An acoustic analysis of Amharic fricatives

This study presents an acoustic analysis of Amharic, an Ethio-Semitic language spoken by over 20 million native speakers and the working language of the Federal Government of the Federal Democratic Republic of Ethiopia. The language has five voiceless fricative phonemes: /f, s, s’, ʃ, h/. Data for the study was collected from 5 male and 5 female speakers aged 20-32 and born and raised in Addis Ababa. A Sennheiser e-815 dynamic microphone was used to record audio data on CSL 4400 attached to a computer with a sampling rate of 44100 Hz and quantization of 16 bits in a quite room. All the fricatives were put in disyllabic Amharic words that begin with a fricative followed by the vowel /a/. Duration of noise, spectral moments (spectral mean, skewness, kurtosis and spectral variance), zero crossing rate and intensity) measurements were taken using Praat and analysed. The results showed that the alveopalatal fricative had the longest mean duration followed by the alveolar fricative, the labio-velar fricative and the glottal fricative. Female participants produced longer fricative sounds than males did at all place of articulations. Among spectral measurements, spectral mean, kurtosis and spectral standard deviation were found to have effects on place of articulation, but the patterns were the same for male and female participants for spectral mean and mean intensity only. The effect of airstream was seen clearly with the ejective fricative /s’/ having shorter duration, and higher spectral mean, kurtosis and standard deviation than the alveolar fricative /s/ for both male and female speakers.

*Key words: Amharic, fricative, acoustic analysis, pulmonic, ejective*