Vowel pronunciation in Swedish dialects analyzed with RuG/L04

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RuG/L04 is a free software for dialectometrics and cartography developed at the University of Groningen (http://www.let.rug.nl/kleiweg/L04/). The software offers tools for visualizing dialect distances on maps based on stochastic clustering and multidimensional scaling, as well as vector and link maps showing the linguistic similarity between locations.

In this paper the RuG/L04 software is demonstrated using dialect data from the Swedia2000 data base (http://swedia.ling.gu.se/), which includes vowels elicited with mono- and bisyllabic words with vowels in a coronal context. In this study 19 vowels that cover the vowel space of Standard Swedish are used. 105 sites in Sweden and Swedish-language areas in Finland are included and each site is represented by 12 speakers (3 elderly women, 3 elderly men, 3 young men and 3 young women).

The vowel pronunciations are analyzed acoustically by means of principal component analysis of Bark filtered spectra, a method which shows high correlation with formant measurements but can be automated more reliably to a higher extent (Jacobi 2009).

Distances in vowel pronunciation between varieties are analyzed by means of cluster analysis and multidimensional scaling (Heeringa 2004). Results are visualized on choropleth maps.

Comparison of the older and the younger speaker group shows a significant ongoing dialect levelling. In peripheral parts of the language area where the older speakers speak very divergent dialects the younger speakers show strong convergence to standard Swedish. In some urban areas, on the other hand, the younger speakers seem to develop varieties that diverge from the standard language. These results are visualized on maps showing the degree of convergence to or divergence from standard Swedish per site.

Convergence and divergence between local dialects are shown on maps linking paris of sites that show the strongest tendencies towards convergence respectively divergence. These maps reveal regions where local dialects are becoming more similar, as well as areas where the dialects seem to develop further apart from each other.

References:

Heeringa W. (2004), Measuring Dialect Pronunciation Differences using Levenshtein Distance, PhD thesis, University of Groningen.
Jacobi I. (2009), On Variation and Change in Diphthongs and Long Vowels of Spoken Dutch, PhD thesis, University of Amsterdam.