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A new speaker-intrinsic vowel formant frequency normalization
algorithm for sociophonetics

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This paper evaluates the strengths and weaknesses of a speaker-intrinsic vowel formant frequency normalization algorithm initially proposed in Watt and Fabricius (2002) and modelled by Thomas and Kendall (2007) for direct comparison with other normalization algorithms. We evaluate the merits of the new routine as a sociophonetic research tool relative to those of two well-known speaker-intrinsic methods documented in Lobanov (1971) and Nearey (1977) through comparisons of the values of two parameters: degree of overlap of vowel spaces and vowel space area ratios. Measurements of angles and Euclidean distances between pairs of points in the vowel space (a method presented in Fabricius 2007) also provide a comparative parameter revealing how different algorithms model the vowel space.

The study uses two existing datasets: 1) a corpus of RP vowels compiled from Hawkins and Midgley (2005) and Moreiras (2006) and 2) previously unpublished data from Aberdeen, northeast Scotland.