The influence of telephonic bandpass filters on speaker recognition: high frequencies and Danish /t/

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This article is an investigation of how telephonic bandpass filters affect the speech signal with possible implications for forensic phonetics. The focus is on three different filters: (1) The filter used in landline connections; (2) the AMR filter, which is used in most cell phone connections, and which delivers a worse signal than landline connections if coverage is poor; (3) the VoLTE filter, which delivers the most modern signal and is used in newer smartphones. The article shows how variation in the pronunciation of Danish /t/ can be used to identify a specific speaker, e.g. in the context of forensic phonetics. Three different sources of /t/-variation are presented: dialectal variation, variation in the pronunciation of foreign languages, and idiolectal variation among speakers of Standard Danish. For all of these sources of variation, it is shown how telephonic bandpass filters affect the speech signal, and especially how landline and AMR filters erase much of the variation as these filters do not transmit particularly high frequencies. The parameters which a forensic phonetician would look at in a high-quality recording will often not be available in a recorded telephone conversation. The article thus suggests some other parameters in the speech signal that might be relevant when looking for variation in the production of /t/ in a telephone recording.