The Effect of Bilingualism on Filled Pauses and their Discriminatory Power

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Filled Pauses in Forensic Voice Comparison

This poster presents an ongoing study of the phonetic quality of filled pauses (FPs) in bilingual speakers and an evaluation of the effect of bilingualism on their discriminatory power. Recent research in forensic voice comparison has established FPs as useful acoustic-phonetic parameters with high discriminatory power in some British dialects (Daley, 2015; Foulkes, Carrol & Hughes, 2004; Hughes, Wood & Foulkes, 2016). The focus of previous work, however, whether in a forensic environment or more generally, has typically been on monolinguals, with few attempts to examine this issue in the bilingual context.

Existing literature provides contradictory predictions for the phonetic realisation of FPs in bilingual speakers when they speak different languages: individuals have been observed to consistently adopt an idiosyncratic variant of hesitation (Künzel, 1997), yet acoustic evidence confirms the systematic variation of vowel qualities in FPs across an array of languages, leading to suggestions that they are language-dependent (Vasilescu & Adda-Decker, 2007). Interaction between L1 and L2, or multiple L1s, expands the possibility beyond the dichotomy of *a* signature variant versus alternation along with language choice, a problem that needs to be addressed empirically.

Research Questions & Method

The current study presents a quantitative evaluation using German and French, two languages which tend to have clearly distinct realisations of FPs – an unrounded, more central variant [ə ~ ɐ] in German (Pätzold & Simpson, 1995), and a rounded, more front variant in French that is slightly more open than [œ] (Candea, Vasilescu & Adda-Decker, 2005). Specifically, it addresses the questions of (1) whether and how phonetic realisations of FPs differ when German-French bilinguals speak in German and French, and (2) whether and how phonetic realisations of FPs differ between German-French bilinguals speaking French and monolingual French speakers.

Formant dynamic data (F1-F3 "at +10% steps across the duration of each token") (Hughes, 2014; McDougall, 2004) and duration of FPs, both with and without a nasal portion, were extracted from German and French recordings of 14 female German-French simultaneous bilinguals from the HABLA corpus (Kupisch, 2011; Kupisch et al., 2012). Data distributions were compared between languages to investigate the effect of language on FP vowel quality in bilinguals. The French data were also compared to those extracted from 24 monolingual French speakers from the NCCFr corpus (Torreira, Adda-Decker & Ernestus, 2010), in order to examine the impact of bilingualism.

The practical implications of the above outcomes on forensic work are considered within the likelihood-ratio framework, by examining how the discriminatory power of FPs is affected when the state of mono-/bilingualism is varied in both the test and reference sets (Table 1). For each set of systems, likelihood ratios for all pairs of speaker comparison were computed using the MVKD formula (Aikten & Lucy, 2004) with a cross-validation procedure. Variation in EER and C_{llr} will be reported.

Table 1. Sets of systems for which the discriminatory power of FPs was assessed

System	*Test Data*	*Reference Data*
1	French monolinguals (NCCFr)	Mixed: NCCFr + HABLA
2	German-French bilinguals (HABLA, French data only)	
3		German-French bilinguals (HABLA, French data only)

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