- **Hypotheses, data graphics**
- **Discussion: Midterm exam**

Background:

- Lab #06 (German vowels)
- Midterm exam

0. Today's objectives

After today's class, you should be able to:

- Critically evaluate a **research hypothesis** based on the predictions of a **model**
- Design a **data graphic** to highlight a comparison
- Understand what **midterm** concepts to revisit, and plan an office hours appointment if needed

1. Testing a model with research questions

- What does it mean to **state the predictions** of
  …the multiple-tubes model
  …perturbation theory

  for how F1–F3 differ in high front unrounded vs. round vowels? (Lab #6)

1. Testing a model with research questions

- **Stating the predictions of a model** means
  - taking the model literally
  - working only with its entities / processes / assumptions and seeing what comes out
  - ignoring things you know about the world from other sources, or ways in which you already think that the model is wrong

- (Also remember to answer all parts of a question or assignment prompt...)

1. Testing a model with research questions

- Why do we need to state the predictions of a model in this way, even if we suspect (or know) the model is wrong?

1. Testing a model with research questions

- Why do we need to state the predictions of a model in this way, even if we suspect (or know) the model is wrong?
  - We want to test whether the model's predictions are a good match to our data

- Where did each of our models make a **good** prediction and a **bad** prediction for the effect of rounding on F1–F3 in Lab #6?

2. Communicating with data graphics

- Consider the data graphics for the vowel-length analysis in Lab #6 (on screen)
  - What kind of information does each graphic **communicate** well?
  - Which graphics are particularly useful for Lab #6?

3. Discussion: Midterm exam

- What does the spectrum of a complex wave represent?
- What happens when a speaker changes the source or the filter in a vowel?
- Other questions?