Vowel articulation in English

LING110
Fall Quarter 2002
Articulatory parameters for classifying vowels

- Height of tongue
- Backness of tongue
- Lip rounding
- Tense/Lax
- Nasality
- Rhotacization
A word of caution

- In terms of phonetics and phonology, the dialects of English are primarily distinguished by differences
  - in vowel quality
  - number of vowels
- Here we will focus on what is often termed “General American” – the type of English used by American newscasters (which is based mostly on Mid-Western varieties; henceforth AE)
- Occasionally, we will be comparing AE to the British English equivalent (often referred to as RP for Received Pronunciation)
Types of English vowels

- English vowels can be distinguished along two main parameters:
  - A
    - **Monophthongs** (vowels that have the same quality throughout their production, e.g. bid)
    - **Diphthongs** (vowels that change quality during their production, e.g. boy)
  - B
    - **Tense** (e.g. bead)
    - **Lax** (e.g. bid)
Which vowel is in what category

**Tense vowels**

[iː] [eɪ] [ɑː] [ɔː] [ou] [uː] [aɪ] [au] [ɔɪ] [ju]

**Lax vowels**

[I] [ɛ] [æ] [ʌ] [ʊ]

**Monophthongs**

[iː] [ɑː] [ɔː] [uː] [I] [ɛ] [æ] [ʌ] [ʊ]

**Diphthongs**

[ei] [ou] [aɪ] [au] [ɔɪ] [ju]
Word of caution

- For tense monophthongs we will be using the symbol for the vowel followed by the *length* diacritic \( [\cdot] \)
- This is to make the distinction between tense and lax vowels clearer
- But in fact the length difference is due to the difference in tenseness, i.e. tense vowels are longer than their lax counterparts because they are tense
- This does not mean that all lax vowels are short: the vowel with the longest *intrinsic duration* is \( [\text{æ}] \), which is lax
Defining the AE vowel space

From Ladefoged, 2001
Front AE vowels

- The body of the tongue is raised towards the front of the oral cavity (palatal region)

- [iː] e.g. heed, bead, neate...
- [ɪ] e.g. hid, bid, knit...
- [ɛ] e.g. head, bed, net...
- [æ] e.g. had, bad, gnat...

Note that
- [æ] is pronounced as a diphthong by many American speakers
- [iː] is the tense counterpart of [ɪ]
Tense and lax [iː] and [ɪ]

From Ladefoged & Maddieson 1996
Tongue position for AE front vowels

heed [iː]

hid [ɪ]

head [ɛ]

had [æ]

From Ladefoged, 2001
Back AE vowels

- The body of the tongue is raised towards the back of the mouth (velar or uvular region)

- [uː] e.g. who’d, wooed, root...
- [ʊ] e.g. hood, foot, book...
- [ɔː] e.g. hawed, dawn, corn… (some dialects)
- [ɑː] e.g. hod, stop, watch...

- [ʊ] is the lax counterpart of [uː]
- [uː] [ʊ] and [ɔː] are rounded
Tense and lax [uː] and [ʊ]

From Ladefoged & Maddieson 1996
Tongue position for some AE back vowels

who’d [uː]

hood [ʊ]

hod [ɑː]

However, many speakers, for example in California,
(a) use an unrounded vowel in the place of [ʊ]
(b) use a central vowel in the place of [uː]

From Ladefoged, 2001
On [ɔː] and [ɑː]

- Finding examples for [ɔː] and [ɑː] is tricky
  - In some words, e.g. coffee, speakers of some AE dialects use [ɔː] while others use [ɑː] (and still others may use a diphthong)
  - Midwestern and Californian dialects have no distinction between these two vowels, but instead have a vowel of intermediate (e.g. is don and dawn different for you?)

- British English, on the other hand, uses both [ɔː] and [ɑː] (but in different contexts), and has an additional vowel, [ɒ]; e.g. calm ([ɑː]), caught ([ɔː]) and cot ([ɒ])
Central vowels

- $[\Lambda]$ e.g. mud, cup, gunk…
- $[\mathring{3}]$ e.g. bird, third, curd…

In AE these two vowels have very similar mid central quality

What distinguishes them is **rhotacization**, the r-coloring of $[\mathring{3}]$

Note: British English has no rhotacization (it is a non-rhotic variety); the quality of $[\Lambda]$ and $[\mathring{3}]$ is distinct, with $[\Lambda]$ being lower
On rhoticity

- The dialects of English are distinguished into
  - Rhotic varieties (e.g. most American English dialects, Irish and Scots varieties)
  - Non-rhotic varieties (e.g. British RP, Australian English)
- The difference lies in the treatment of [r] at the end of syllables
  - In rhotic varieties, these [r]s are pronounced and color the preceding vowel (rhoticization); e.g. car [kɑːr], bird [bɜːd]
  - In non-rhotic varieties, these [r]s are not pronounced; e.g. car [kɑː], bird [bɜːd]
The diphthongs

- [ei] e.g. hay, may, rate...
- [ɔi] e.g. boy, toy, Lois...
- [ou] e.g. hoed, foam, boat...
- [ai] e.g. height, type, right...
- [au] e.g. house, mouse, trout...
- [juː] e.g. cute, mute, puke...
[eɪ]

- [eɪ] may be pronounced in many different ways
- The first part is often very close to [ɛ]
- But many RP speakers and many Midwestern Americans have a closer initial quality (hence the transcription [eɪ])
- Other varieties (e.g. Cockney, Australian English) have a more open quality
- Still others (e.g. Scots) have a monophthong [e]
- Note: [e] is also used as a symbol for [eɪ] in many American textbooks
[aɪ] and [aɬ]

- Though we use the symbol [a] for these diphthongs, for most speakers the beginning quality is neither front nor back and closer to [ʌ]

- The ending quality is *lower* than that indicated by the symbols [ɪ] and [ɬ]

- Texan and other South and Southwest varieties have a monophthong [aɬ] instead of the diphthong [aɪ]
[ɔI] and [oʧ]

- Despite the different symbol used, [ɔI] and [oʧ] do not have particularly different starting qualities in AE
- Both [ɔI] and [oʧ] end in qualities slightly lower than the symbols [I] and [ˤ] suggest
- [oʧ] is transcribed as [o] in many American textbooks
- In British English [oʧ] has a central beginning quality (hence the transcription [əˤ]), though this is now changing towards [oˤ]
This combination is most often considered as a sequence of [j] and [u:]

However, sequences of (s)+consonant+[j] can only occur before [u:]; e.g.
spew, few, cue, beauty

This gap needs no explanation if we classify [ju:] as a diphthong
For classification purposes

- **High vowels**: [iː] [ɪ] [uː] [ʊ]
- **Low vowels**: [æ] [ɑː]
- **Mid vowels**: [ɛ] [ɔː] [ʌ] [ɜ̯]
- **Front vowels**: [iː] [ɪ] [ɛ] [æ]
- **Back vowels**: [ɑː] [ɔː] [uː] [ʊ]
- **Central vowels**: [ʌ] [ɜ̯]
- **Round vowels**: [uː] [ʊ] [ɔː] [ɜ̯]
The AE vowel chart

From Ladefoged, 2001
The RP vowel chart

From Ladefoged, 2001
Context-depended variation
Stress and the tense/lax distinction

- Stress is not necessarily the same as orthographic accent (though the latter may denote the former)
- Stressed syllables are those that sound more prominent relative to others (within a word or phrase)
- English words have at least one stressed syllable; e.g. America
- If long, they may have more; e.g. examination
- Stressed syllables in English are articulated “more carefully” (hyperarticulated) than other syllables, and thus show greater loudness, longer duration and vowels of more peripheral quality than unstressed syllables; e.g.

  - conduct (noun) vs. conduct (verb)
    
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[kæn\dəkt]  [kænd\kt]
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Unstressed vowels

- Unstressed vowels are often reduced to [ə] (schwa), [ɪ]/[ɨ]:
  - atom [ˈætəm]
  - atomic [ˈɑːtəmɪk]
  - declare [dɪˈklɛr]
  - declaration [ˌdɛkləˈreɪʃn]

- Whether you use one or two of these vowels depends on your accent
But be careful: not all unstressed vowels are reduced to [ə] or [ɪ]; e.g.

unseasonably

[ʌnˈsɪznəbliː]
Nasalization

- Vowels are nasalized in syllables **closed** by a nasal consonant
  - ban [bæn]
  - hungry ['hæŋgrɪ]
  - win [wɪn]

- *compare*...
  - enemy [ɛnəmi]

- The degree of nasalization depends on the accent