Social and linguistic correlates of assibilation and affrication of coronal plosives in a corpus of urban youth vernacular

In French, the release of coronal plosives followed by high front vowels presents the acoustic phonetic characteristics of a "noisy fricative release" [1]. While the phonetic motivations of this phenomenon – turbulent airflow released through the relatively narrow channel of the following high vowel – are quite clear, the phonological status and acoustic phonetic properties of the consonants depends on the variety of the language.

In Canadian French, coronal plosives have been shown to participate in clear allophonic distinctions: /t/ and /d/ are assibilated into /ts/ and /dz/, respectively, when followed by high front vowels /i/ and /y/ [1] [2], such as in *petit* 'small' /pətsi/, tu 'you' /tsy/, dix 'ten' /dzis/, and durer 'to last' /dzyke/. Reports of Metropolitan varieties, on the other hand, seem to point to more retracted realizations, typically perceived as affrication. Several corpus studies concluded, for instance, that "plosives may indeed take an affricated release" [1]. Affricated voiceless plosives have also been attested in journalistic speech styles [3]. Previous work in sociophonetics found affricated releases of /t/, /d/ followed by high front vowels to be emblematic of multiethnic urban youth speech styles. Since the early 2000s, palatalization and affrication, in particular, have also been linked to youth speech styles [4] in large urban areas of France, among them Paris [5] and Marseille [6]. And yet, neither the perceptual salience [7], nor the spread of affrication of plosives in Metropolitan French has been confirmed in large corpora collected in fieldwork settings. At most, plosive releases accompanied by strong friction noise have been considered characteristic of "an individual speaker with a tight and tense speech style" [1] and "depend on the speakers and situations" [7]. This study seeks to examine the discrepancy behind some of these findings by identifying both the social and linguistic correlates of coronal plosive releases in a corpus of urban youth vernacular.

Over eight hundred voiceless (/t/) and voiced alveolar plosives (/d/) before two high vowels (/i/ and /y/) have been extracted from three male and three female speakers in the open-access Multicultural Paris French (MPF) corpus [8], a repository of unconstrained conversations between 34 male and female teens between 13 and 17 years of age. The speakers were recorded in conversational settings in a suburb (*banlieue*) of Paris.

Speakers were split into groups according to their biological gender and reported cultural and linguistic background. Following previous comparative investigations of the MPF corpus [9], cultural background has been operationalized as 'multicultural' (MC) of immigrant descent and 'Franco-dominant' (FD) of non-immigrant descent [10]. In addition to linguistic factors, such as type of consonant, following vowel, and prosodic position (word-initial or word-medial), each word containing coronal plosives was also tagged for its degree of novelty (new vs. old information) in the immediate discourse context. Each token was segmented and transcribed using spectrograms in Praat [10] by one of the authors. Ten percent of the tokens, chosen randomly, have also been analyzed by an external expert with over 90% inter-coder reliability. To distinguish between acoustic realizations, VOT was used to measure the length of the release phase, while CoG (Center of Gravity, or Spectral Mean) was used to estimate the degree of frontedness (more or less assibilated vs. affricated) of the consonant [11] [12]. Spectrograms and audio in Praat were used for joint acoustic and perceptual analyses. It was hypothesized that longer VOTs and lower CoGs would strongly correlate with – and be perceived as – more retracted (affricated) realizations.

The first results of descriptive statistical analyses suggest that the realizations of the coronal plosives analyzed in this study should be placed on a continuum from more or less fronted (perceived as assibilated) to more or less retracted (perceived as affricated) releases. Although the clarity of VOT and CoG measures depended, to a large extent, on the identity of the speakers, all speakers' speech showed a wide variety of realizations. To the best of our

knowledge, this type of variability has not yet been reported for Parisian French. Retracted (affricated) realizations of plosives occurred in larger numbers in the speech of MC male and MC female speakers than in FD speakers in general, but a more precise acoustic analysis of these releases remains necessary. There was a gender split in realizations of the voiced affricated palato-alveolar /d/: regardless of their cultural backgrounds, female speakers in both groups (MC and FD) tended to use fewer affricated realizations of plosives than their male peers. In each gender group, however, assibilated releases could also be found (Figure 1, see supplemental file). While voiceless plosives in word-initial position were more frequent across all phonetic contexts, when more retracted (affricated) realizations of plosives occurred word-medially, they tended to be particularly strong and salient (Figure 2, see supplemental file). New information in direct addresses to the hearer, especially in the context of a direct address in tu (informal 'you'), tended to correlate with longer, and perceptually more salient, releases. Inferential statistical tests are expected to support the validity of these first findings and should also further ascertain the role of pragmatic factors. In this initial phase of the study, it appears that there is indeed some degree of grammaticalization of plosive realizations in this contemporary variety of Metropolitan French.

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