

Distinguishing speakers using formant dynamics in read and spontaneous speech: a study of British English /u:/

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While research in speaker characteristics has traditionally focussed on 'static' properties of the speech signal (e.g. measurement of formant frequencies at a vowel's midpoint), more recent work has shown that dynamic (time-varying) features of speech carry important information about a speaker. An increasing number of studies have demonstrated speaker-distinguishing properties of formant frequency dynamics, including my own work on Australian English /aɪ/ and Standard Southern British English intervocalic /r/ sequences presented at previous IAFPA conferences and in the Association's journal (see McDougall 2004, 2006). However this research has largely been restricted to read speech and relatively small numbers of speakers. In the forensic domain, phoneticians are frequently required to compare speakers on recordings made under very different circumstances and involving different speaking styles, for example a telephone conversation and a police interview. It is therefore important that the effectiveness of formant-dynamic based techniques for characterising speakers is investigated for larger populations and across different speaking styles.

The DyViS database developed at Cambridge as part of the research project 'Dynamic Variability in Speech: A Forensic Phonetic Study of British English' (Nolan, McDougall, de Jong and Hudson 2006) provides an ideal resource for such an investigation. The database contains recordings of 100 male speakers of SSBE aged 18-25 undertaking tasks involving a range of speaking styles. The present paper presents a study of the formant dynamics of Standard Southern British English /u:/ produced by 20 speakers from the DyViS database. F1 and F2 contours of /u:/ in read sentences and semi-spontaneous conversations will be examined. Discriminant analysis will be used to compare the degree of individual variation exhibited by the formant dynamics of /u:/ under each speaking condition and to determine the extent to which speaker-specific information is preserved across conditions. Implications for forensic speaker identification/comparison will be discussed.

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References

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