Realization and representation of plosives in Jutlandic varieties of Danish: Variation in phonetics predicts variation in phonology

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The Danish speech community today is probably one of the most radically homogenous in the world, but before the 1960s, the majority of the speech community consisted of dialect speakers (Kristiansen 2003) and variation abounded at every major linguistic level of description. Much of the variation has been covered in dialect descriptions and overviews from the 20th century (see Hovdhaugen et al. 2000), but the bulk of this work is theoretically dated, and makes only passing mention to e.g. subphonemic variability.

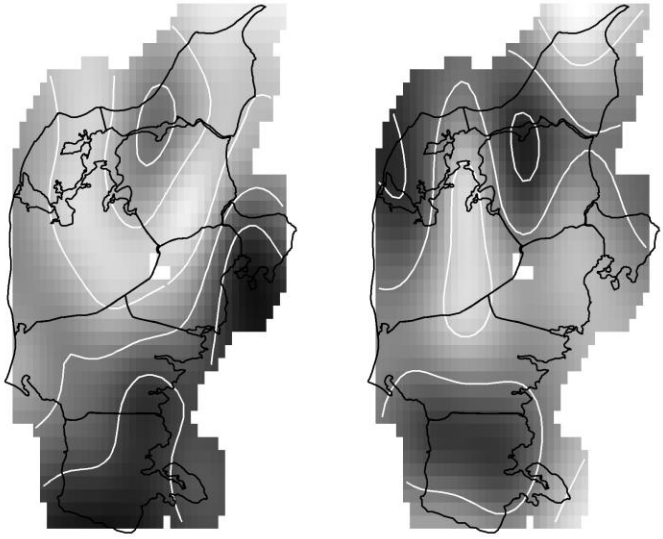
The large-scale dialect leveling that has taken place has to a large extent been government-sponsored (by e.g. being enforced in schools), and little effort has been made to revitalize the dialects. However, great effort was made to record dialect speakers for posterity (Goldshtein & Puggaard 2019). During the period 1971-1976, sociolinguistic interviews were recorded with elderly speakers from 402 different (mostly rural) parishes. The recordings of Insular Danish have been used for lexicographic work (Gudiksen & Hovmark 2008), but until recently, the recordings of Jutlandic Danish had not been used for research.

There is overt regional variation in the phonetic implementation of the Danish aspirated alveolar stop /t/ - something the population is generally aware of, but which has received no treatment in the scientific literature. While Standard Danish has a highly affricated variant [t^{s}], Northern Jutlandic Danish has a shorter, purely aspirated variant [t^{h}]. In this paper, the received knowledge about this distinction is tested, and it is shown that in the traditional dialects of the Jutland peninsula, variation is 1) not limited to /t/ and 2) not limited to Northern Jutland. In fact, all aspirated stops show similar complex patterns of variation all across the Jutland peninsula. The similarities between different phonemes mirror recent findings showing that stops with the same laryngeal setting tend to covary across languages and individual speakers (Chodroff & Wilson 2018; Chodroff et al. 2019).

Using recordings from 213 parishes in the Jutland peninsula, we extracted values for voice onset time (VOT) and release center of gravity (COG) along with contextual phonetic information from a total of 17,504 stops. Fitting the data to generalized additive models using location (longitude × latitude) as a non-linear predictor shows regional variation for both voicing lag and affrication. The fitted values are mapped in Figures 1 and 2. The statistical analysis also shows that affrication is partially dependent on voicing lag, but is not predictable from voicing lag. Finally, systematic patterns are found connecting variation in simple onset position with reduction phenomena in unaspirated stops and allophone selection in other syllabic positions.

The realization of the fortis series of stops generally predicts variable patterns of allophone selection across both the fortis and lenis series. Dialects with long voicing lag often show alternations between lenis stops and voiceless fricatives (e.g. /b/ → [f], /g/ → [x]) in weak prosodic contexts, whereas dialects with shorter voicing lag often show alternations between lenis stops and voiced fricatives (/b d g/ → [v ð ɣ]). This suggests that voicing may be phonologically active in varieties without long voicing lag. Additionally, the extent of phonetic affrication in a dialect area partially predicts the likelihood of fortis stop spirantization, indicating that affrication is gradiently phonologically active. It follows that some varieties display laryngeal neutralization in weak prosodic contexts, and that this can be taken as a diagnostic for the phonological activation of voicing and affrication.

For this project, a large, understudied corpus of elderly dialect speakers has been used to investigate patterns of variation in the phonetic realization of stop consonants, and these patterns then serve as input to a phonological analysis of lenition and contrast. The data display interesting patterns of phonetic variation, which in turn is shown to predict phonological variation.



Figures 1 and 2. Figure 1 (left) maps fitted values for VOT by geographical location; darker shading indicate higher fitted values. Figure 2 (right) maps results of a similar model for COG, where darker shades indicate higher fitted COG values relative to VOT. Made using R (R Core Team 2019) and the add-on packages mgcv (Wood 2017) and mgcViz (Fasiolo et al. 2019).

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