Two strategies for distinguishing ngã and sâc tones in Northern Vietnamese
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The six tones of Northern Vietnamese involve F0 and phonation properties. We examine the acoustic manifestation of two rising tones usually characterized as having distinct phonation (ngã = creaky and sâc = modal) in 1584 vowels produced by 9 Hanoi speakers (88 real three word compounds, 8 target vowels /a/, /i/, /u/ with sâc and ngã in first two syllables). Based on measurements of F0, energy, duration and phonation properties (spectral tilt, CPP, and HNR) we observed two strategies for producing the two tones: a) both F0 and phonation differences, where creaky voice appeared in >78% of the ngã tones (N=7); b) only F0 difference, where creaky voice appeared in <6% of the ngã tones (N=2). Classification of the data into the two tones with Binary Logistic Regression Analyses confirmed the distinct behaviors. In the first strategy, the main property distinguishing ngã from sâc is HNR (84%) but F0 was also very successful (75%). In the second strategy, F0 was the only significant property (90%). Given that there were no age, gender or educational differences, we suggest that the patterns may be due to i) a regional dialectal difference or ii) a change in progress in Vietnamese.