

Southern French (De-)Nasal(ized) Vowels: [œm bɔ̃m vɛ̃m blaŋ]

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Introduction

- ▶ In Southern varieties of hexagonal French, phonemically nasalized vowels are described as denasalized resulting in a post-vocalic nasal closure which is either homorganic to a following obstruent or realized as [ŋ] word-finally or intervocalically (Violin, 2001; Violin-Wiget, 2006).
- ▶ In the present study, I analyze phonetic evidence for the phonological representation of these nasal vowels /ã, œ̃, ɛ̃, ɔ̃/ using interview speech from 5 individuals from the Midi-Pyrénées region of southern France.

This talk: Outline

- ▶ The pattern
- ▶ The problem & research question
 - ▶ What is underlying, what is the phonological process?
 - ▶ Looking at F1/F2 and vowel duration
- ▶ Current study design
- ▶ Data analysis & results
- ▶ Discussion & conclusion

Midi-Pyrénées in the South of France



Figure: Le Midi (Kahle and Wickham, 2013, "ggmap"), source: Wikipedia.

Vowel Denasalization: The Pattern

Phonetic realizations of nasal vowels (in boldface):

Word-internal	prof ɔ̃ d ~ prof ɔ nd	'profonde'
	vʁem ɑ̃ ʁyn ~ vʁem ɑ ʁyn	'vraiment une'
Word-final	bl ɑ̃ # ~ bl ɑ ʁ#	'blanc'
Boundary-crossing	ɑ̃ #plys ~ ɑ m#plys	'en plus'

Phonology of Nasal Vowels

- ▶ Phonological descriptions of this phenomenon in French have not been consistent or relied heavily on close phonetic evidence.¹
- ▶ Given the diachronic history of French, it might follow to assume a [+nasal] feature is preserved, but shifted to a following obstruent, e.g., $\tilde{V}b \rightarrow V^mb$.
- ▶ However, citing a very similar process in Gwari, Hyman (1972) considers deriving CVN(T) structures via “denasalization of [vowels] . . . very strange indeed” (pg. 176). Violin (2001, pg. 102) also calls this “phonetically unnatural.”

¹That I've been able to find so far.

Phonemic or Phonological? Or ... ?

- ▶ The phonetic realization of nasalized vowels in Southern French superficially resembles the phonologized status of nasalized vowels in English (Beddor, 2009; Byrd et al., 2009; Solé, 2007).
- ▶ The back nasal [ŋ], rather than [m,n], alternates with nasalized vowels due to having longer, slower transitions (Ohala and Ohala, 1993).
 - ▶ Sometimes, the velar nasal is described as an “appendix” to a nasal vowel: passive constriction produced by lowered velum approaching the back of the tongue.
- ▶ **Research Question:** Is there evidence from oral and nasal vowel durations which indicates whether this is a process of a shifting [+nasal] feature or if the nasal consonant is underlying?

Effects of Nasalization on Vowel Quality in French

- ▶ In Northern Metropolitan French, numerous acoustic and articulatory studies confirm that mid front vowels lower, i.e., [ɛ̃] → [æ̃] and mid back/low vowels raise, i.e., [ɑ̃] → [ɔ̃] and [ɔ̃] → [õ] (Maeda, 1993; Violin, 2001).
- ▶ Articulatory studies have shown that this is a result of differing lingual and/or labial gestures (Carignan, 2013).
- ▶ **Research Question:** Is there acoustic evidence suggesting different oral and nasal vowel articulations in Southern French?

Participants

Five participants from Midi-Pyrénées were recorded reading a word list and a short passage.

ID	Sex	Age	Hometown
81aaa1-wl	Male	21	Castres
81abn1-wl	Female	37	Lacaune
81acc1-wl	Male	54	Lacaune
81ajc1-wl	Male	73	Lacaune
81amb1-wl	Female	69	Lacaze

Method

- ▶ A semi-automatic Praat script was used to extract F1, F2, F3 and other acoustic measures, including phonological environment, from oral and nasal vowels.
- ▶ Coded perceived denasalization (“yes,” “no”) and nasal consonant epenthesis (“no”, [m,n,ŋ]). Excluded liaison environments.
- ▶ So far, I have tabulated and extracted measurements from 471 nasal and 526 oral vowels (about 200 measurements per speaker).

Results & Analysis

Descriptives

Confirming previous studies . . .

- ▶ About 80% of nasal vowels exhibit (visually and/or acoustically) an appreciable amount of denasalization.²
- ▶ Epenthesis is nearly always homorganic to a following obstruent, but varies depending on its place and manner of articulation.
- ▶ There is a positive correlation between the perceptual strength of the obstruent place of articulation and likelihood of nasal place assimilation.

²I assume some nasalization is phonetically inevitable.

Vowel Spaces: Oral and Nasal [ɛ, œ, ɑ, ɔ]

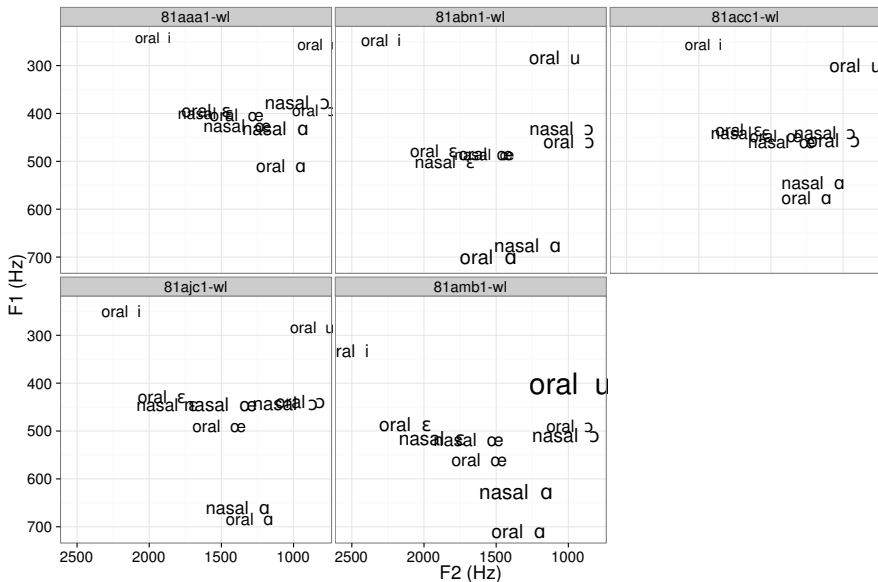
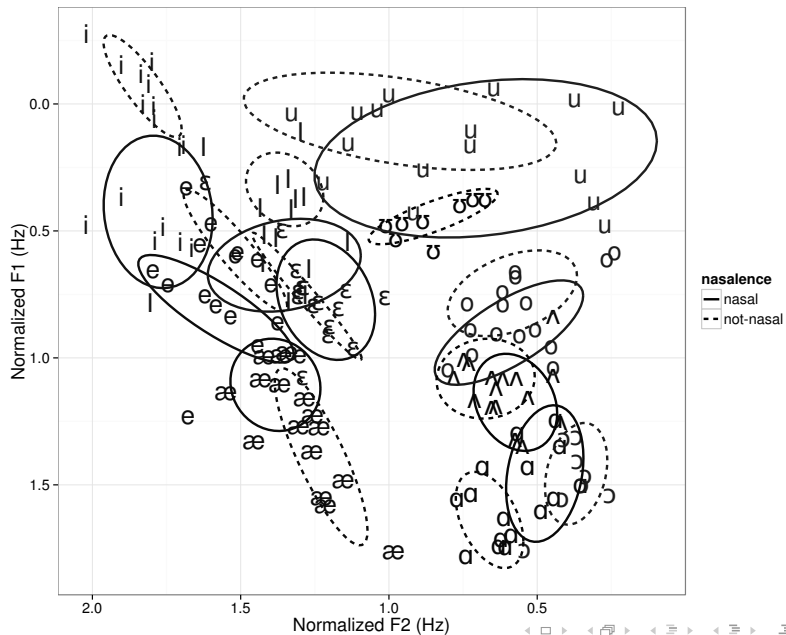


Figure: All speakers' vowel spaces showing oral/nasal pairs for [ɛ, œ, ɑ, ɔ]

Vowel Spaces

- ▶ For most speakers and most vowels, oral and nasal counterparts largely overlap in their position in the vowel space.
- ▶ **Exception:** For speakers 81aaa1-wl and 81amb1-wl, [ã] is significantly higher than its oral analog [ɑ].
- ▶ This is not surprising if we consider that the low vowels require a larger opening of the velopharyngeal port to produce the percept of nasality.

English Vowel Space: Oral & Nasalized (Risdal, 2014)



Vowel Duration: Oral and Nasal [ɛ, œ, ɑ, ɔ]

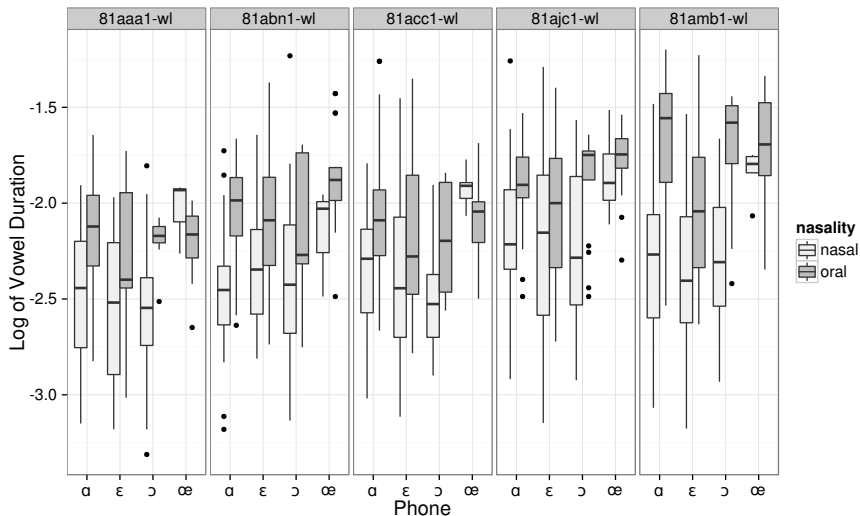


Figure: Vowel duration differences between oral and nasal vowels.

Vowel Duration

- ▶ Oral vowels are consistently longer in duration than their nasal counterparts. This holds across all speakers for the most part.
- ▶ **Exception:** For speakers 81aaa1-wl and 81acc1-wl, nasal [œ̃] is longer than oral [œ] and for speakers 81ajc1-wl and 81amb1-wl, durational differences are attenuated with respect to other vowel pairs.
 - ▶ Perhaps some speakers use vowel duration as a technique for distinguishing [œ̃] and [ɛ̃] which are otherwise in the process of merging in innovative French.
- ▶ The speaker which doesn't follow this exception, 81abn1-wl, is the speaker whose [ɛ̃] and [œ̃] are most merged.

Discussion

- ▶ Acoustic analysis of the vowels [ɛ, œ, a, ɔ] and [ẽ, œ̃, ã, õ] show that oral and nasal vowels largely have the same articulatory targets.
- ▶ Except for height differences between [a/ã] for two speakers, comparisons between oral and nasal vowels in Southern French do not seem to resemble phonologically nasalized vowels in English speakers wrt phonetic effects.
- ▶ For all speakers, nasal vowels are shorter in duration compared to their oral counterparts in closed syllables.

Conclusion

- ▶ Based on the acoustic evidence, I argue that phonemic nasal vowels in Southern French are articulated as an oral vowel plus a nasal consonant, i.e., / \tilde{V} / of Northern Metropolitan French is /VN/ in Southern French.
- ▶ This is compatible with:
 - ▶ [ŋ], the most vowel-like nasal consonant, being underlying;
 - ▶ identical oral/nasal F1/F2 targets;
 - ▶ differences in vowel duration;
 - ▶ absence of schwa-epenthesis resyllabifying $\tilde{V}N$ which would violate INTEGRITY, e.g., *[gʁɑ.nə.də] “grande (f).”

Thank you!

Thank you to my 201A classmates, Kie Zuraw, and the *Phonologie du Français Contemporain* project at www.projet-pfc.net.

Questions?

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