High variability phonetic training in two Spanish pronunciation courses: Data and lessons learned

Danielle Daidone   University of North Carolina Wilmington

Silvina Bongiovanni   Michigan State University

Ryan Lidster   Marshall University

Alisha Reaves   Towson University

Jamie Root   New York University

Chisato Kojima   Illinois-Wesleyan University

CASPSLaP
February 17, 2022

High variability phonetic training

- High variability phonetic training (HVPT) is an effective tool for learning non-native contrasts in a lab setting (Thomson, 2018)
- HVPT:
  - 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

High variability phonetic training

- HVPT studies mainly limited to L2 English, only one so far with L2 Spanish (see meta-analysis by Uchihara, Karas, & Thomson, 2021)
- Herd, Jongman, & Sereno (2013):
  - Trained learners on /ɾ/-/r/, /ɾ/-/d/, and /r/-/d/
  - Forced choice task: hear [ˈka.ɾa], choose *cara* or *cada*
  - Perceptual training group outperformed control group overall

High variability phonetic training

○ Few studies have examined its efficacy outside a lab setting (Barriuso & Hayes-Harb, 2018)
○ 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?
3. Do students see HVPT as useful for their learning?

Methods

Participants

Students in 300-level Spanish pronunciation classes who consented to have their data used after the semester:

- ○ UNCW: 11
- ○ MSU: 29

Control group of 400-level advanced grammar students who received no explicit phonetic instruction but did all the same HVPT pretest, training sessions, and posttests:

- ○ MSU: 12

Method

Contrasts:

- /ɾ/ vs. /r/   *caro* vs. *carro*
- /ɾ/ vs. /d/   *coro* vs. *codo*
- /e/ vs. /ei/   *reno* vs. *reino*
- Stress   *término* vs. *terminó* (1 vs. 3)

                   práctica vs. *practica* (1 vs. 2)

                   aportara vs. *aportará* (2 vs. 3)

- <g> vs. <gu>   *agitar* vs. *aguitar

                   manguera vs. *mangera*

Method

Pretest (Baseline)

- In week 1 of semester

Training

- A single training per contrast, trainings spaced throughout the semester
- Had to reach 90% accuracy, or else repeat training
- Order of training differed between classes

Posttests

- During finals week, divided into two tests:
  - Trained words (Posttest 1)
  - Generalization to new words (Posttest 2)

Stimuli

Recorded by 6 speakers:

Argentina (1 female), Spain (male and female), Cuba (male and female), and Mexico (1 male)

4 voices appeared in pretest and training:

AR (female), MX (male), SP (female), CU (male)

4 voices appeared in posttest, 2 new:

AR (female), MX (male), SP (male), CU (female)

Stimuli

Pretest:

- 10 items per contrast (12 for stress) x 4 speakers x 5 contrasts = 208 items total
- About 15 min

Training:

- 20 items (24 for stress) x 4 voices per training = 80 items (96 for stress)
- About 5 minutes each, if no repeats

Posttests:

- Known words: 208 items (same as pretest, half new speakers)
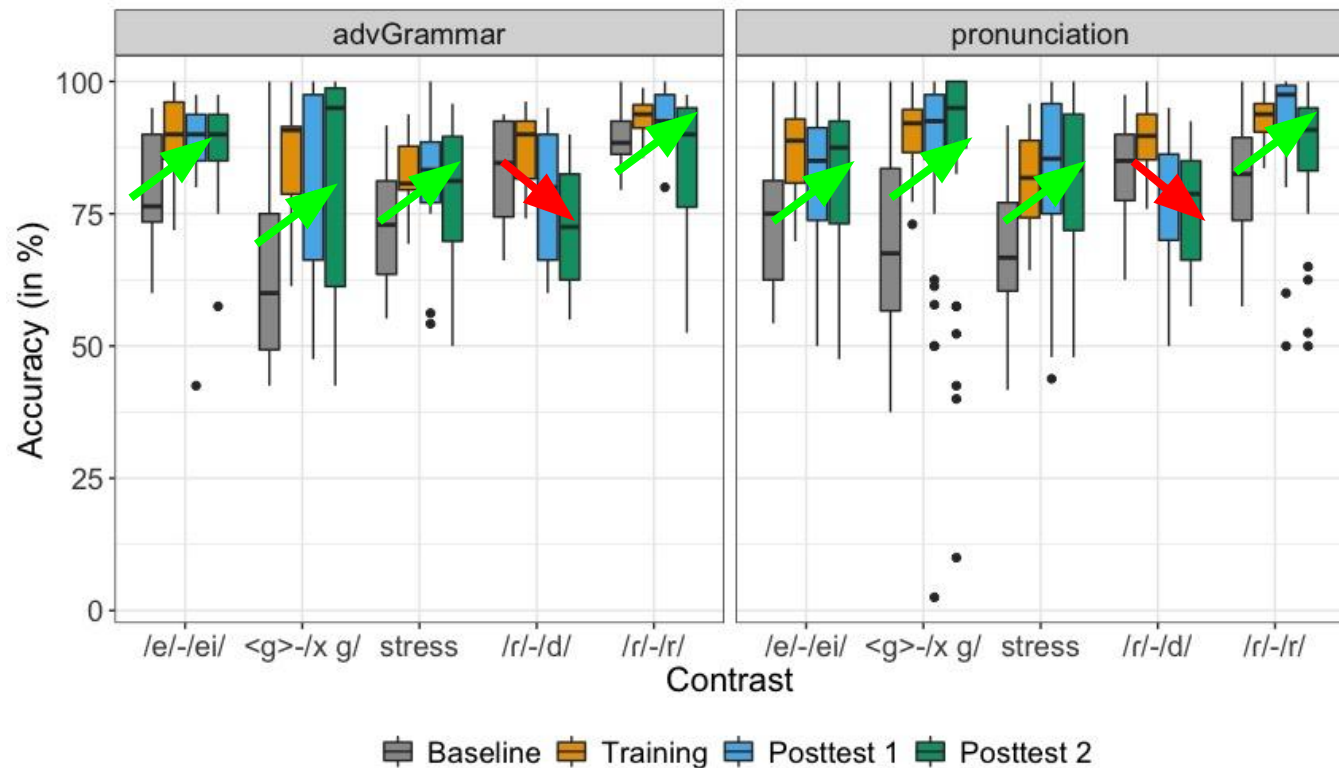- Generalization: 208 items (new words, half new speakers)

continúo

continuó

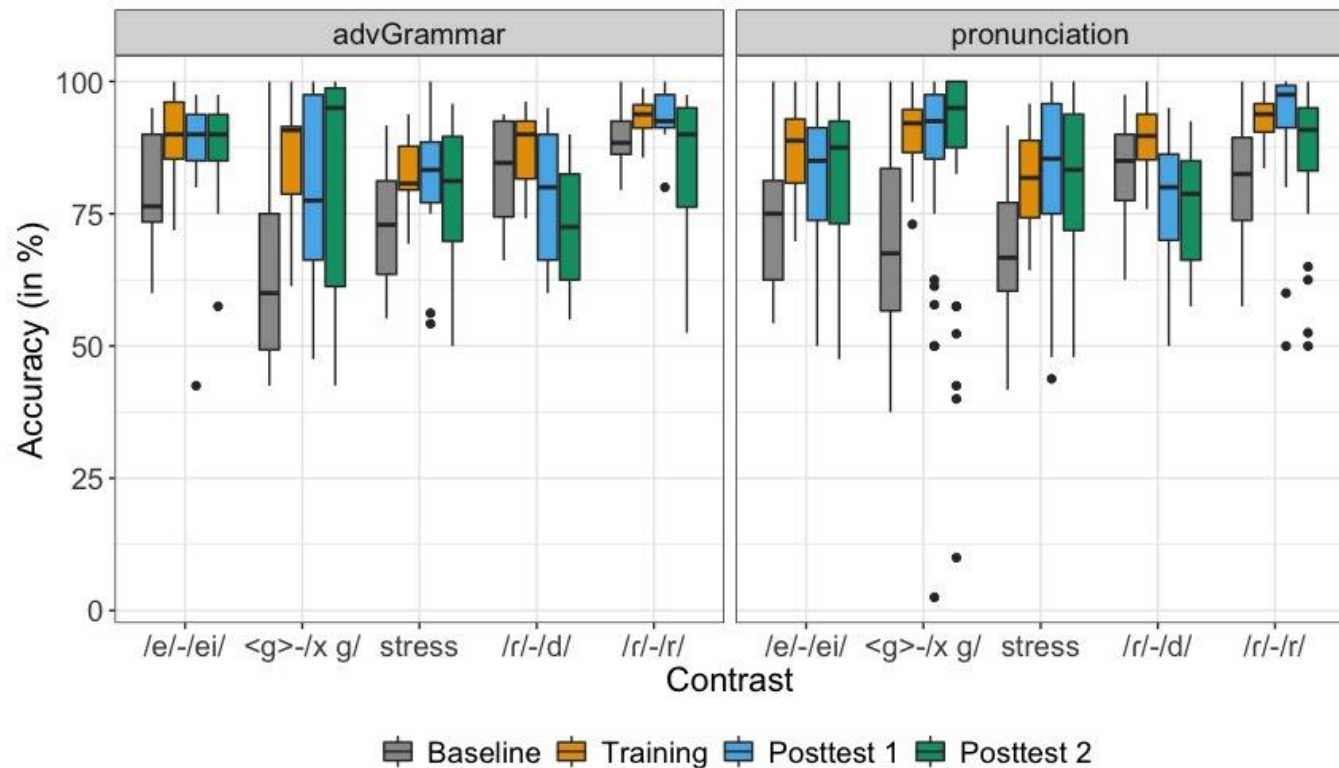¿Qué dijo la persona?

What did the person say?

Findings
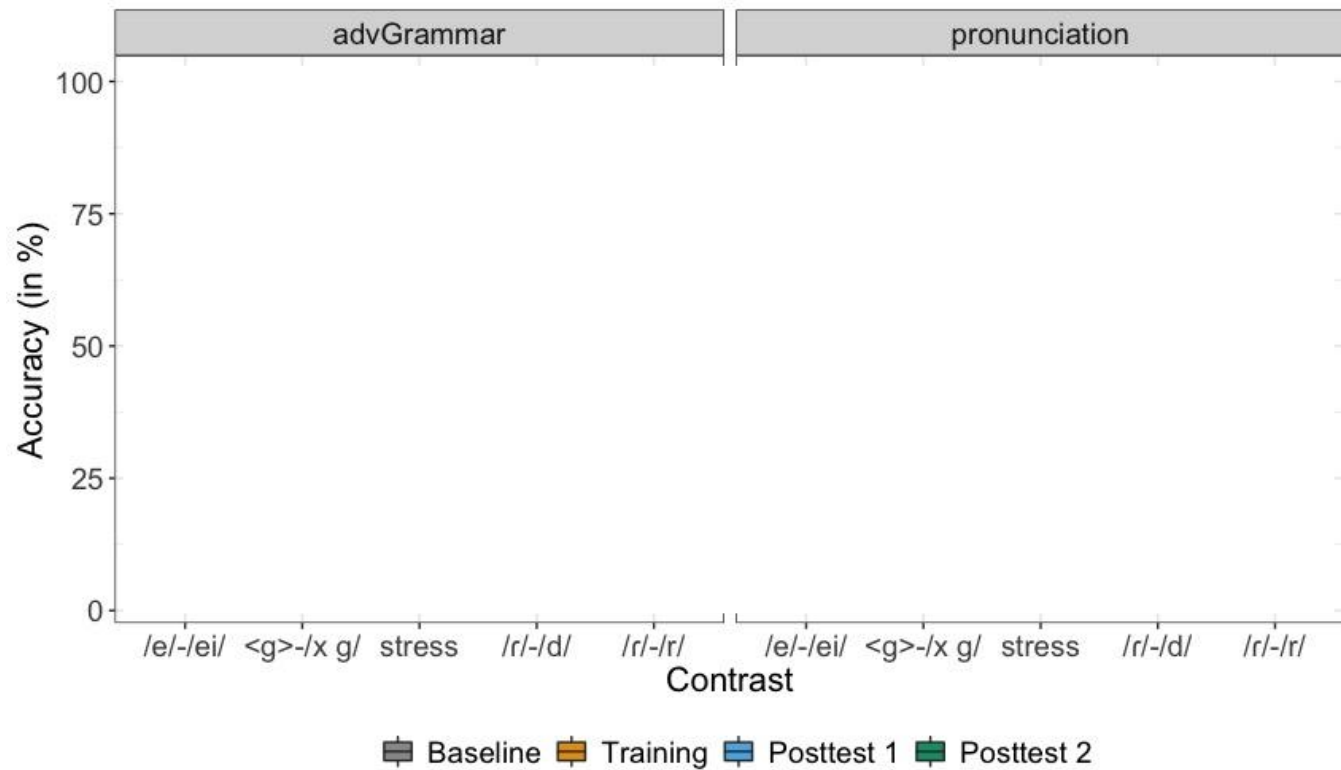
Similar patterns across instruction groups

Gains from baseline to Posttests
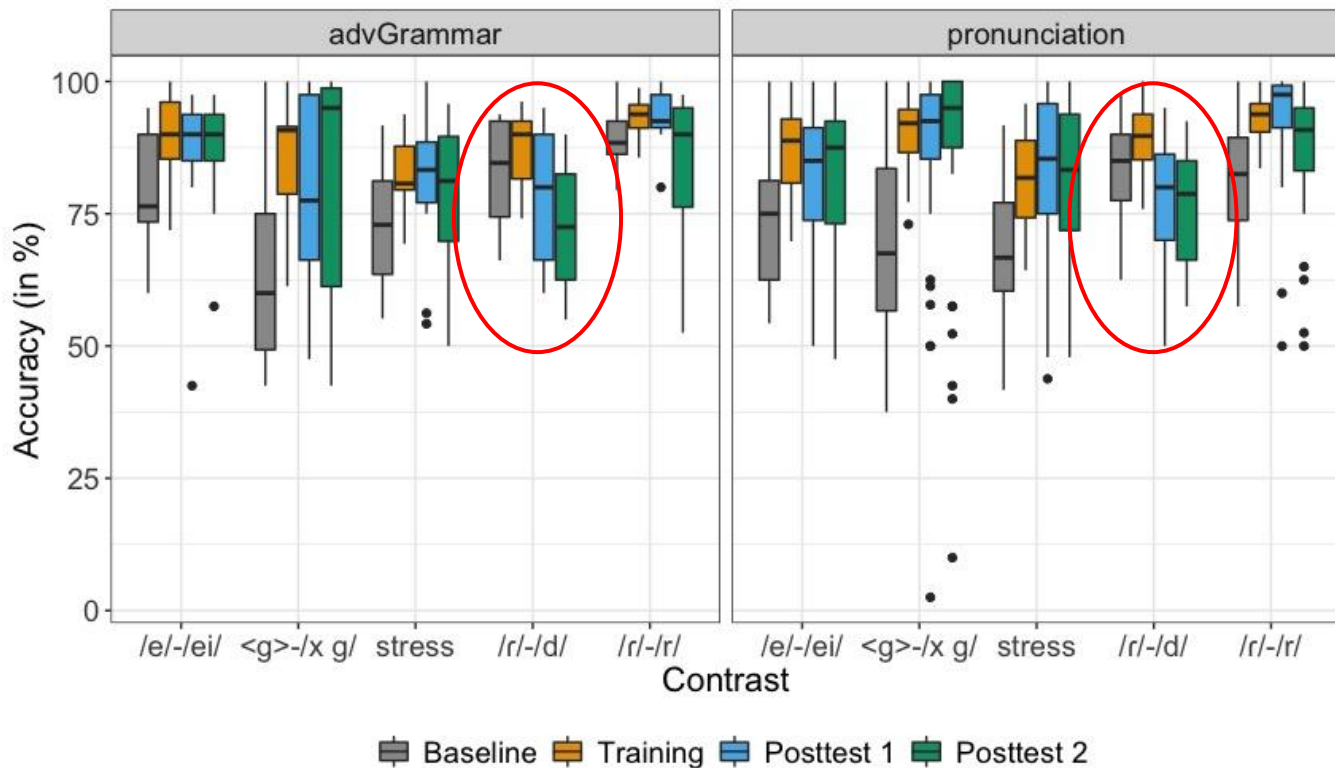
/ɾ/-/d/→ decline in performance

Mixed three-way ANOVA

- DV: Accuracy
- Within: Contrast, Session
- Between: Group

Results:
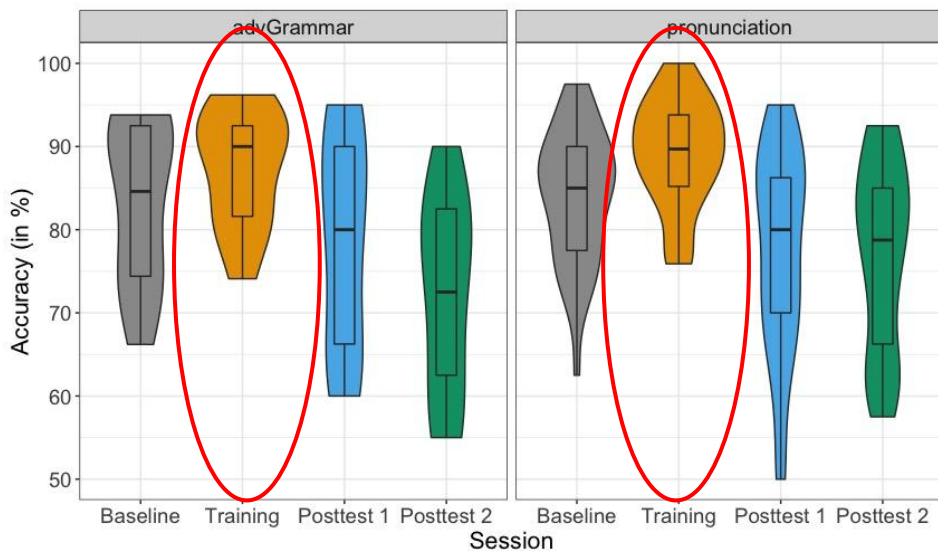
- ~~Group~~
- Contrast, Session
- Contrast*Session

Mixed three-way ANOVA

- DV: accuracy
- Within: Contrast, Session
- Between: Group

Pairwise comparisons

- Baseline → statistically different from Posttests (all contrasts)
- Posttests not statistically different from each other
  - Except with /ɾ/-/r/ (lower scores in Posttest 2)
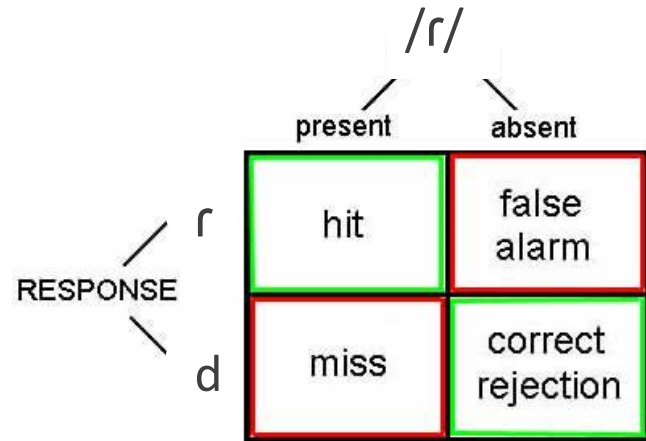
/ɾ/-/d/

- Cline during training
- HVPT + instruction shows better performance during training.
 - But, does not extend to Posttests

/ɾ/-/d/

○ Also calculated d' and c values to examine sensitivity and response biases.
  ◦ Hit, miss, false alarm, correct rejection.

○ C → response bias
  ◦ Zero c: no bias
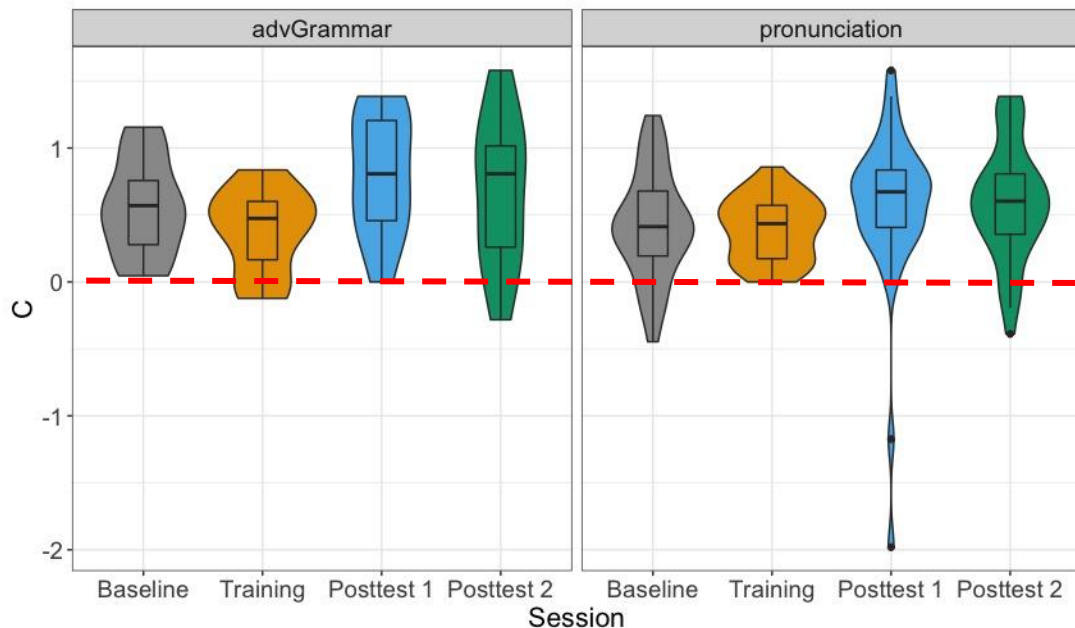 ◦ Positive c: bias towards /d/
  ◦ Negative c: bias towards /ɾ/

/ɾ/-/d/

○ Also calculated d' and c values to examine sensitivity and response biases.
  ◦ Hit, miss, false alarm, correct rejection.

○ C → response bias
  ◦ Zero c: no bias
  ◦ Positive c: bias towards /d/
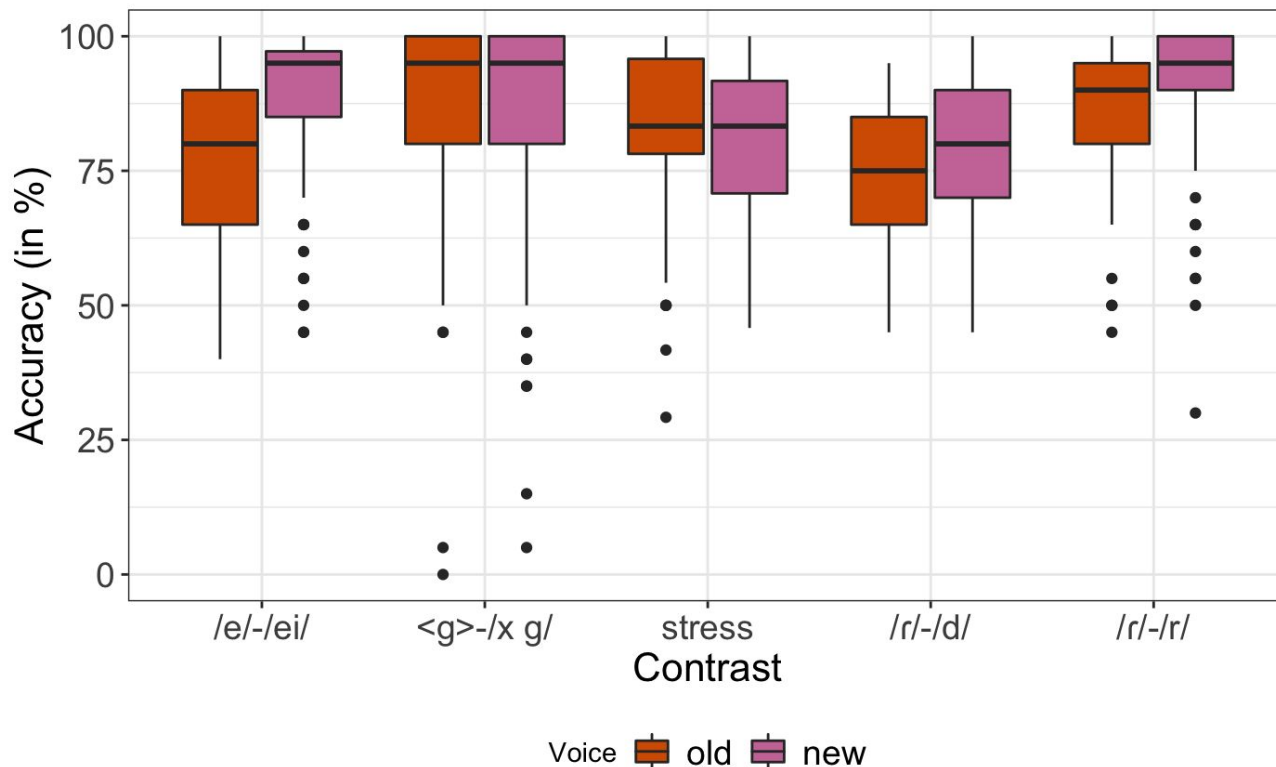 ◦ Negative c: bias towards /ɾ/
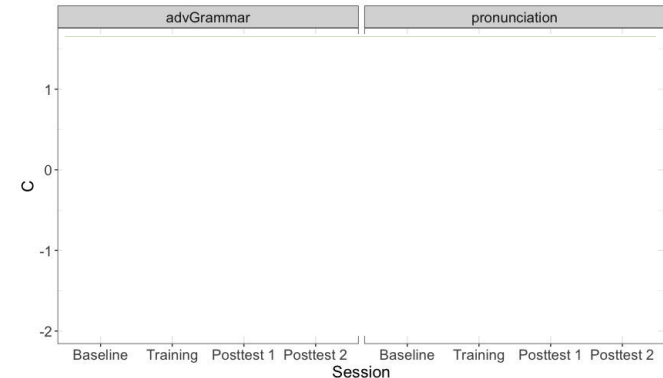
/ɾ/-/d/

- Regardless of session, c is positive.
  - They are biased to say /d/

- Learners are more likely to be presented with /ɾ/ and say /d/ (miss) than the opposite (false alarm)

- Bias decreases during training, but it was was not enough to reduce bias at the time of Posttests.
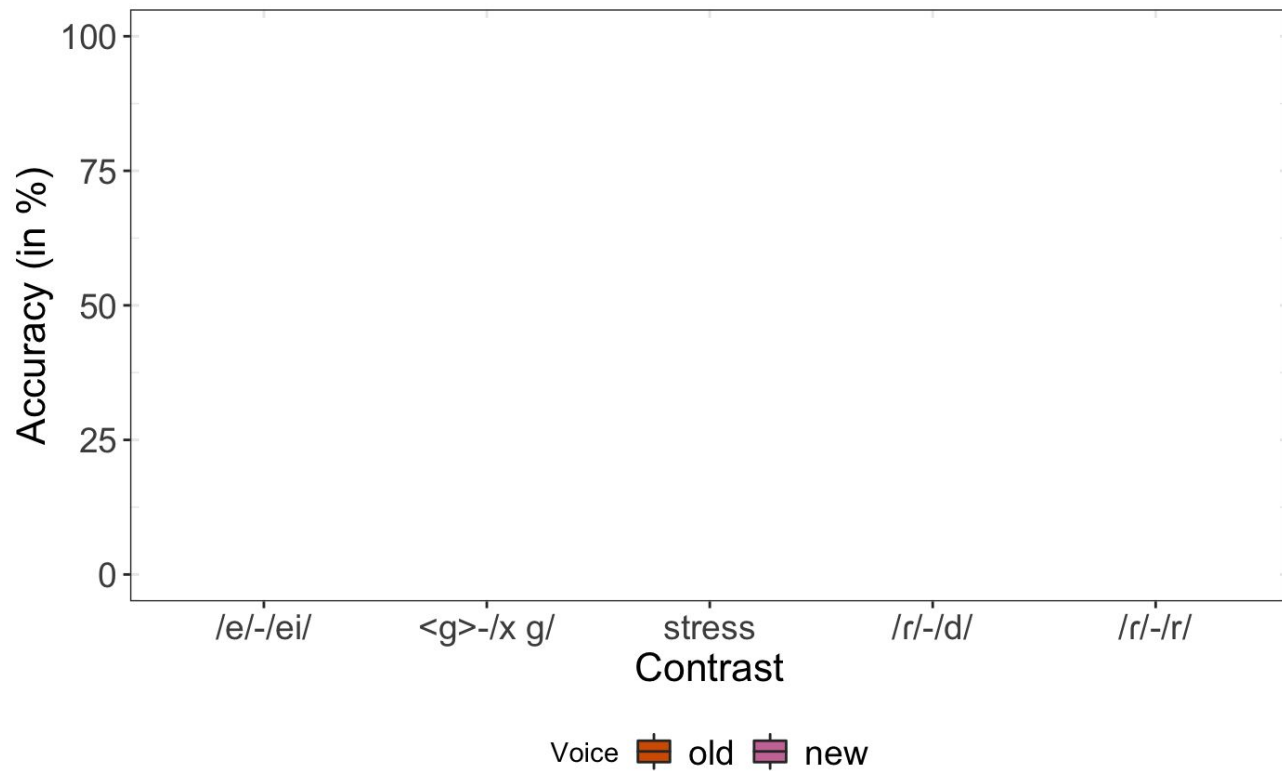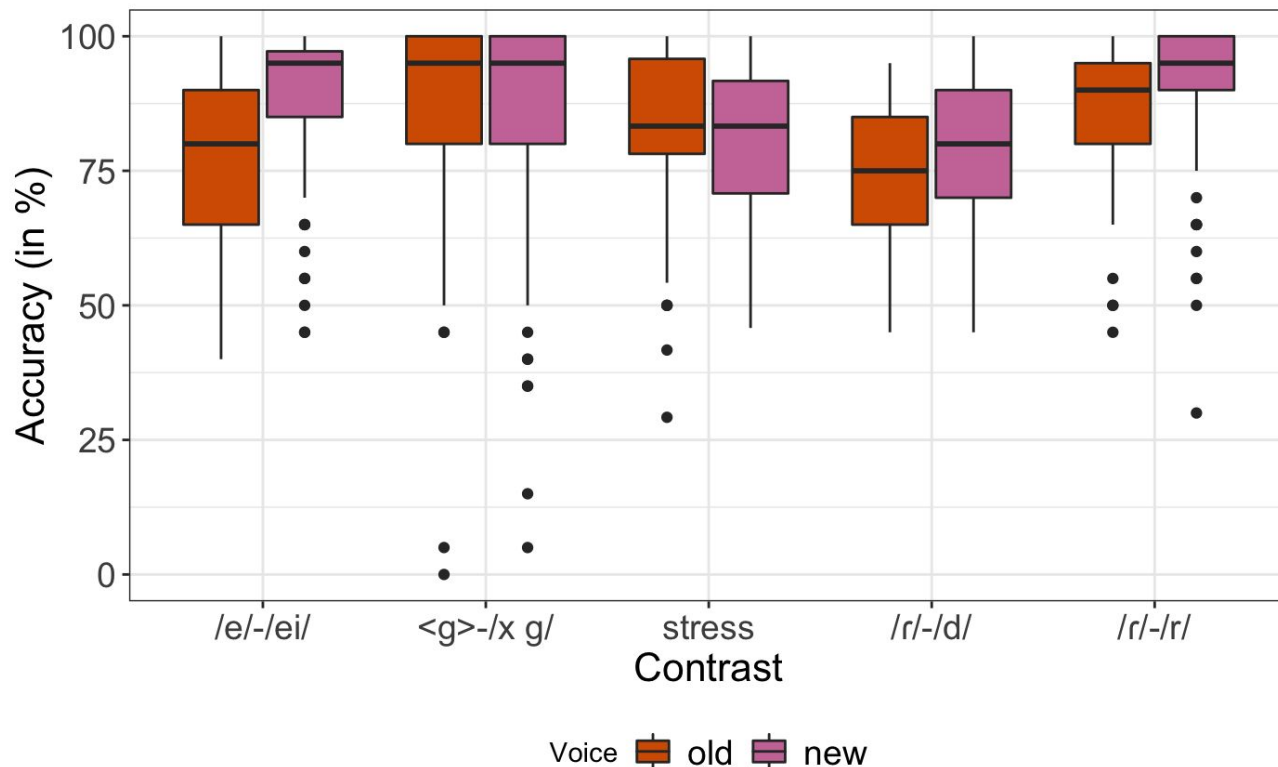
Posttest 1 + Posttest 2 data

RM ANOVA

- DV: Accuracy
- Within: Contrast, Session, Voice

Results:

- Voice
- Contrast
- Session
- Contrast*Voice

Posttest 1 + Posttest 2 data

RM ANOVA

- DV: Accuracy
- Within: Contrast, Session, Voice

Pairwise comparison

- New is better than old
  - No statistical difference with <g>-/x g/ and stress

Student impressions

"**The online HVPT training is beneficial**!! It allowed me to hear native speakers' pronunciation of the words and also hear the differences between words that looked similar. **It really helped me learn this semester & I definitely think you should incorporate it in your classes in the future!**"

"mientras los entrenamientos de percepcion son muy util, *completandolos fue frustrante para mi*. ademas no me gusta que puede oir cada palabra un tiempo"

"This is the first Spanish course I've taken that uses this kind of perception training. All of my courses in the past have focused primarily on grammar and vocabulary, so the **HVPT training definitely did a lot more for my listening skills and pronunciation** than any other course I've taken."

Discussion

Back to RQs

- RQ1: Do students improve from pretest (baseline) to posttest?
  - For the most part, yes!
    - Except tap-d :((we'll come back to this contrast)

- RQ2: Can they generalize to <u>new words</u> and new speakers?
  - Yes, they do!
  - *not statistically significant differences*
    - Except tap-trill → so here they don't

Back to RQs

- RQ1: Do students improve from pretest (baseline) to posttest?
  - For the most part, yes!
    - Except tap-d :((we'll come back to this contrast)

- RQ2: Can they generalize to new words and <u>new speakers</u>?
  - Yes, as accurate or better with new speakers

Back to the RQs

- RQ3: Do students see HVPT as useful for their learning?
  - For the most part, yes (frustration aside)

What's going on with /ɾ/-/d/?

Compare to Herd et al. (2013):

- No stats within group, but in raw numbers they improved slightly
- What differed from our study:
  - Given feedback on correct/incorrect, always heard stimulus again: *Right! That was cara. Let's hear cara again.*
    - Need that auditory feedback to be effective?
  - Had 2 20-30 min sessions per contrast
    - Need more training time to be effective?
  - Posttest within 2-3 weeks of training
    - Gains not sustained after a long period?
    - U-shaped curve learning… and we post-test them while still in U-land?
  - Self-selected students
    - Ours not motivated?

Does the training alone help?

○ Seems like it!
   ◦ No statistical differences between groups
   ◦ In and of itself it appears to be beneficial, with or without pronunciation instruction
      ● Though we are not advocating to replace phonetics/pronunciation instruction

They learned. We learned.

- At the 300- (and 400-) levels learners still exhibit difficulties with sound-grapheme correspondences.

- Lower-levels of instruction could benefit greatly for incorporating HVPT to train for less-transparent sound-grapheme correspondences.
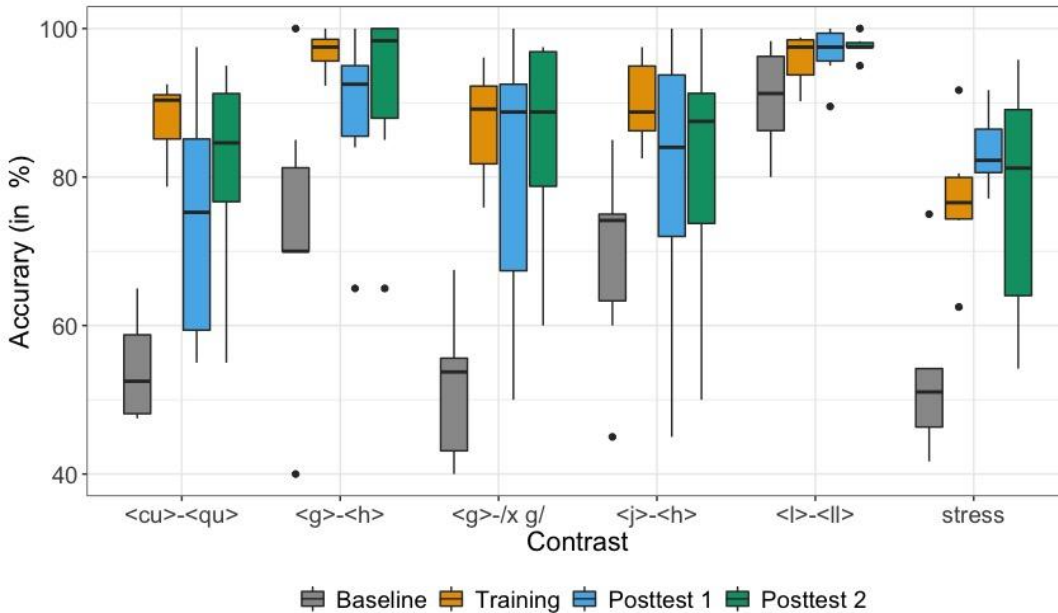 - Piloted with one group of beginner Spanish students

Beginner course

- <cu> vs. <qu>   *cuide* vs. **quide*
- <g> vs. <h>   *gemelo* vs. **hemelo*
- <j> vs. <h>   *joya* vs. *hoya*
- <l> vs. <ll>   *lama* vs. *llama*
- Stress   *término* vs. *terminó*
    práctica vs. *practica*
    aportara vs. *aportará*
- <g> vs. <gu>   *agitar* vs. **aguitar*

Beginner course

- Some baseline scores at random (cu-qu, g-/x g/, stress)

- Achieve ~80%+ by Posttest(s)

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 strategize as to what to pay attention to
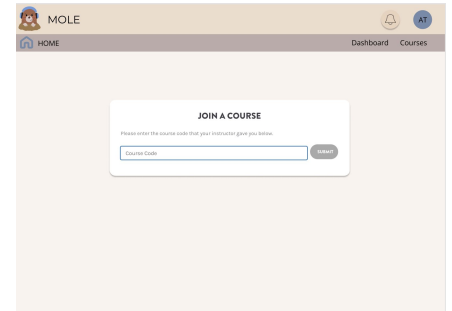
In the works

New experimental protocols:

- ○ regional variation tasks
- ○ extend work with beginner learners
- ○ more contextualized tasks

Multilingual Online Listening Exercises (MOLE)

- ○ French, Japanese and Spanish

Working on developing user-friendly website

Thank you! Questions?

Danielle Daidone   daidoned@uncw.edu

Silvina Bongiovanni   bongiov8@msu.edu

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.

○ Herd, W., Jongman, A., & Sereno, J. (2013). Perceptual and production training of intervocalic /d, ɾ, r/ in American English learners of Spanish. *The Journal of the Acoustical Society of America, 133*(6), 4247-4255.

○ Uchihara, T., Karas, M., & Thomson, R. (2021, June). High Variability Phonetic Training (HVPT): A meta-analysis. Paper presented at Pronunciation in Second Language Learning and Teaching (PSLLT) conference [Online].

Additional slides

beginner

beginner

Contrast

C

Baseline　Training　Posttest 1　Posttest 2