Background

• Theoretical Issues
  - Is speaker voice part of the memory representation of words?
  - Can listeners learn phonotactic constraints that are dependent on the speaker’s identity, during brief exposure?

• Onishi, Chambers, & Fisher, 2002
  - Listeners can learn 2nd-order phonotactic constraints where consonant position (onset vs. coda) is dependent on vowel identity:
    - E.g., tab and bar are words, but *pab & *lap are not words
  - With the same auditory exposure, listeners failed to learn 2nd order constraints of equal complexity involving speaker voice as one factor.

• But these constraints should be learnable...

Bilingual children learn the phonotactic patterns of two languages represented by their two parents (Bosch & Sebastián-Gallés, 2001)

Procedure

- Subjects hear word & repeat it as quickly as possible
- Voice key measures reaction time

- 146 possible words recorded by male and female speaker under these constraints— but only when they didn’t produce the words
- Subjects judged legal novel words significantly faster than illegal novel words, F(1,23)=28.134, p < .01
- Subjects tended to be more accurate on illegal novel words than legal novel words, F(1,23)=17.506, p = .06

Old-New Task

- After hearing each word, subjects clicked “old” if they had heard the word before in the study and “new” if they had not heard the word before
- Each subject judged 144 words
  - Study: 72 words
  - Test: 24 studied + 24 illegal novel + 24 legal novel mixed

Results

- 30 subjects again failed to learn constraints
- “Tell” condition subjects were slightly slower on illegal novel words, but did not reach significance, F(2,28)=2.242, p = .12
- A possible confound: subjects cannot actually produce two different patterns when one of the constraining factors is speaker voice– the subject only has one voice!

Experiment 2

- Goal: have subjects learn these constraints without producing the words
- Subset of Experiment 1 materials used (words with [c] were removed to allow for subsequent vowel study)

Conclusions

- Subjects were able to learn voice-dependent 2nd-order constraints— but only when they didn’t produce the words
- Speaker voice is part of representations
- Production helps shape representations

Acknowledgments & References

This work was supported by NIH R01 HD044458 awarded to Gary Dell, Jennifer Cole and Cynthia Fisher. The authors thank the members of the UIUC Phonotactic Learning group for their comments and suggestions on this work. All errors or omissions are the responsibility of the authors.

- Chambers, K., Onishi, K., & Fisher, C. Under review. A vowel is a vowel: Generalizing newly-learned phonotactic constraints to new contexts.