

A Fibrescopic Analysis of Nasal Diphthongs in Brazilian Portuguese

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INTRODUCTION

Brazilian Portuguese is described with nasal diphthongs in its phonological inventory. This presentation examines the results of phonasograph and fibrescopic measurements of front and back nasal diphthongs. Focus is given to the articulatory characteristics and the timing of velum opening and closing movements.

Phonological opposition: /aw/ vs /aw̃/ and /ej/ vs /ej̃/
Nasals are phonetically realized as [ãw̃ⁿ] and [ẽj̃ⁿ]

CORPUS

- 10 words with oral [aw]-[ej] and 10 words with nasal diphthongs [ãw̃]-[ẽj̃].
- [paw]; [saw]; [maw]; [taw]; [kaw]; [pãw̃]; [sãw̃]; [mãw̃]; [kãw̃] and [tãw̃]; [dej]; [sej]; [lej]; [hej]; [nej]; [bẽj̃]; [sẽj̃]; [tẽj̃]; [hẽj̃]; [nẽj̃].
- Carry-sentence: [dʒiɡu ___ todu dʒie] (Say ___ every day)
- 1 female speaker speaking Brazilian Portuguese from São Paulo. 2 repetitions at normal speech rate.

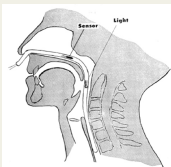
REFERENCES

Amelot, A., Honda, K., Maeda, S. & Basset, P. (2006). Evaluation of a phonasography. Meeting of the Acoustical Society of America.
 Demasi, R., Savariaux, C. & Demolin, D. (2015). An articulatory study of posterior nasal diphthongs in Brazilian Portuguese. ICPHS. Glasgow.
 Ohala, J. J. (1971). Monitoring Soft Palate Movements in Speech. 81st Meeting of The Acoustical Society of America. Washington, D.C.

INSTRUMENTATION:

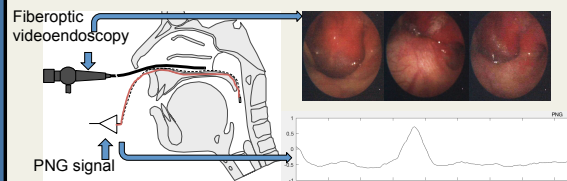
PhotoNasoGraph (PNG) + Fibroscopy

PNG: Previous Works: Ohala (1971), Amelot et al. (2006)

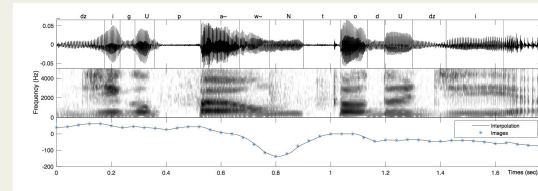
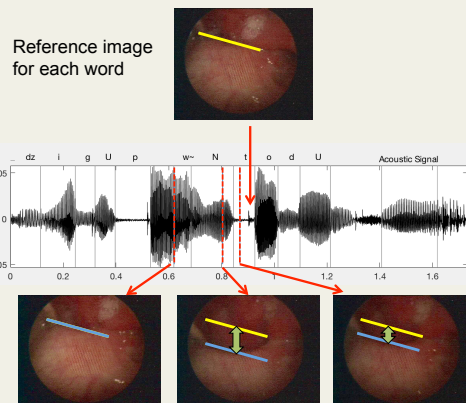


Phonasograph with a phototransistor and a mini lamp in the tube, to monitor the timing of soft palate movements and the relative amount of velar opening during speech.

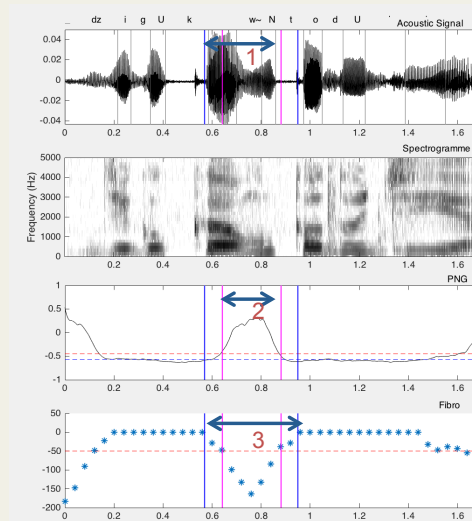
Our Experimental setup: PNG + Fibroscopy



MEASUREMENTS Fiberscopic data



MEASUREMENTS Temporal Measurements for velopharyngeal port opening + velar movements



RESULTS

1. Acoustic Duration of oral and nasal diphthongs

		Duration (msec)
Oral diphthongs	ANT	249
	POST	299
Nasal diphthongs	ANT	292
	POST	323

2. Duration of velopharyngeal port opening for nasal diphthongs (PNG)

		Duration of OP (msec)
Nasal diphthongs	ANT	335
	POST	321

3. Duration of velar movement for nasal diphthongs (fiberscopic data)

		Duration of VM (msec)
Nasal diphthongs	ANT	415
	POST	392

CONCLUSION & REMAINING PBS

1. Velum can open at various moments during the first vowel.
2. The second part of the diphthong is fully nasal.
3. A short nasal closure occurs at the end of the nasal diphthong.
4. Velum is lower for anterior nasal diphthongs.
5. Opening is bigger for anterior nasal diphthongs. Results confirm previous EMA studies by Demasi et al. (2006).

