



THE ARTICULATORY TBU: GESTURAL COORDINATION OF TONE IN THAI



Robin Karlin (rpk83@cornell.edu) and Sam Tilsen Department of Linguistics, Cornell University

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Abstract #2pSC21

OVERVIEW

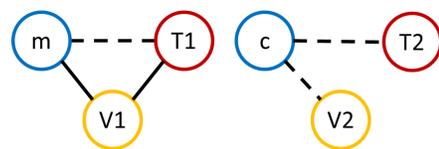
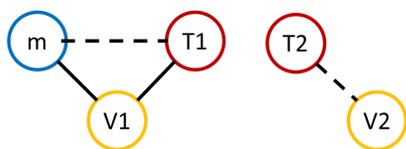
- The autosegmental theory of phonology has proposed a **tone-bearing unit** (TBU) to describe how tone languages represent lexical tone.
- Articulatory Phonology (AP) has promoted the idea that tone is an articulatory gesture, and as such can be coordinated with C(onsonant) and V(owel) gestures.
- I present evidence from an articulatory and acoustic study on Thai, a tonal language that uses the mora as its TBU.
- I argue that the TBU is an articulatory gesture that T gestures coordinate with, and that in languages that use the mora as their TBU, this level of abstract organization is reflected in mora-sized co-selection sets.

HYPOTHESIS: ARTICULATORY TBU

- Tilsen (2014) proposes that there are co-selection sets of various sizes, which reflect hierarchical phonological structures such as the segment and the mora.
- In a language like Thai, the moraic co-selection set consists of the gesture that corresponds to the mora (a V or moraic C gesture), the non-moraic C gestures, and the T gesture.

Hypothesized coupling relationships: *maa, mua*

Hypothesized coupling relationships: *maan, maat, muan, muat*



METHODOLOGY

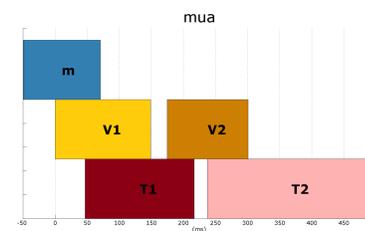
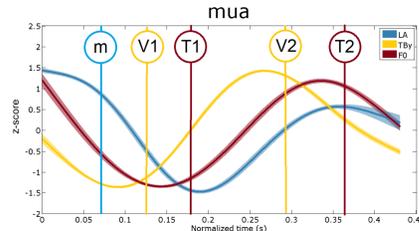
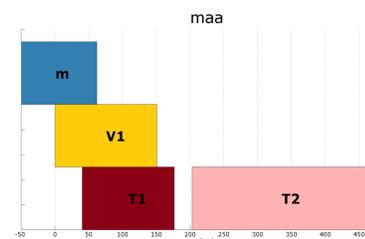
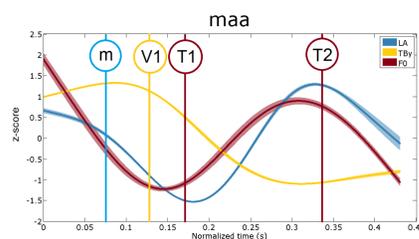
- Electromagnetic articulograph (EMA) study with four native speakers of Central Thai.
- Target words were bimoraic words with the falling tone, with a H(igh)-L(ow) contour.

| | Monophthongs | | Diphthongs | |
|----------------|--------------|------|------------|------|
| No coda | มา | mâa | มัว | mûa |
| Coda: n | มาน | mâan | มวน | mûan |
| Coda: t | มาต | mâat | มวด | mûat |
| Moraic coda: n | มัน | mân | | |

TONE GESTURES AS CONSONANT-LIKE GESTURES

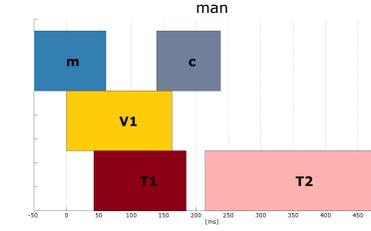
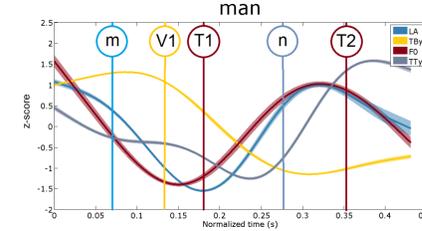
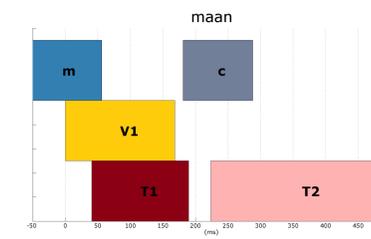
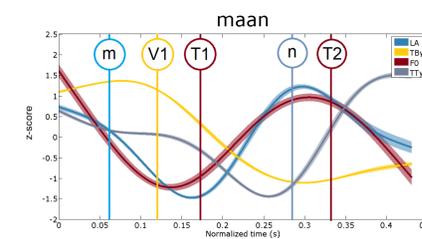
In the first mora (T1)

- In the first mora, T1 is a non-moraic gesture, and coordinates with V1 like the second gesture of a CC cluster.
- T1 shows a C-center effect with V1 and C, similarly to Gao's 2008 findings.



In the second mora (T2)

- In the second mora, T2 is still a non-moraic gesture, but coordinates like a coda consonant, as opposed to an onset consonant.
- When a non-moraic coda is present, T2 behaves like the second member of a complex coda (Marin & Pouplier, 2010).

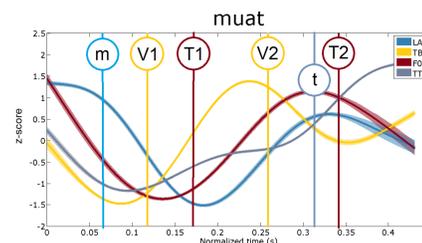
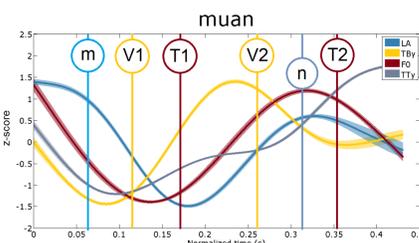


MORAIC GROUPINGS OF GESTURES

- Tighter timing correlations (lower standard deviations) between gestures that share a mora than those that are in different moras.

| Within | | Across | | Moraic | |
|--------------|----------|--------------|----------|--------------|----------|
| Relationship | St. Dev. | Relationship | St. Dev. | Relationship | St. Dev. |
| V1 - m | 15.5 ms | T2 - n | 31.2 ms | | |
| T1 - V1 | 19.3 ms | V2 - V1 | 31.2 ms | | |
| T1 - m | 22.9 ms | T1 - V2 | 33.2 ms | | |
| T2 - V1 | 25.5 ms | V2 - m | 35.3 ms | | |
| T2 - V2 | 27.7 ms | T1 - n | 42.1 ms | | |
| T2 - m | 28.4 ms | n - m | 42.6 ms | | |
| T2 - T1 | 29.4 ms | | | | |

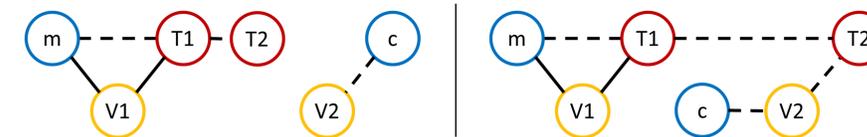
- Patterns most visible in target words with diphthongs, where each moraic segment has a distinct gesture.



DISCUSSION

- Evidence that T gestures coordinate with C and V gestures in a way that is reminiscent of autosegmental tonal association.
- However, there is a degree of T1-T2 stability that suggests that tone may be coordinated with each other in addition to being coordinated with their tone-bearing gestures.

Proposed alternative coupling relationships with T1-T2 coordination



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Marin, S., & Pouplier, M. (2010). Temporal organization of complex onsets and codas in American English: testing the predictions of a gestural coupling model. *Motor Control*, 14(3).

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