Examining correlations between phonetic parameters: Implications for forensic speaker comparison

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The research presented in this paper builds upon a previous pilot study (Gold and Hughes 2012). This paper explores the correlation structure of speech parameters from a sociolinguistically homogeneous set of male speakers of Southern Standard British English using a series of segmental, suprasegmental and linguistic parameters. Data was extracted from a subset of speakers from the Dynamic Variability in Speech (DyViS) database (Nolan et al., 2009) and consist of: midpoint F1, F2 & F3 values for /a ɔ u/, midpoint F1, F2 & F3 values hesitation markers UM and UH, dynamic F1, F2 & F3 values for PRICE /aɪ/, long-term formant distributions (LTFD) F1- F4, mean and standard deviation of fundamental frequency (F0), mean articulation rate (AR), voice onset time (VOT) for word-initial /t/ and /k/, and click rate (ingressive velaric stops). The results of the study present a complex correlation structure between linguistic-phonetic variables, and not all correlations are predicted by phonetic theory. The results of the correlations are discussed in relation to implications that exist when combining parameters for forensic speaker comparison casework; specifically, the caution that needs to be yielded by experts in casework to avoid over- or under-estimating the strength of evidence.