

Production Exercise #3
Part 1: Measuring Formants
due April 1st, 2022 by 11:59 pm
Linguistics 341

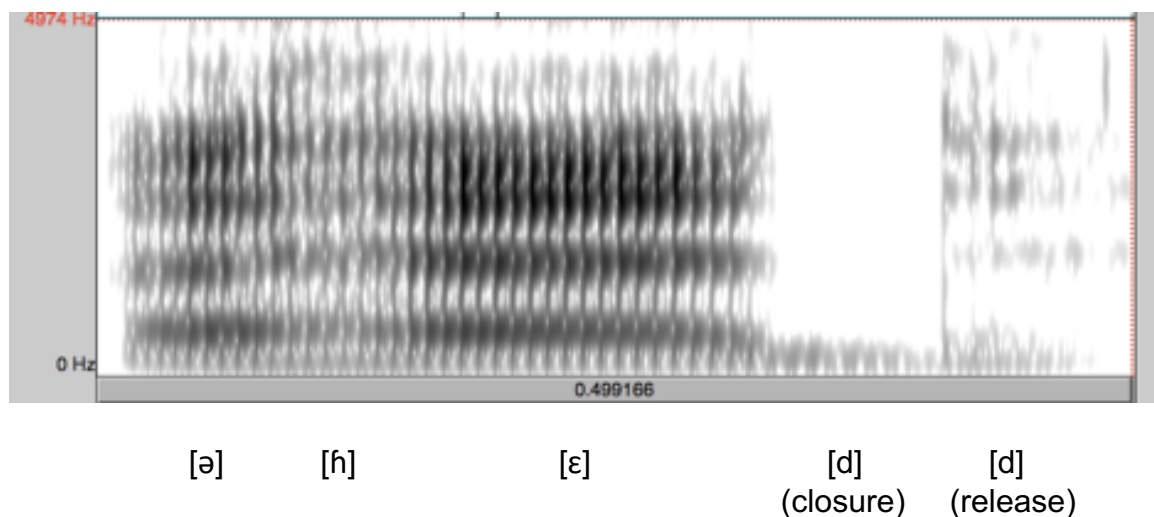
Task 1: Record yourself saying the following English words:

1. heed
2. had
3. hod (a "hod" is a long-handled box used to carry coal or bricks)
4. who'd
5. hid
6. hayed
7. head
8. hood
9. hoed
10. hud
11. straight ahead

You can make recordings of yourself by using Praat. Try not to overarticulate when you say each word (i.e., speak naturally).

Task 2: Measure the first three formant frequencies in each of the vowels you've produced. For "straight ahead", just measure the formants for [ə] in the first (unstressed) syllable of "ahead".

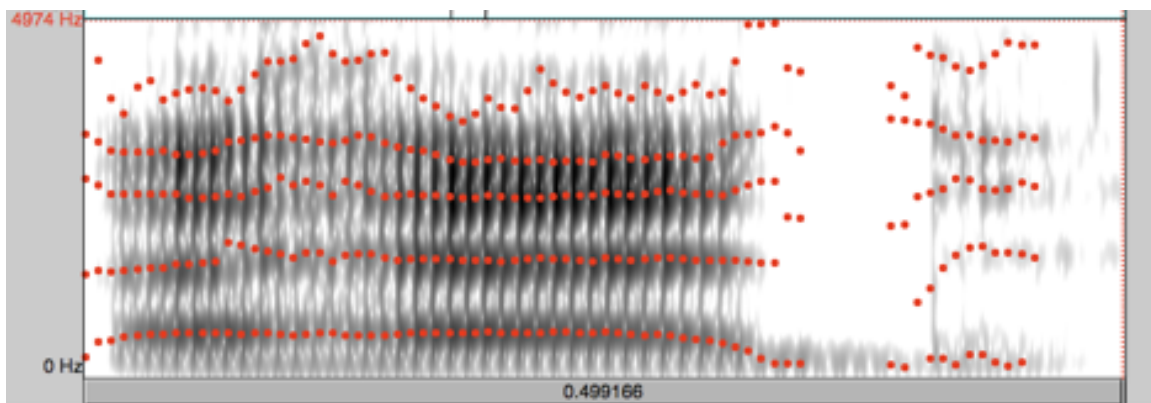
Example. Here's a spectrogram of my production of the word "ahead":



The **formants** are the dark, horizontal bars you see in the spectrogram. These bars reflect resonances in the vocal tract.

Remember that the y dimension in a spectrogram is the frequency dimension. Your task is to measure the center frequency of each of the first three formants (i.e., the three lowest frequency formants) in each vowel you've recorded. You can do this by picking a spot in the center of the formant band, in the (time) center of the vowel, and clicking on the spectrogram. A frequency value, in red, should appear on the left-hand side of the window in Praat. That is the formant frequency that you should write down.

Note: Praat has a feature that can help you find the center formant frequencies. If you're looking at your recorded sound in the edit window, pull down the "formant" tab and make sure the "show formants" option is clicked. Red lines will show up that will mark out the center frequencies of each formant.



Be advised that the formant tracker doesn't always work properly, so you should make sure that the measurements it gives you line up with what you see in the spectrogram.

Write down your formant measurements in a table like this:

Vowel	F1	F2	F3
[ə]	500 Hz	1500	2500 (these are just example values)
[i]			
[æ]			
[u]			
[ɑ]			
etc.			

Note that the world in reality is always more complicated than the world in theory, so your measurements for [ə] will probably not match up exactly with these.

Task 2b: Once you've written down your formant measurements for these vowels, please submit them to me via the link on the course homework page.

<https://dusannikolic.com/Linguistics341/HW4.html>

Task 2c: You should also submit the recordings you've made of your vowels in each word via the dropbox in **D2L, under HW4**.

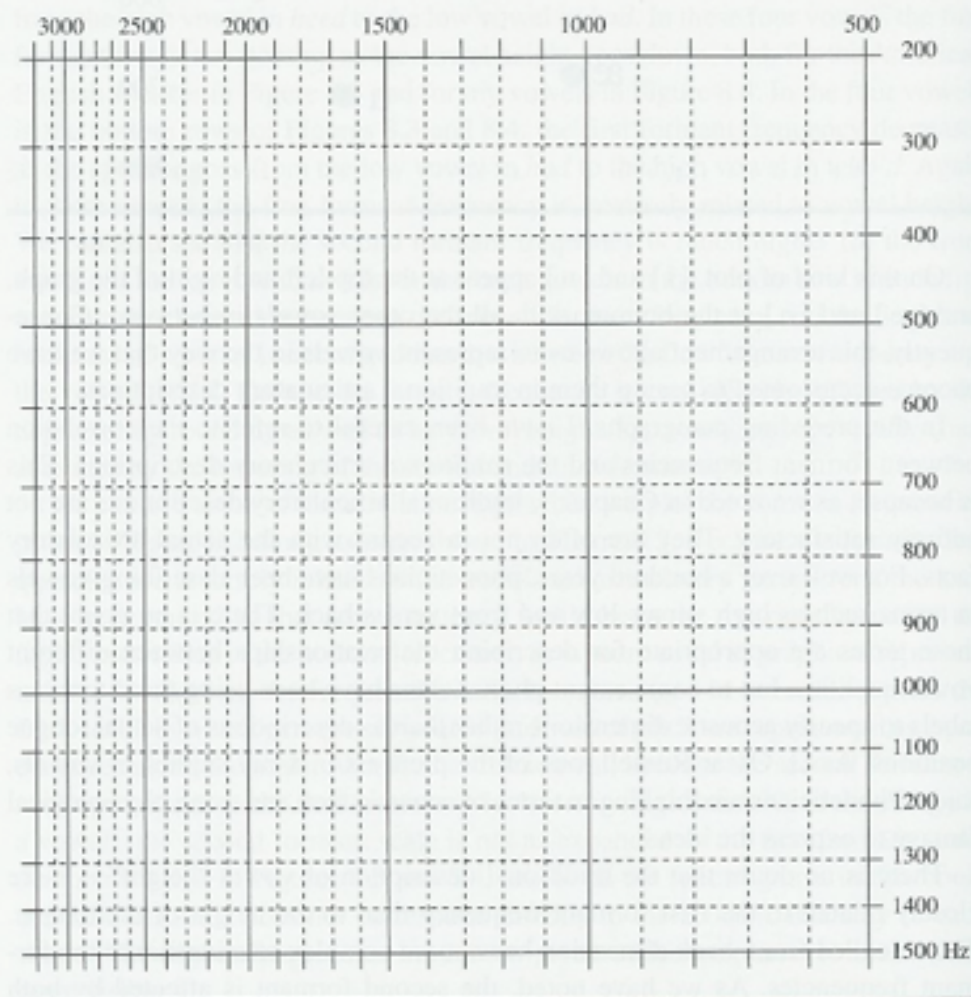
Task 3. Plot your vowel space

Measure the first two formant values for each of your vowels and then plot them—with your other measurements from Task 2—in the chart below, from the *A Course in Phonetics* textbook. Make sure you label each vowel in the chart with its phonetic symbol.

Note that you may make a similar chart using Excel, or some other graph-making mechanism. The chart below is unique, though, in that its axes are logarithmic, meaning that the spacing is compressed at higher frequencies. This spacing reflects the response of the human auditory system--we can more easily hear distinctions at the lower end of the frequency scale than at the higher end of the frequency scale. If you plot your formants using the typical, linear scale for each axis, you will be presenting your vowel space as it is transmitted acoustically, rather than how listeners perceive your vowels auditorily.

However you make your formant chart, you should submit an electronic copy of it via the dropbox in **D2L, under HW4**.

FIGURE 8.6 A blank formant chart for showing the relation between vowels. Using the information in Figures 8.3 and 8.4, plot the frequency of the first formant on the ordinate (the vertical axis) and the second formant on the abscissa (the horizontal axis).



Production Exercise #3

Part 2: Exotic Vowels

This production exercise is designed to test your ability to produce various vowel distinctions which are not found in English. To complete the exercise, listen to the example files for each production item that have been posted to:

<https://dusannikolic.com/Linguistics341/PEX3.html>

Then attempt to imitate those example files to the best of your ability. Record yourself producing each item in Praat, save your recordings to a sound file(s), and submit them to the **dropbox on D2L, under PEX3**.

Please let me know if you have any questions or any technical difficulties in completing this exercise.

Dutch front rounded vowels

1. [byt]

2. [pøt]

3. [pœt]

Vietnamese vowels

4. [ti]

7. [teɪ]

5. [tɯ]

8. [tɤ]

6. [tu]

9. [toʊ]

French oral and nasal vowels

10. [lo]

13. [lɛ̃]

11. [lɔ̃]

14. [la]

12. [lɛ]

15. [lã]