

**Contact-induced tonal development?
A comparison of register in three Cham dialects**

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It is often assumed that Eastern Cham (Phan Rang Cham), a language spoken in south-central Vietnam, has evolved from a classic register system to a tone system (Blood 1967; Hoàng 1987; Moussay 1971; Phú *et al.* 1992; Thurgood 1993, 1996, 1999). This claim is based on the fact that pitch is the most important phonetic property in the contrast between registers/tones, even if it downplays the role of other acoustic cues and of phonological distribution (Brunelle 2005a, b, 2006). The central role of pitch in Eastern Cham has been attributed to contact with Vietnamese, a language that has a full-fledged tone system (Thurgood 1996, 1999). It is generally accepted that the Cham dialects that are less (or not) in contact with Vietnamese have preserved a more conservative register system relying on voice and vowel quality (Baumgartner 1998; Edmondson and Gregerson 1993; Thurgood 1996, 1999).

A laryngographic study of three Cham dialects was conducted to replicate previous results and test the claim that the acoustic cues of the tone/register contrast are similar to those found in neighboring languages. The first dialect that was investigated, Eastern Cham, is in close contact with Vietnamese. The second dialect, Mekong Delta Cham, is also in contact with Vietnamese, but its speakers are less integrated in the Vietnamese polity (Taylor 2007). The third dialect is spoken in Kompong Chhnang province, Cambodia, and is only in contact with Khmer, a non-tonal language. Ten speakers of each dialect (5 men, 5 women) recorded wordlists of minimal pairs differing in their tones/registers. Three articulatory properties (glottal opening, larynx height and f_0) and two acoustic variables (first and second formants) were measured for each speaker.

Surprisingly, our results show that there is much more variation between speakers within than across dialects. In all three dialects, the two registers/tones have statistically different means for all measured phonetic indicators. The differences between speakers mostly lie in the phasing of the acoustic properties with the syllable. The most interesting result is that f_0 (pitch) is a robust acoustic property of register/tone in all three dialects. Since Cambodian Cham is not in contact with tone languages at all, this sheds doubt on the claim that Eastern Cham is becoming tonal because of contact with Vietnamese and suggests that pitch is an original property of the Cham register contrast. Despite important lexical differences, it seems that Cham dialects are less phonetically divergent than previously assumed.

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