Tonal contour clustering in Tongugbe Ewe: a preliminary investigation

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In the initial stages of describing a tone system, it is a common practice to elicit controlled productions (of minimal pairs) and transcribe them based on auditory impressions. However, this method often involves few speakers and may be subject to the researcher's language experiences and auditory bias. Considering these limitations, *Contour Clustering* (Kaland 2023) potentially serves as a complementary method with a data-driven, automatic approach.

This study combines these two methods to investigate the tonal system and acoustic tonal space of Tongugbe, a lesser-studied dialect of Ewe (Niger-Congo; West Africa). Like other dialects, Tongugbe has three level tones: High, Mid, Low. Intriguingly, Tongugbe reportedly has two realizations of Mid, differing in height and duration (Kpoglu 2019; 2020).

We elicited 982 Ewe nouns produced by 26 Tongugbe speakers (local variety: Mepegbe), which yielded 1,412 f0 contours extracted from the rhyme vowel of each syllable. The wordlist consisted of a balanced set of three level tones. The tonal transcriptions are based on the literature and consultation of a native speaker-linguist, mainly using the impressionistic auditory description method. The contours were subjected to clustering analysis using the Contour Clustering application (Kaland 2023).

Preliminary results show four clusters of surface f0 contours (Figure 1). Cluster 2 and 4 may be the surface realization of High and Low tone syllables respectively, while Cluster 1 and 3 are possibly different realizations of the Mid tone, as proposed by Kpoglu (2019; 2020). A closer inspection of the results is planned to compare the tonal classifications based on the wordlist and the clustering analysis. With a combined methodological approach, results of this exploratory investigation will provide further insights on the Tongugbe Ewe tone system, thereby contributing to our understanding of the mapping between phonological tones and their phonetic realization.
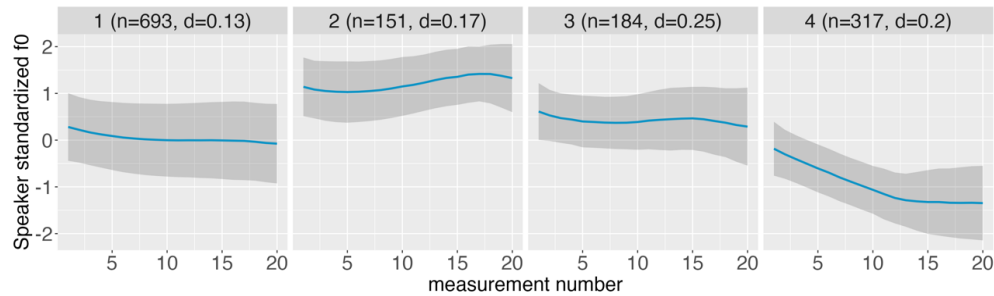
Figure 1. Visualization of the f0 contours obtained from cluster analysis with 4 clusters assumed. The four panels each represents a cluster.

References

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