

A Pathway to Tonogenesis: Shifting Language Dynamics in Kuy and the Perception-Production Link – Raksit T. Lau-Preechathammarach

Tonogenesis, the development of a tonal contrast, is theorized to arise from a shift in cue weighting between the original contrast's primary cue (e.g. VOT, phonation) and its secondary f0 cue. Intergenerational shifts in cue weighting have been shown for tonogenetic languages: younger speakers weigh f0 more heavily when identifying and producing VOT contrasts (Korean [1], Afrikaans [2]). Intense multilingualism in mainland Southeast Asia has been proposed as an explanation for the spread of tone across unrelated languages over the past millennia [3]. In Thailand, recent modernization and centralization have led to minority language speakers moving from rural areas into cities, resulting in increased usage of Thai, a tonal language. Speakers of Kuy, an endangered Austroasiatic language with a modal-breathy phonation contrast, are among those who are increasingly using Thai, and past research has suggested that Kuy is undergoing tonogenesis [4,5]. This study investigates whether Kuy speakers' increased usage of Thai is linked to a shift in cue weighting between f0 and breathiness.

I hypothesize that if multilingualism in a tonal language is a catalyst for tonogenesis, greater usage of Thai will lead to f0 being weighted more heavily and breathiness less so as a cue for the phonation contrast in Kuy. Results are presented from 32 Kuy speakers (evenly distributed across generation (20s vs. 60s) and gender (F vs. M)) from a perception experiment, presented through OpenSesame on a tablet, carried out in the village of Ban Khinak in northeast Thailand. Speakers were coded for whether they had spent a long time away from home or not as a proxy for Thai usage as all those who had lived elsewhere reported being in cities where they mostly used Thai and met few other Kuy people. ≥ 4 years was considered "away long", as it was the cutoff value at which there was a relatively even balance by generation and gender. Participants listened to 2 synthesized syllables, each representing a modal-breathy minimal pair: /ti:/ 'old' vs. /ti:/ 'tall' and /ta?/ 'to grab' vs. /ta?/ 'to place under'. Each syllable was synthesized to orthogonally vary along 5 open quotient (OQ) values (a correlate of breathiness) and 5 f0 values (a correlate of tone): the lowest OQ x highest f0 token was modeled off the modal member of the pair and the highest OQ x lowest f0 token off the breathy one. In each block, participants heard the 25 stimuli in randomized order and picked which of two images corresponded to the word they heard. The experiment consisted of 16 blocks, alternating between the 2 syllables, totaling 400 tokens per participant. A mixed effects logistic regression analysis was carried out separately for each minimal pair, examining all interactions between five fixed effects (OQ, f0, Generation, Gender, and Away Long) and including random intercepts for Speaker.

For both syllables, the results reveal significant main effects of OQ and f0 ($p < .001$) and a significant interaction of OQ*Gender*Away Long ($p < .05$). For *ti:*, OQ*f0*Gender*Away Long ($p < .05$), f0*Generation*Gender*Away Long ($p < .001$), and OQ*Generation ($p < .01$) are also significant, while for *ta?*, f0*Gender*Away Long ($p < .05$) and OQ*Generation*Away Long ($p < .001$) are also significant. Those away long have a more linear (and potentially more variable) relationship between OQ and likeliness of identifying a token as *breathy*, whereas those not away long have a more s-like relationship (Figure 1). The opposite pattern holds for f0. The steeper s-like relationships suggest that OQ is a stronger cue and f0 a weaker one for those not away long when compared to those away long. However, this finding is tempered by generation for *ti:*, such that only old females' and young males' f0 curves are affected by being away long. These results accord with findings from acoustic data from 32 speakers (same generation and gender distribution) in a previous production study I carried out in the same village. Those away long have a smaller H1*-H2* (an acoustic correlate of OQ) and greater f0 difference between modal and breathy voice than those not away long (Figure 2). These results together show that Kuy speakers who have spent more time away from home rely less on breathiness and more on f0 than those who have spent less time away in both perceiving and producing the historical modal-breathy phonation contrast, suggesting that transitioning multilingual situations may pave the way for contrasts to shift via redistribution of cue weights.

Figure 1: Model predictions for *ti*: perceptual data (left: OQ curves; f0 curves): curves more s-like for group for whom cue is weighted more heavily (not away long for OQ vs. away long for f0)

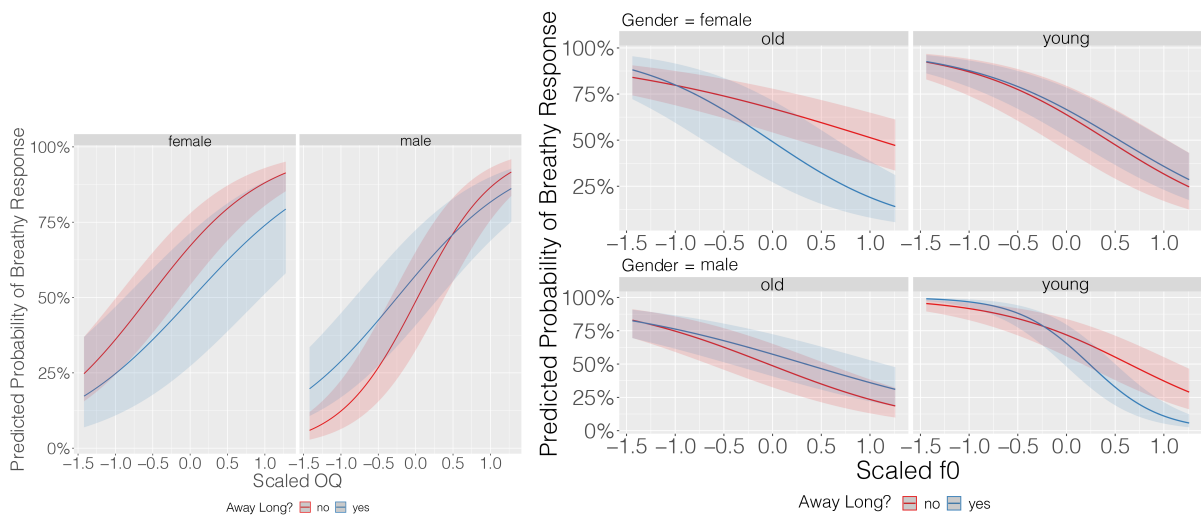
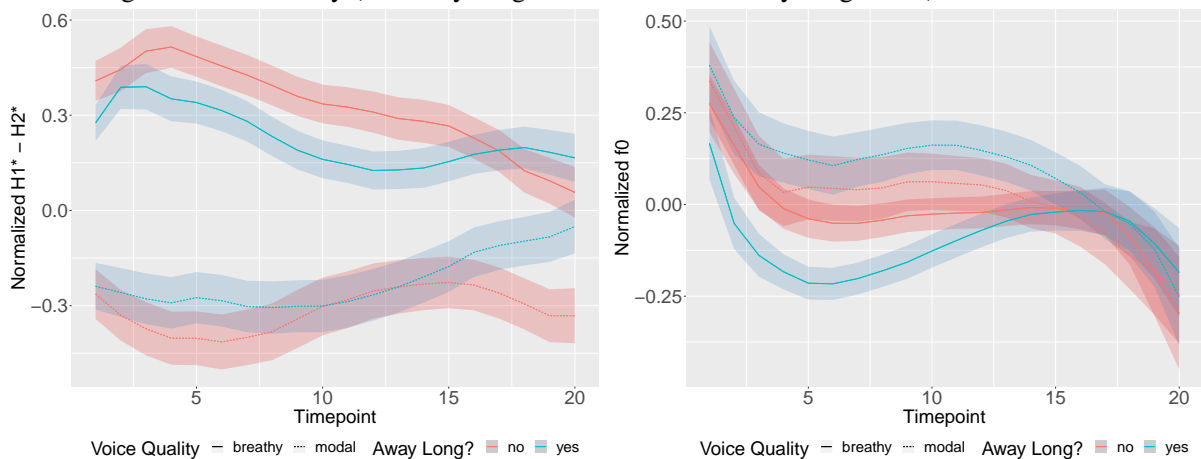


Figure 2: Acoustic data from previous production study: curves are farther apart for group for whom cue is weighted more heavily (not away long for H1*-H2* vs. away long for f0)



References

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