- **Review and discussion before midterm exam**

Background:

- Midterm exam review guide

0. Today's plan

- Exam structure / procedure

- General exam review
    - Some key concepts
    - Questions from the Padlet board

- Lab #06 discussion

- Some other interesting examples

1. Exam structure/procedure

- See [Midterm exam information and review guide](#)
  - Be sure to see the information about what is allowed for the **notes sheet**

- Any questions about how the exam will work?

2. General exam review

- If you've been approaching this course according to the recommendations, you should be in **good shape** going into the midterm!

    - Doing **readings** before class, and reviewing them again after class

    - Downloading and reviewing **lecture outlines**

    - Explicitly thinking about how **hands-on work** relates to readings and class topics

2. General exam review

- Particularly helpful resources might be

  - [Midterm exam information and review guide](#)

  - Modeling formants [lecture outline](#), W Sept 14

  - Source-filter model [summary diagram](#)

- Don't forget to review the **feedback** on your prep questions and past labs

2. General exam review

- What is the relationship between **tube length** and **resonance frequency**?
    - What else do you need to know to answer this question?
    - What applications have we seen for resonance frequencies of tubes?

2. General exam review

Questions on the Padlet board

- Lots of questions about **modeling formants** (good!)
  - Some examples follow, in the context of Lab #06 discussion

- Don't forget **basic wave properties** also

3. Lab #06 discussion

- Measuring and plotting vowel formants

  - Any questions here?

- Using **models** of vowel acoustics to make **predictions** about other vowels

  - The key to making predictions is to be as specific as possible given the information you have

3. Lab #06 discussion

- What does this look like for Lab #06?

  - Question is: How does each model predict F1-F3 will differ in high front round vowels as compared to their unrounded counterparts?

  - So…What do we know? How can we use this to make a prediction?

3. Lab #06 discussion

Multiple-tubes model

- How does it model [i]? (What piece of the model is responsible for each formant?)

  - F1:

  - F2:
  - F3:

- What does [y] add or change in the configuration?

3. Lab #06 discussion

Multiple-tubes model

- How does it model [i]? (What piece of the model is responsible for each formant?)

    - F1: Helmholtz resonance (depends on constriction, back cavity)

    - F2: back-cavity resonance

    - F3: front-cavity resonance

- What does [y] add or change in the configuration?

    - Lip rounding ≈ compression
      → Lengthens the *front cavity*

3. Lab #06 discussion

Perturbation theory

- How does it model [i]? Constriction at:

    - F1

    - F2

    - F3

- What does [y] add or change in the configuration?
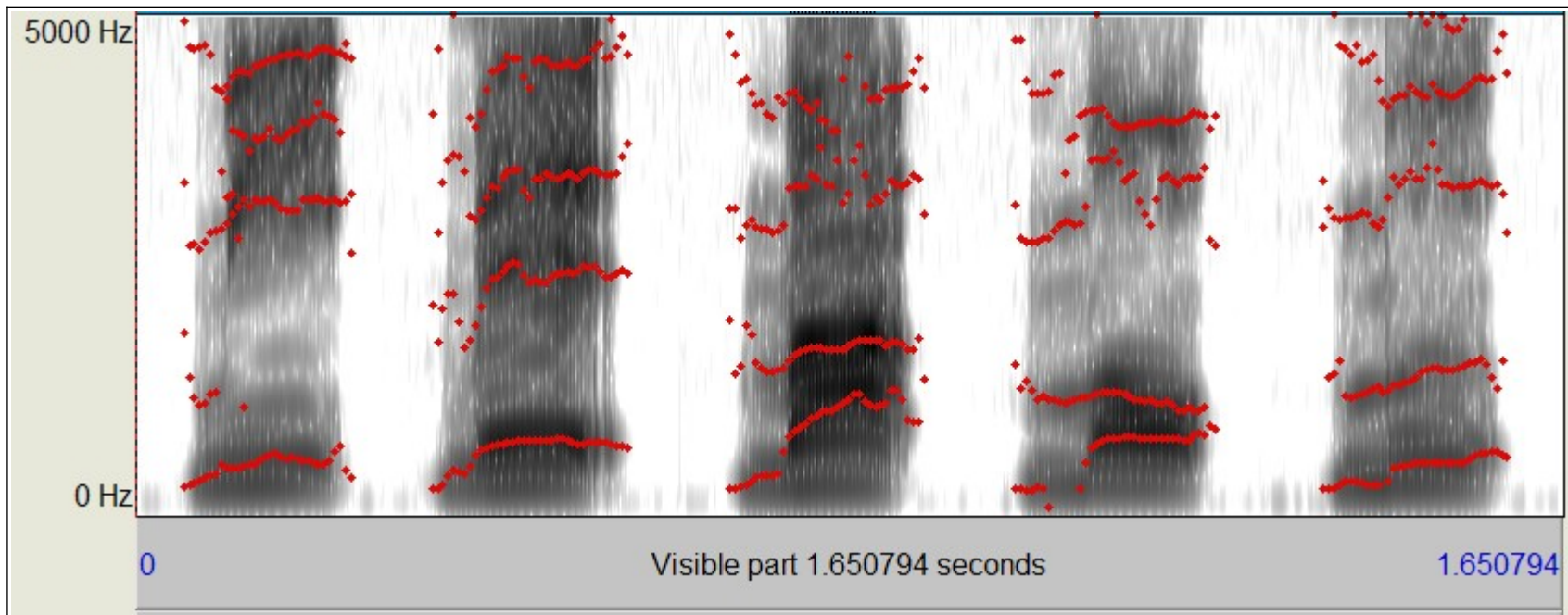
3. Lab #06 discussion

Perturbation theory

- How does it model [i]? Constriction at: palate
    - F1 = lower than schwa
    - F2 = higher than schwa
    - F3 = higher than schwa

- What does [y] add or change in the configuration?
    Constriction at lips
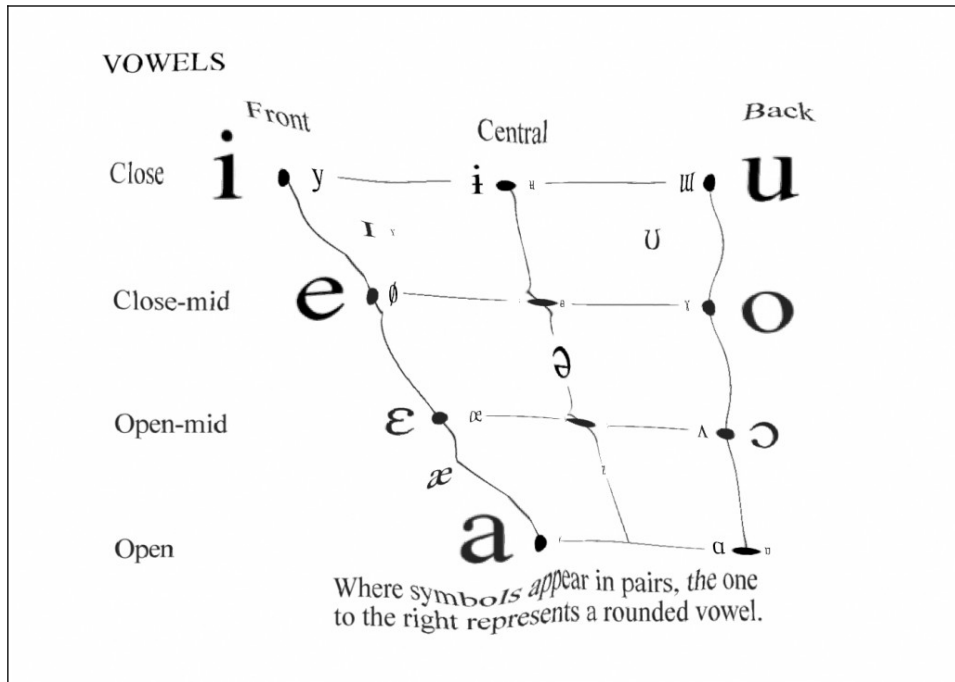   → What lessons can we draw from [u]?

- Can we identify the 5 vowels of <u>Japanese</u>, from the sound file on the *V&C* web site?

  - Which vowel here is surprising? (Plot F1xF2?)

- Graphic by Jeff Mielke, NCSU ([source](#))

"These are IPA charts in which area represents the crosslinguistic frequency of IPA symbols, according to the segment inventories in P-base." [compare [WALS map](#)]