High Variability Phonetic Training in French phonetics courses

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High Variability Phonetic Training (HVPT)

- HVPT involves:
  - Forced choice identification task (e.g. */l/ or /r/?*) or discrimination task (e.g. *same or different?*)
  - Listeners hear multiple voices
  - Given feedback on their responses

- HVPT is an effective tool for learning non-native contrasts in a lab setting (Thomson, 2018).

High Variability Phonetic Training (HVPT)

- Few studies have examined the efficacy of HVPT outside a lab setting (Barriuso & Hayes-Harb, 2018)
- HVPT studies mainly limited to L2 English, with no studies on L2 French (to our knowledge)
- To our knowledge, none have looked at the effectiveness of HVPT as a part of required coursework
  - **French**, Japanese & Spanish

Research Questions

When HVPT is implemented as required coursework…

1. Do students improve from pretest to posttest?
2. Can they generalize to new words and new speakers?

Methods

Recruitment

- Activities were administered to all students in each class as part of regular homework.
- Consent was obtained after the end of the semester.
- Only the data of those who consented is reported here.

Participants

- Students in 300-level French phonetics courses who consented to the use of their data.

Phase 1 (S 2021)	**Phase 2** (F 2021, S 2022)
Towson: 5	**NYU**: 8
NYU: 6	
P1 total : 11	**P2 total** : 8
Total Participants: 19	

Contrasts

Liaison* (Ø / [z])	[i.lɛm] *il aime* / [il.zɛm] *ils aiment*
[y] vs [u]	[ty] *tu* / [tu] *tout*
Nasal vowel vs Oral Vowel + [n]	[ve.te.ʁɑ̃] *vétéran* / [ve.te.ʁan] *vétérane*
Nasal Vowels**	[vɛ̃] *vin* / [vɑ̃] *vent* / [vɔ̃] *vont*
[s] vs [z]	[de.sɛʁ] *dessert* / [de.zɛʁ] *désert*

* Present in all pre- and posttests, but absent in Phase 2 trainings.

** 2-way nasal contrasts added for Phase 2 trainings.

Tasks

Pretest (Baseline)

- During first week of classes

Trainings

- Same voices from pretest
- A single training per contrast, trainings spaced throughout the semester
- Had to reach 85-90%* accuracy, or else repeat training

  ** [u]/[y] & nasals = 85%, other = 90%*

Posttests (2)

- During finals week, divided into two tasks:
  - Trained words (old & new voices) (Posttest 1)
  - Generalization to new words (old & new voices) (Posttest 2)

bu

bout

Qu'est-ce que la personne a dit ?

What did the person say?

Stimuli

Pretest:

- 63 items x 4 speakers = 252 items total
  - Liaison (10 items)
  - [y] vs [u] (10 items)
  - Nasal vowel vs Oral Vowel + [n] (18 items, 3 sets of 6 items)
  - Nasal vowels (15 items, 5 per nasal vowel)
  - [s] vs [z] (10 items)
- About 15 min

Trainings:

- 10-18 items x 4 voices per training = 40-72 items
- About 5 minutes each, if no repeats

Posttests (2):

- PT1: Known words: 252 items (old words, half new speakers)
- PT2: Generalization: 252 items (new words, half new speakers)

Stimuli (cont.)

Recorded by 6 speakers:

- France (F1, F2, M1, M2)
- Quebec (F3, M3)

4 voices appeared in pretest and training:

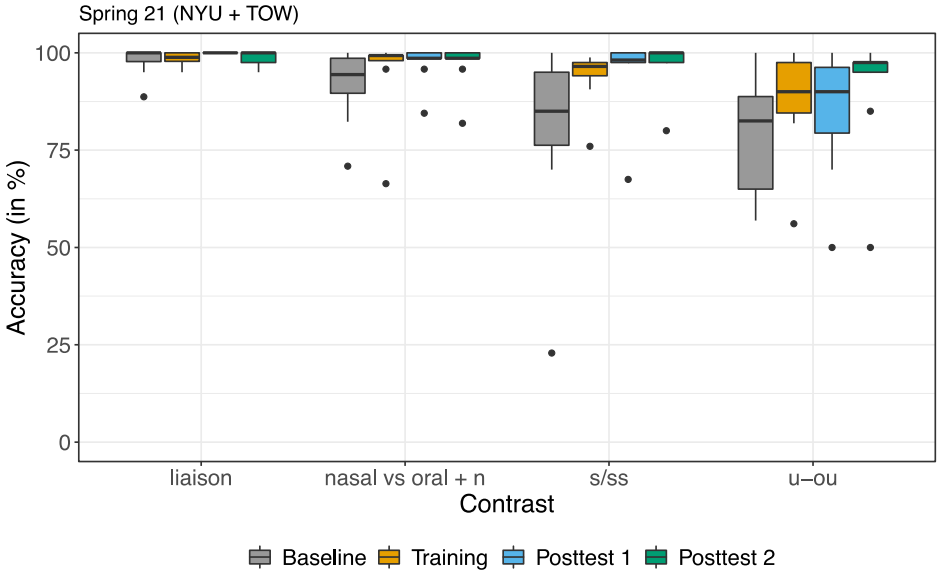
- F1, F3, M1, M3

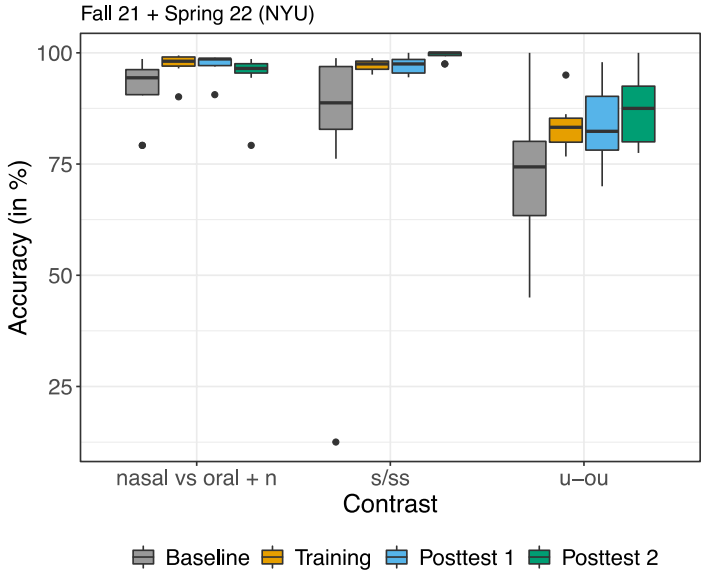
4 voices appeared in posttest, 2 **new**:

- F1, M1, **F2**, **M2**

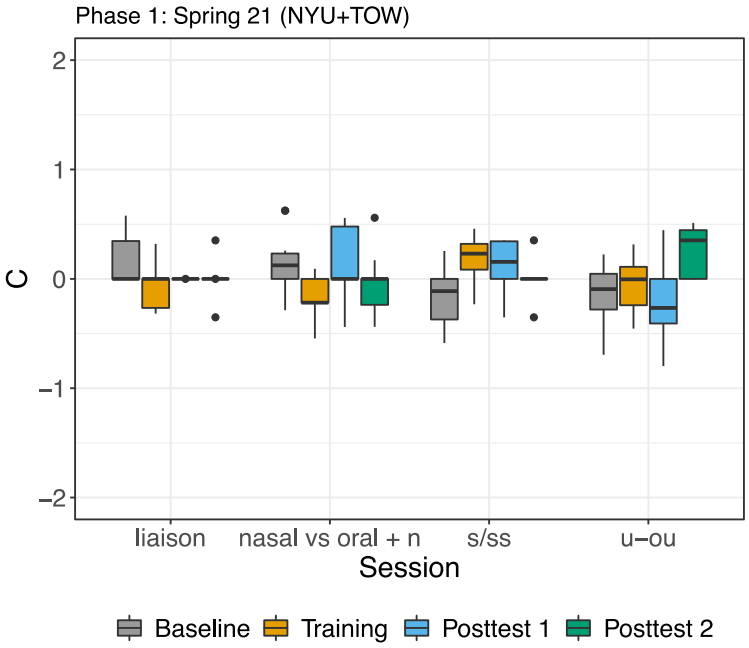
Results

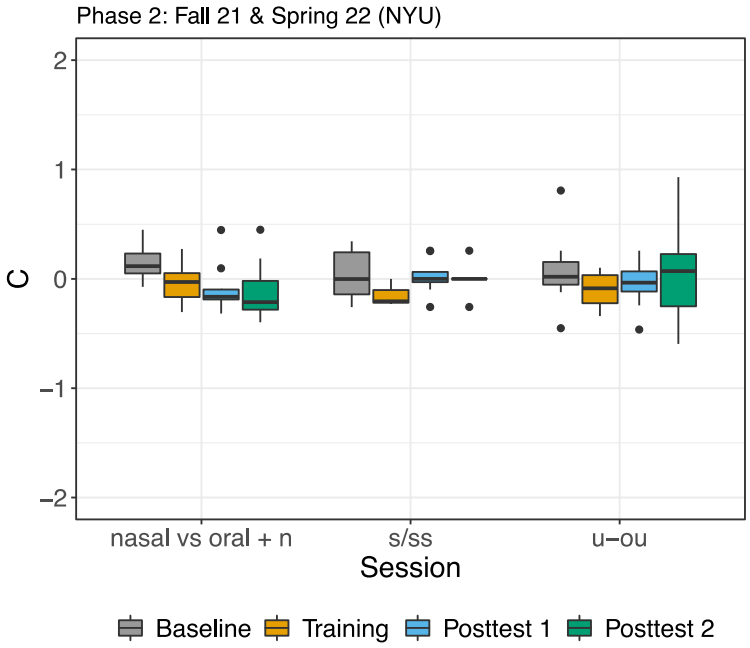
Accuracy (excluding nasals)





c (excluding nasals)





ANOVA (Accuracy by Contrast and Session)

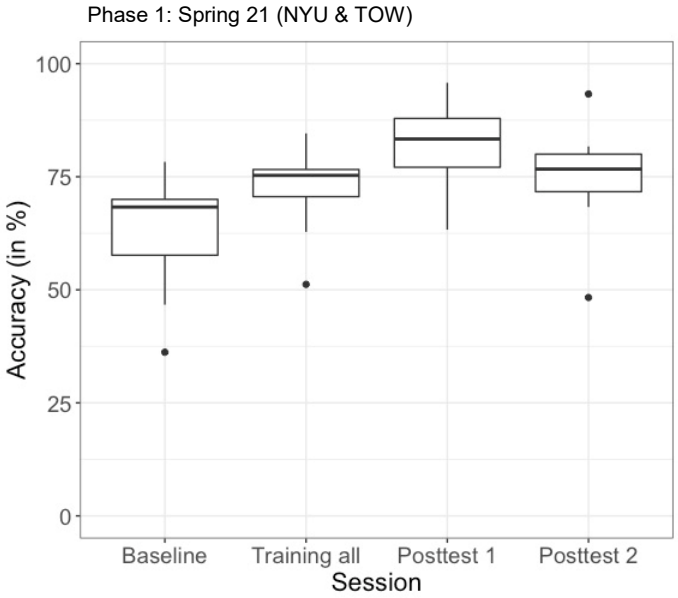
Phase 1	F	*p*	Eta squared (effect size)
Contrast	6.397	<.001	0.182
Session	23.431	<.001	0.078
Contrast * session	3.867	<.001	0.065

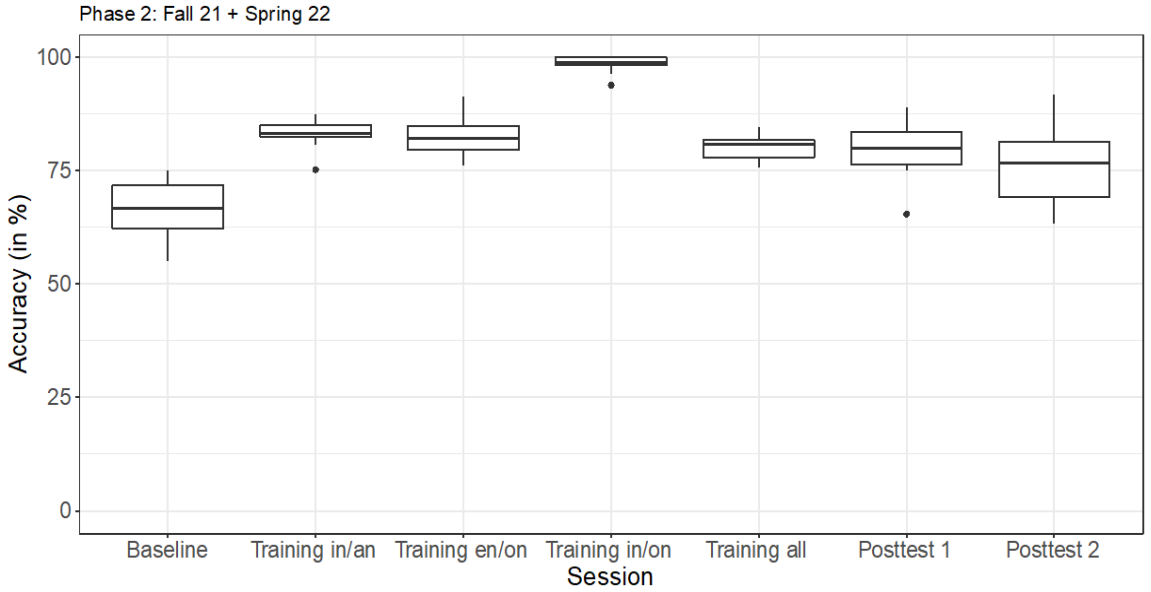
- An ANOVA of accuracy by contrast and session showed significant effects for both ($p < .001$).
- The interaction between contrast and session was also significant ($p < .001$).

Phase 2	F	*p*	Eta squared (effect size)
Contrast	13.295	<.001	0.206
Session	6.325	<.001	0.147
Contrast * session	0.786	0.583	0.036

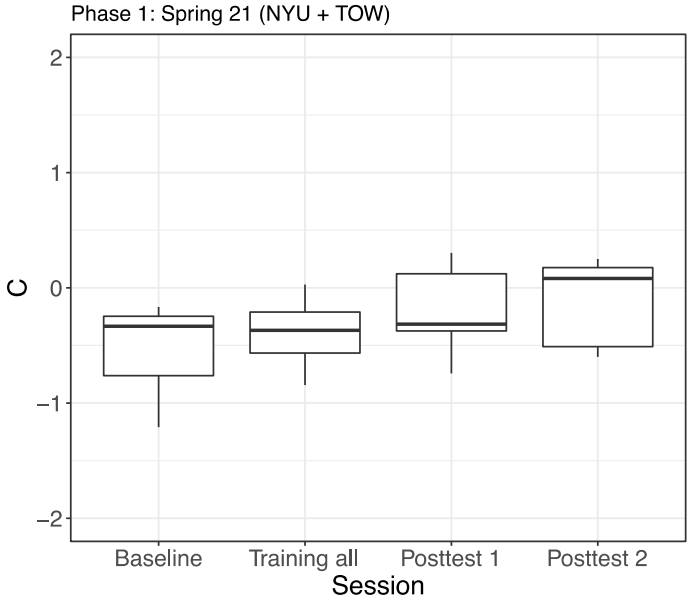
- Again ANOVA of accuracy by contrast and session were significant ($p < .001$).
- The interaction between contrast and session was NOT significant ($p = 0.583$).

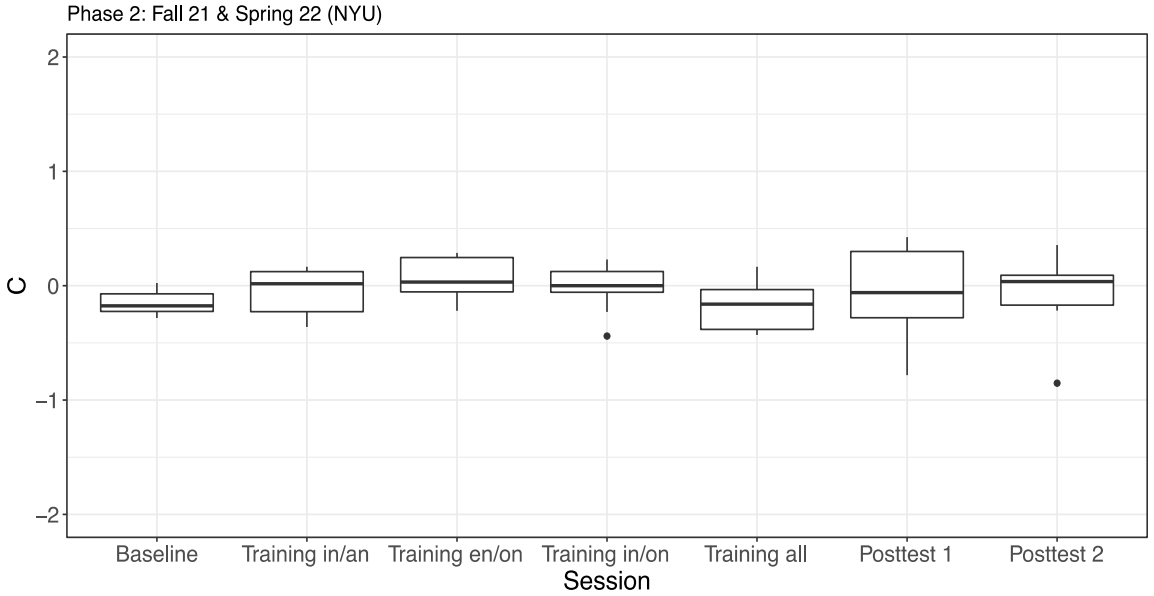
Accuracy (nasals)





c (nasals)


Phase 1: Spring 21 (NYU + TOW)
C
2
1
0
−1
−2
Baseline
Training all
Posttest 1
Posttest 2
Session


Phase 2: Fall 21 & Spring 22 (NYU)
C
2
1
0
−1
−2
Baseline
Training in/an
Training en/on
Training in/on
Training all
Posttest 1
Posttest 2
Session

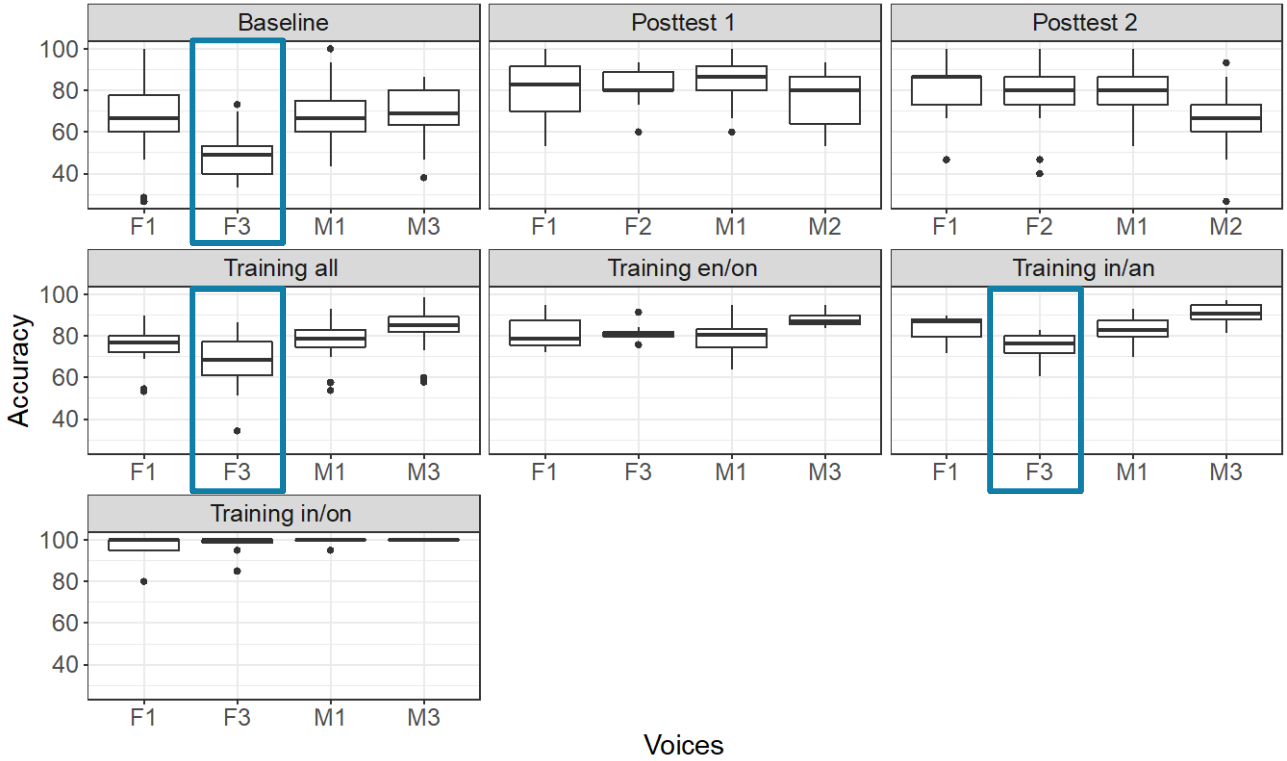
2-way ANOVA of accuracy (nasals)

Phase 1	F	*p*	Eta squared
Contrast	12.39	<.001	0.338

Phase 2	F	*p*	Eta squared
Contrast	29.793	<.001	0.71

- An ANOVA of accuracy by session was significant ($p < .001$).
- There was a large effect size

Phase 2: Nasal Vowels by Voice



Discussion

Back to RQs

- RQ1: Do students improve from pretest (baseline) to posttest?
  - For the most part, yes!

- RQ2: Can they generalize to new words and new speakers?
  - Yes, they do!
  - Posttest 2 was better than the pretest, and not significantly worse than Posttest 1

Student impressions

I thought it really helped me **learn how to distinguish between sounds** and was a valuable way to gain **a better understanding of the sounds we were learning in class in a more applied way**.

I think the HVPT is a **good assessment**. However, some of them were **very tedious** like the nasal vowels one.

Ce n'était **pas du tout sympa**. Parfois, c'était très difficile, et d'autres temps, c'était assez facile. Mais, je pense que **les devoirs HVPT sont très utiles** pour un cours de phonétique. Alors, **je pense que si il n'y avait pas de HVPT, je ne pourrais pas distinguer entre les voyelles nasales en français**. Pour les autres types de HVPT, j'aurais pu les distinguer sans HVPT, mais HVPT m'a aidé quand même.

It is a **great tool**, I would just try and get better quality audio clips because at certain points, they were distorted or muddled. I **love the addition of different accents**, although it is challenging, it is quite **cool to hear differences** and get accustomed to the various ways french can be spoken.

They learned. We learned.

- At the 300-level, learners still exhibit difficulties with sound-grapheme correspondences.
  - Accuracy for [s]/[z] started low, but quickly improved.

- Lower-levels of instruction could benefit greatly for incorporating HVPT to train for less-transparent sound-grapheme correspondences.
  - Especially with nasal vowels, which are more difficult and require more exposure.

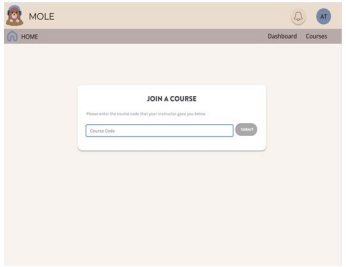
More lessons learned

- Adaptability to (some) learner individual needs
  - Some students need more tries.
    - HVPT allows students to work at their own “pace” while still showing gains.
  - Some students need more support.
    - We added practice sessions to help them focus on the correct part of the contrast.

In the works

Future experimental protocols:

- extend work with beginner & intermediate learners
- more contextualized tasks



Working on developing user-friendly website:

- *Multilingual Online Listening Exercises (MOLE)*
- French, Japanese and Spanish

Thank you! Questions?

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References

- Barriuso, T. A., & Hayes-Harb, R. (2018). High variability phonetic training as a bridge from research to practice. *CATESOL Journal, 30*(1), 177-194.
- Thomson, R. I. (2018). High variability [pronunciation] training (HVPT): A proven technique about which every language teacher and learner ought to know. *Journal of Second Language Pronunciation, 4*(2), 208-231.