Developing graphical methods in sociophonetics
outline of a research agenda
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Developing graphical methods in sociophonetics: outlines of a research agenda
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1. Watt & Fabricius S-centroid normalization
   • a vowel extrinsic, formant intrinsic centroid-based normalization algorithm (Watt & Fabricius 2002; Fabricius, Watt & Johnson 2009)
   • built into the NORM normalization and plotting suite (Thomas & Kendall 2007)
   • has been applied to a broad range of data from varieties of English and other languages (Kamata 2006, Winn et al. 2008, Methrie 2011, Bigham 2012, Simonet 2012)
   • further road-tests published and in progress (Clapper 2009, Flynn 2012)
   • centroid (S) of triangular vowel space is
     - F3, F2 of [i] = F1 of [i]
     - all original Hz values then expressed relative to S

2. S-centroid angle method
   • makes vowel space configurations more easily comparable across speakers
   • angles on F1-F2 plane relative to S
   • (S with co-ordinates 1,1) is common to all speakers in sample when using W&F (or modified W&F) method
   Advantage: unlike real vowels, S does not move over time because it is a product of the normalization algorithm
   • angles are positive above horizontal line, and run counterclockwise from 0° to 180°; negative and clockwise below it (0 to -180°)

3. S-centroid anchor method
   • documents interspeaker variation and change over time by measurements in degrees relative to a stable point, rather than eyeball judgments of relative vowel locations (measured in Fabricius 2007)
   • can be used in combination with Euclidean/Cartesian distances (as in Fabricius 2007, Richards, Haddock & Foulkes 2009)
   • quantification enables further statistical testing

Illustrated here with RP generational data from Hawkins & Midgley (2005), Moreiras (2006) (oldest and youngest age groups); template for spiderweb diagrams (see below) available from Anne Fabricius: fabri@ruc.dk

4. Future directions
   • can we use these methods to make a principled distinction between the Centre and Periphery of a vowel space (Labov 1994)?
   • what will be the value of adding angle measurements to the set of criteria used to gauge the efficacy of normalization algorithms?
   • how can angle measurements be adapted to deal with clouds of tokens rather than average points, as at present?
   • what statistical models are optimal for data of this kind?

References


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