

Acoustic speaker characteristics of fricative /x/ in standard Dutch

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This study aims to investigate within- and between-speaker variation in acoustic features of the fricative /x/ in standard Dutch. More specifically, we want to answer the following question: In standard Dutch, which acoustic features are characteristic of speakers?

Fricative phoneme /x/ has a varying place of articulation in standard Dutch, ranging from velar [x] to uvular [χ], which is claimed to vary idiolectally [3]. Moreover, when place of articulation is uvular, the fricative may be produced with “scrape”, i.e. uvular trill [1]. In standard Dutch in the Netherlands, place of articulation and scrape show regional differences [1]. Place of articulation is (palato-)velar in southern regions, uvular in the linguistic core (Randstad) and northern regions, and mixed in transitional regions. Scrape occurs in over 72.5% of fricatives in the linguistic core and northern regions, in 45% of fricatives in transitional regions, and in 5% of fricatives in southern regions. The auditory findings for place of articulation [1] have been confirmed acoustically [2]. To our knowledge, no acoustic reports on scrape in /x/ are currently available.

The present study has extracted 3,492 /x/ fricatives from 58 male speakers (aged 18-50) from spontaneous telephone conversations in the Spoken Dutch Corpus [4]. Speakers were all reported to have standard Dutch as their first, home, and work language. However, speakers came from different regions in the Netherlands. Several spectral and temporal features were extracted for each fricative.

Preliminary results indicate that speakers can be discriminated with 12.9% accuracy using spectral and temporal features. Spectral slope, followed by spectral standard deviation and centre of gravity, are the best-performing speaker discriminants.

In the work presented here, results are extended by including a new feature for the presence of scrape in /x/. Within- and between-speaker variation will be more closely examined, also in relation to regional differences.

References

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