Acoustics of the collapsing ATR harmony in Igbo

Like many of West African languages, Igbo requires vowel harmony based on the feature advanced tongue root, or ATR. The vowel system in this case contains two sets of phonemes, which differ in pairs only by the value of this feature.

The harmony system in Igbo is unusual for Benue-Congolese languages. Eight phonemes /i ɪ u ʊ e o ɔ a/ are in pairs opposed to each other in traditional descriptions (Emenajo 1967), however, from typological point of view, the system is asymmetrical both in high/low and front/back dimensions. Height-asymmetric [ATR] systems are common in West Africa, but of 44 Benue-Congolese languages, only one has an /i ɪ u ʊ e o a/ system, where harmony collapse began within height 2 (2014).

The ATP feature itself is still poorly studied from the point of view of articulation and acoustics (nonetheless, Edmondson & Esling 2006, Esling et al. 2019). In this work, we investigate the acoustic parameters, which have shown themselves as correlates of ATR contrast (Fulop et al. 1998, Guion et al. 2004, Olejarczuk et al. 2019), on the data of an asymmetric and, according to our assumption, decreasing Igbo vowel system.

Instrumental analysis via Praat (Boersma & Weenink 2017) indeed showed the evidence of height 2 harmony decreasing: /ɔ/ splits into two clusters, one of which performs as expected from a –ATR vowel, and the other one showing extreme similarity ​​to a +ATR /o/ counterpart in different dimensions.

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