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The Acoustic Analysis of Fortis/Lenis features in Glides and Rhotics in Maasai

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The Maasai (Maa) language has about 22 consonant sounds (Karani, 2018). Among these consonants, Maa has two glides: /w/ and /j/ (written as “y” in its orthographic form) which can be produced in a weak form (often described as lenis) or in a strong form (described as fortis) where the orthographic forms are the graphemes “ww” and “yy”. We consider “y” vs “yy” as distinct phonemes, as well as “w” and “ww” although the list of words with “ww” and “yy” is limited in the available lexicon (Levergood 1987). In addition, Maa language has 2 forms of rhotics: a voiced tap /r/ which can be considered as a lenis form which is orthographically represented by “r” and a trill /r/ written as “rr” which can be considered as a fortis form (Payne 2010, Karani 2018). Most of the time, the duration is a strong marker of the lenis/fortis opposition (Tucker and Bryan 1966). Whereas the speaker can easily adjust the duration of glides /w/ and /j/, this is not the case for the rhotic tap /r/ where the speaker must change the production of the rhotic to produce a trill. This study will also shed light on the current debate on the voicelessness feature of the strong “r” in Maasai (Tucker and Bryan, 1966; see also PHOIBLE database Inventory MAASAI - UPSID 451). However, there is a need to investigate the articulatory and acoustic features of these sounds as proposed by Levergood (1987). Therefore, the phonetic variations observed in these glides and rhotics in Maasai are the focus of the current study. This question is addressed by a comprehensive phonetic analysis of these sounds using data collected using laboratory equipment including Electrolaryngographic (ELG).

In order to phonetically describe the features of these phonemes of Maasai, 10 women and 10 men who are native speakers were recorded in 2022 and 2023 in Arusha, Tanzania using the instrumental device EVA2 that allows recording sound and Electrolaryngographic (ELG) data. The ELG signal can be useful to precisely determine the vocal features as employed by DiCanio (2012). The corpus was based on isolated words with a list of 20 items containing the lenis/weak form of the target phoneme (e.g., ayok, ewok, a-rók) and a list of items containing the fortis/strong form of the target phoneme (e.g., a-yyiet, ewwuas, a-rríj). To elicit the data, a native speaker of Maa (one of the authors) had to pronounce the target word and the research participant had to repeat the word three times. The entire corpus (20 speakers x 3 sounds /w,j,r/ x 2 modes (fortis/lenis) x 20 words x 3 repetitions = 7200 items) is currently being analyzed using Praat. The preliminary results confirm that the duration is the strongest marker for the distinction between weak/short vs strong/long features. The analysis also took into account the position of the target phoneme in the word (initial, medial and final) as well as the vowel that co-occurs with the target phoneme in the syllable. Concerning the nature of the strong rhotic in Maasai, the ELG signal shows that some forms are clearly voiceless but this is far from being systematic.

References

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