Comparison of the vowel systems in three varieties of Swedish

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This paper focuses on the acoustic analysis of the vowel systems in three varieties of Swedish: Central Swedish (CS), Finland Swedish (FS) and Estonian Swedish (ES). While the vowels of the first two varieties have been subject to some earlier comparative studies (e.g. Kuronen 2000) those of ES have received virtually no attention except Ewald *et al*. (2017) who investigated cross-dialectal variation in the long close vowels in these varieties. The aim of this study is to compare the quality of both short and long vowels in the vowel space of these three varieties of Swedish.

Vowel tokens were extracted from isolated words produced by six elderly female speakers from each variety. As formants have been shown not to be static but to display vowel inherent spectral change over time (e.g. Nearey and Assmann 1986) trajectories of the first three formants were modelled with discrete cosine transform (DCT) coefficients (see Watson and Harrington (1999), Williams and Escudero (2014) for details of the method). Using several Praat scripts the formant frequencies were measured at 30 equidistant points over the central 60% of each vowel, enabling the comparison of the formant means as well as the direction and magnitude of the formant movement.

The results reveal a number of differences in the phonological inventory as well as phonetic realization of the vowels of the three varieties. For instance, one of the most striking features of the ES vowel inventory as compared to that of CS and FS is the lack of /y:/. On average, the vowels of CS exhibited a higher degree of formant movement (i.e. diphthongization) than the vowels in the other two varieties.

References

Ewald, O., Asu, E. L., Schötz, S. 2017. The formant dynamics of long close vowels in three varieties of Swedish, INTERSPEECH 2017, August 20–24, 2017, Stockholm, Sweden, 1412–1416.

Kuronen, M. 2000. Vokaluttalets akustik i sverigesvenska, finlandssvenska och finska, Doctoral dissertation, University of Jyväskylä, Jyväskylä, Finland.

Nearey, T. M., Assmann, P. F. 1986. Modeling the role of inherent spectral change in vowel identification, J. Acoust. Soc. Am., vol. 80, 1297–1308.

Watson, C. L., Harrington, J. 1999. Acoustic evidence for dynamic formant trajectories in Australian English vowels, J. Acoust. Soc. Am., vol. 106, 458–468.

Williams, D., Escudero, P. 2014. A cross-dialectal acoustic comparison of Northern and Southern British English vowels, J. Acoust. Soc. Am., vol. 136, 2751–2761.