Subsegmental interactions between affrication and devoicing in Québec French

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The present paper proposes an analytical framework for the interaction of affrication in Québec French (QF) with two separate and often incomplete processes of devoicing, namely, obstruent devoicing (OBD) and high vowel devoicing (HVD). Given that these phenomena frequently generate both contour segments and partial assimilations, I propose that the combination of Agreement by Correspondence Theory and Q Theory ('ABC+Q', Inkelas & Shih 2016) provides a particularly apt model, as it is able to operationalize subsegments within an optimality theoretic framework. This paper also serves to account for previously unexplained data and expands the literature on featural processes within ABC+Q Theory, which is more frequently used for tone.

Affrication in QF is the process by which /t, d/ canonically become [t^s, d^z] before /i, y/ (e.g., Dumas 1987). These sequences, however, demonstrate a high degree of variation in their voicing. Bento (1998) notes that the fricative-like release of /di, dy/ is frequently realized as voiceless, especially among women. To a lesser degree, the stop portion may be partially or entirely devoiced as well, something whose formal motivation remains, to my knowledge, heretofore unexplored.

Meanwhile, variationist studies show that preceding fricatives and affricates are among the more significant contexts triggering the separate process of HVD in QF, independent of their underlying voicing (Cedergren & Simoneau 1985, Bayles 2016). This process is noted to be incomplete at times (Gendron 1966, Oullet et al. 1999) and demonstrates a preference to target /i/ over /y/ (Gendron 1966, Martin 2004). The interaction of affrication as a process with high vowel devoicing, with or without consideration of OBD, is little explored in the literature, if at all. An informal inquiry shows that partial vowel devoicing occurs more often than not with affrication of /ti/ sequences, and slightly less so in /di/. A more complete investigation of corpus data (Blondeau et al. 2012) and expanded experimental data is currently underway.

Q Theory (e.g., Shih & Inkelas 2014) can account for these various permutations with a relatively small amount of special machinery. In this theory, what are traditionally called segments (Q) are in fact composed of maximally 3 subsegments (q) which may be heterogenous. Paired with ABC Theory (e.g., Walker 2000), these representations can be implemented in an OT framework. CORR constraints reference various similarity conditions, motivating co-indexation, while ID-qq constraints penalize co-indexed subsegments mismatching for a given feature. In my analysis, I propose two separate, phonetically-motivated similarity conditions: first, [TURB], the resemblance between the turbulence of coronal stop release into a high vowel, on one hand, and fricatives, on the other (e.g., Kim 2001), to motivate affrication, e.g., C(t t s_i)V(i_i i i). Second, [F.VOI] captures the affinity of fricatives with voicelessness due to competing aerodynamic requirements of turbulent noise production and voicing (Stevens 1971), e.g., C(t t $s_{i,j}$)V($i_{i,j}$ i i).

OBD might explained by this same principle, via a "snowball effect" of fricative release, conditioned by the high vowel, leading to an iterative spreading of voicelessness. It is currently being tested, however, whether HVD necessarily accompanies OBD. If not, a more general markedness constraint may have to be used, as the intermediate (z) subsegment cannot co-index itself. If yes, then the derivational chain is effectively the following: (1) assibiliation of C(d d d) to C(d d z) due to [TURB], (2) high vowel devoicing (partial or total) due to [F.VOI], and (3) obstruent devoicing (partial or total, i.e., C(d t s) or C(t t s), respectively) due to a more general similarity condition of adjacent subsegment voicing. Once the variation in the interaction of these phenomena can be quantified, the separation of these conditions will allow us to model the optionality and granularity of HVD and OBD in weighted grammars.

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