Linguistics 103 Hayes/Lefkowitz
General Phonetics Winter 2012

Acoustic Phonetics Curriculum and Study Guide

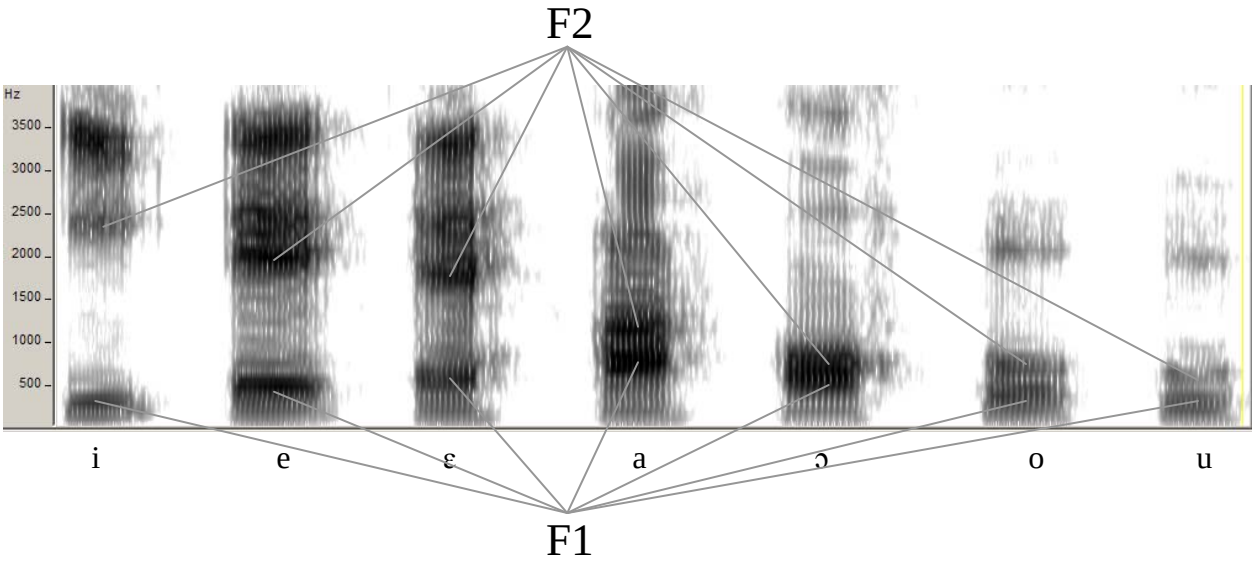
Know how to do these things. Rogers Ch. 7-8 covers them pretty well, so looking again at these will help.

1. Pitch

- Calculate pitch from a waveform or spectrogram (vertical stripes).
- Use Wavesurfer to view pitch contours

2. Vowels

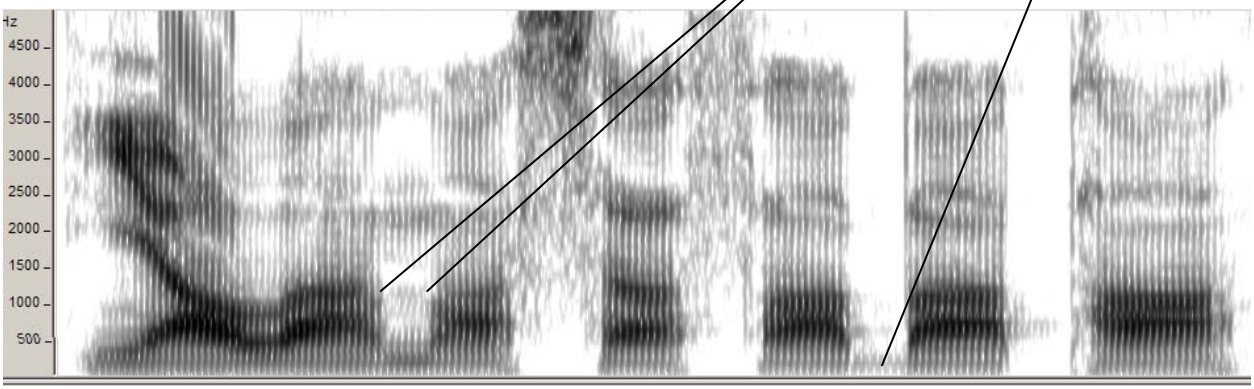
- Know how to spot the lowest formants on a spectrogram.
  - A useful precaution: in [i] F2 is quieter than F3; don't mistake F3 for F2.
  - Knowing the *rough* formant frequencies of vowels helps you spot the formants for a particular vowel.
- Roughly identify vowels (particular, more than one at a time) by using the basic relations between formant frequency and vowel quality:
  - High F1, low vowel / low F2, high vowel
  - High F2, front vowel / low F2, back vowel
  - Rounding lowers all formants



3. Identifying segment boundaries

- Segment a spectrogram, relying on various cues:
  - Vowels are loud and look it; especially stressed vowels and low vowels

- All sonorants (vowels, approximants, nasals) are vertically striped, one stripe per pitch period.
- Glides look like quiet high vowels.
- Nasals, liquids also look like quiet vowels. Nasals have <u>sharp boundaries</u>.
- Stops ([b] and [b] below) are usually fairly silent, except for a very low <u>voice bar</u> in truly-voiced stops.
- Fricatives ([s] and [f] below) look fuzzy, sibilant fricatives are louder than non-sibilants.

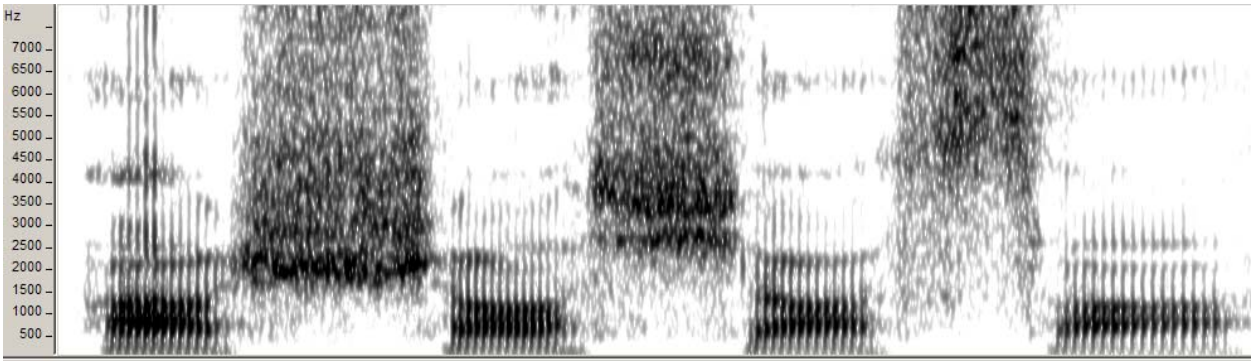


4. Identify voicing in stops

- Look for the voice bar, as in comparing the last two consonants of [jalamafabapa] above. This can be very useful in transcribing your term paper recording.

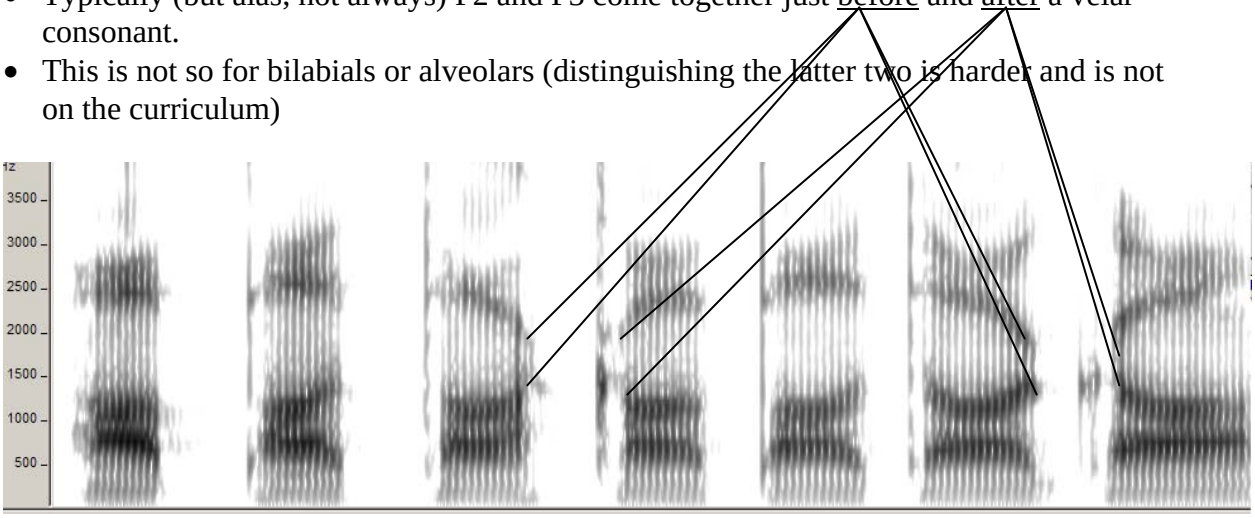
5. Matching up sibilants to their spectrogram representation by pitch

- Listen to the sibilant for its auditory pitch and match it up.
  - If you make the spectrogram yourself, it pays to adjust the pitch maximum up to 8000 hertz.



6. Identifying velar consonants by their velar pinch

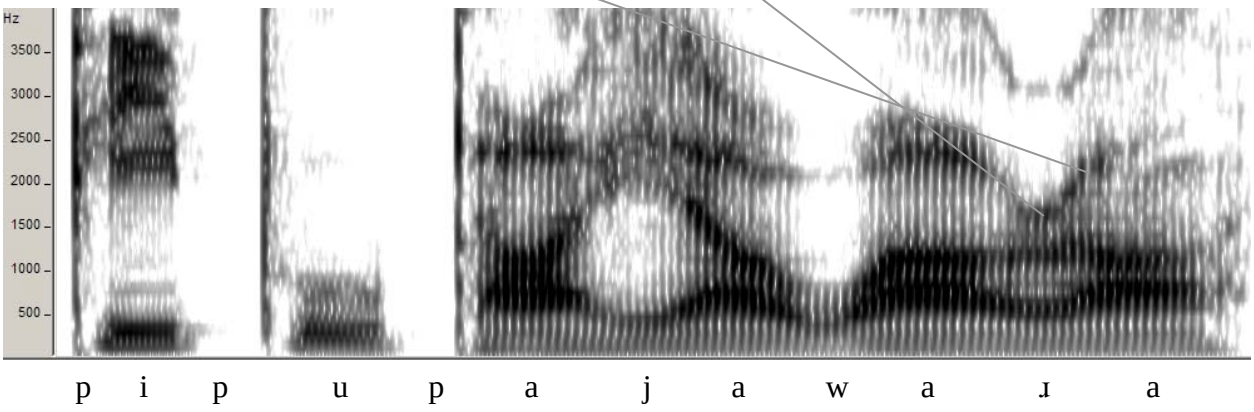
- Typically (but alas, not always) F2 and F3 come together just before and after a velar consonant.
- This is not so for bilabials or alveolars (distinguishing the latter two is harder and is not on the curriculum)



- You can do this for nasals, too, but it's harder: coarticulatory nasality obscures the vowel formants.

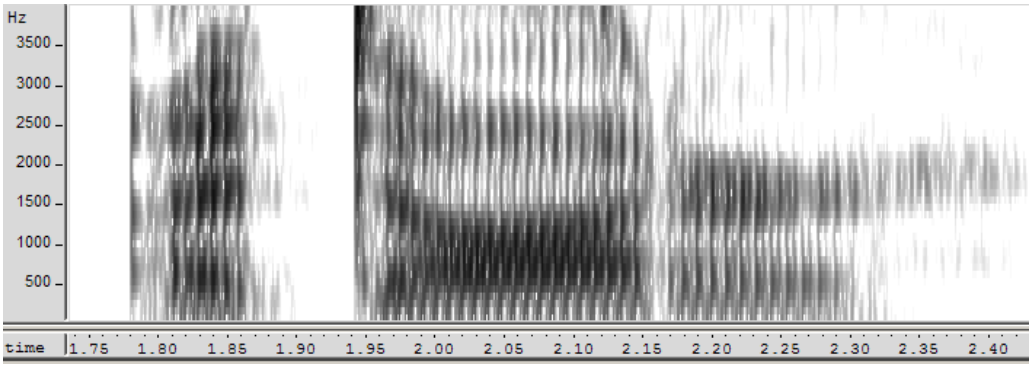
7. Identifying /ɹ/ by low F3; glides by vowel-like formant frequencies

In a [ɹ] (also [ɻ], [ɚ]) F3 comes down close to F2. In the following spectrogram, note that [j] and [w] resemble their partner vowels [i] and [u] in their formant frequencies, but are quieter.



8. Taps

- These are easy because they look like very short stops. *A daughter* has one of both*:*



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9. Measuring Voice Onset Time

We will cover this when we get to Rogers Chapter 12.