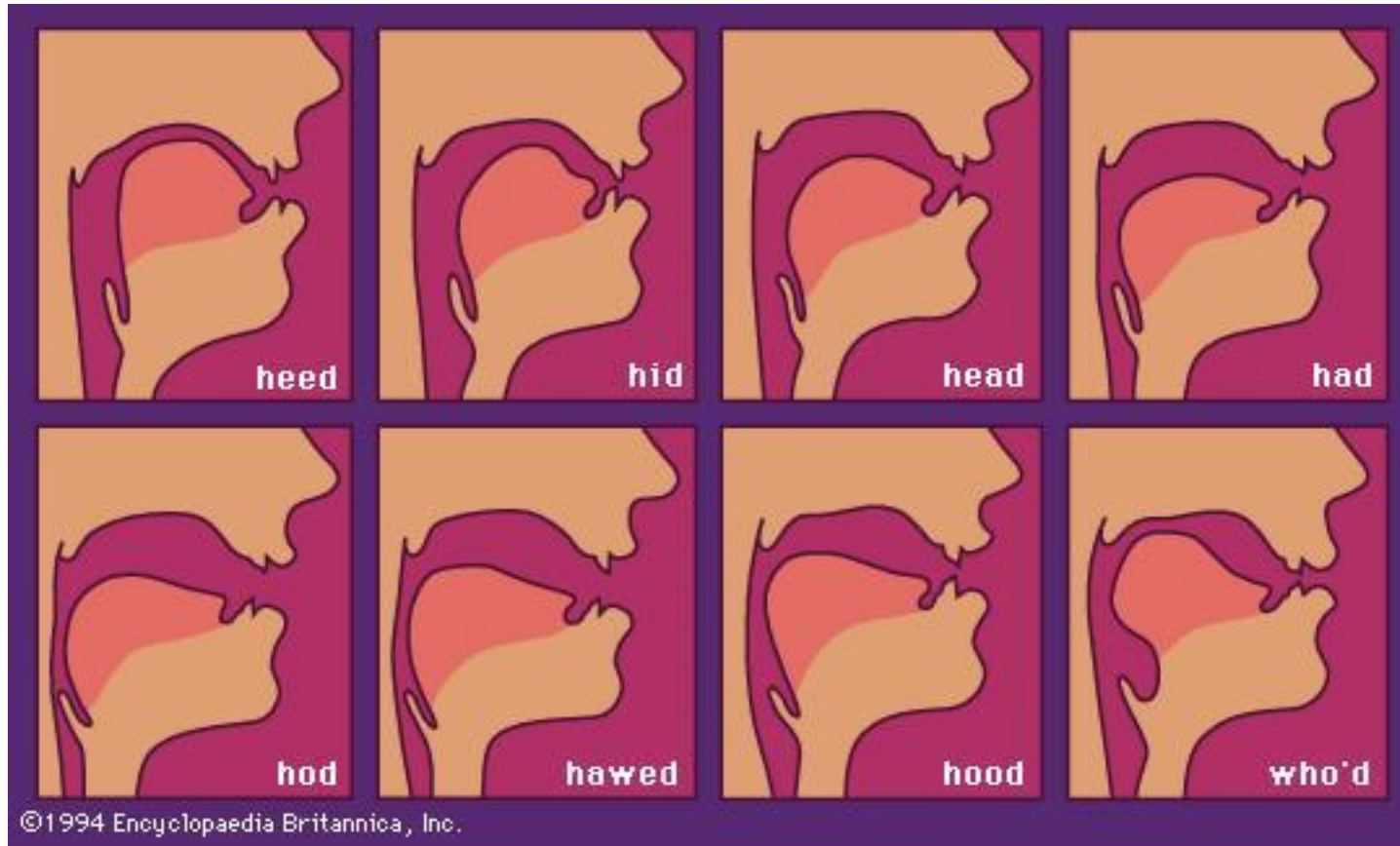


Week 3: Phonetics II



Rebecca Starr
30/1/25

EL1101E
NUS AY2024-25

Today

- Introducing Vowels
- Vowels in US, UK, and Singapore English
- Stress

Reminder: Consonants vs. Vowels

- Consonants: airflow through the oral cavity is **obstructed** in some way.
- Vowels: airflow through the oral cavity is **not obstructed**.

Reminder: Three key features capture consonants

1) Voicing (voiced vs. voiceless)

2) Place of articulation

- Where is the air flow obstructed?
- Bilabial, labiodental, interdental, alveolar, post-alveolar, palatal, velar, glottal

3) Manner of articulation

- How is the air flow obstructed?
- Stops (plosives and nasals), fricatives, affricates, approximants (liquids and glides)

Can we use the same features for vowels?

- All vowels (in English) are voiced, so voicing is not a useful feature in distinguishing vowels.
- What about place of articulation? Are there bilabial vowels?
- What about manner of articulation? Are there fricative vowels?

Can we use the same features for vowels?

- We do position our articulators differently for different vowels, but not in the same way as for consonants.
- While some languages do contrast nasal and oral vowels, other manner features do not apply.
- So, we need some new features.

What features are important for vowels?

- Say “MEE MOO MEE MOO MEE MOO”
- What is an important difference between [i] and [u]?

Feature: lip rounding

- Some vowels are **rounded**, meaning they are produced with rounded lips. MOO.
- Some vowels are **unrounded**. MEE.



Which of these vowels are rounded?

- MOW
- MAY
- PUT
- PUTT
- MET
- PIT
- MAMA
- MOP

Which of these vowels are rounded?

- **MOW** rounded
- MAY unrounded
- **PUT** rounded
- PUTT unrounded
- MET unrounded
- PIT unrounded
- MAMA unrounded
- **MOP** Singapore, UK: rounded US: unrounded

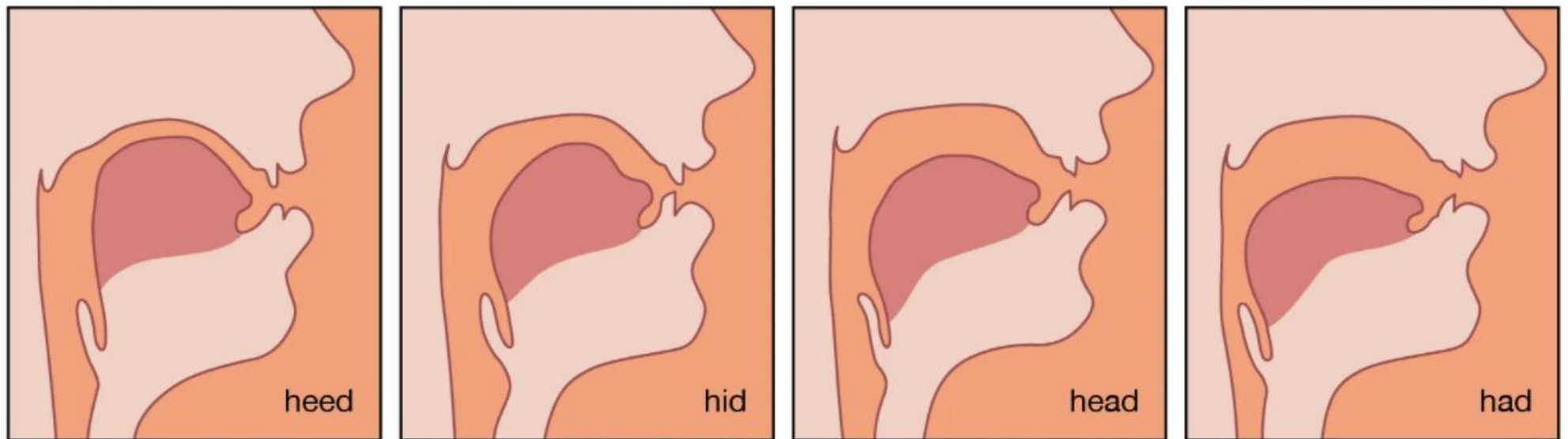
More features

- Make a slide between EE and AHH.
- Now do it again, really slowly.

More features

- Make a slide between EE and AHH.
- Now do it again, really slowly.
- Did you notice that you go through some other English vowels on the way down?
- Also, what did you notice your mouth doing?

Feature: height



Feature: height

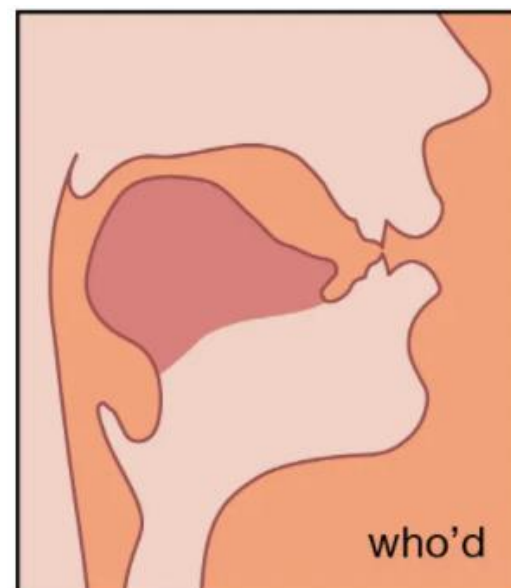
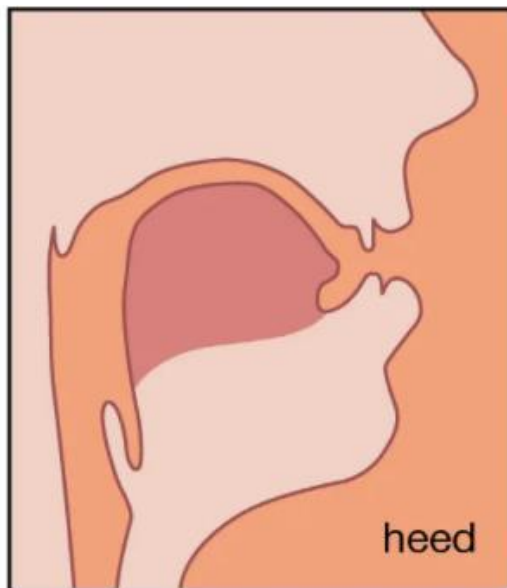
- [i] is a **high** vowel (aka “closed”)
- [ɛ] is a **mid** vowel
- [ɑ] is a **low** vowel (aka “open”)
- This three-level height division is arbitrary, but common because it captures the key vowel distinctions in most languages.
 - On the full IPA chart there are four height divisions.

Feature: frontness

- Let's go back to [i] and [u]. Before, we talked about lip rounding.
- But there is another difference!
- [i] is a high **front** vowel.
- [u] is a high **back** vowel.

Feature: frontness

- **Frontness** (or “advancement”) refers to horizontal movement of the tongue body.



Feature: frontness

- We usually distinguish three levels of frontness:
 - Front
 - Central (remember, “mid” was used for height)
 - Back

Practice: features

- Say PET vs. PUTT:
 - Which one is a front vowel?
- Say LOGO vs. LOG:
 - Which one is lower?

Practice: features

- Say PET vs. PUTT:
 - Which one is a front vowel? **PET**
- Say LOGO vs. LOG:
 - Which one is lower?

Practice: features

- Say PET vs. PUTT:
 - Which one is a front vowel? **PET**
- Say LOGO vs. LOG:
 - Which one is lower? **LOG**

Feature: tense vs. lax

- Some languages have a vowel **length** distinction:
 - Japanese: obasan vs. obaasan.
- In many varieties of English, we distinguish between **tense** vowels and **lax** vowels.
- Tense vowels: more extreme tongue position, longer duration. Produced with greater articulatory effort.
- Lax vowels: less extreme tongue position, shorter. Produced with less effort.

Feature: tense vs. lax

- Singapore English doesn't have a tense-lax distinction.
- As a result, some pairs of vowels that are distinct in UK English are not distinct for many speakers of Singapore English.
- See if you pronounce these pairs differently:
 - TEEN, TIN
 - FOOL, FULL
 - CAUGHT, COT

Feature: tense vs. lax

- Singapore English doesn't have a tense-lax distinction.
- As a result, some pairs of vowels that are distinct in UK English are not distinct for many speakers of Singapore English.
- See if you pronounce these pairs differently:
 - TEEN, TIN
 - FOOL, FULL
 - CAUGHT, COT

(All first words in the above pairs are tense, second are lax, as pronounced in standard UK English.)

Feature: tense vs. lax

- In English, one-syllable words that end in vowels can typically only end in tense vowels.
 - Tense vowel words: “me”, “mow,” “too”, “may”
 - Lax vowel interjections: “meh.” “uhhh”

Feature: tense vs. lax

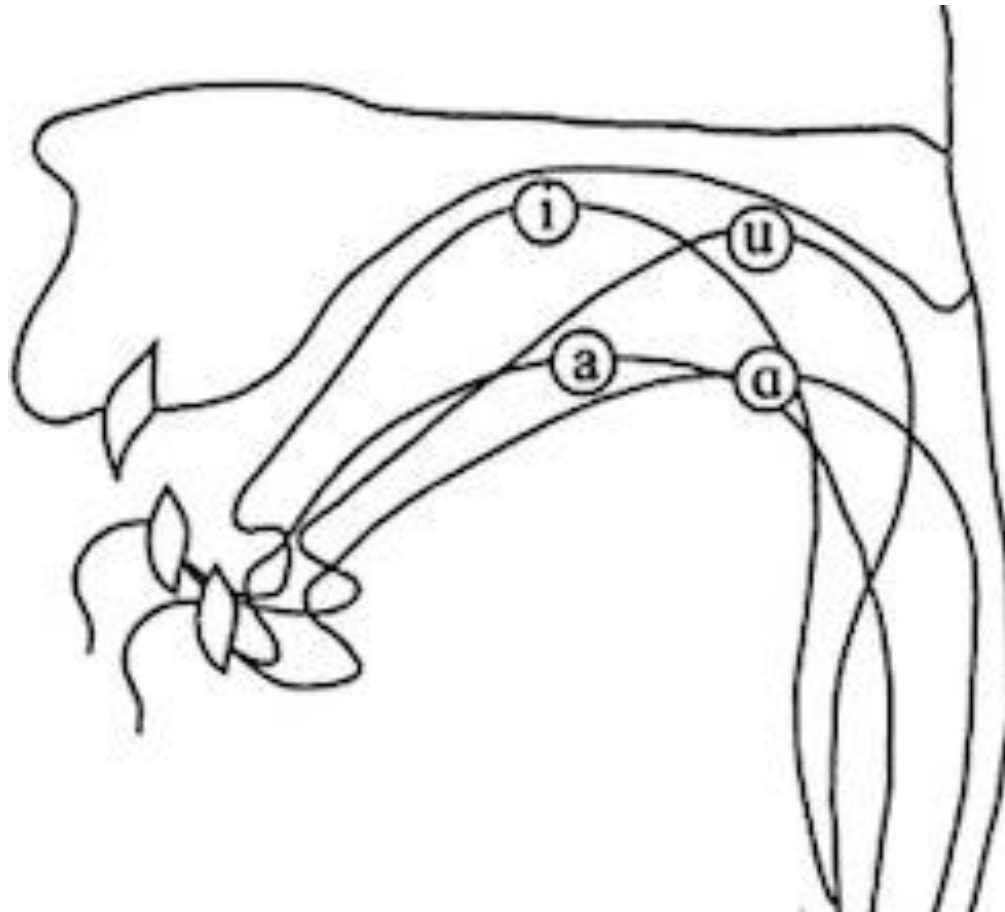
- Note: for some vowels, particularly [ɑ] and [ɔ], not all linguists agree whether they should be classified as tense or lax.
 - The tense-lax distinction is only relevant for certain pairs of vowels.
 - Typically, [ɔ:] is classified as tense in UK English and paired with its lax neighbor [ɒ] (e.g., “bought” vs. “bot”), while [ɔ] is classified as lax in US English and paired with its tense neighbor [o] (e.g. “boat” vs. “bought”).
 - We won’t be testing you on whether [ɑ] or [ɔ] are tense or lax.

Feature: tense vs. lax

- So, you may see some textbook or online materials that divide up tense vs. lax vowels differently.
- Please stick with the tense vs. lax categories we will learn in lecture, to preserve your sanity.

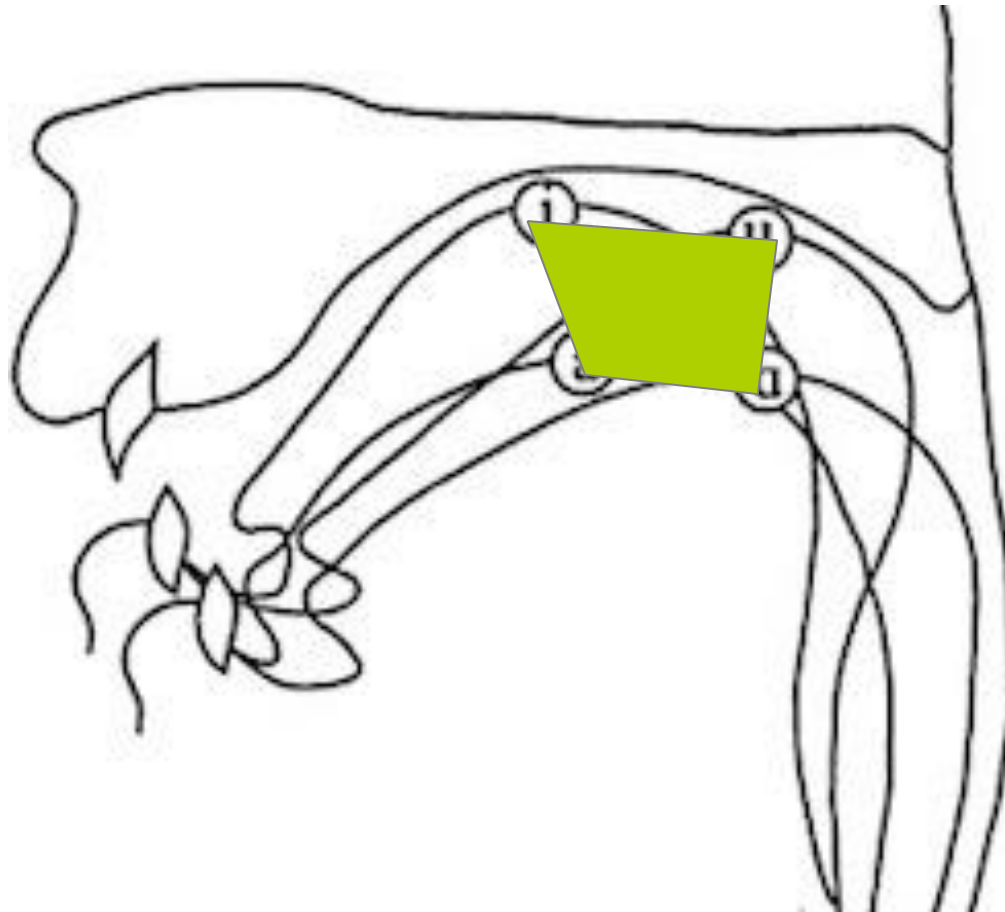
Representing the vowel system

- The two dimensions of height and frontness form a little trapezoid inside the mouth:

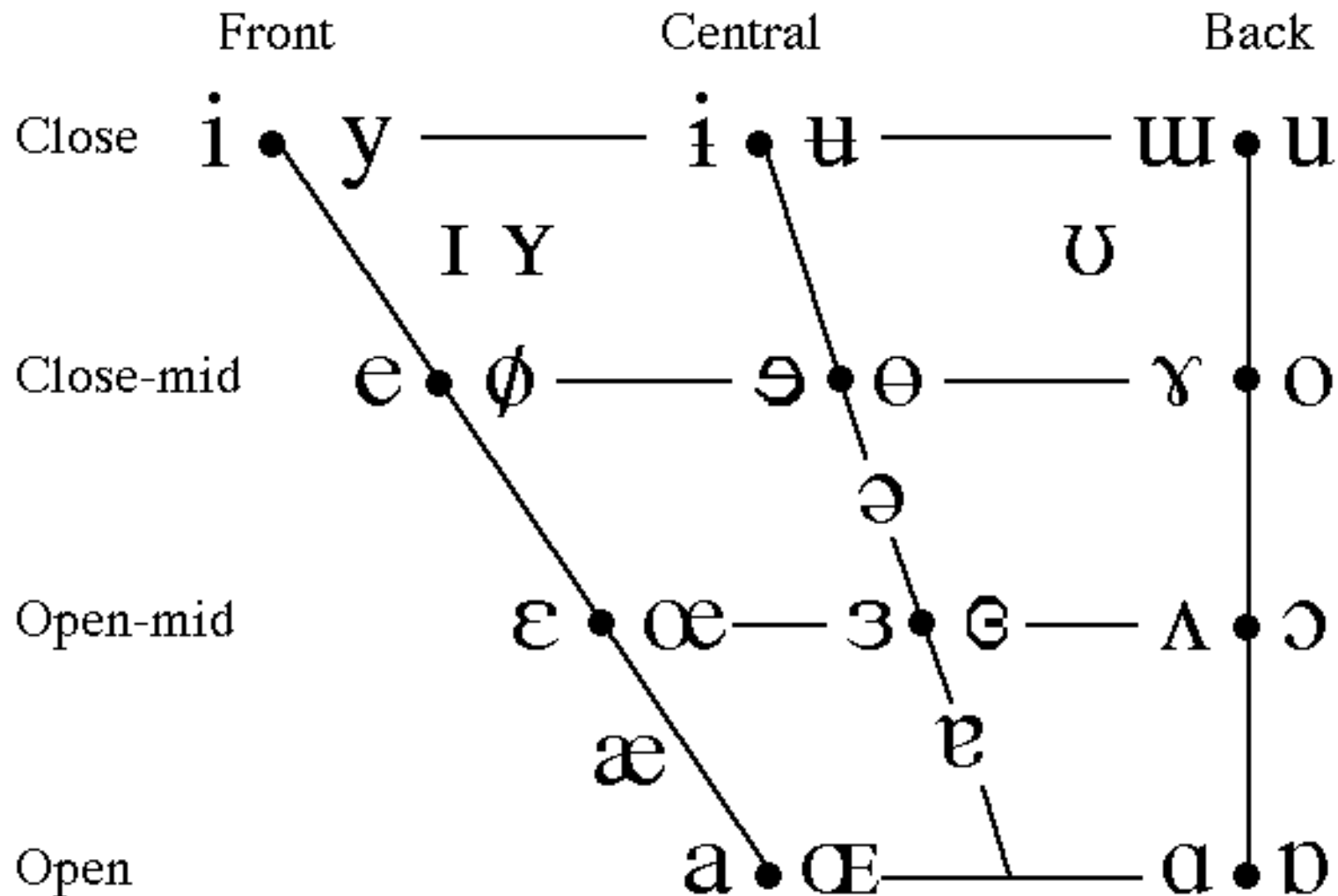


Representing the vowel system

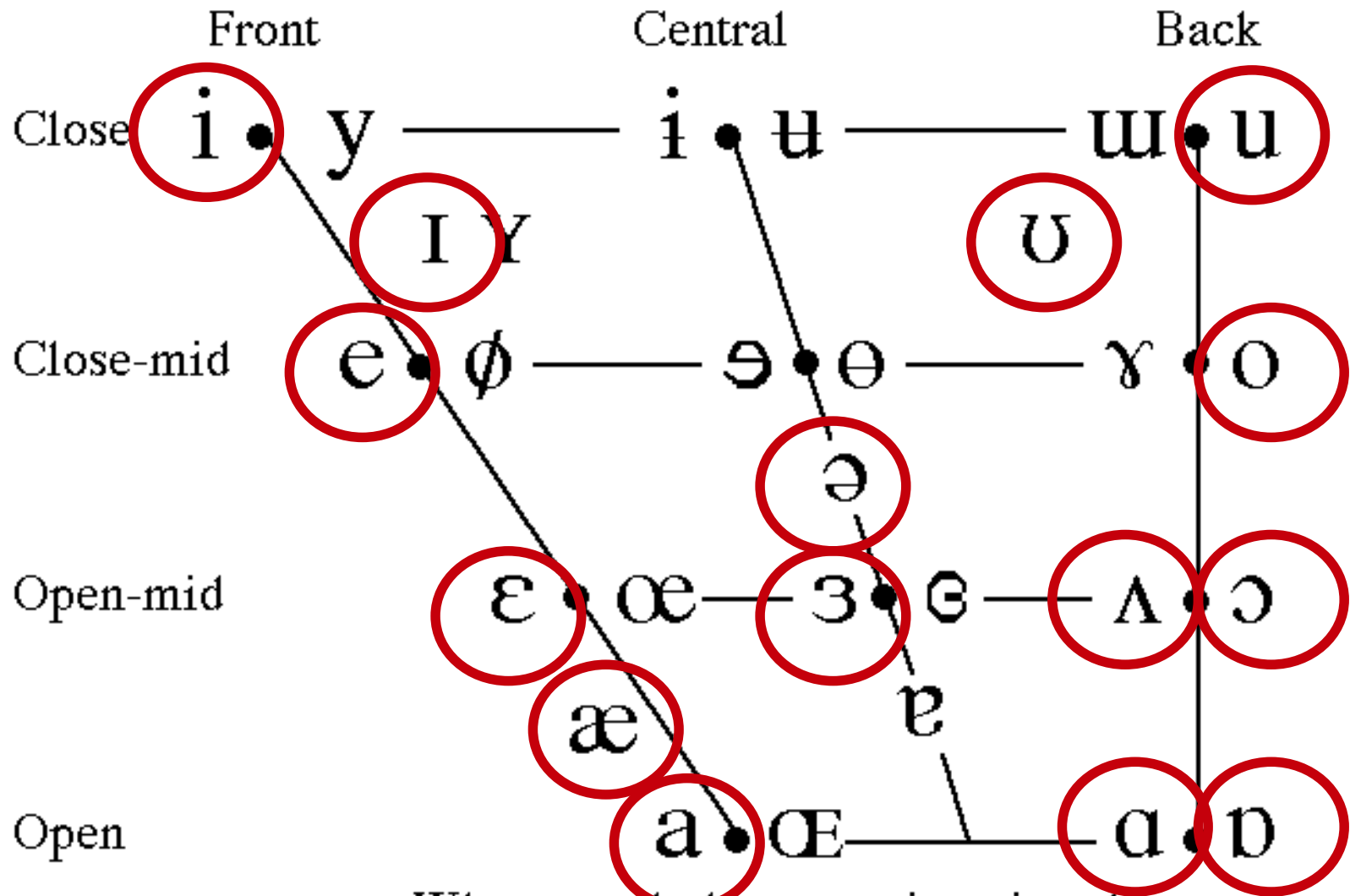
- The two dimensions of height and frontness form a little trapezoid inside the mouth:



Full IPA vowel chart



Full IPA vowel chart: symbols you need to know



Where symbols appear in pairs, the one to the right represents a rounded vowel.

Where is tense vs. lax?

- Notice that this chart represents only:
 - Height
 - Frontness
 - Roundedness (rounded vowels are to the right of each dot)
- Tense vs. lax is not represented on the chart.

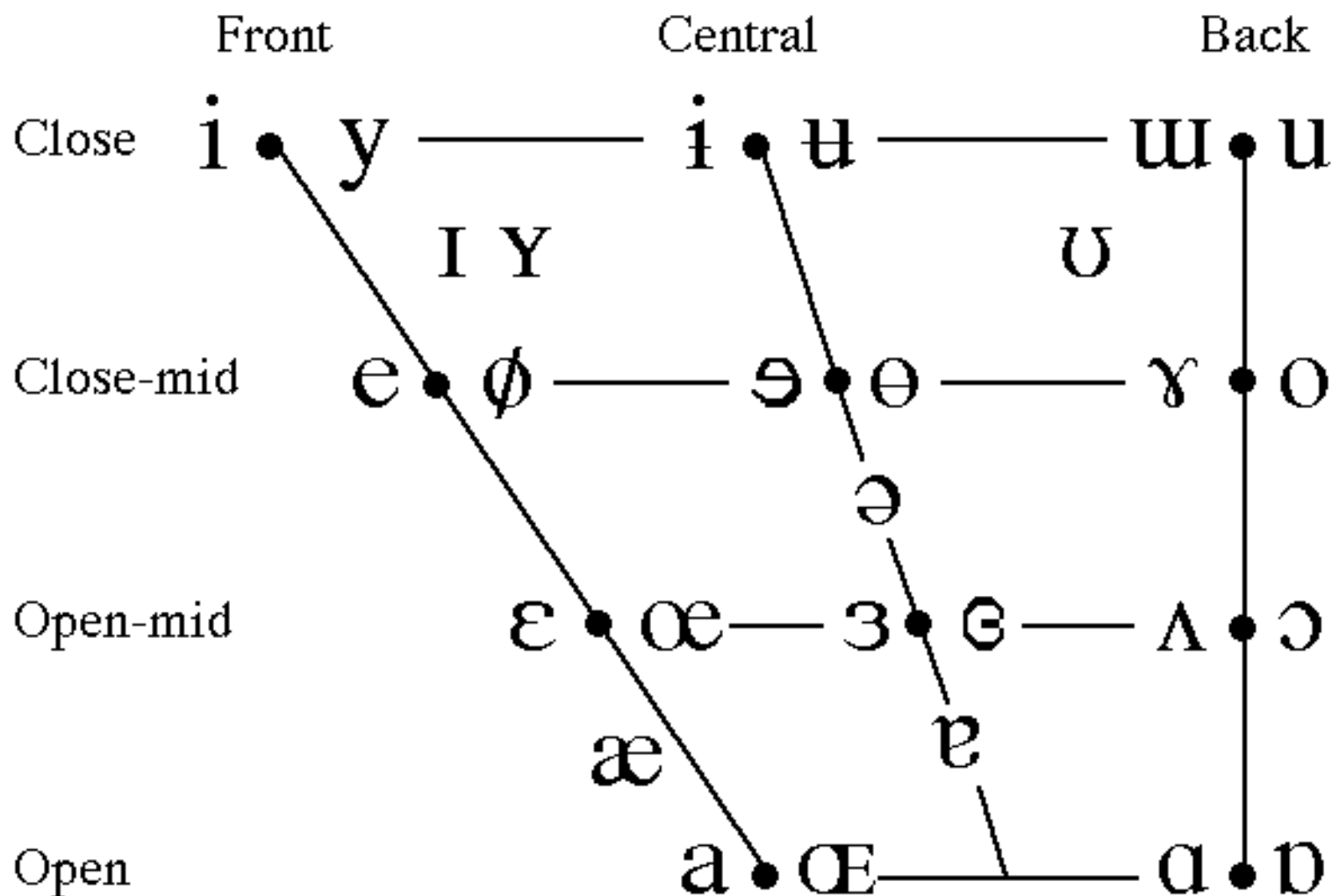
Are these all the vowels?

- The IPA chart represents all **monophthongs**:
 - vowels which are produced in a steady state from start to finish.
- Many languages (including English) also contain **diphthongs**:
 - vowels which move from one state to another.
 - MY, JOY, COW, etc.
 - More on this in a bit!

Summary: vowel features

- Lip rounding: rounded, unrounded
- Height: high, mid, low
- Frontness: front, central, back
- Tenseness: tense, lax
- Monophthongs vs. diphthongs

Question: how many possible vowels are there?



Where symbols appear in pairs, the one to the right represents a rounded vowel.

The infinite vowel space

- Technically, there are an infinite number of possible vowels produced in slightly different positions.
- We divide them into categories using the IPA, but this is not 100% precise.
- This is one factor that makes IPA transcription for vowels a bit variable: for some vowels, it is not totally clear which transcription is best.

Variable vowels

- Vowels are particularly prone to variation between different people, regions, etc.
- Vowels also vary depending on what surrounds them: BAT, BAG.
- Often, instead of a narrow (precise) transcription, it makes more sense to use a broad transcription to get a consistent IPA symbol across slightly different instances of the “same” vowel.

A note about Singapore and vowels

- Singapore English pronunciation developed with influence from Malay and Chinese dialects.
- There are a few vowel **shifts**, **mergers**, and **splits** when compared to UK English:
 - Shift: a vowel has changed position and thus sounds different.
 - Merger: Vowels that used to be distinct have been merged into a single vowel.
 - Split: One vowel splits into two vowels.

A note about Singapore and vowels

- This is not unusual – all dialects of English (including UK English) have vowel system changes over time.

So what are we learning for this course?

- You should be able to identify the key phonetic features that distinguish US, UK, and Singapore English.
- We are going to learn the vowel systems of:
 - Standard US English (aka “General American”)
 - Standard UK English (aka “Received Pronunciation”)
 - Singapore English

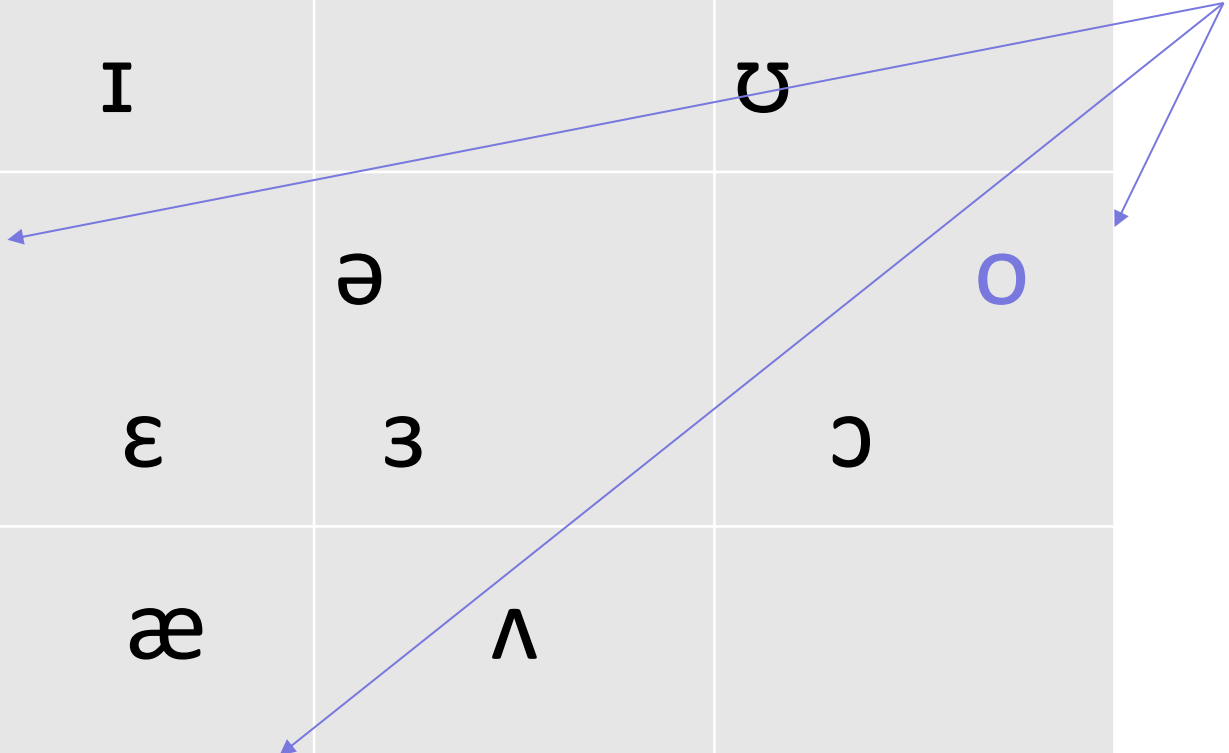
General American vowels

	front	central	back
high	i ɪ		u ʊ
mid	e ɛ	ə ɜ	o ɔ
low	æ a	ʌ	ɑ

General American vowels

	front	central	back
high	i ɪ		u ʊ
mid	e ɛ	ə ɜ	o ɔ
low	æ a	ʌ	ɑ

Only appear
in diphthongs



General American vowels

	front	central	back	
high	i ɪ		u ʊ	rounded
mid	e ɛ	ə ɜ	o ɔ	
low	æ a	ʌ	ɑ	

General American vowels

	front	central	back
high	i		u
mid	e	ə	o
low	æ	ʌ	ɑ

Diagram illustrating the positions of General American vowels on a vowel chart. The chart is a 3x3 grid with rows labeled high, mid, and low, and columns labeled front, central, and back. A yellow box highlights the central region, enclosing the vowels ɪ, ʊ, ɜ, ɔ, ʌ, and ɔ. A green arrow points to the vowel ɔ, labeled "lax".

GenAm Monophthongs

- [i] sheep, key, seize
- [ɪ] ship, kit, rip
- [ɛ] set, mess
- [æ] trap, ham, arrow
- [u] goose, few, who
- [ʊ] foot, full, look, could
- [ʌ] strut, cub, hum
- [ɔ] thought, hawk
- [ɑ] lot, stop, calm
- [ɜ] nerd, hurt [only occurs before r in stressed syllables]
- [ə] writer, accomplish [for unstressed, reduced vowels]

GenAm Diphthongs

- [aɪ] my, side, aisle, choir
- [eɪ] face, weight, steak
- [ɔɪ] boy, coin
- [aʊ] mouth, crowd, flower
- [oʊ] goat, sew, stove

NOTE: Diphthongs are considered tense due to longer duration and greater articulatory effort.

Postvocalic r

- Standard US English is “rhotic”, meaning that [r] following a vowel is retained.
- [r] often changes the sound of the preceding vowel, making it tricky to transcribe. Here are standard US transcriptions:
 - [ɪr] near, deer
 - [ɜr] nurse, turn
 - [əɹ] writer, biker
 - [ɛr] there, hair
 - [ɔr] north, boar
 - [ʊr] tour, moor
 - [jɜr] Europe, pure

Note: sometimes people write a little diacritic on the vowels instead of the full [r], like this: ɜ̥

GenAm examples

- What words are these?
 - (1) [feɪvər]
 - (2) [bɜrnɪŋ]
 - (3) [ɪntɛnfənəl]
 - (4) [θaʊzənd]

GenAm examples

- What words are these?

- | | |
|------------------|-------------|
| (1) [feɪvər] | favor |
| (2) [bɜːrnɪŋ] | burning |
| (3) [ɪntənʃənəl] | intentional |
| (4) [θaʊzənd] | thousand |

GenAm examples

- What is this sentence:

[oʊ maɪ ɡɒd kɛrən ju kænt jəs æsk pi:pəl waɪ
ðeɪr waɪt]

GenAm examples



- What is this sentence:

[ou maɪ ɡɒd kɛrən ju kænt jəs æsk pipl̩ waɪ
ðeɪr waɪt]

“Oh my God, Karen, you can’t just ask people
why they’re white.” (*Mean Girls*)

Received Pronunciation

- Received Pronunciation refers to a type of educated, “posh” UK English that we think of as the standard (although most Brits don’t really speak this way).
 - Still, the basic vowels apply to most educated English people, particularly those in the South.
 - The accent most common in Southern Britain today is Southern Standard British English (SSBE).
- All vowels in UK English differ in subtle ways from US English, but only a subset differ enough to require different IPA.

RP vowel chart

	front	central	back
high	i ɪ		u ʊ
mid	e ɛ	ə ɜ	ɔ
low	æ a	ʌ	ɒ ɑ

RP vowel chart

	front	central	back
high	i ɪ		u ʊ
mid	e ɛ	ə ɜ	ɔ
low	æ a	ʌ	ɒ ɑ

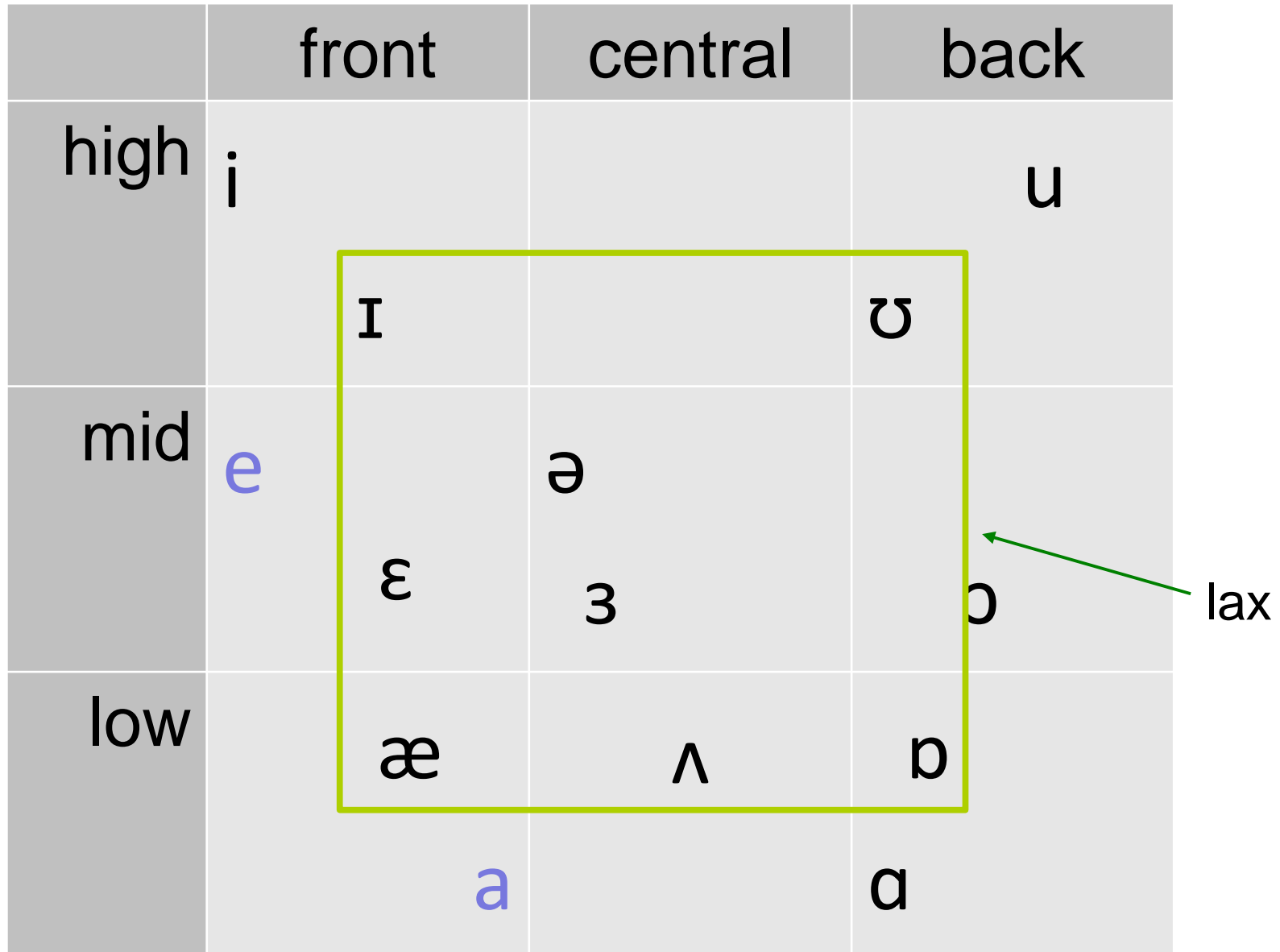
where
did [o]
go?

new
vowel









RP vowel chart

	front	central	back	
high	i ɪ		u ʊ	rounded
mid	e ɛ	ə ɜ	ɔ	
low	æ a	ʌ	ɒ ɑ	

RP vowel chart



US vs. UK differences

	US	UK
• lot:	[ɑ] 	[ɒ] 
• law:	[ɔ] 	[ɔ:]  (‘:’ means long)
• class:	[æ] 	[ɑ] 
• coat:	[oʊ] 	[əʊ] 

RP: Postvocalic r

- When r comes after a vowel and before a pause or a consonant, it is deleted and realized as a schwa [ə] or replaced with a long vowel (indicated with :).

• near [nɪə]



• care [kɛə]

• cure [kjʊə]

• curse [kɜ:s]

• horse [hɔ:s]



• biker [baɪkə]

NOTE: Alternative IPA conventions in British English

- To indicate the difference between tense and lax vowels, some UK phoneticians add the length diacritic to all of the tense vowels (e.g., [i:]).
- Some UK phoneticians use [e] for [ɛ] and [a] for [æ].
- We won't be using either of these conventions in this course.

RP Practice

- What IPA symbol(s) represent the vowel in US and UK English?

(1) bath

(2) trap

(3) glow

(4) shop

RP Practice

- What IPA symbol(s) represent the vowel in US and UK English?

	US	UK
(1) bath	[æ]	[ɑ]
(2) trap	[æ]	[æ]
(3) glow	[oʊ]	[əʊ]
(4) shop	[ɑ]	[ɒ]

RP Practice

- What sentence is this?

[ðə neɪmz ʃɜ:lɒk həʊmz ən ði ɛdrəs ɪz tu tu wʌn
bi beɪkə strɪt]

RP Practice

- What sentence is this?



[ðə neɪmz ʃɜ:lɒk həʊmz ən ði ədres ɪz tu tu wʌn
bi beɪkə strɪt]

“The name’s Sherlock Holmes and the address
is 221B Baker Street.”

Reminder: RP vowel chart

	front	central	back
high	i ɪ		u ʊ
mid	e ɛ	ə ɜ	ɔ
low	æ a	ʌ	ɒ ɑ



Singapore Eng. vowel chart

	front	central	back
high	i		u
mid	e ɛ	ə	ɔ ɒ
low		a	

So many mergers!

- Mergers of several vowels
 - [ɪ] → [i]
 - [ʊ] → [u]
 - [æ] → [ɛ]
 - [ʌ] → [a]
 - [ɒ] → [ɔ]

Diphthongs

- Unlike GA and RP, SingE has monophthongal [e] and [o]:
 - plate [plet] 
 - loaf [lof] 
- Diphthongs:
 - [ai] my, bite
 - [ɔi] boy, soil
 - [au] now, out
 - [iə] here, near
 - [uə] poor, sure

Postvocalic r

- Most Singaporeans delete postvocalic r, as in RP.
 - But more and more young people do not, particularly in careful speech.
- squares [skwɛz], [skwɛrz]



Tense vs. Lax?

- Singapore English is not considered to have a tense-lax distinction, in terms of the articulatory effort and length with which vowels are produced.
- The vowel pairs [e] vs. [ɛ] and [o] vs. [ɔ] are just distinguished by their position (high-mid vs. low-mid).

SingE Practice

- Identify these words transcribed in SingE:
 - [krɛ]
 - [postə]
 - [tʃans]
 - [kɔfɪŋ]
 - [ʃautəd]
 - [fiə]

SingE Practice

- Identify these words transcribed in SingE:
 - [krɛʃ] crash
 - [postə] poster
 - [tʃans] chance
 - [kɔʃɪŋ] coughing
 - [ʃautəd] shouted
 - [fiə] fear

Summary

Example	US - GA	UK - RP	SingE
SHEEP	i	i	i
SHIP	ɪ	ɪ	i
SET	ɛ	ɛ	ɛ
TRAP	æ	æ	ɛ
CLASS	æ	ɑ	a
GOOSE	u	u	u
FOOT	ʊ	ʊ	u
STRUT	ʌ	ʌ	a
THOUGHT	ɔ	ɔ:	ɔ
LOT	ɑ	ɒ	ɔ
COMM <u>A</u>	ə	ə	ə

Summary (cont'd)

Example	US (GA)	UK (RP)	SingE
MAY	eɪ	eɪ	e
MY	aɪ	aɪ	aɪ
BOY	ɔɪ	ɔɪ	ɔɪ
MOW	oʊ	əʊ	o
NOW	aʊ	aʊ	au
NEAR	ɪr	ɪə	ɪə
SQUARE	ɛr	ɛə	ɛ(r)
TOUR	ʊr	ʊə	uə(r)
PURE	jɜr	jʊə	jo(r)
NORTH	ɔr	ɔ:	ɔ(r)
START	ɑr	ɑ:	a(r)
NERD	ɜr	ɜ:	ə(r)
WRITER	ər	ə	ə(r)

Some resources

- Summary of English sound system:
http://en.wikipedia.org/wiki/English_phonology
- Chart contrasting IPA for English dialects (including Singapore English):
http://en.wikipedia.org/wiki/International_Phonetic_Alphabet_chart_for_English_dialects

Some resources: Soundy stuff

- Full interactive IPA chart:
<https://www.seeingspeech.ac.uk/ipa-charts/>
- US English IPA with sounds:
<https://americanipachart.com/>

Apps

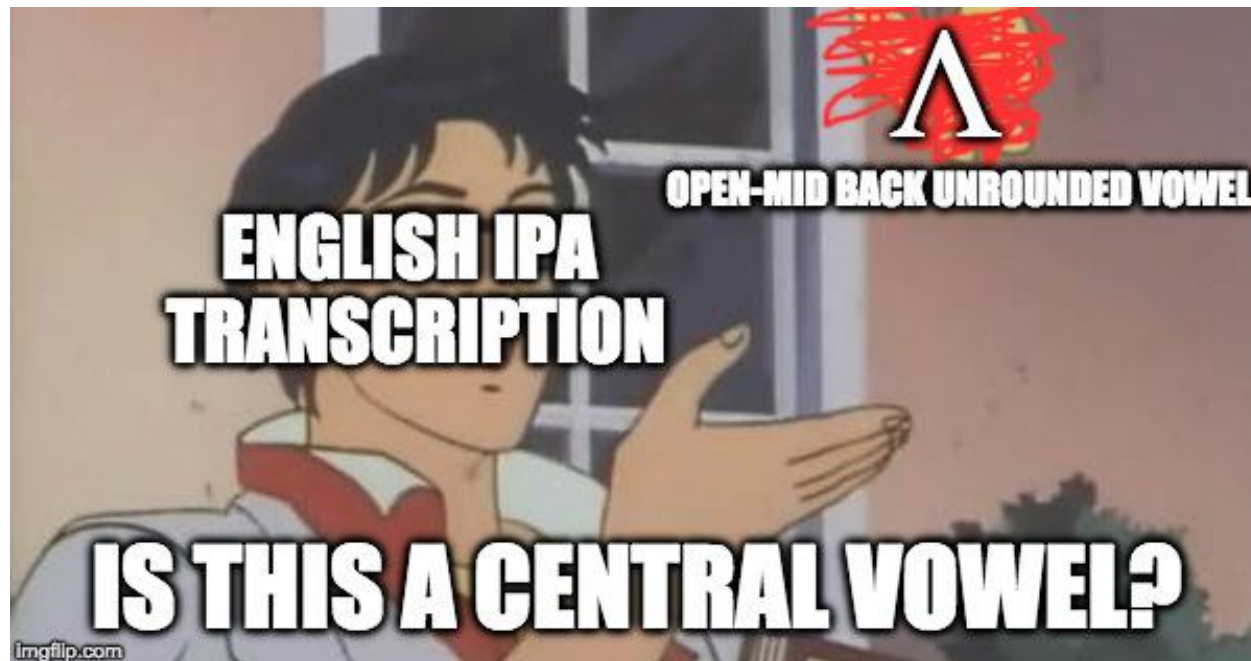
- Android:
 - Pronunroid
<https://play.google.com/store/apps/details?id=com.hoardingsinc.pronunroid>
- iPhone:
 - iPA Phonetics:
<https://itunes.apple.com/us/app/ipa-phonetics/id869642260?ls=1&mt=8>
- If you find any other useful apps, please let us know!

Note: variations in IPA

- You will see that some sources use slightly different IPA notation, or use different terms for some phonetic features.
- These differences are due to pronunciation variation, the imprecise nature of the IPA system, and preferences for more narrow or broad transcription.
- Don't freak out.

Note: variations in IPA



- One thing you might notice: [ʌ] on the full IPA chart is listed as a back vowel, but in English it is used to transcribe a central vowel.
- Although IPA is intended to be universal, in fact there are little idiosyncrasies like this in transcription conventions within languages.



Lexical Stress

- Stress: emphasis placed on a particular linguistic unit.
 - “You want me to do *what*?”
- Lexical stress: emphasis placed on a particular syllable within a word.
 - Next week, more about syllables
- In English, stress is very important in distinguishing between certain words.
 - e.g., insight vs. incite


How is lexical stress realized?

- Stressed syllables are higher, louder, and longer than unstressed syllables.
- The vowels of unstressed syllables are likely to be reduced (produced as schwa [ə]).
- Examples:
 - accountable [ə'kaʊntəbəl] 
 - recent ['risənt] 

Types of stress

- Primary stress:
 - All words* have one syllable that receives primary stress.
 - We mark primary stress in IPA with a straight apostrophe (') before the syllable.
 - collect [kə 'lɛkt]
 - Marking stress is optional in IPA.
- In connected speech, one-syllable **function words** (e.g. 'and', 'of', 'for') are often unstressed.
 - “cats and dogs” ['kæts ənd 'dɒgz]

Types of stress

- Secondary stress:
 - Longer words sometimes have syllables receiving secondary stress, an intermediate level of stress.
 - Secondary stress is marked with a low apostrophe (,)
 - organization [ˌɔrgənɪˈzeɪʃən] 

Stress patterns in English

- English has many word pairs like the following.
Can you see a pattern?
 - record: ['rɛkərd], [rə'kɔrd]
 - address: ['ædrɛs], [ə'drɛs]
 - import: ['ɪmpɔrt], [ɪm'pɔrt]

Stress patterns in English

- English has many word pairs like the following. Can you see a pattern?
 - record: ['rɛkərd], [rə'kɔrd]
 - address: ['ædrɛs], [ə'drɛs]
 - import: ['ɪmpɔrt], [ɪm'pɔrt]
- The version with **initial stress** is a noun, while the verb has **final stress**.

Stress in Singapore English

- Stress works a bit differently in Singapore English than in US/UK English.
- Unstressed syllables do not lower in pitch or shorten as much, and there is less vowel reduction.

Practice

- Where is the primary stress in these words:
 - surroundings
 - taxidermy
 - linguist
 - linguistics
 - phonetics
 - phonological
 - Singapore

Practice

- Where is the primary stress in these words:
 - sur**round**ings
 - **tax**idermy
 - **lin**guist
 - lin**guis**tics
 - pho**net**ics
 - phono**log**ical
 - **Sin**gapore

Key Concepts for Phonetics

- The speech chain
- The vocal tract
- Consonants: voicing, place of articulation, manner of articulation.
- Vowels: lip rounding, height, frontedness, tenseness, monophthong vs. diphthong.
- Key differences in US, UK, and Singapore English pronunciation.
- Stress: primary, secondary stress.

Next week

- Phonology!