The part of phonetic reduction in the expression of social distance

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In this work we consider hypoarticulation as a way to convey social distance in human relationships. We will demonstrate that phonetic reduction of vowels in casual speech is a social marker of closeness between people.

Intra-speaker linguistic variations, such as stylistic alternations, are known to reveal and convey the social characteristics of the interaction situation. Work by Léon (1993), and Labov (1972, 2006), among others, demonstrated this by observing some phonetic cues of the speech production, such as breathiness in the charming voice of Brigitte Bardot or diphthong realizations in "the lower middle class crossover effect". Thus, the variation in vowel realization can index social information on the speaker, but can they convey information on the listener ?

This stylistic alternation is guided by different aspects of the communication situation, such as the identity of the interlocutor and the nature of the relationship between individuals (Labov, 1972; Eskenazi, 1993). Scarborough et al. (2007, 2013), for the most recent, showed that the physical presence of the listener, his mother tongue, or his hearing impairment do influence the acoustic quality of vowels and the degree of hypoarticulation (Lindblom, 1990). In other word, one's listener's identity can constraint the degree of speech reduction.

We here propose a socio-phonetic examination of the link between the social distance between two speakers and the degree of hypoarticulation (Lindblom, 1990).

To investigate the interaction between social distance and vowel reduction, we ran a data-driven experimentation. We selected a subpart of the PFC-Québec corpus (Côté, 2014; Durand et al. 2002), which involved 21 native speakers of Quebec French : 6♂ and 15♀, ranging from 20 years old to 60+ years old. In that subcorpus we selected 3 of the 4 tasks done by every speaker : the first task was to read aloud a list of words, the second task was a 20 minutes conversation with an unknown researcher (mostly female students), and the third and last task was a 20 minutes conversation with a family member (mostly brother or sister dyads).

Among those 7 hours of conversations and 21 read lists, we manually annotated and automatically extracted the F1, F2 (Bark) and duration (s) of 18 345 tokens of oral vowels /i,e,ɛ,a,ɔ,o,u/ in 1st and 2nd open syllable of bisyllabic words.

F1 and F2 measures allowed us to compute 1) the distance of each token from the centroid of the vowel system, 2) the distance of each token from the centroid of the vowel category, 3) the compacity (distance between F1 and F2) of each token. Those 3 measures and each vowel duration allowed us to portray vowels' hypoarticulation in each 3 styles.

Mixed models combined to Tuckey HSD posthoc tests allowed us to observe more reduction in conversation than in red speech, moreover vowels were also more reduced when speech was directed to a family member then when it was directed to a stranger.

In family interactions vowels were closer to the centroid of the system, vowel category were less scattered, compact vowels where more diffused and diffused vowels were more compact, eventually vowels were shorter ($p<0.01$).

All these observations allow us to conclude that speech is more hypoarticulated when speakers interact with family members then when they interact with strangers. Moreover the lists reading allowed us to replicate the results of Harmegnies and Poch-Olivé (1992,1994) on French vowel reduction in conversational speech (vs. read speech).

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