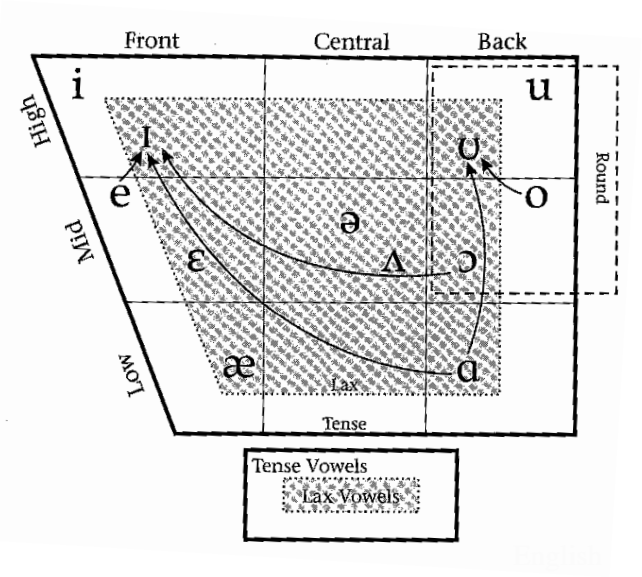
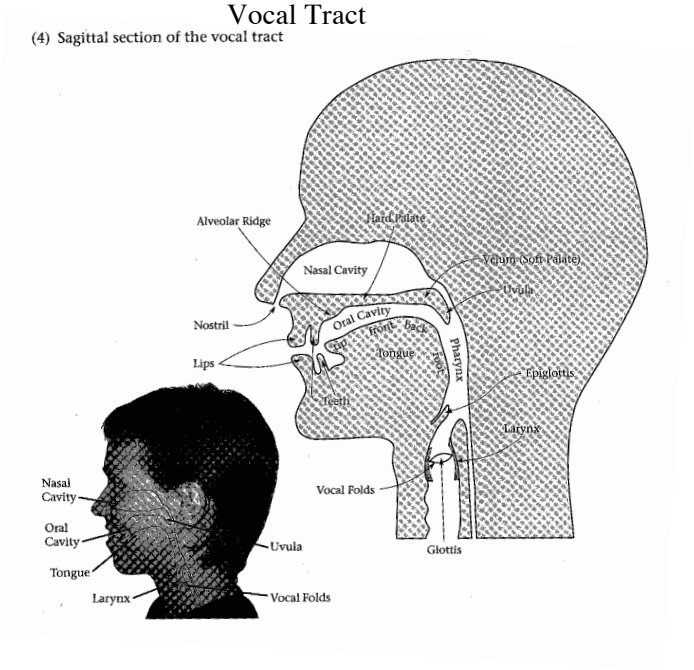
Articulatory Phonetics

English vowel space



Vocal Tract



English consonants

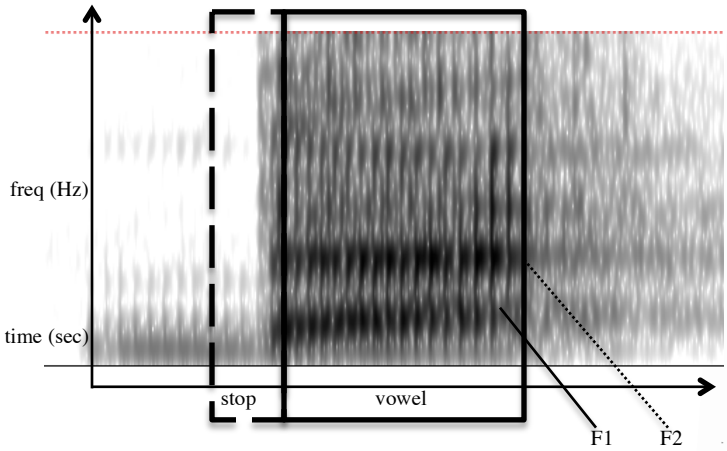
Manner of Articulation \ Place of Articulation	Bilabial		Labio-dental		Inter-dental		Alveolar		Post-Alveolar		Palatal		Velar		Glottal	
Stop	p	b					t	d					k	g	ʔ	
Fricative			f	v	θ	ð	s	z	ʃ	ʒ					h	
Affricate									ʧ	ʤ						
Flap								ɾ								
Nasal		m						n						ŋ		
Lateral Liquid								l								
Retroflex Liquid								ɹ								
Glide	ʍ	w[3]										j				

State of the Glottis: Voiceless | Voiced

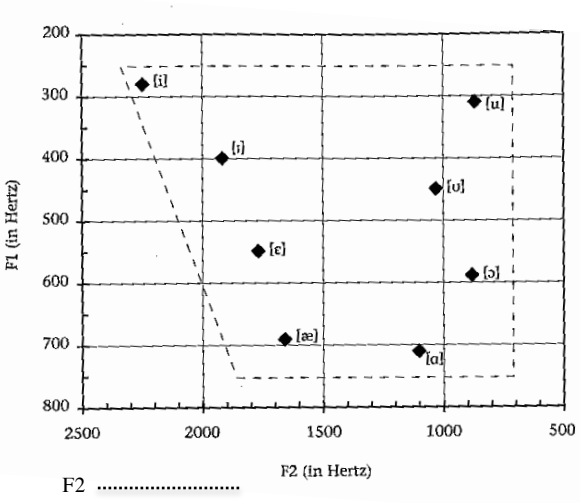
Notes:
. liquids and glides are approximants
. just consider [w] a labio-velar approximant

Acoustic Phonetics

Spectrogram (time; x, frequency; y, energy; darkness)



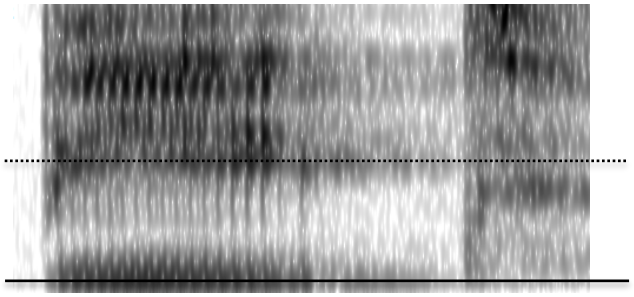
Vowel chart w/formants



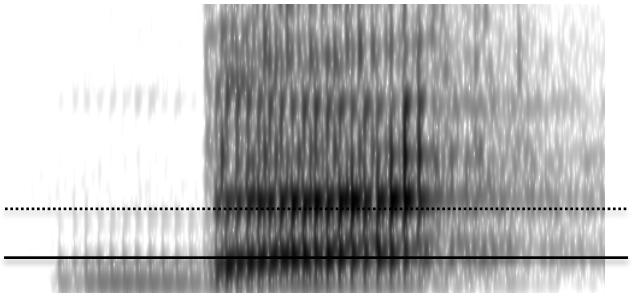
Vowels

F1 ——— F2 .....

First formant (F1): vowel height (openness)

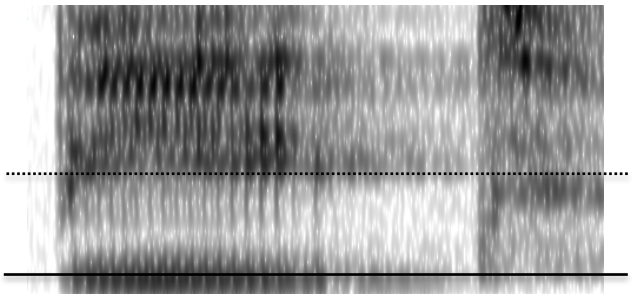


High (beat)

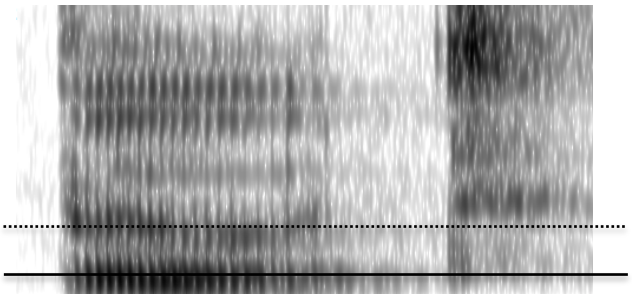


Low (bat)

Second Formant (F2): tongue advancement (vowel frontness)



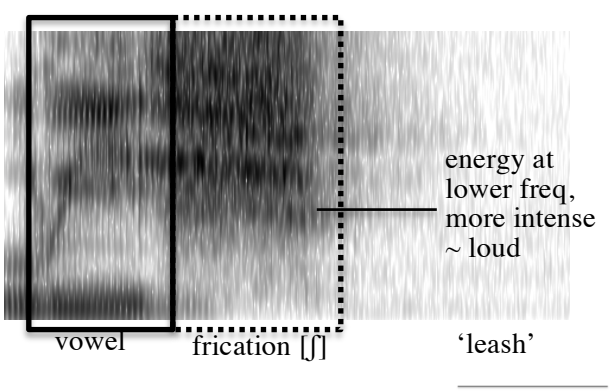
Front (beat)

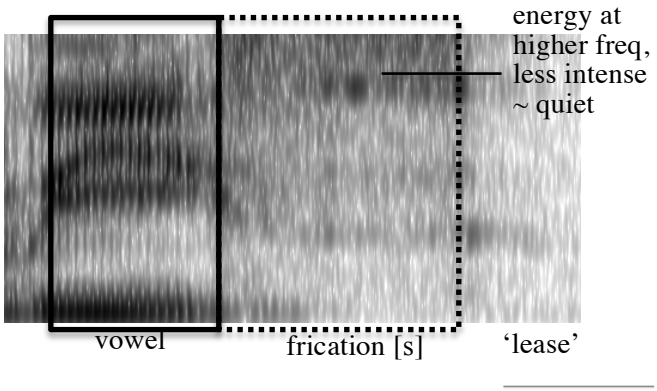


Back (boot)

Consonants

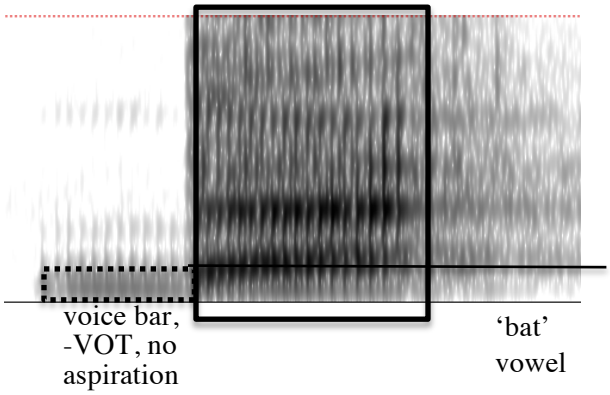
Frequency (and intensity) of spectral energy: can help distinguish some consonants (such as [ʃ] v. [s])

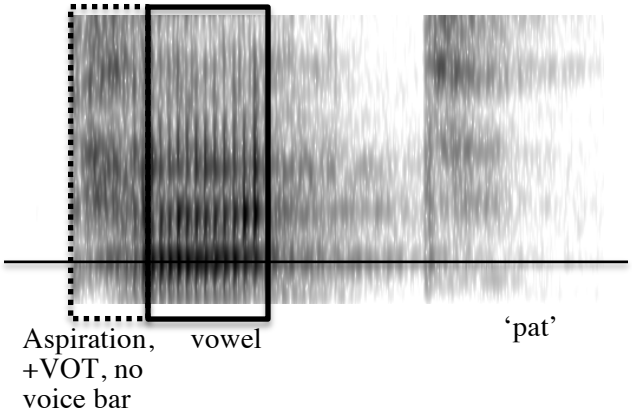




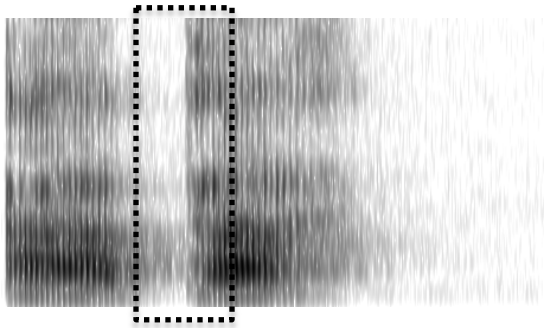
Voice bar/Voice Onset Time (VOT): voice bar can be (but not always) present for voiced, never for voiceless; voice onset time always positive for voiceless and sometimes negative for voiced; VOT voiceless > VOT voiced.

(VOT is something you don't need to know for this course; this is just for your information).

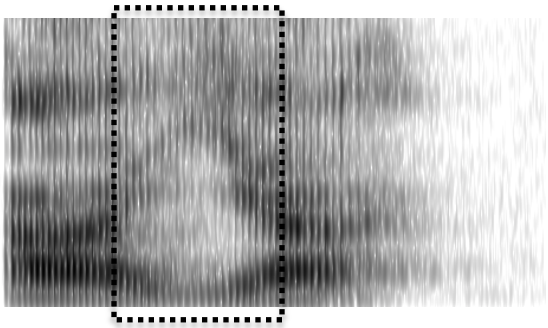




Abrupt changes in waveform: good place to start in distinguishing stops from other consonants



plosive [p], signal is [ɑpɑ]



glide [j], signal is [ɑjɑ]