

## ABSTRACT

MD. JAHURUL ISLAM. Explaining four-way stop categories in Bangla: Perspectives of Harmonicity, Intensity, Center of Gravity, and Open Quotient. (Under the direction of Professor Dr. Jeff Mielke.)

This study investigated the four-way stop contrast in Bangla with a view to explaining the distinctions between the stop classes by means of acoustic (HNR, intensity, and center of gravity) and electroglottographic or EGG (open quotient) parameters. The subjects (5 female and 4 male) of the study were native Bangla speakers as spoken in Dhaka, Bangladesh; all of them were residents of Raleigh, NC for less than 5 years, at the time of data collection. A list of stimuli containing 64 authentic Bangla words with the 16 stop sounds were carefully generated, with balanced distributions of syllables, voicing, and aspiration. The respondents read out the words on the list while being recorded. All the recording sessions were conducted in the Phonology Lab at NC State University. An EG2-PCX electroglottograph was used for collecting the data as stereo wav files: one channel for audio, and the other for EGG signals.

Praat was used to extract the Harmonicity, Intensity and Center of Gravity measures from the audio signals; the OQ values also were calculated from the EGG signal in Praat, and then processed in R. The four-parameter logistic functions were fit to all the four parameters, and their coefficients analyzed. Results indicated that both the acoustic and electroglottographic parameters successfully distinguished the four stop categories. The parameters baseline and crossover were able to effectively distinguish the aspirated categories from the unaspirated ones, while the interaction between baseline, crossover, and slope were able to further distinguish the voiced stops from their aspirated/unaspirated counterparts. Supporting Davis (1994) and Mikuteit and Reetz (2007), this study suggested that 'breathy-voicing' is only an optional features in Bangla voiced-aspirated stops.