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The Phonetic Approach to Voice Qualities: Some Insights on Tongue Settings

Zuleica Camargo^{1*}, Heloisa Lacerda da Silva², and Nathalia dos Reis³

^{1*} Graduate Program in Applied Linguistics and Language Studies (LAEL), Catholic University of São Paulo (PUC-SP), São Paulo, Brazil

² Undergraduate course in Speech Therapy, Catholic University of São Paulo (PUC-SP), São Paulo, Brazil ³Menino Jesus Children's Hospital, São Paulo, Brazil

Abstract

The phonetic theory provides an analytical, descriptive and scientific approach to a challenging object: voice quality. This study aimed at investigating the correspondences between auditory and visual perceptions of voice qualities and vowel acoustic measurements (formant frequencies F1 and F2). The hypothesis outlined is that long-term mobilizations of the tongue, underlying some voice qualities, could affect some speech segments, like vowels, which would have their physiological and acoustic representations modified by such prosodic cue. The project was approved by the Ethics and Research Committee (CAAE nº 16400319.7.0000.5482). A database of audio recordings, sagittal ultrasound tongue images (during vowel productions) and auditory voice quality judgments (annotations of the Vocal Profile Analysis Scheme - VPAS) from 06 adult speakers were analyzed, generating Voice Quality Profiles (auditory and visual) and Brazilian Portuguese oral vowels trapeziums (F1 and F2 measures). Speakers with advanced tongue tip and body voice quality settings (VQSs) revealed acoustic correlates of anteriorization of posterior vowels. Speakers with a lowered tongue body VQS showed an acoustic tendency to lower high vowels, especially posterior oral vowels. A speaker with retracted tongue body VQS, with associated lowered tongue body, tended toward acoustic correlates of retracted anterior (to a lighter degree) and central oral vowels, in addition to marked lowering of posterior vowels. The incidence of tongue VQS may interfere with the acoustic and articulatory identity of oral vowels, taken as susceptible segments to voice quality settings.

Keywords: evaluation, phonetics, speech therapy, ultrasound, voice quality