Length as a contrastive feature in Vietnamese vowels

As noted in Emeneau (1951) and Thompson (1965) studies of Vietnamese grammar, the monophthongs /ə/ and /ʌ/ in Vietnamese, which have a limited distribution in non-open position only, are considerably shorter than the other nine monophthongs. These two monophthongs have similar formant values with another two monophthongs, /a/ and /ə/, respectively, as described in Han (1966). In this study I investigate the production and perception of these four vowels. My research question focuses on two matters in production: the duration difference between the vowels and the correlation between the formant similarity and the duration difference. As for perception, I aim to study what native speakers use as perceptual cues of the vowels. Labov and Baranowski (2006) shows, for example, that a 50 msec difference between two overlapped vowels is enough to act as a cue for categorical perception between short e and /ah/ in American English.

The two vowel pairs in three dialects of Vietnamese, Hanoi, Hue and Saigon, are studied. The production data is a recorded wordlist embedded in framed sentences, including 108 tokens of the short vowels and 144 tokens of the long vowels for each of the three dialects. The normalized vowel charts show that these two pairs of vowels are distinct in Hanoi dialect, nearly distinct in Hue dialect, and nearly merged in Saigon dialect. Going in the opposite direction from the formant values, the duration difference appears in Saigon and Hue dialects only, which suggests that duration becomes important for speakers of these two dialects to compensate for the non-distinguishability in the formant values.

A perception experiment was done with 17 native speakers of the Hanoi and Saigon dialects. The perception experiment consists of both identification and discrimination tests, using recorded and synthetic (shortened and lengthened) vowels. The results show that while speakers of the Saigon dialect use duration as an important perceptual cue for both pairs, speakers of Hanoi dialect only use duration as a perceptual cue for one pair.

My study on Vietnamese vowels suggest that as one acoustic feature becomes less prominent, another acoustic feature becomes more important; and even though speakers might not use a feature in their production, they may still rely on it in their perception.

References: