

HOMEWORK I: ENGLISH VOWELS
Ling 411/511 Phonetics: Guion-Anderson

Part 1

You will be working with the sound files from the *Handbook of the International Phonetic Association* (<http://uoregon.edu/~guion/LING411/American-English/Vowels/>) and from the CD-ROM from the Ladefoged book (<http://pages.uoregon.edu/guion/LING411/Vowels%20and%20Consonants/chapter3/amengvowels.html> or Chapter 3 on your CD).

Your task is to measure the first and second formants (F1 and F2) of the English vowels listed below. You will learn how to do this using the PRAAT software in the discussion section. Briefly, you will read in the sound file to PRAAT, then select the sound file and click on “edit”. Zoom into the word you are working on. On the spectrogram, you will determine the temporal midpoint of the vowel and place the cursor there. Then, get the first and second formant frequencies by opening the “Formant” menu and selecting “get first formant” and “get second formant”. In the case of the true diphthongs, make two measures, one 1/4 of the way into the vowel, and one 3/4 of the way into the vowel.

Vowels from the *Handbook of the IPA*

	IPA		IPA
bead	[i:]	bode	[ou]
bid	[ɪ]	good	[ʊ]
bayed	[eɪ]	bood	[u:]
bed	[e]	bud	[ʌ]
bad	[æ]	bird	[ɜ:]
pod	[ɑ:]	a(bove)	[ə]
buy	[aɪ]	bough	[aʊ]
boy	[ɔɪ]		

Vowels from the Ladefoged CD

	b_d	IPA		b_d	IPA
1	bead	i:	9	bode	ou
2	bid	ɪ	10	bood	u:
3	bayed	eɪ	11	bud	ʌ
4	bed	e	12	bird	ɜ:
5	bad	æ	13	bide	aɪ
6	bod(y)	ɑ:	14	bowed	aʊ
7	bawd	ɔ:	15	Boyd	ɔɪ
8	budd(hist)	ʊ			

After you have collected the F1 and F2 measures create a table for each speaker in which you report your measurements. Then you will plot the measurements on the attached vowel chart. Please use colored pencils or different plotting symbols for the two sets of vowels. In the case of diphthongs, connect the 1/4 and 3/4 points with an arrow to show the formant movement. Add a legend indicating which vowels are from which data set. Write the IPA symbol next to the data points. Connect the monophthongal vowels (excluding the central vowels such as [ʌ], [ə] “schwa” and [ɜː] “rhotacized vowel”) for each speaker to give an idea of overall vowel space.

You will note that the two speakers have different vowel formant values and have an overall different vowel space. In a short paragraph, explain why the two speakers differ. In your answer you will need to reference some of the concepts from the readings and lectures about the acoustics of vowel production.

Part 2: (Required for Graduate Students, optional/extra credit for Undergrads)

Now you will record your own English vowels. Say the same words that are used on the Ladefoged CD plus “a(bove)”. You can record your vowels on any computer. Many of you have microphones you can use. If you do not have a microphone, see the professor or GTF during office hours to use one of ours. To record in PRAAT choose the “New” menu and select “Record Mono Sound”. Select a sampling rate of 11025 and hit record. Now read the word list. After you hit stop, go to the “File” menu and select “write to WAV file”. Then save and name the file.

Note that you may or may not have a different vowel in the words “bod(y)” and “bawd”.

Finally, measure the F1 and F2 for your vowels (following the procedure above) and plot them on a graph (you may use the same graph as you used for part one, a new copy of the same, or a computer program). Then draw an outline of your vowel space by connecting the points for the monophthongal vowels.

Are your vowels more like the IPA Handbook or Ladefoged CD vowels? Why do you think this is?

