An experimental acoustic study of dental and interdental non-sibilant fricatives in the speech of a single speaker[*]

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Dental and interdental non-sibilant fricatives are relatively rare in the languages of the world and are not known to contrast in any language. It is known that a dialect-specific difference appears to operate in English, with American English speakers favouring an interdental realisation and British English speakers a dental one. This study investigates possible motivations for the 'dialect-inappropriate' use of an interdental realisation in the speech of a native British English speaker. An experiment is conducted to see whether a dental realisation of /θ/ for this speaker would produce an unsatisfactory [θ], e.g. no frication, /s/-like frication etc. It is concluded that the dental realisation of /θ/ could function distinctively for this speaker, and that some other factor is responsible for the preferred interdental realisation. A further experiment is conducted to ascertain how frication is generated for dental and interdental fricatives for this speaker. As previously suggested by Shadle (1997), the lips do appear to function as obstacles for the generation of frication.

1   INTRODUCTION

The production of a fricative consonant involves a degree of constriction in the vocal tract which will, with an appropriate rate of airflow, generate turbulence. The International Phonetic Alphabet (IPA) provides more unitary symbols for fricative places of articulation than for any other manner of consonant. Among these are the symbols /θ/ and /ð/, defined as applying to a "voiceless dental fricative" and a "voiced dental fricative" respectively (IPA 1999: 177). Fricatives are traditionally cross-classified as 'sibilants' or 'non-sibilants'. The precise definition and use of these terms is disputed, as will be discussed at greater length below. For the present, it is sufficient to note that researchers agree in describing the dental fricatives /θ/ and /ð/ as non-sibilants.

The sounds /θ/ and /ð/ occur in most varieties of English, but are relatively uncommon cross-linguistically. The UPSID survey of 317 languages (Maddieson 1984) reports that /θ/ occurs in 18 languages (5.7% of the sample), and /ð/ in 21 (6.6% of the sample), with variants of /ð/ in a further two languages (23/317 = 7.3%). The dental place of articulation involves a constriction between tip (apex) or blade of the tongue and the upper incisors. However, it is clear that some variation exists in the way individual speakers (and dialects) of English produce /θ/ and /ð/. British English is said to prefer a dental realisation, whereas in American English an interdental pronunciation is more common (Ladefoged and Maddieson 1996: 143; Cruttenden 2001: 183-184). The interdental realisation involves contact / approximation between the blade of the tongue and the upper incisors and can be described alternatively as laminal dental. More precise descriptions of the articulation of (inter)dental fricatives are provided below. Where required, the interdental articulation can be distinguished from the dental articulation by means of the IPA 'advanced' diacritic, giving the composite symbols [θ̟], and [ð̟] (Laver 1994; Ladefoged and Maddieson 1996). The linguistic phonetic use of the subscript advanced diacritic will be utilised here. The Extended IPA symbols intended for

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