Acoustic correlates of a unique, bidirectional [ATR] harmony system: The case of Ethiopian Komo

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This poster presents the results of the first acoustic investigation of the vowel system in Komo [xom], an endangered and understudied language spoken by fewer than 3,000 speakers in Ethiopia. We focus on the correlates of the Advanced Tongue Root [ATR] feature, which underlies a typologically unique harmony system.

Komo has a seven vowel /i, ɪ, ɛ, a, ɔ, ʊ, u/ inventory with [ATR] contrast in the high vowels. African languages with these properties overwhelmingly exhibit [+ATR] dominant harmony where [–ATR] 'recessive' vowels assimilate to [+ATR] 'dominant' vowels (Casali 2003, 2008). By contrast, Komo exhibits bidirectional harmony made up of two distinct processes, both triggered by the high vowels (Otero 2015). In one process (expected for a language with this inventory), [+ATR] spreads leftward to non-high vowels which surface as allophonic variants (e.g. /dɔ̀t' - úk/ → [dòt'úk], 'squat-AD2'). In the other process, [–ATR] spreads rightward, targeting high vowels (e.g. /mʊ̀t' - úk/ → [mʊ̀t'ʊ́k], 'dig-AD2'). The consequence of this system is that [+high, +ATR] vowels serve as *triggers* of one process and *targets* of the other. This challenges the notion that only one value can be dominant in an [ATR] harmony system (Baković 2001, Casali 2015).

In order to determine the correlates of the Komo [ATR] feature, we analyze field recordings of ~2,400 vowel tokens taken from 28 different verb paradigms produced by 12 native Komo speakers. Measurements include F1, F2, duration, spectral tilt and center of gravity. In addition to capturing the vowel distributions, we investigate the magnitude of both assimilatory processes by quantifying the degree of V-to-V coarticulation in harmonic and neutral contexts. We discuss the results in the context of the Komo vowel system and relate them to acoustic studies of the [ATR] feature in Nilo-Sahran, Niger-Congo and Altaic languages (Guion et al. 2004; Kang & Ko 2012; Starwalt 2008).

References

Baković, E. (2000). *Harmony, dominance, and control*. New Brunswick, NJ: Rutgers University dissertation.

Casali, R. F. (2003). [ATR] value asymmetries and underlying vowel inventory structure in Niger-Congo and Nilo-Saharan. *Linguistic Typology* 7(3). 307-382.

Casali, R. F. (2008). ATR harmony in African languages. *Language and Linguistics Compass* 2, 496–549.

Casali, R. F. (2015). Revisiting markedness and dominance relations in tongue root harmony systems. Paper presented at the 46th Annual Conference on African Linguistics, Eugene, OR.

Guion, S. G., Post, M.W. & Payne, D.L. (2004). Phonetic correlates of tongue root vowel contrasts in Maa. *Journal of Phonetics 32,* 517-542.

Kang, H. and Ko, S. (2012). In Search of the Acoustic Correlates of Tongue Root Contrast in Three Altaic Languages: Western Buriat, Tsongol Buriat, and Ewen. *Journal of the Altaic Society of Korea* 22. 179-197.

Otero, M. A. (2015). [+ATR] dominant vowel harmony except when it's not? Evidence from Ethiopian Komo. In Ruth Kramer, Elizabeth C Zsiga, & One Tlale Boyer (eds.), *Selected Proceedings of the 44th Annual Conference on African Linguistics*, 212-220. Somerville, MA: Cascadilla Proceedings Project.

Starwalt, C. G. A. (2008). *The Acoustic Correlates of ATR Harmony in Seven-and-Nine Vowel African Languages: A Phonetic Inquiry into Phonological Structure*. Ph.D. Dissertation. The University of Texas at Arlington: Arlington, Texas.