by a dorsal closure.

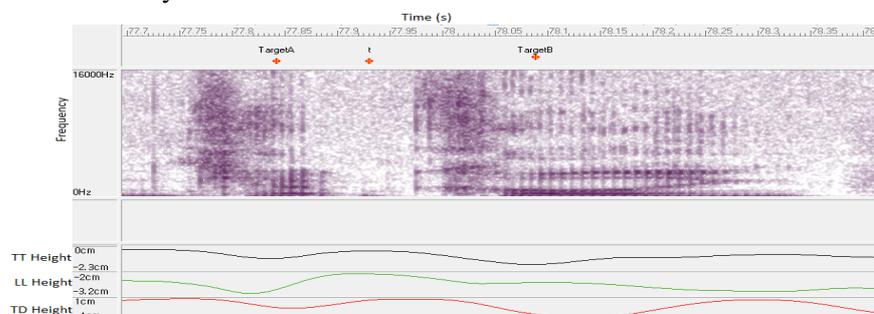


Fig 2: “kept calling” [kɛpˈkɔlɪŋ]. Tongue tip height (black), lower lip height (green) and tongue dorsum height (red).

There is a large body of work devoted to explaining a perceived effect of morphological class whereby monomorphemic words (e.g., *mist*) undergo the most deletion, and simple past forms (e.g., *missed*) undergo the least, with semiweak forms (e.g., *kept*) patterning between the two (e.g. Guy & Boyd, 1990). The few categorical deletion cases in our study do not support this analysis (see also Tagliamonte & Temple 2005, who suggest that this pattern does not exist for categorical ‘t,d/ Deletion’ in British English). However, four of five Southern British English speakers show lower average tongue tip height for monomorphemes (2-4mm differences). Figure 3 shows pooled results for all speakers in each dialect group.

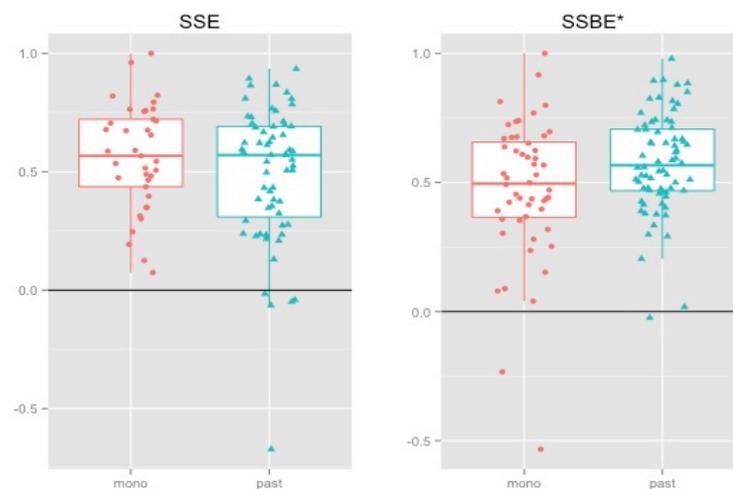


Fig 3: Scottish (left) and Southern British (right) English speakers' normalized tongue tip heights in monomorphemes and simple past forms.

We provide full descriptive results from the DoubleTalk corpus for these effects.

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