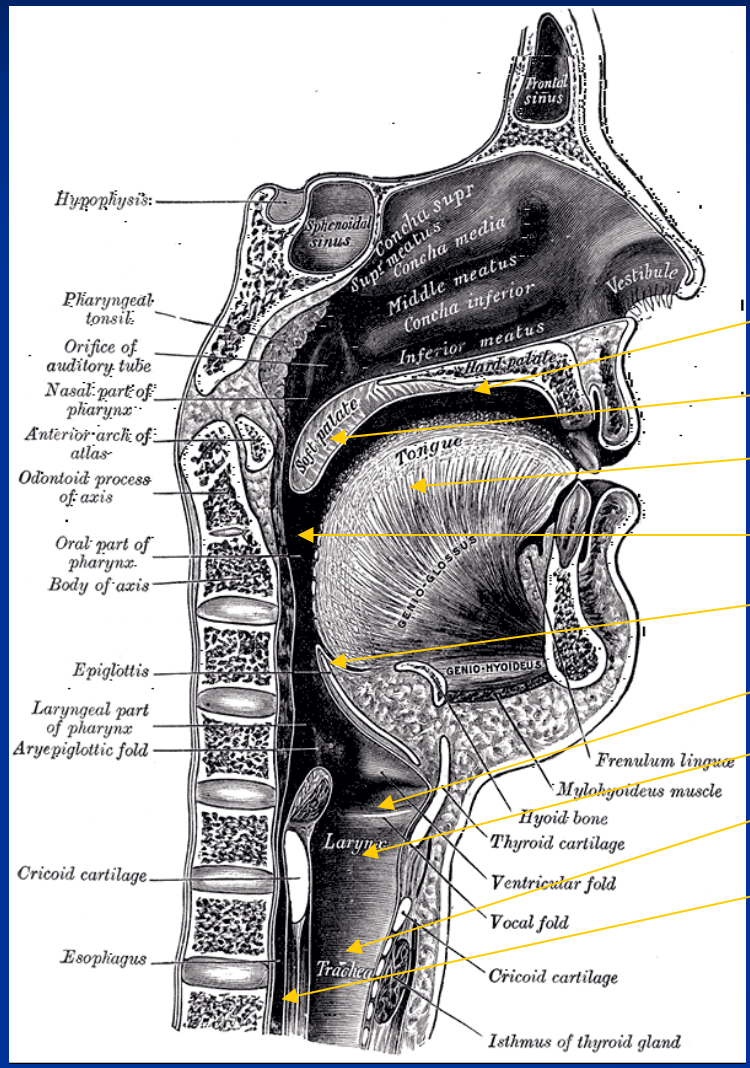
Reviewing English Phonetics

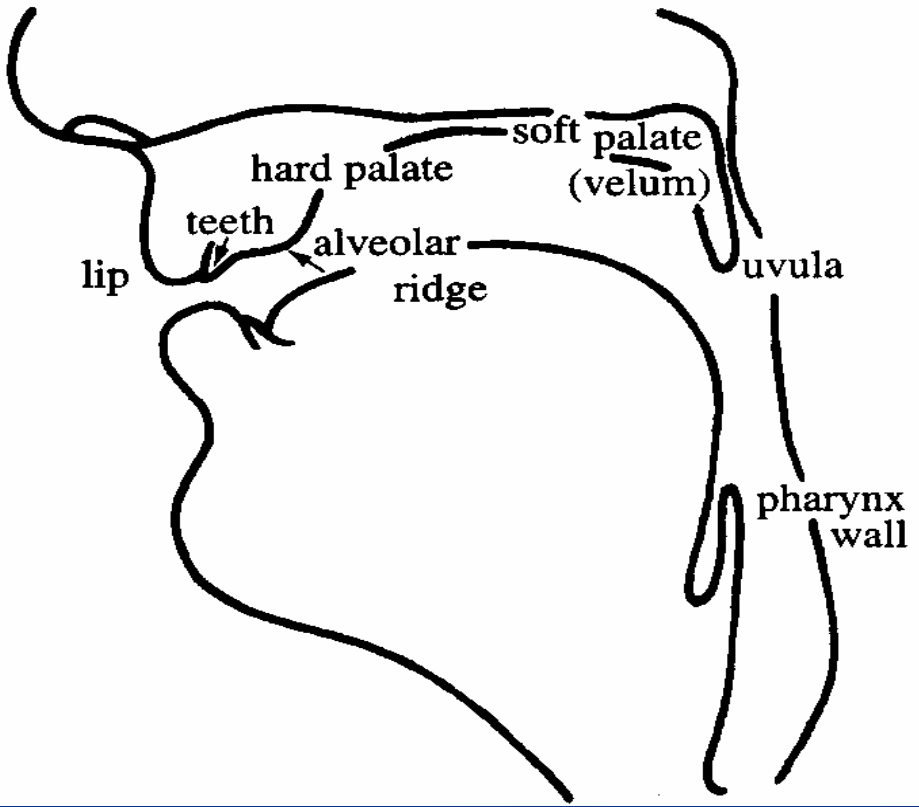
1. Vocal Organs



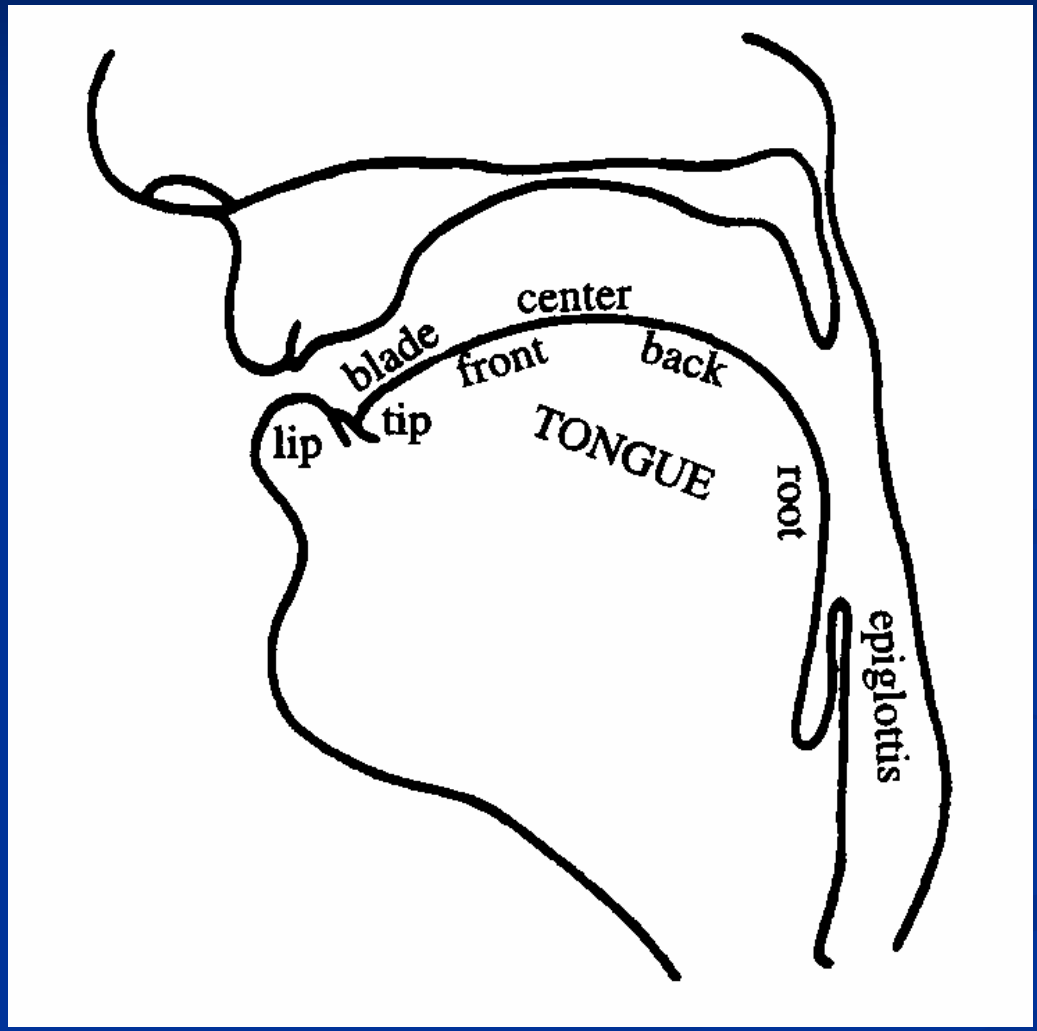
Hard palate
Soft palate
Tongue
Oral part of pharynx
Epiglottis
Vocal fold
Larynx
Trachea
Esophagus

2. The articulators (the upper surface)

The principal parts of the upper surface of the vocal tract.



3. The articulators (the lower surface)

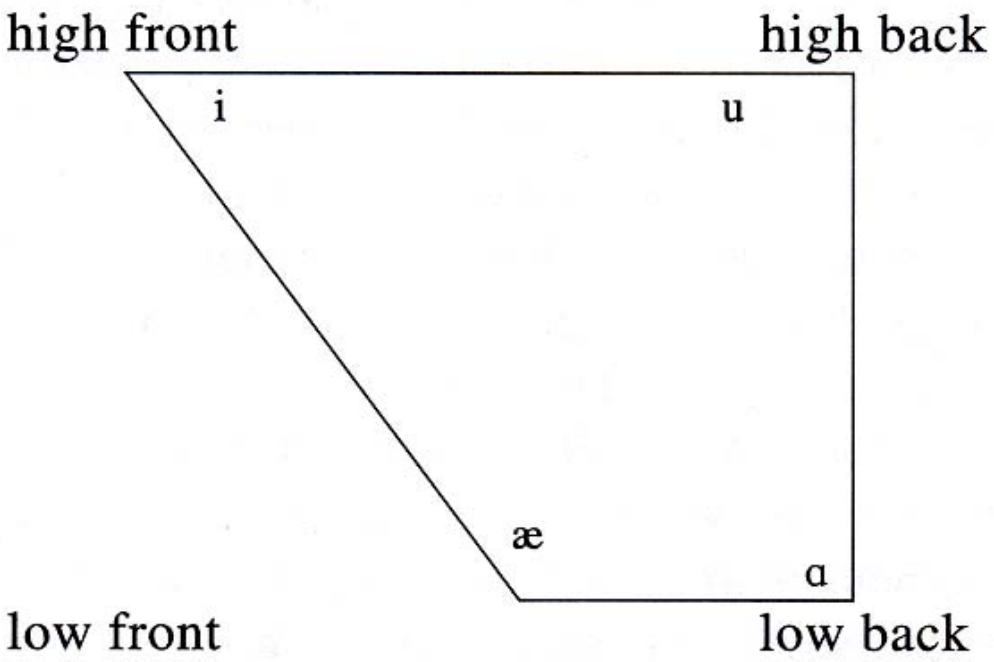


4. How to describe English vowels

1. Tongue positions
2. Tense or lax vowels
3. Stressed vowels, unstressed vowels, reduced vowels
4. English vowels in different accents

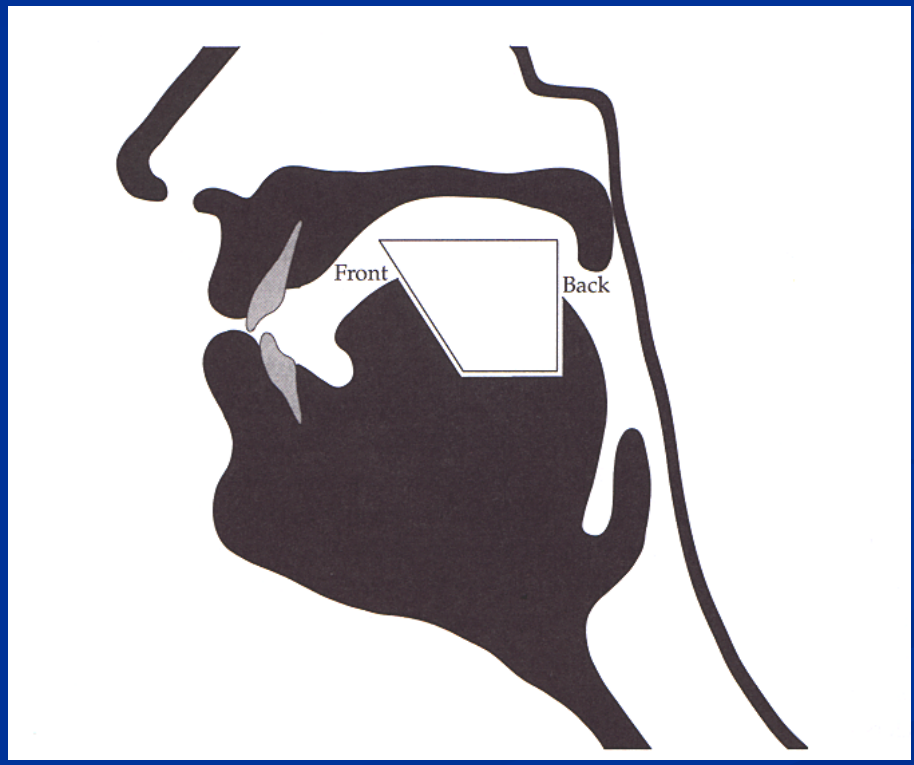
5. The vowel space

FIGURE 4.1 The vowel space.



6. A More specific notion of the vowel space

Make sure we can locate the “vowel space” and know the basic features of each vowel



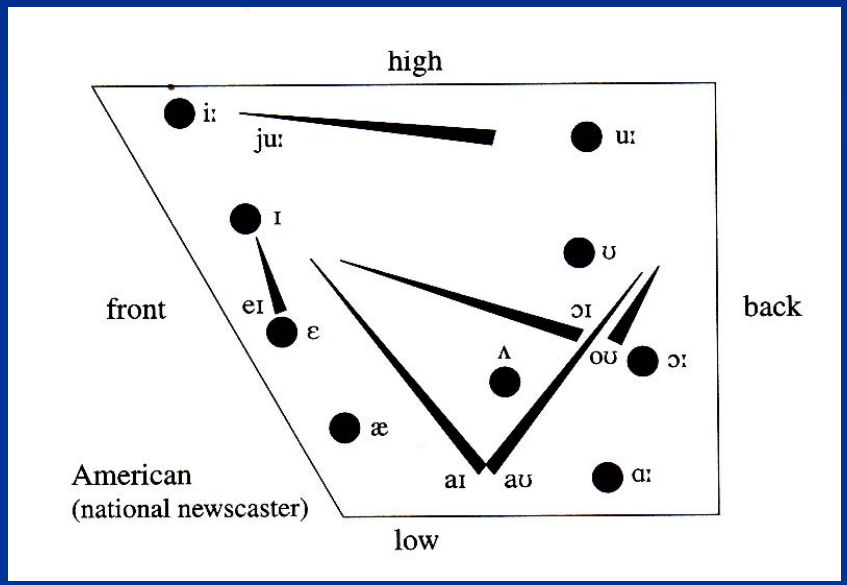
7. Monophthongs or diphthongs?

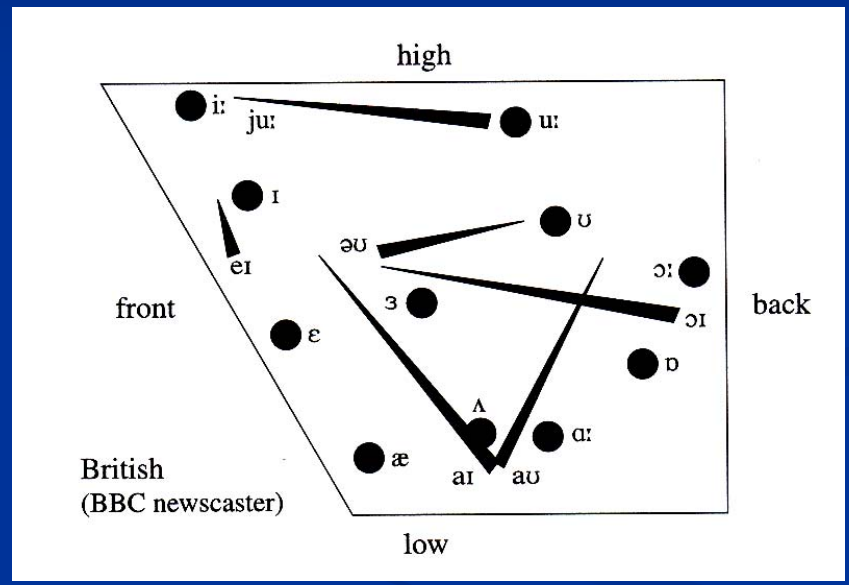
1. Can you identify the following vowels as monophthongs or diphthongs?

   [ou] [i] [u] [✈] [au] [♋✋]

2. Can you identify the “track” of the sounds mentioned above?

8. The “tracks” of the diphthongs





9. Rounded and unrounded vowels

1. The relationship between front vowels and rounded vowels.

2. How do you read /◆/ in food?

3. Identify the track of the /ɚ◆/ sound in English.

10. Unstressed syllables

The symbol [★] or [✹]may be used to designate many vowels that have a **reduced vowel** quality (AmE).

	Stressed syllable	Unstressed syllable	Reduced syllable
i	appreciate	creation	deprecate
ɪ	implicit	simplistic	implication
eɪ	explain	chaotic	explanation
ɛ	allege	tempestuous	allegation
æ	emphatic	fantastic	emphasis
ɑ, ɒ	demonstrable	prognosis	demonstration
ɔ	cause	causality	
oʊ, əʊ	invoke	vocation	invocation
ʊ	hoodwink	neighborhood	
u	acoustic	acoustician	
ʌ	confront	umbrella	confrontation
ɜˑ, ɜ	confirm	verbose	confirmation
aɪ	recite	citation	recitation
a ʊ	devout	outsider	
ɔɪ	exploit	exploitation	
ju	beauty	beautician	circular

11. Tense and lax vowels (AmE)

Not simply a matter of “tension”

Closed syllables vs. open syllables

Tense Vowels	Lax Vowels	Most closed syllables	Open syllables	Syllables closed by		
				[r]	[ŋ]	[ʃ]
i		beat	bee	beer		(leash)
	ɪ	bit			sing	wish
eɪ		bait	bay			
	ɛ	bet		bare	length	fresh
	æ	bat			hang	crash
ɑ		hot	pa	bar		slosh
ɔ		bought	saw	bore	long	(wash)
oʊ		boat	low	(boar)		
	ʊ	good				push
u		boot	boo	poor		
	ə/ʌ	but		purr	hung	crush
aɪ		bite	buy	fire		
aʊ		bout	bough	hour		
ɔɪ		void	boy	(coir)		
ju		cute	cue	pure		

12. Rules for English vowel allophones

1. A given vowel is longest in an open syllable, next longest in a syllable closed by a voiced consonant, and shortest in a syllable closed by a voiceless consonant.

2. Other things being equal, vowels are longer in stressed syllables.

3. Other things being equal, vowels are longest in monosyllabic words, next longest in words with two syllables, and shortest in words with more than two syllables.

   speed speedy speedily

4. A reduced vowel may be voiceless when it occurs after a voiceless stop (and before a voiceless stop).

   permission, tomato, compare, potato, catastrophe

   preparatory, introduction, replicate, complicate

5. Vowels are nasalized in syllables closed by a nasal consonant.

   ban, run, seen

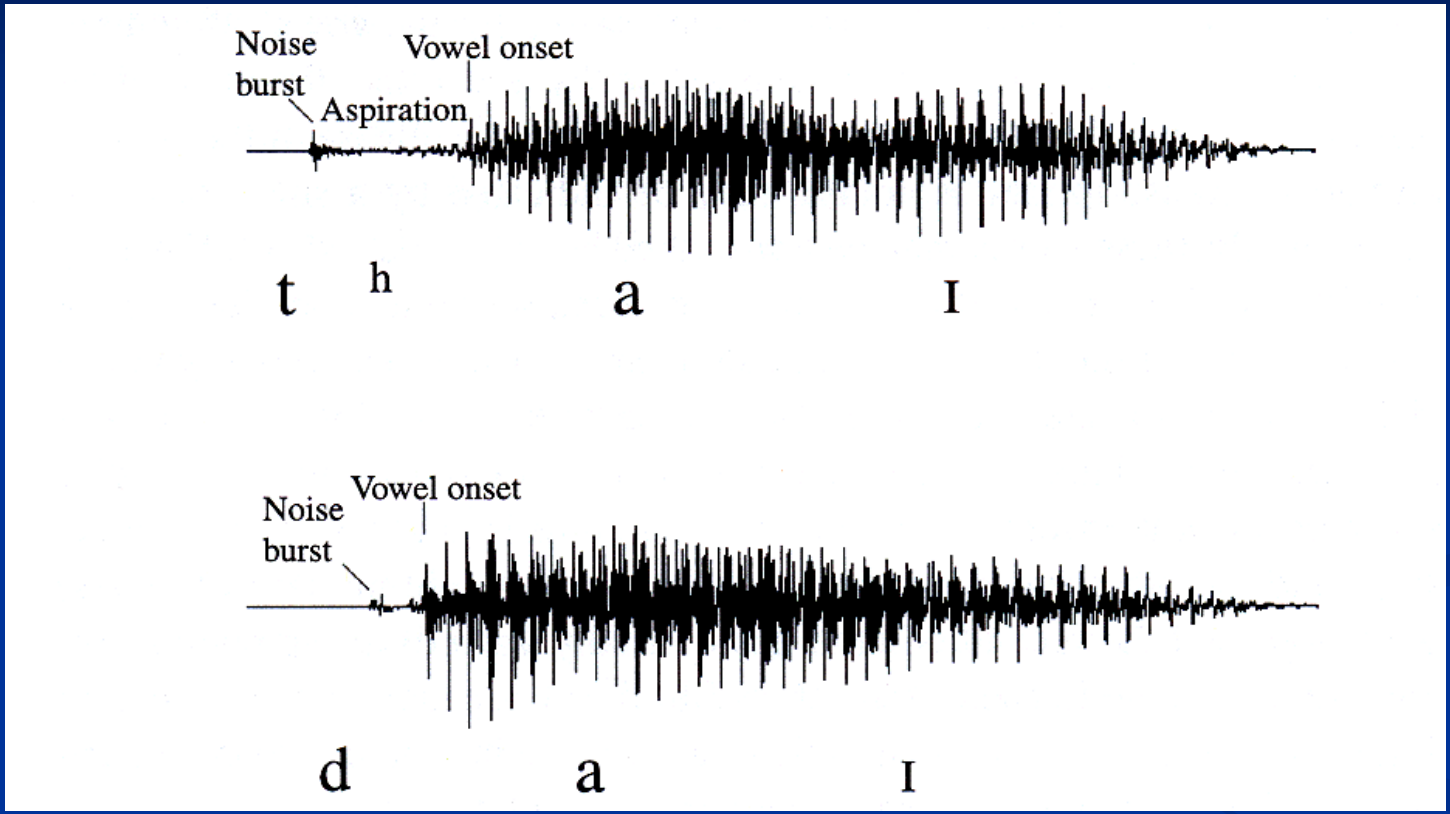
6. Vowels are retracted before syllable final [ɹ̠].

   peel, pail, pal

13. An overview of the English consonant

Manners of Articulation	Place of Articulation						
	Bilabial	Labiodental	Dental	Alveolar	Palatal	Velar	Glotal
Stop Voiceless Voiced	/p/ /b/			/t/ /d/		/k/ /g/	
Fricatives Voiceless Voiced		/f/ /v/	/  / /  /	/s/ /z/	/  / /  /		/h/
Affricate Voiceless Voiced					/t  / /d  /		
Nasal-voiced	/m/			/n/		//	
Liquid-voiced				/l/	/r/	[]	
Glide/Approximant Voiceless Voiced	/hw/ /w/				/j/	/hw/ /w/	

14. Vowel onset and aspiration

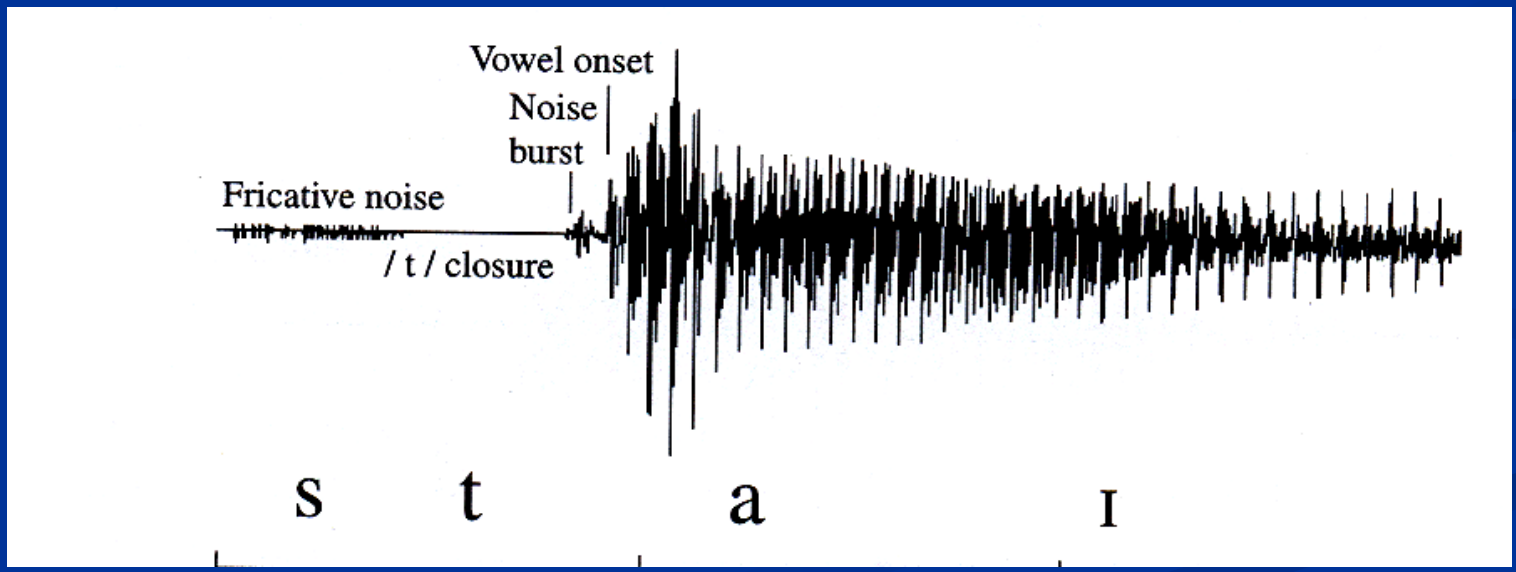


Try the following set of sounds and examine the VOT:

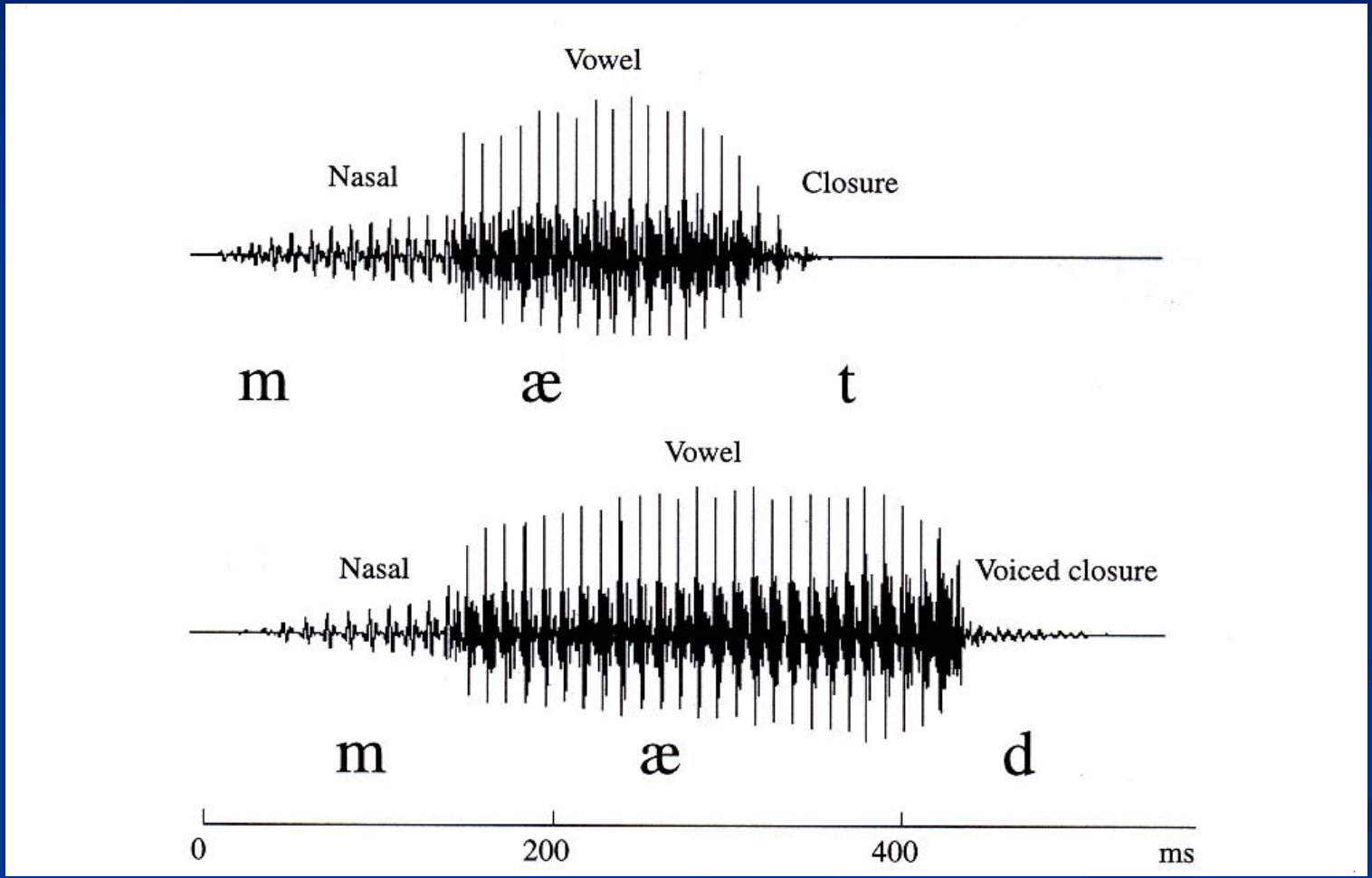
tie sty die pie spy buy kye sky guy

What may happen if /s/ is clustered with /t/, /k/, and /p/? Figure 3.1 shows that two things are to happen for any stop consonant before vowels.

1. If the stop consonant is voiceless, there will be a period of “aspiration” before the VOT (vowel onset time).
2. If the stop consonant is voiced, there will not be a period of “aspiration” before the VOT.
3. Figure 3.1 shows that the “aspiration” simply does not exist.



15. the ending consonants



16. The diacritic [❁]: no audible release

1. advocate
   action
   [💻✈&❁💧■Ⅱ]

2. “It’s a big day.”

17. The glottal [ʔ] sound

1. []
2. rap, rat, rack
3. beaten, kitten, fatten

18. The [☼] sound

1. What is “lateral plosion”?
2. little [💻●🖐☼●♊]
3. city [💻♦🖐☼♓]

19. Approximants

1. What are approximants?
2. What are the sound qualities of these approximants?
3. What are the functions of these approximants?

20. Rules for English consonant allophones

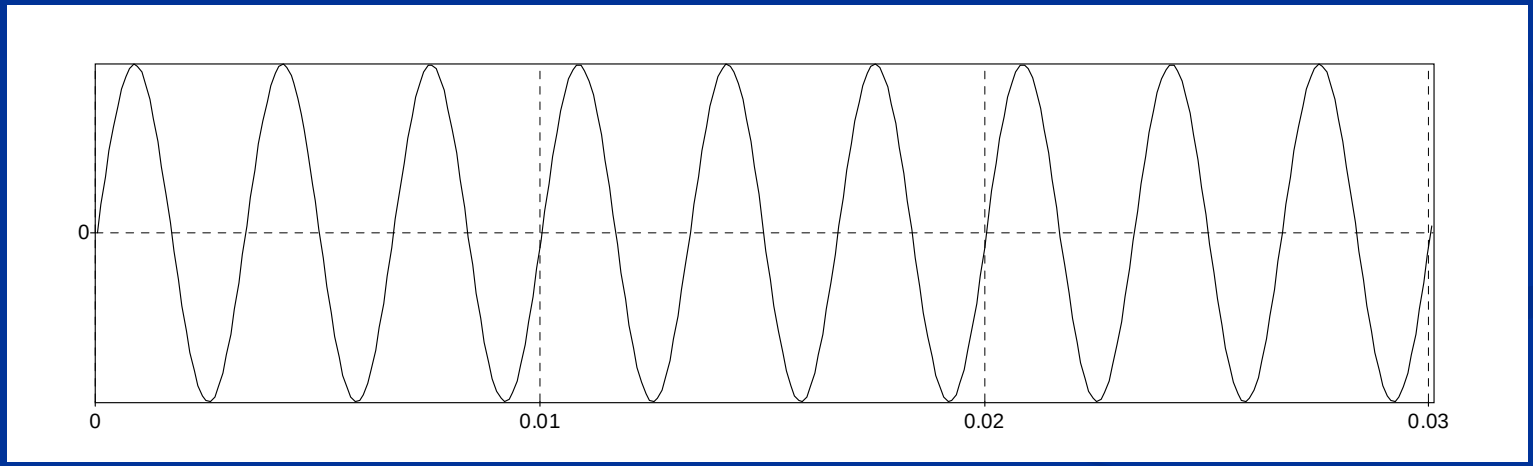
Review the textbook, pp. 71-75.

21. Transcriptions

1. What is phonetics?
2. What is a phoneme?
3. What are allophones?
4. What are diacritics?
5. What is “narrow transcription”?

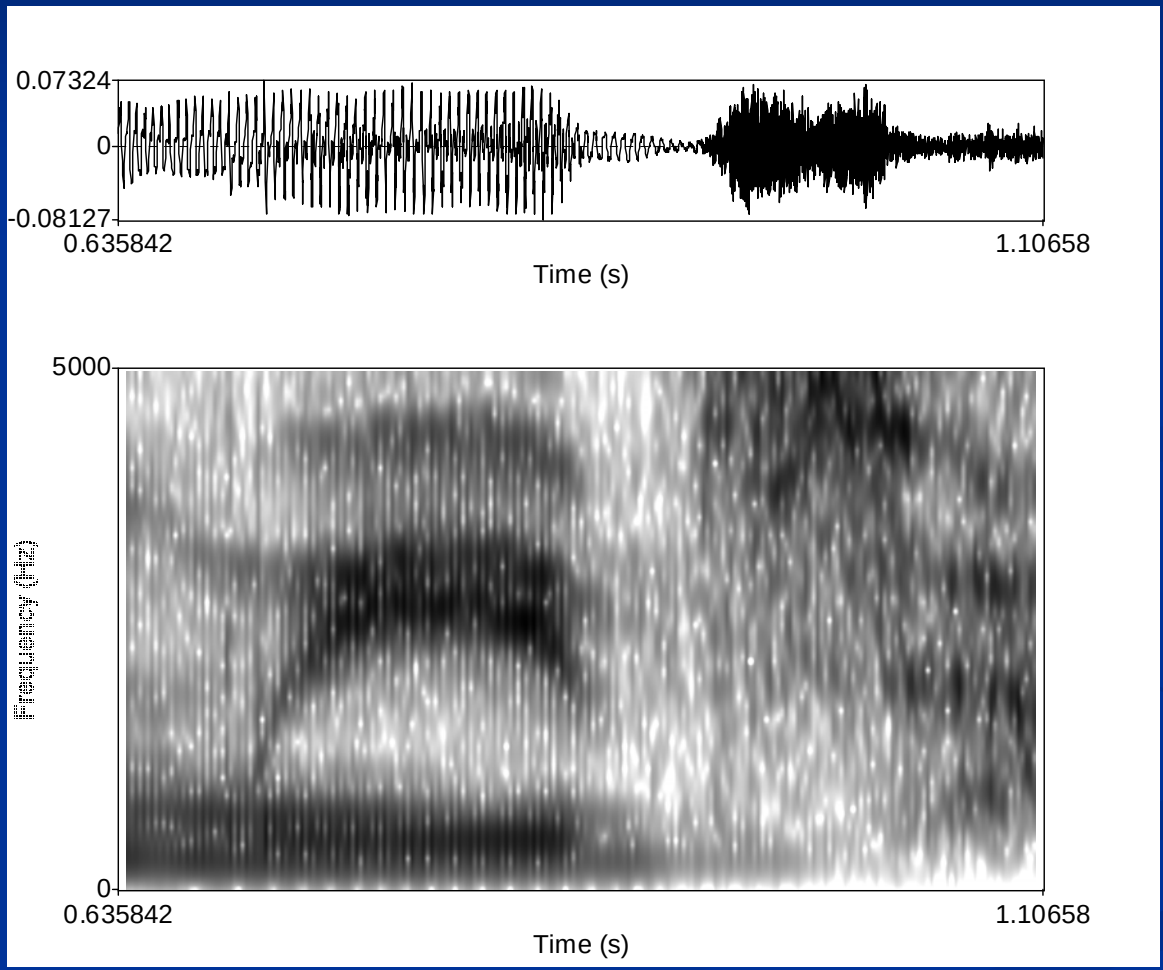
21. Sound waves and the frequency

Frequency: The number of complete repetitions (cycles) of variations in air pressure occurring in a second. The unit of frequency measurement is the hertz (Hz).



22. Formants

Formants 1-4: leaves (Amanda)



23. The relationship between F1 and F2

Formant 1: reflecting the “high” or “low” of the vowel in the oral tract

Formant 2: reflecting the “backness” of the vowel in the oral tract

Try to use praat to figure out the relationship described above.

See also CBCAP

24. Spectrograms with broad/narrow bands

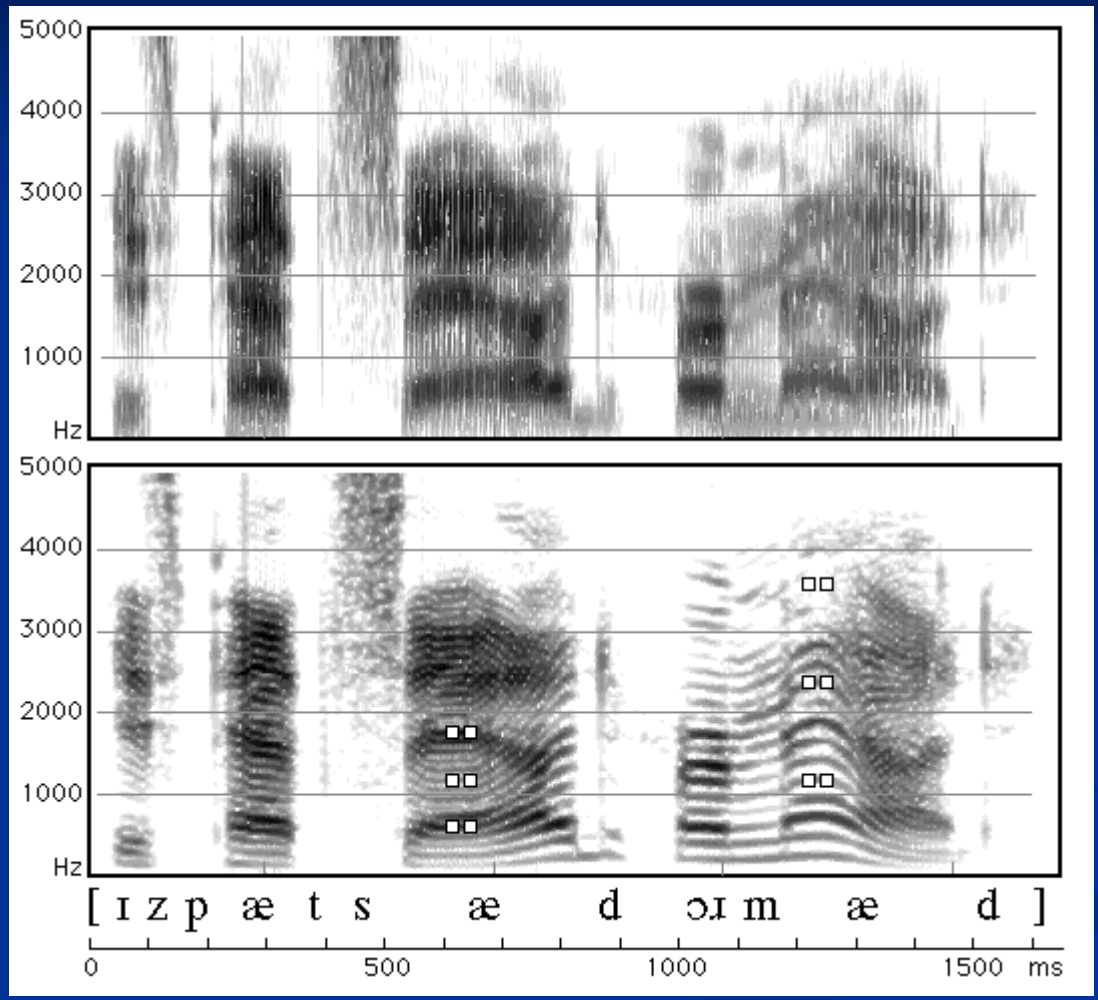


Figure 8.16 (p. 203) (Use KAY for demonstration.)

25. The strong form and the weak form

1. The form in which a word is pronounced when it is considered in isolation is called its **citation form**. At least one syllable is fully stressed and has no reduction of the vowel quality.
2. There is a **strong form**, which occurs when the word is stressed, as in sentences such as "I want money and happiness, not money or happiness." There is also a **weak form**, which occurs when the word is in an unstressed position.

Word	Strong Form	Weak Form	Example of a Weak Form
a	eɪ	ə	a cup [ə 'kʌp]
and	ænd	ənd, n̩d, ən, n̩	you and me ['juː ən 'miː]
as	æz	əz	as good as [əz 'gʊd əz]
at	æt	ət	at home [ət 'hoʊm]
can	kæn	kən, kn̩	I can go [aɪ kn̩ 'goʊ]
has	hæz	həz, əz, z, s	he's left [hɪz 'lɛft]
he	hi	i, hɪ, ɪ	will he go? [wɪl ɪ 'goʊ]
must	mʌst	məst, məs, mṣ	I must sell [aɪ mṣ 'sɛl]
she	ʃi	ʃɪ	did she go? ['dɪd ʃɪ 'goʊ]
that	ðæt	ðət	he said that it did [hɪ 'sɛd ðət ɪt 'dɪd]
to	tuː	tʊ, tə	to Mexico [tə 'mɛksɪkoʊ]
would	wʊd	wəd, əd, d	it would do ['ɪt əd 'duː]

27. Stress

1. The most reliable thing for a listener to detect is that a stressed syllable frequently has a longer vowel than that same vowel would be if it were unstressed.

2. Stress can always be defined in terms of something a speaker does in one part of an utterance relative to another.

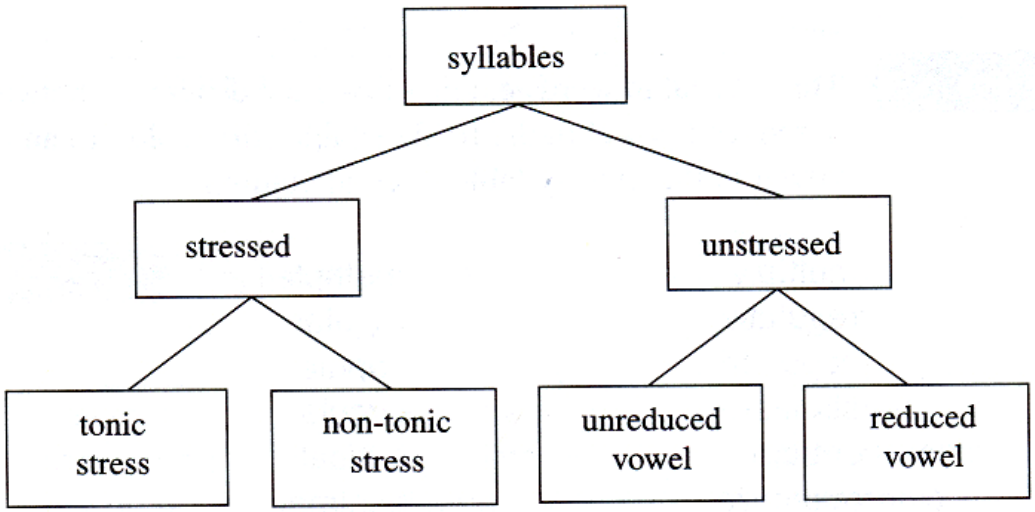
3. A stressed syllable is often, but not always, louder than an unstressed syllable.

4. A stressed syllable is usually, but not always, on a higher pitch.

28. The tonic stress

A syllable may be especially prominent because it accompanies a peak in the intonation. We will say that syllables of this kind have a tonic stress. Given this, we can note that English syllables are either stressed or unstressed. If they are stressed, they may or may not be the tonic stress syllables that carry the major pitch change in the tone group. If they are unstressed, they may or may not have a reduced vowel.

FIGURE 5.1 Degrees of prominence of different syllables in a sentence.



29. Where is the tonic syllable located?

1. In general, new information is more likely to receive a tonic accent than material that has already been mentioned.

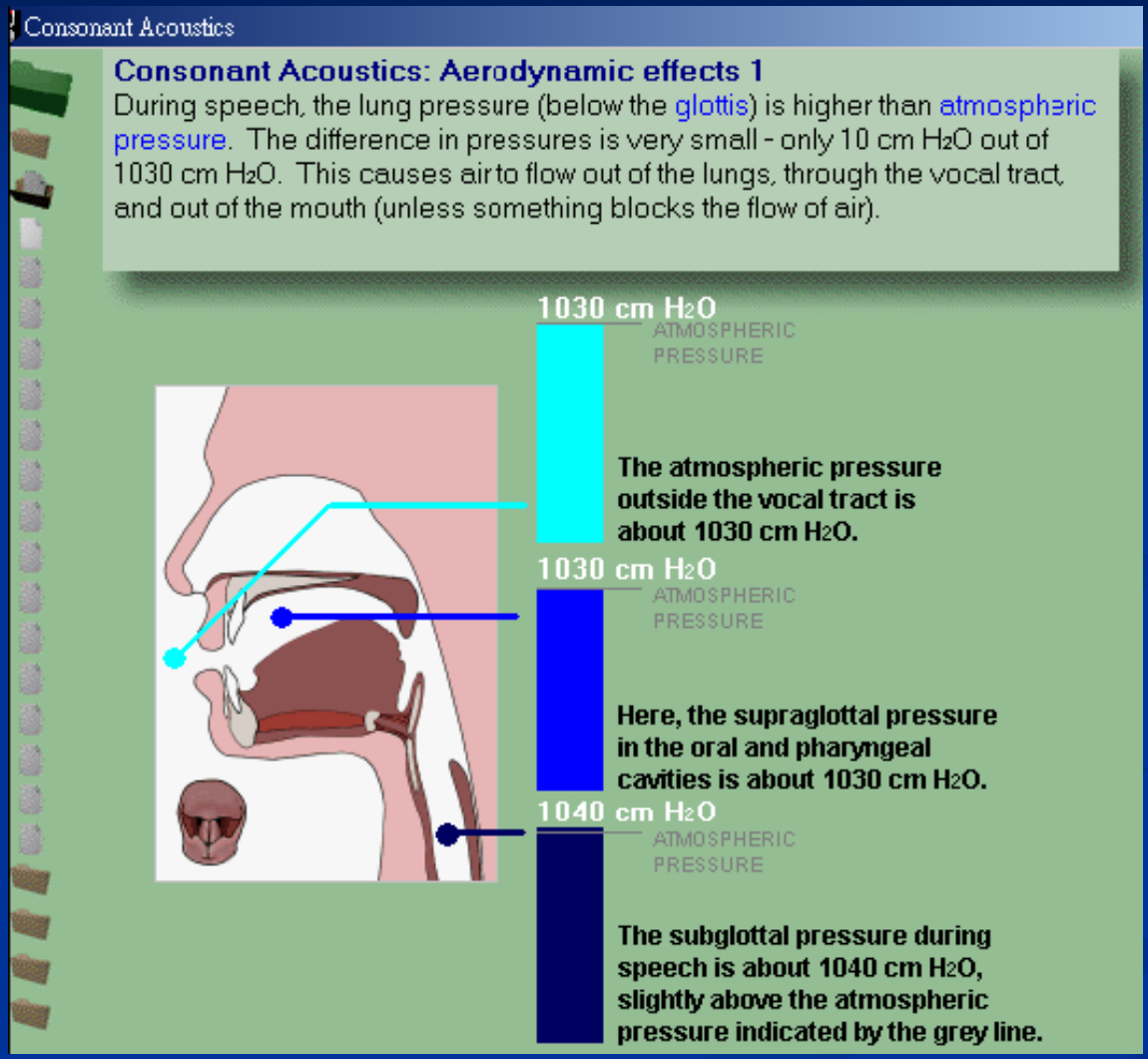
2. The topic of a dialogue.

3. However, the topic of a sentence is less likely to receive the tonic accent than the comment that is made on that topic.

4. Contrasting elements

5. Emphasized materials

30. The general concept



What happens when we pronounce a sound?

31. Voice onset time (VOT)

1. For voiceless plosive consonants, vocal vibration is stopped for a period that is a little longer than the hold phase, so that there is still no vocal fold vibration around the moment of release and possibly for a further brief time afterwards. This delay, measured from the start of the explosion to the point where vocal fold vibration begins, is called the Voice Onset Time (VOT).

2. The VOT is expressed in milliseconds (1 ms = 1,000th of a second). The listener use the VOT to categorize the plosive they are hearing as voiceless or voiced.

32. Examples on Thai

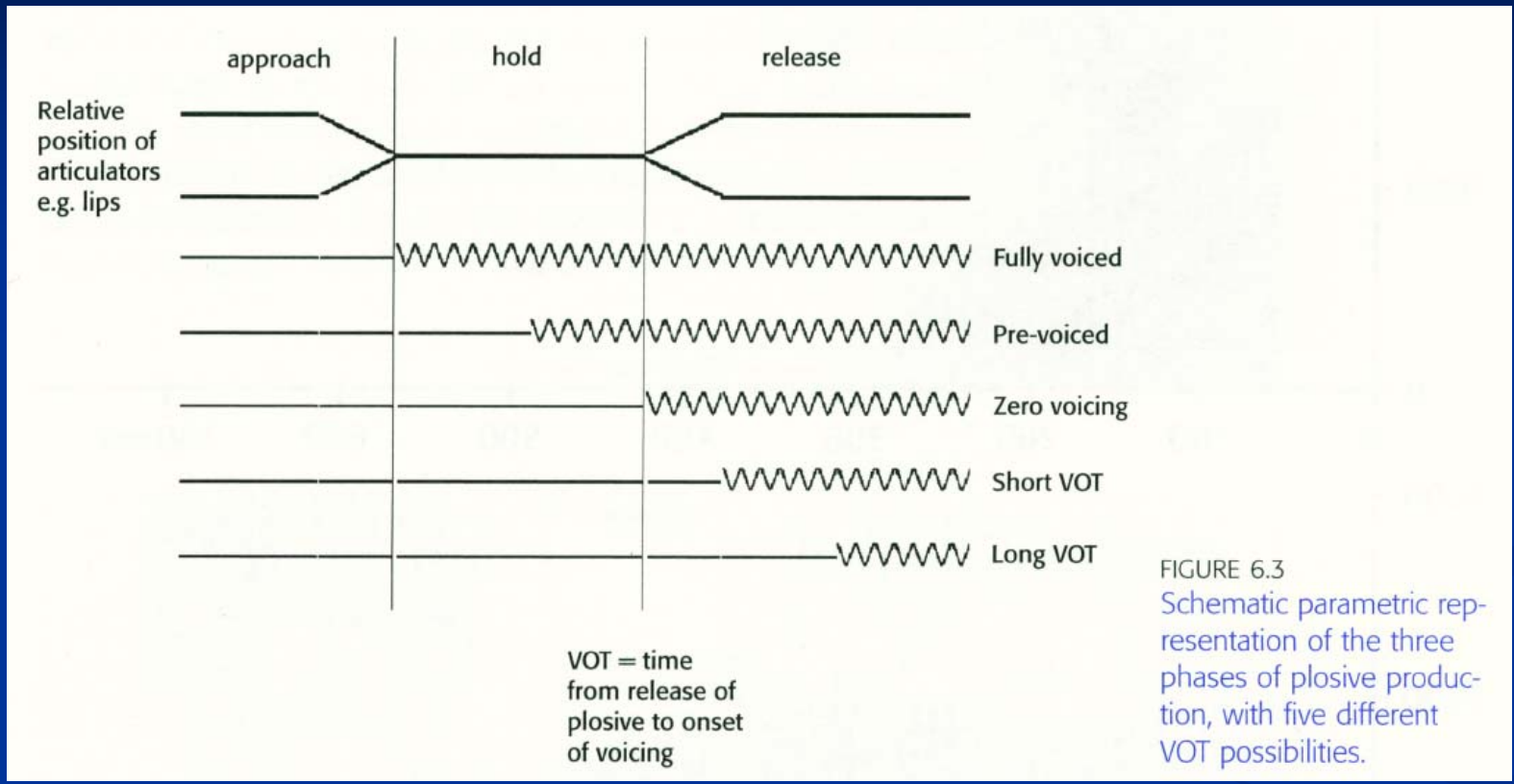


FIGURE 6.3
Schematic parametric representation of the three phases of plosive production, with five different VOT possibilities.

Fully voiced
Short VOT (10 ms or so: voiceless unaspirated)
Long VOT (very long VOT: 50 ms or more – strongly aspirated)
[ba] (crazy) [pa] (aunt) [pʰa] (cloth)
[d□□a] (to curse) [t□□a] (eye) [t□□ʰa] (landing place) *(Thai)*

33. Examples on French and English

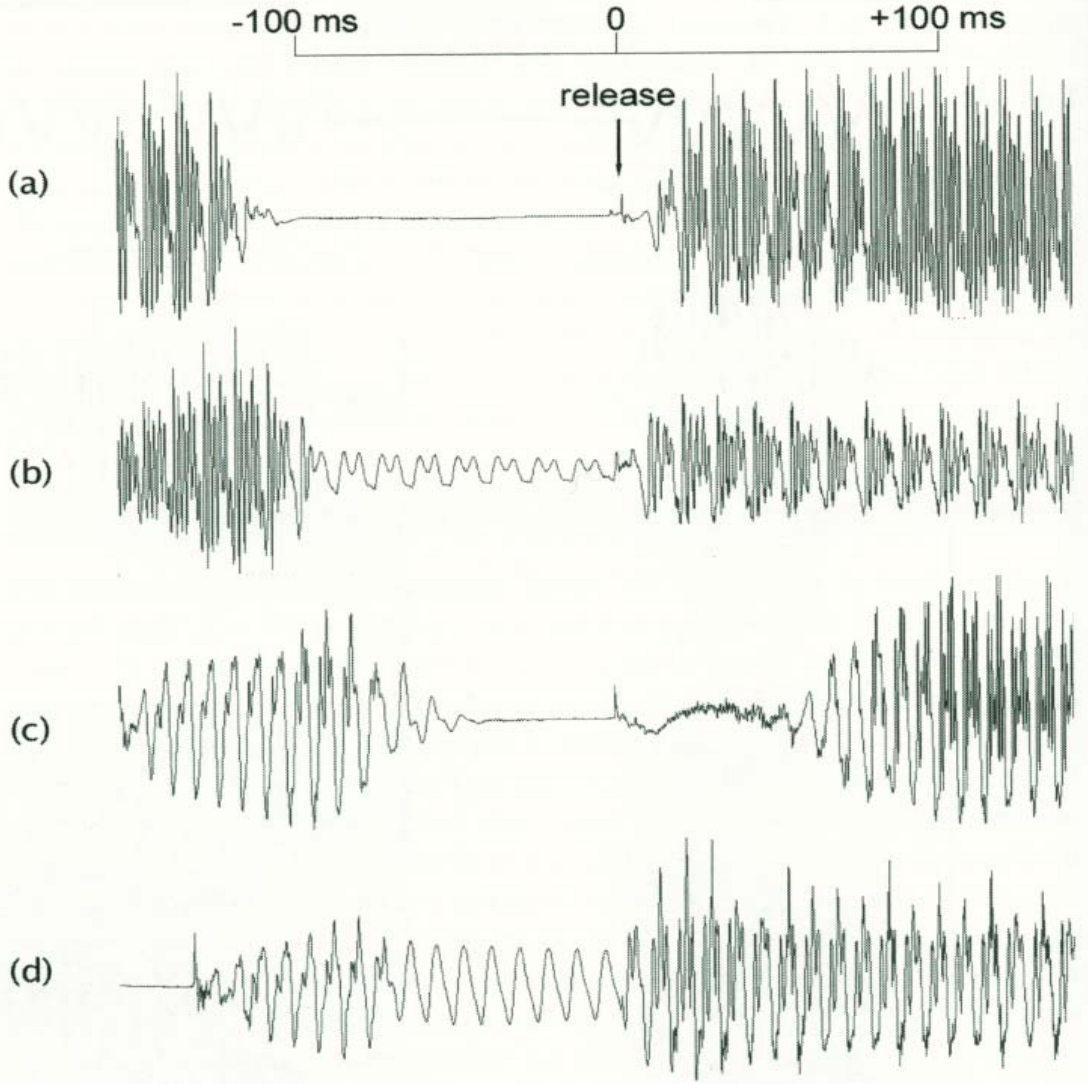


FIGURE 6.2
Waveforms showing intervocalic plosives in French and English, aligned by moment of release. The words are French (a) *apart*, (b) *abeille*, and English (c) *apart*, (d) *obey*. In this context the voiced plosives show voicing throughout the hold phase in both languages.

34. Examples on Sindhi

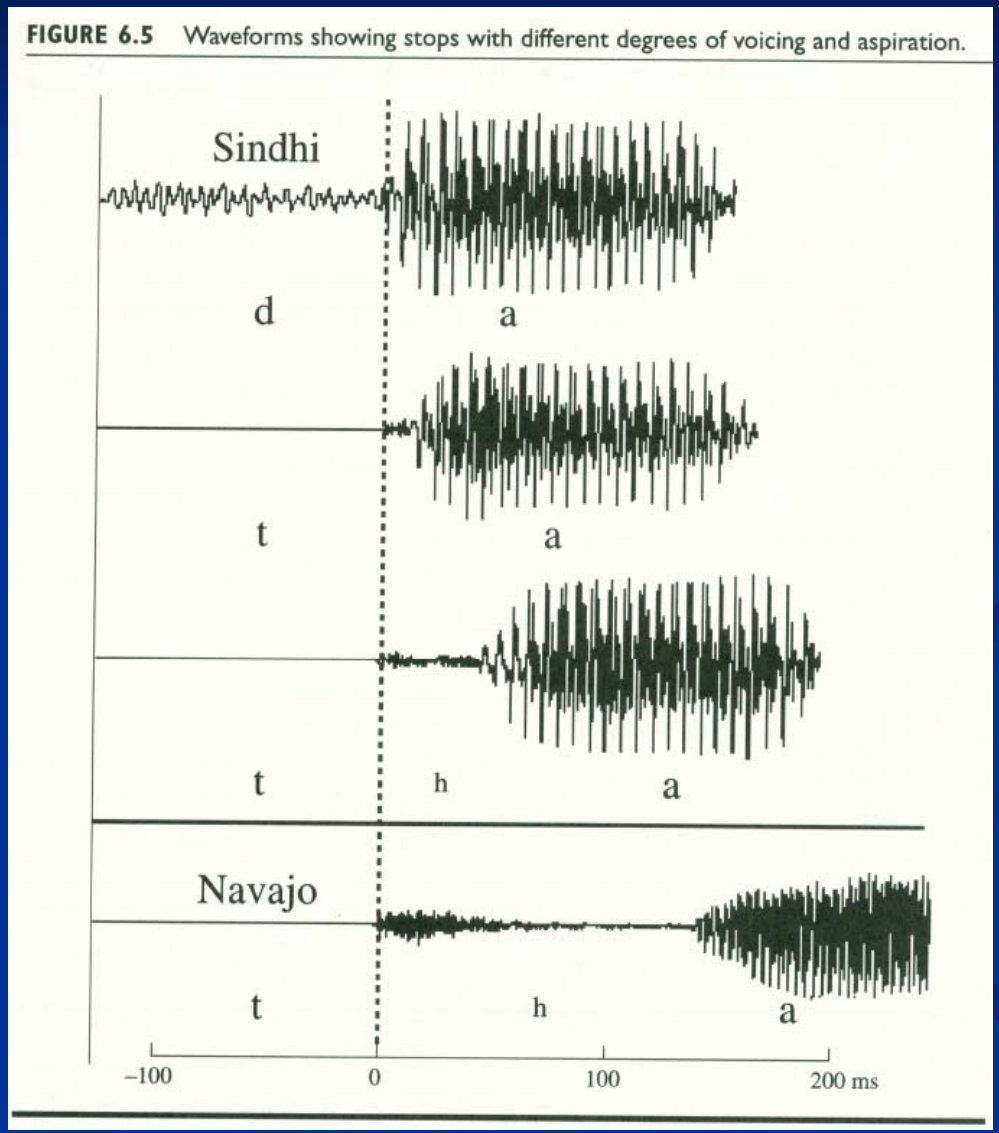


FIGURE 6.5 Waveforms showing stops with different degrees of voicing and aspiration.