

Ling 105
Sounds of Language

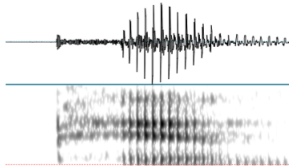
Thursday, September 12, 2024

Kevin Ryan

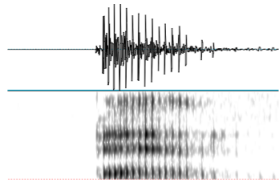
Aspiration & voice onset time

Aspiration

- In English, voiceless stops (except ʔ) are **aspirated** (p^h , t^h , k^h) at the beginning of a word or stressed syllable
- As in *pass* and *apostrophe*, but not *stop*, *apple*, or *spot*



"pin"



"bin"

Closure phase

- The **closure phase** of voiceless stops such as /p/ sounds like nothing

Allophones

- English phoneme /p/
- Allophone = contextual variant (realization) of a phoneme
 - aspirated allophone [p^h]
 - unaspirated allophone [p]
- **Complementary distribution**: allophones occur in non-overlapping environments
- In English, a **minimal pair** cannot be distinguished by aspiration alone

Language-specificity

- Languages carve up the phonetic space differently
- Hindi
 - [pa:l] “take care of” 🎵
 - [p^ha:l] “knife blade” 🎵
 - [ba:l] “hair” 🎵
- Also non-syllable-initially, e.g.
 - [stan] “breast”
 - [st^hal] “site”

Voice onset time

- Measure **voice onset time** (VOT) for (word-initial) English *b* and *p* vs. Hindi *b*, *p*, and *ph*
- Is (word-initial) English *b* closer to Hindi *b* or *p*?

English devoicing

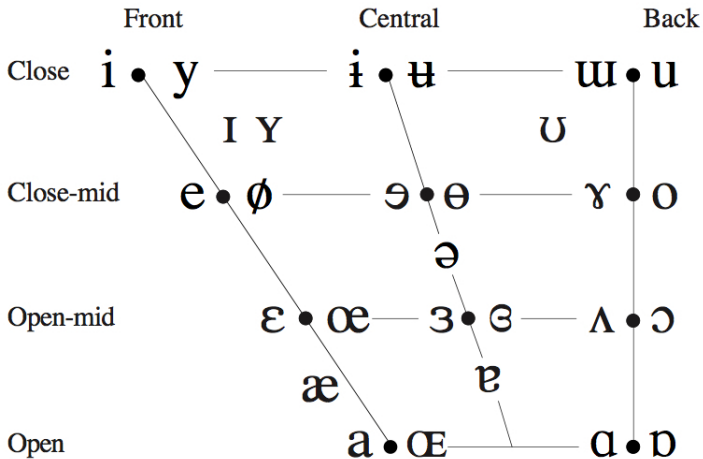
- An English voiced stop /b, d, g/ is usually devoiced utterance-initially
- IPA?
- Devoicing is less likely non-initially, e.g. *bin* vs. *a bin*
- Language-specific (compare e.g. Hindi)

VOT in French

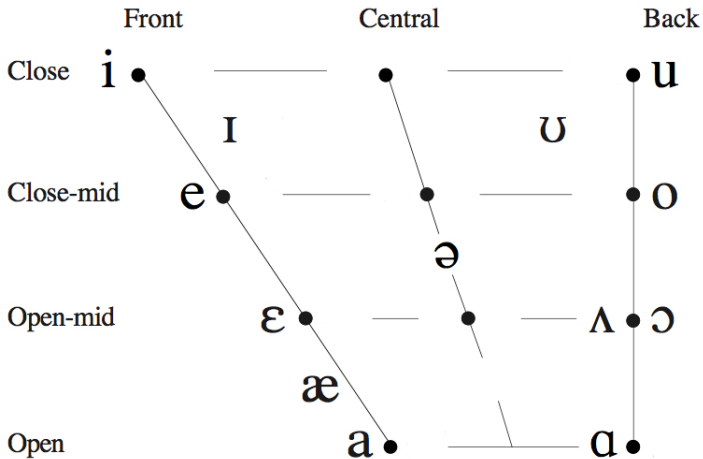
- Unlike English, French /b/ is fully voiced in all contexts, while /p/ has a VOT closer to zero (e.g. *pot*, *bon*)

Vowels

IPA vowel chart



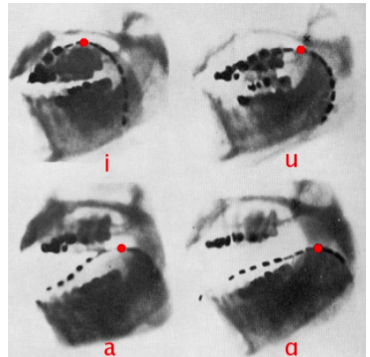
< 50% relevant for English



Vowel space

- Trapezoid maps onto tongue positions
 - **height** (high, mid, low)
 - **backness** (front, central, back)
- A third, orthogonal dimension: lip **rounding**

Vowel space



(Daniel Jones 1972)

English vowels: monophthongs

- [ɑ, e, i, o, u] have their Latinate values
- [æ, ɛ, ɪ, ɔ, ʊ] are their lax counterparts

i *bead*

ɪ *bid*

ɛ *bed*

æ *bad*

ɑ *bod*

(ɔ) *bawd*

ʊ *hood*

u *booed*

ʌ *bud* (stressed only)

ə *sofa* (unstressed only)

ɜ̃ *bird* (stressed only)

ə̃ *better* (unstressed only)

English vowels: diphthongs

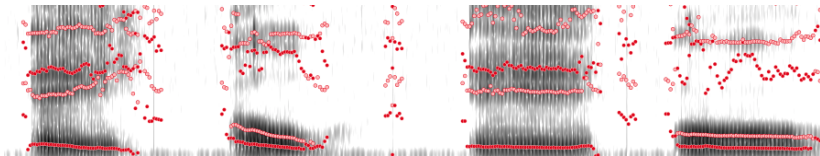
- Di-phthong

minor diphthongs	eɪ	<i>bade</i>
	oʊ	<i>bode</i>
<hr/>		
major diphthongs	ɔɪ	<i>Boyd</i>
	aʊ	<i>crowd</i>
	aɪ	<i>bide</i>
	ju	<i>beauty</i>

- Use [a] in diphthongs, unlike stand-alone [ɑ]

Minor diphthongs

- ei, ou (dynamic) on left
- e, o (steady-state) on right ([minor_diphthongs.wav](#))
- English vs. Spanish



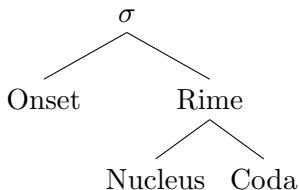
Schwa

- [ə]: always (in English) unstressed, reduced, roughly centered
- Most AE speakers have two reduced vowels, [ə] and [ɪ] (e.g. *Rosa's roses*)
- [ə] vs. [ʌ]
- Unstressed “er” is rhotacized schwa [ɝ]

Tense/lax

- Longer, more peripheral
- Rule of thumb: Roman letters are tense, others lax
 - ɑ e i o u
 - æ ɛ ɪ ɔ ʌ ʊ ə
- Another hint: if it can occur at the end of a monosyllabic (formal English) word, it's tense: *spa, lay, lee, low, loo*
- Tense vowels normally don't precede codas [ŋ] or [ʃ]

Syllable structure



- Nucleus is obligatory (universally)
- Onset & coda are optional (in English)
- Onset & coda can contain only consonants
- Nucleus is usually a vowel, but can be a **syllabic consonant** in some languages

Syllabic consonants

- English: l, m, n (additionally, some use [ɹ] instead of [ʒ, ʒ])
- *apple* [æpl̩]
- *bottle* [bɒtl̩]
- *bottom* [bɒtm̩]
- *button* [bʌʔn̩]
- *blossom* [blɒsm̩]