

LING 450/550

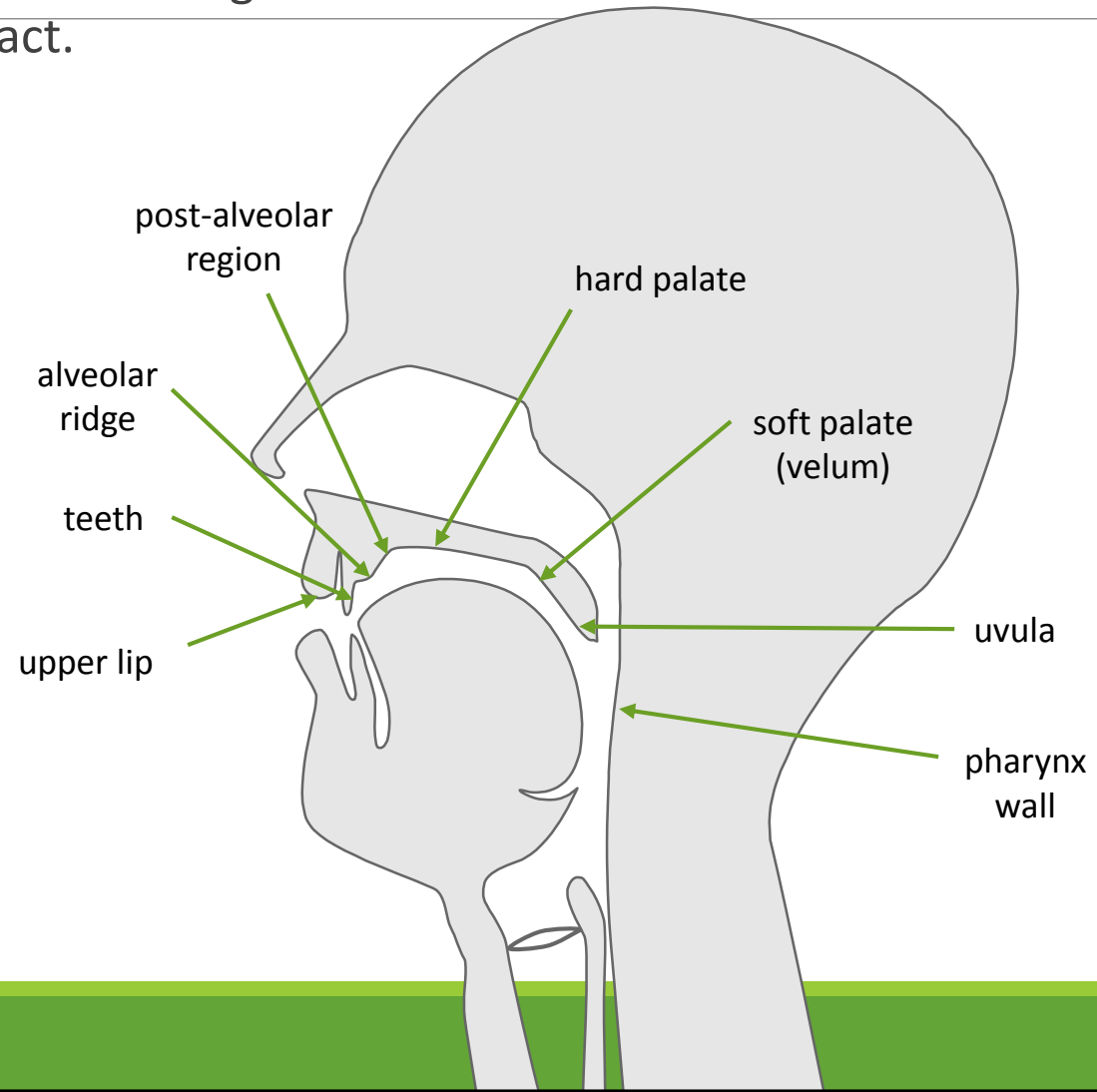
2 – International

Phonetic Alphabet (IPA)

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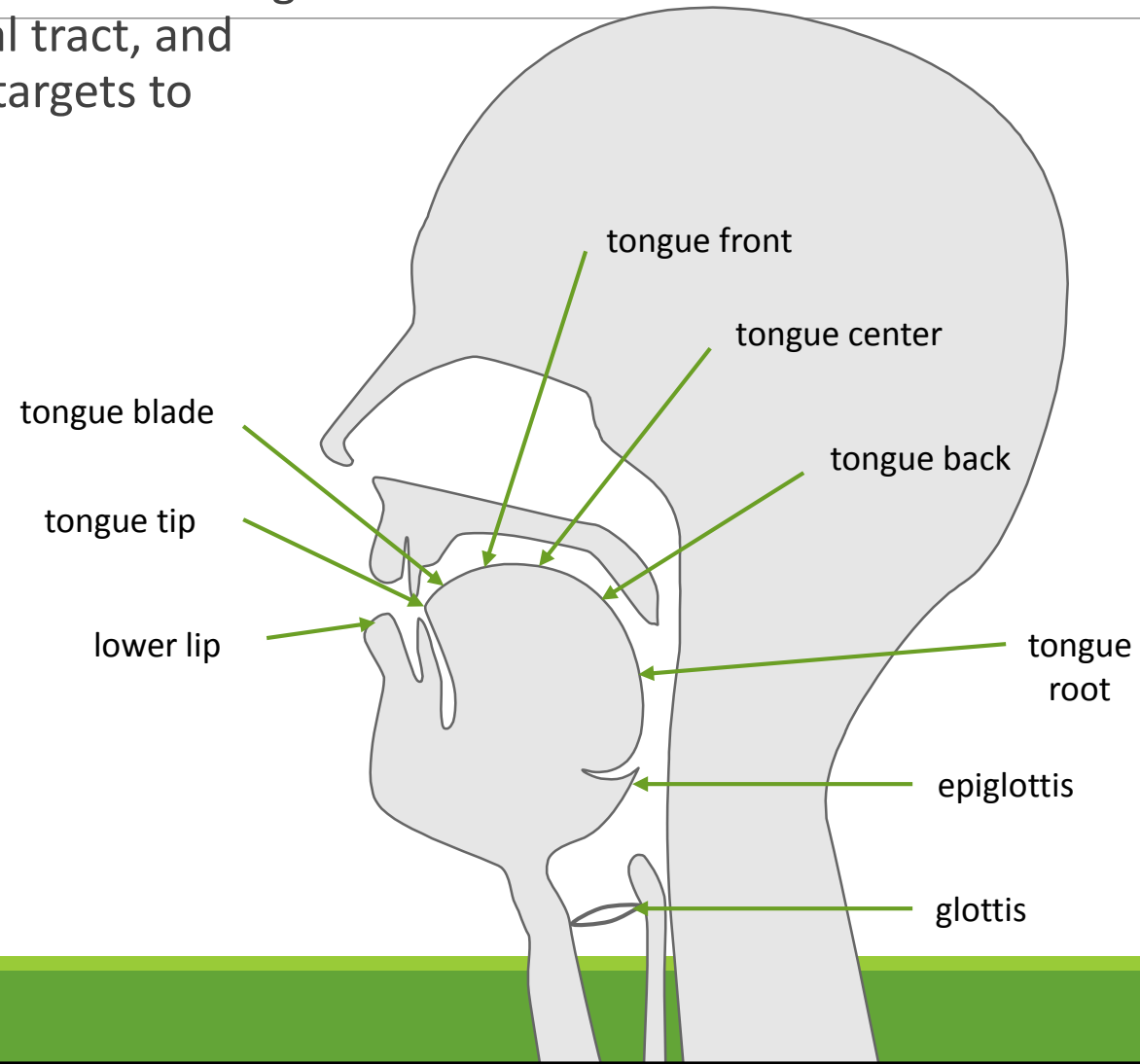
# Passive Articulators

Most *passive articulators* are located along the upper surface of the oral tract.



# Active Articulators

Most *active articulators* are located along the lower surface of the oral tract, and move toward their passive targets to create a constriction.



# Alphabets

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Think of example words to answer each of the following questions about English.

## Sounds from symbols

- What sounds can the letter *c* make?
- What sounds can the letter sequence *ei* make?
- What sounds can the letter *y* make?

## Symbols from sounds

- How can we spell the consonant sound at the beginning of the word *fish* (besides *f*)?
- How can we spell the vowel sound in the word *fish* (besides *i*)?
- How can we spell the consonant sound at the end of the word *fish* (besides *sh*)?

# Phonetic Alphabets

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In phonetic alphabets, each symbol represents exactly one sound/articulation, and each sound is represented by exactly one symbol (one-to-one sound-symbol correspondence)

Phonetic alphabets can be used to transcribe any sound of any spoken language

There are different phonetic alphabets, but we will focus on the International Phonetic Alphabet (IPA)

- Devised and maintained by the International Phonetic Association
- See the front and back covers of the Ladefoged & Johnson text

# Main IPA Consonant Chart

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b		t d			ʈ ɖ	c ɟ	k ɡ	q ɢ		ʔ
Nasal	m	ɱ	n			ɳ	ɲ	ŋ	ɴ		
Trill	ʙ		r						ʀ		
Tap or Flap		ⱱ	ɾ			ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative			ɬ ɮ								
Approximant		ʋ	ɹ			ɻ	j	ɰ			
Lateral approximant			l			ɭ	ʎ	ʟ			

Like the periodic table, the organization of the main IPA consonant chart gives us information about each sound

# Main IPA Consonant Chart

	Bilabial	Labiodental	Dental	Alveolar	Post alveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k ɡ	q ɢ		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	ɴ		
Trill	ʙ			r					ʀ		
Tap or Flap		ⱱ		ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			

Place of articulation: front  back of oral cavity

# Main IPA Consonant Chart

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k ɡ	q ɢ		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	ɴ		
Trill	ʙ			r					ʀ		
Tap or Flap		ⱱ		ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			

Manner of articulation: ↑ more constricted, ↓ less constricted

“Plosive” = pulmonic egressive oral stop



# Main IPA Consonant Chart

	Bilabial		Labiodental		Dental		Alveolar		Post alveolar		Retroflex		Palatal		Velar		Uvular		Pharyngeal		Glottal	
Plosive	p	b					t	d			ʈ	ɖ	c	ɟ	k	g	q	ɢ			ʔ	
Nasal		m		ɱ				n				ɳ		ɲ		ŋ		ɴ				
Trill		ʙ						r									ʀ					
Tap or Flap				ⱱ				ɾ				ɽ										
Fricative	ɸ	β	f	v	θ	ð	s	z	ʃ	ʒ	ʂ	ʐ	ç	ʝ	x	ɣ	χ	ʁ	ħ	ʕ	h	ɦ
Lateral fricative							ɬ	ɮ														
Approximant				ʋ				ɹ				ɻ		j		ɰ						
Lateral approximant								l				ɭ		ʎ		ʟ						

Voicing: voiceless, voiced

# Main IPA Consonant Chart

	Bilabial	Labiodental	Dental	Alveolar	Post alveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k ɡ	q ɢ		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	ɴ		
Trill	ʙ			r					ʀ		
Tap or Flap		ⱱ		ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			

**Nasal stops** are *nasal*, meaning that air flows out the nose (but is stopped in the mouth)

All other consonants are *oral*, meaning that air flows out the mouth

# Main IPA Consonant Chart

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k ɡ	q ɢ		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	ɴ		
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Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			

Lateral fricatives/approximants are *lateral*, meaning that air flows around the sides of the tongue

All others consonants are *central*, meaning that air flows through the center of the vocal tract

# The Consonants of English

	Bilabial	Labio-dental	Dental	Alveolar	Palato-alveolar	Palatal	Velar	Glottal
Stop	p b			t d			k g	ʔ
Nasal	m			n			ŋ	
Tap				r				
Fricative		f v	θ ð	s z	ʃ ʒ			h
Affricate					tʃ dʒ			
Approximant	w			ɹ		j		
Lateral				l				

- While **w** is labiovelar, it sometimes appears in the bilabial column of an IPA chart for English

[http://sail.usc.edu/span/rtmri\\_ipa/](http://sail.usc.edu/span/rtmri_ipa/)

# Reading Transcriptions

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Find the mistake in each of the following English transcriptions.

<i>Word</i>	<i>Transcription</i>
strength	[stɹɛŋθ]
crime	[cɹaɪm]
wishing	[wɪʃɪŋ]
wives	[waɪvs]
these	[θɪz]
hijacking	[haɪjækɪŋ]
chipping	[tʃɪppɪŋ]
yelling	[yɛlɪŋ]
sixteen	[sɪxtɪn]
thesis	[ðɪsɪs]

# Other IPA Consonant Charts

Non-pulmonic stops

Other

Clicks	Voiced implosives	Ejectives
◌ǀ Bilabial	◌ɓ Bilabial	◌' Examples:
◌ǃ Dental	◌ɗ Dental/alveolar	◌p' Bilabial
◌ǂ (Post)alveolar	◌ɟ Palatal	◌t' Dental/alveolar
◌ǁ Palatoalveolar	◌ɠ Velar	◌k' Velar
◌ǁ Alveolar lateral	◌ɣ Uvular	◌s' Alveolar fricative

◌ɱ Voiceless labial-velar fricative

◌ɰ Voiced labial-velar approximant

◌ɥ Voiced labial-palatal approximant

◌ħ Voiceless epiglottal fricative

◌ʕ Voiced epiglottal fricative

◌ʡ Epiglottal plosive

◌ç ◌ʒ Alveolo-palatal fricatives

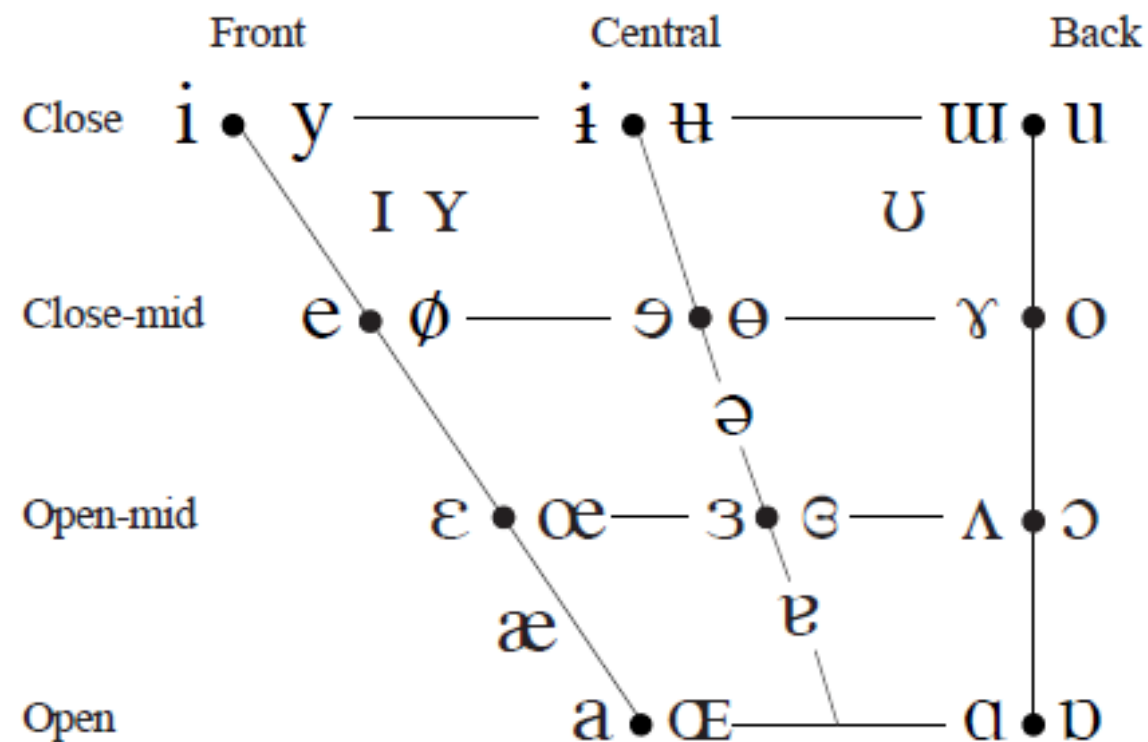
◌ɹ Voiced alveolar lateral flap

◌ɕ Simultaneous ʃ and x

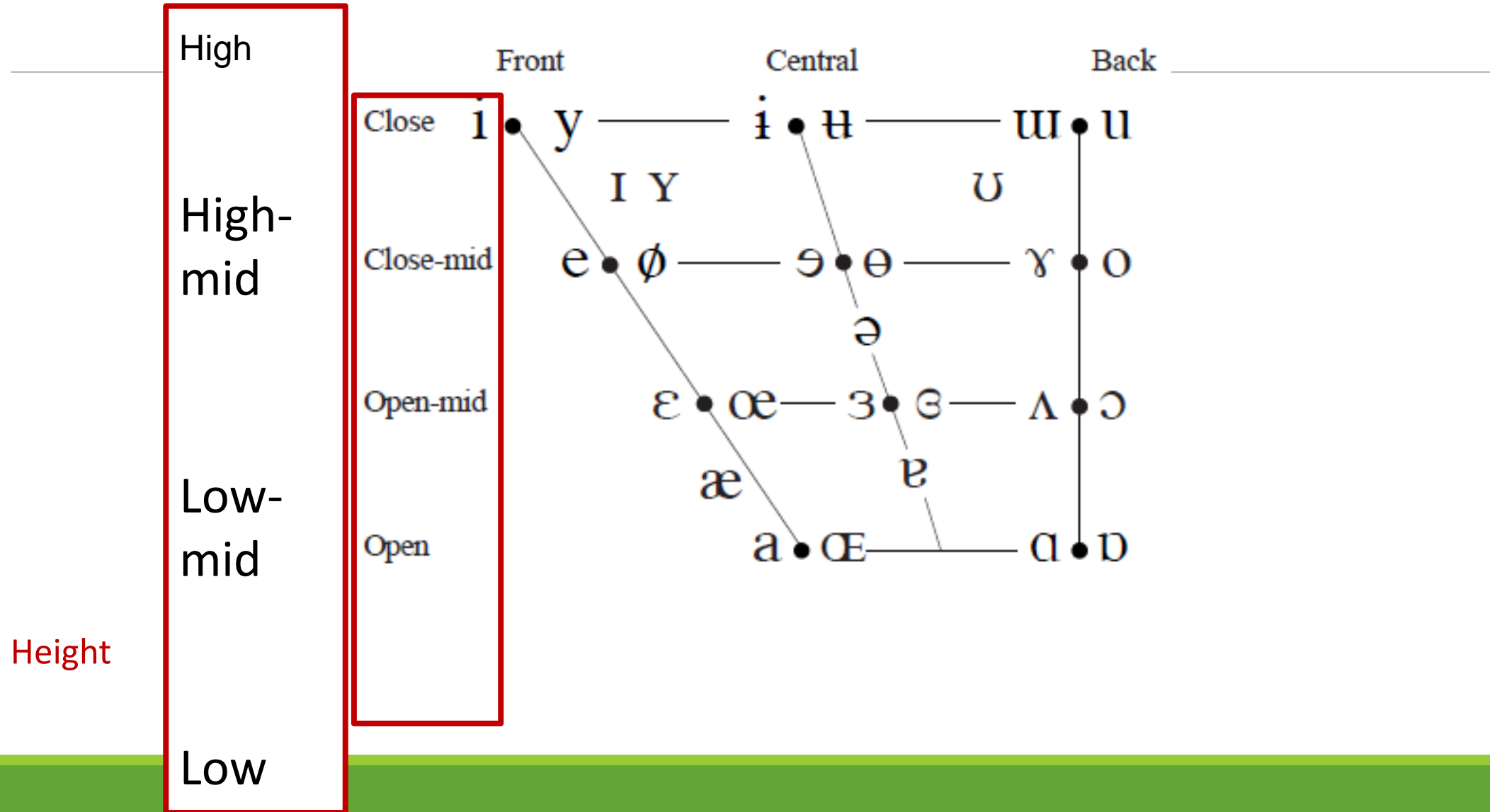
Affricates and double articulations can be represented by two symbols joined by a tie bar if necessary.

◌kp ◌ts

# IPA Vowel Chart

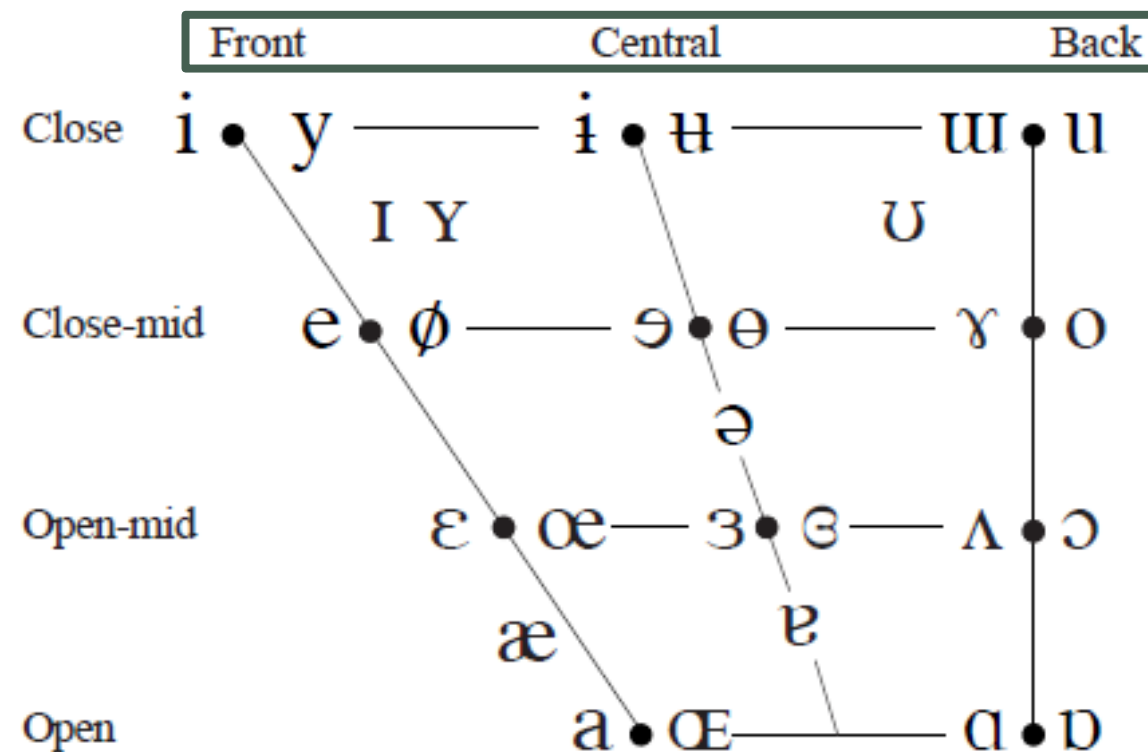


# IPA Vowel Chart



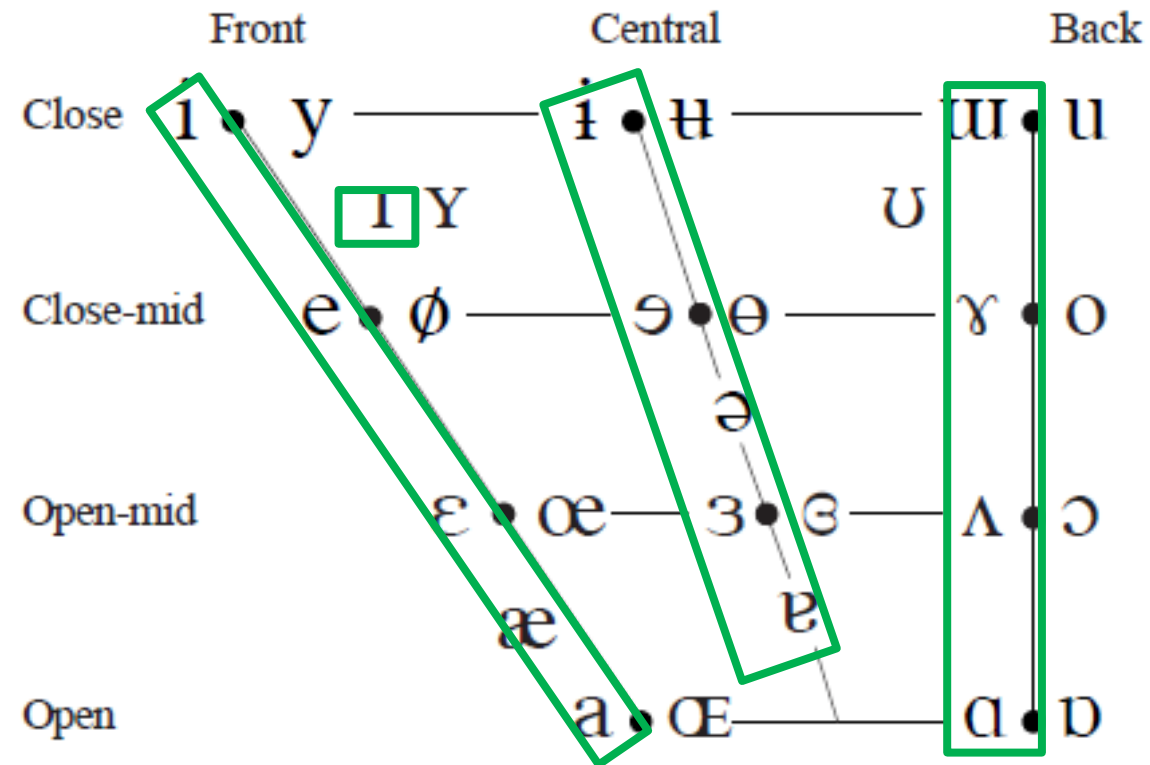


# IPA Vowel Chart



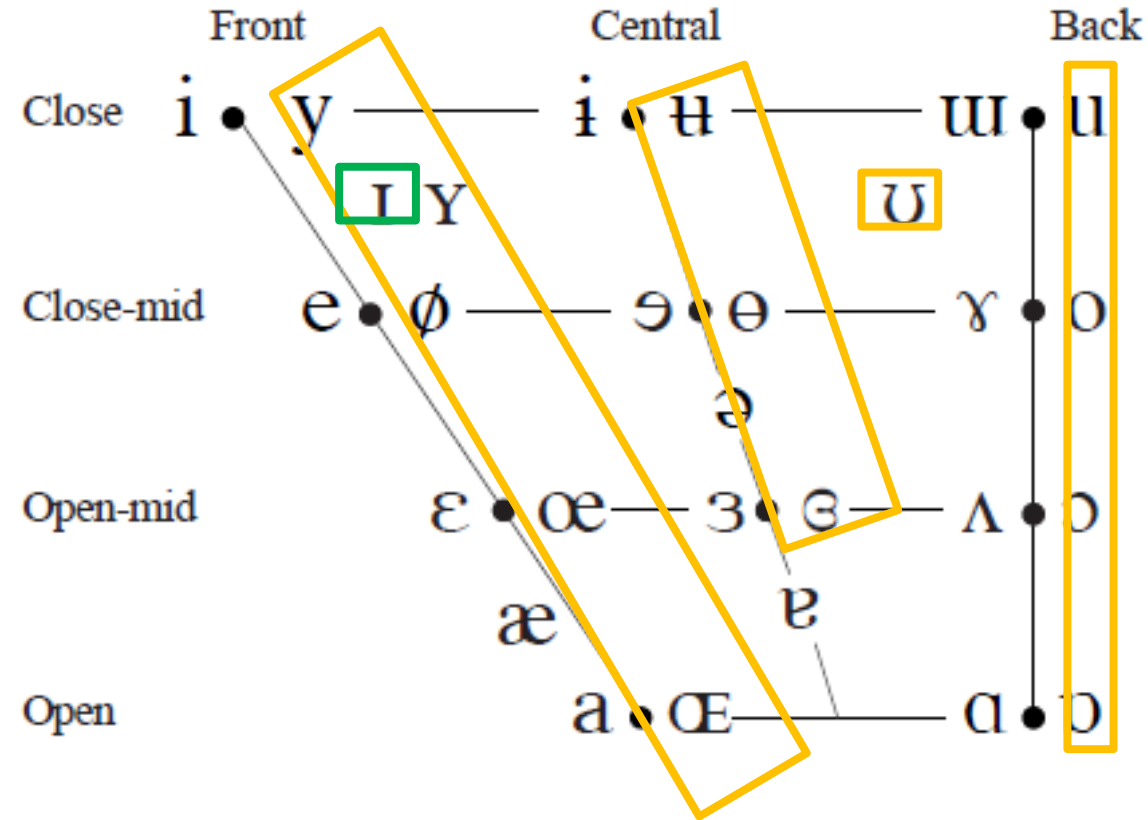
Backness

# IPA Vowel Chart



Roundedness: lips are **unrounded** or **rounded**

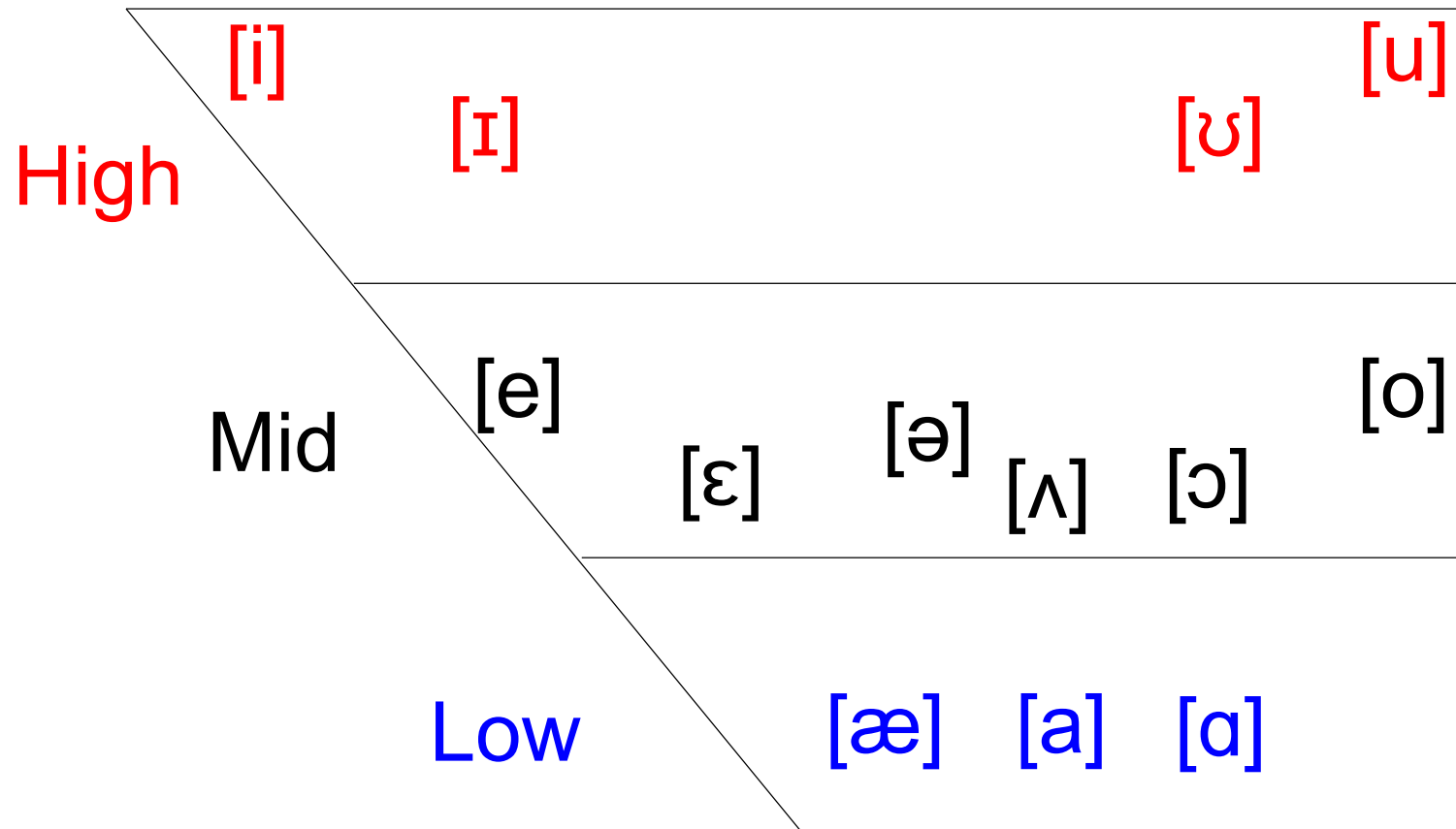
# IPA Vowel Chart



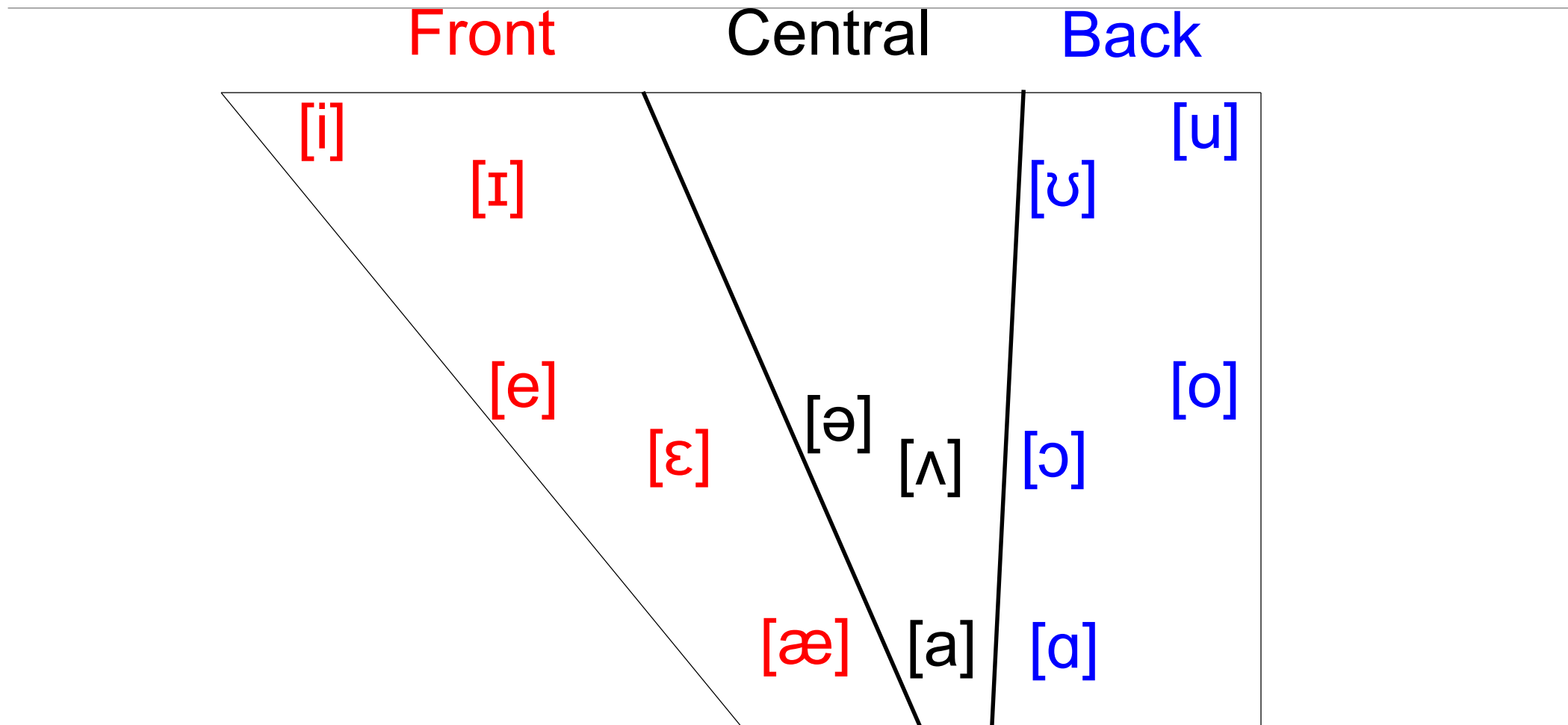
Roundedness: lips are **unrounded** or **rounded**

# American English Vowels: Height

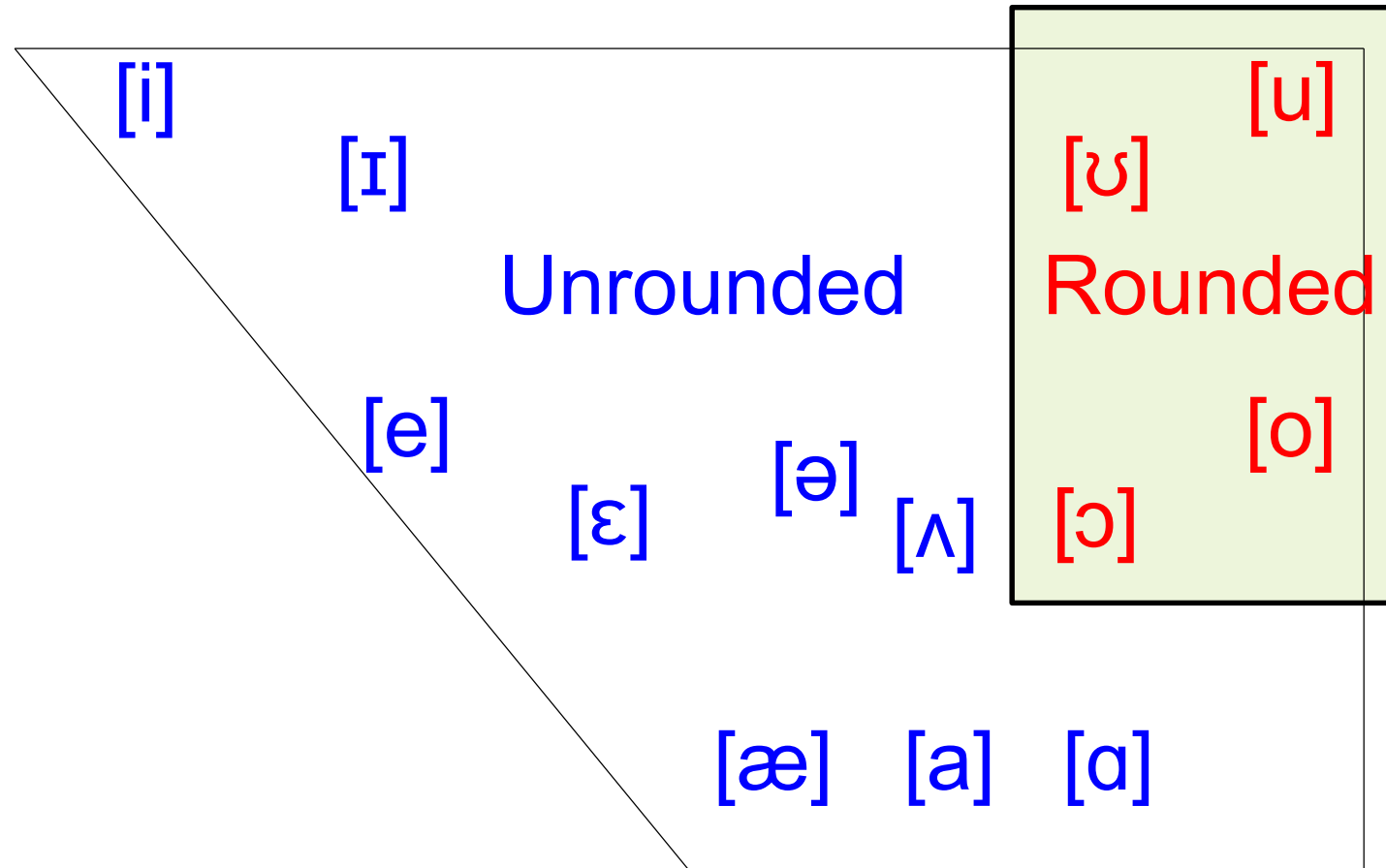
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# American English Vowels: Backness

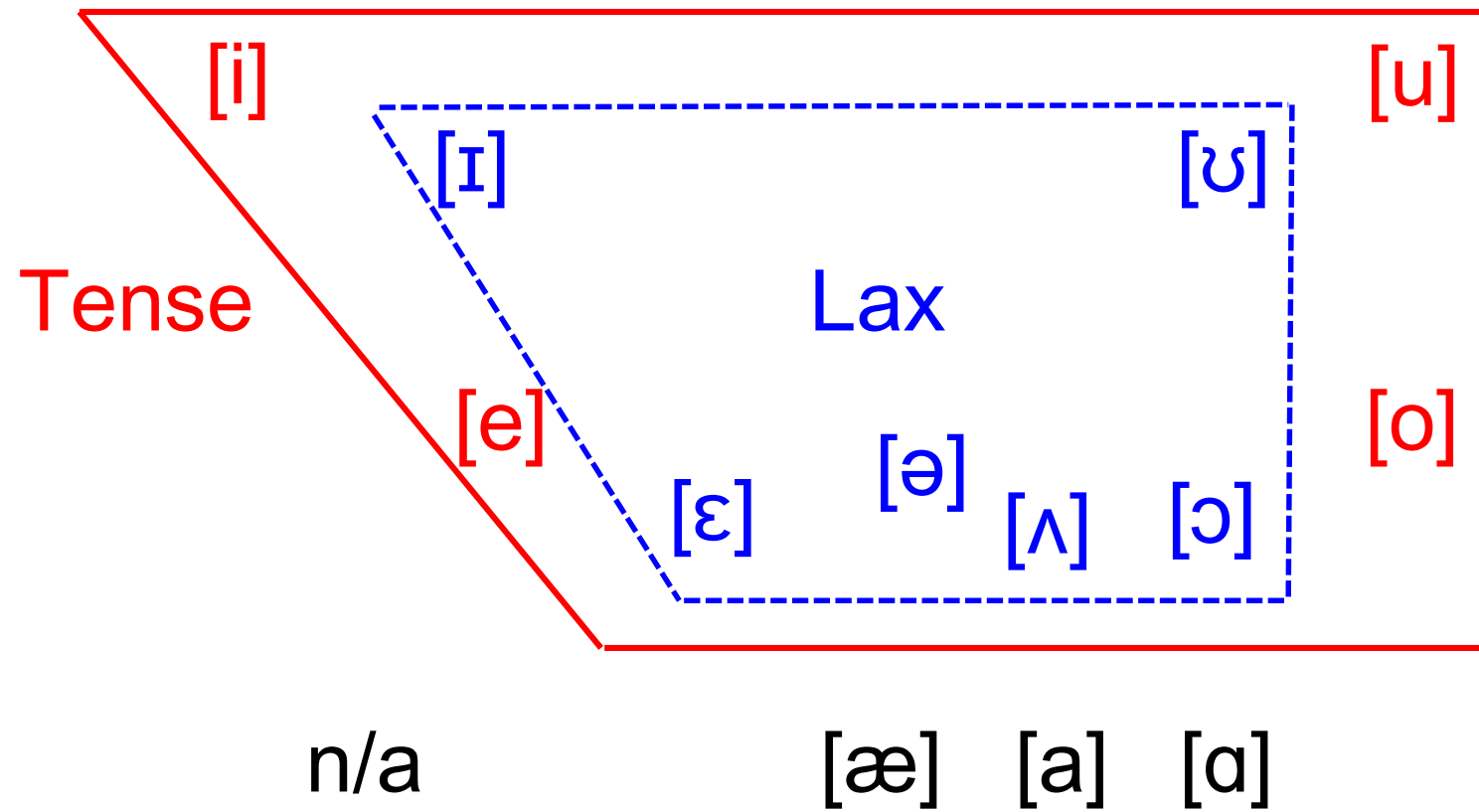


# American English Vowels: Roundedness



# American English Vowels: Tenseness

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# American English Vowels: Tenseness

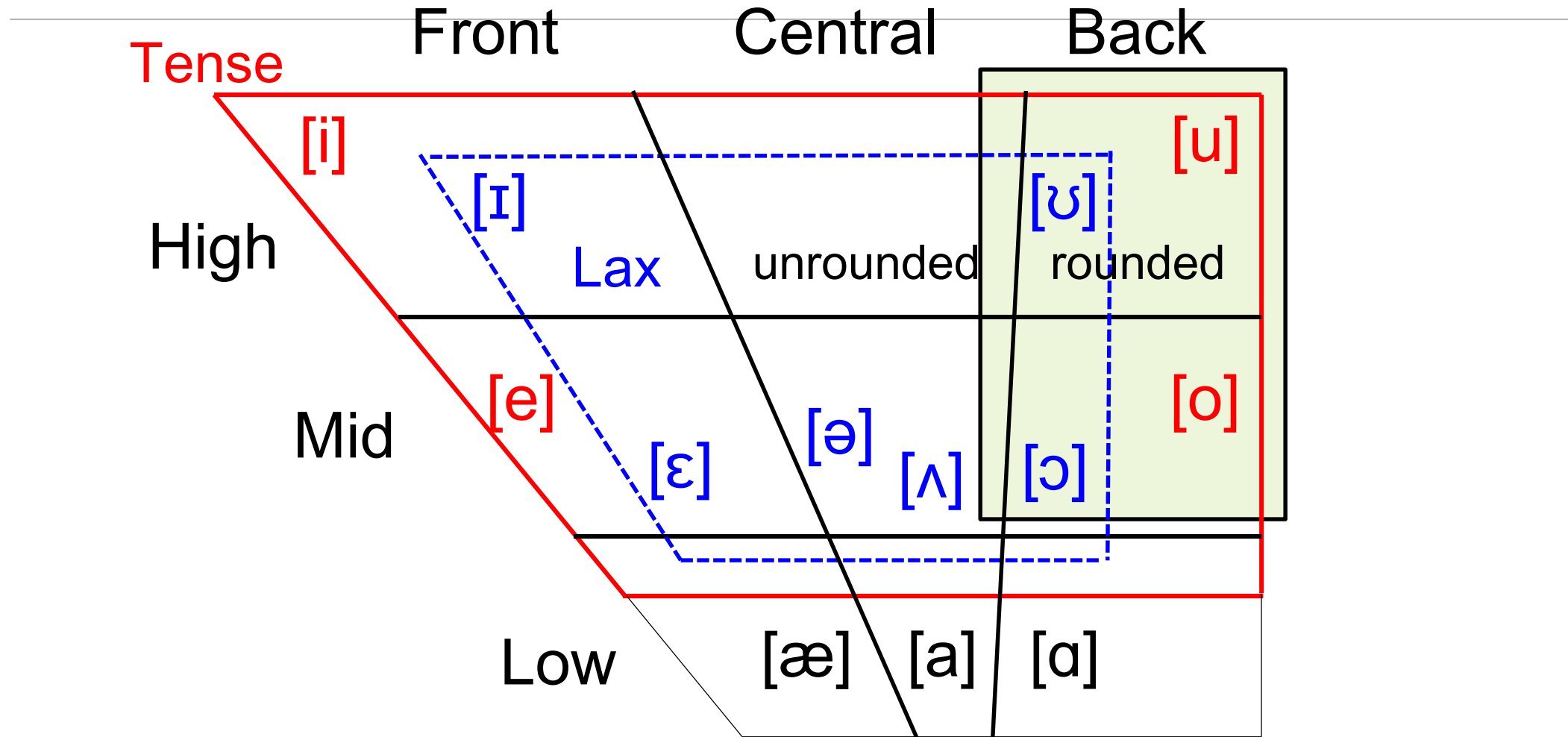
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Instead of tense and lax, other terms may be used to capture the difference between **i** and **ɪ**, between **u** and **ʊ**, etc.

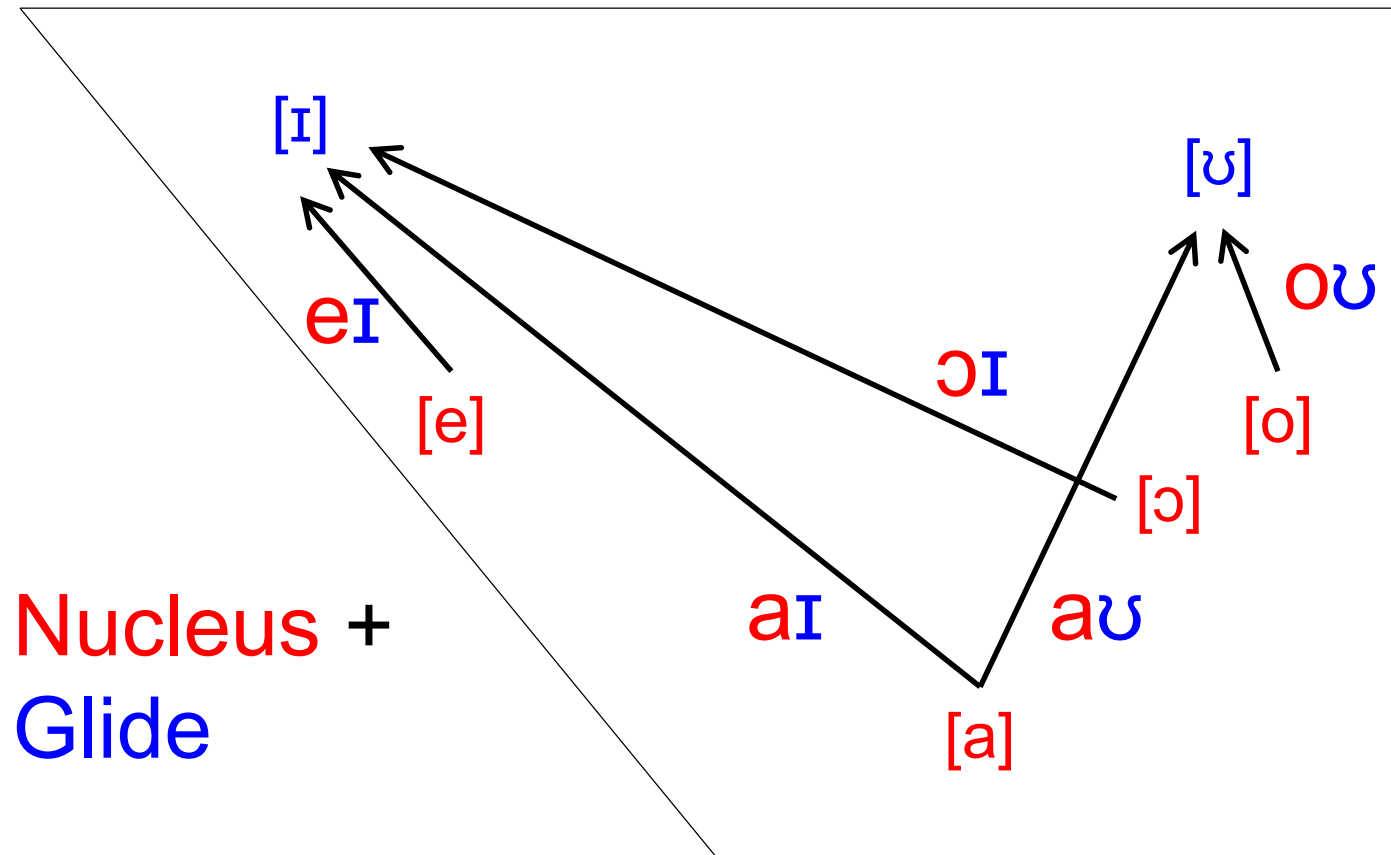
- High and lower-high
- Long and short



# American English Vowels: Summary



# American English Vowels: Diphthongs



# Reading Transcriptions















































































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Find the mistake in each of the following English transcriptions.

<i>Word</i>	<i>Transcription</i>
man-made	[manmeɪd]
football	[fʊtbol]
tea chest	[tiːtʃest]
tomcat	[tomkæt]
tiptoe	[tiptʊ]
avoid	[ævɔɪd]
remain	[rəˈmeɪn]
bedroom	[bedrʊm]
umbrella	[ʌmbrelə]
manage	[mænædʒ]

# Diacritics

Placed above or below a symbol to modify its description

 Voiceless	 	 Breathy voiced	 	 Dental	 
 Voiced	 	 Creaky voiced	 	 Apical	 
 Aspirated	 <sup>h</sup>  <sup>h</sup>	 Linguolabial	 <sub>~</sub>  <sub>~</sub>	 Laminal	 <sub>□</sub>  <sub>□</sub>
 More rounded	 <sub>ɔ</sub>	 Labialized	 <sup>w</sup>  <sup>w</sup>	 Nasalized	 <sub>~</sub>
 Less rounded	 <sub>ɔ̟</sub>	 Palatalized	 <sup>j</sup>  <sup>j</sup>	 Nasal release	 <sup>n</sup>
 Advanced	 <sub>+</sub>	 Velarized	 <sup>ʎ</sup>  <sup>ʎ</sup>	 Lateral release	 <sup>l</sup>
 Retracted	 <sub>-</sub>	 Pharyngealized	 <sup>ʕ</sup>  <sup>ʕ</sup>	 No audible release	 <sup>ɹ</sup>
 Centralized	 <sub>̞</sub>	 Velarized or pharyngealized			
 Mid-centralized	 <sub>̠</sub>	 Raised	 <sub>̠</sub> (  <sub>̠</sub> = voiced alveolar fricative)		
 Syllabic	 <sub>̩</sub>	 Lowered	 <sub>̣</sub> (  <sub>̣</sub> = voiced bilabial approximant)		
 Non-syllabic	 <sub>̥</sub>	 Advanced Tongue Root	 <sub>̠</sub>		
 Rhoticity	 <sub>̤</sub>  <sub>̤</sub>	 Retracted Tongue Root	 <sub>̡</sub>		

# Suprasegmentals

Used to indicate stress, length, syllable boundaries, intonation groups

'	Primary stress
ˊ	Secondary stress
	ˌfəʊnəˈtɪʃən
ː	Long eː
ˑ	Half-long eˑ
◌̥	Extra-short e̥
	Minor (foot) group
	Major (intonation) group
.	Syllable break ˌi.ækt
◌̣	Linking (absence of a break)

# Tone

Used to indicate lexical tone (when different pitch levels or movements cause a change in the meaning of a word)

Two systems: diacritics or lines (“tone letters”)

ONES AND WORD ACCENTS					
LEVEL			CONTOUR		
é or	┐	Extra high	ě or	∧	Rising
é	┐	High	ê	∨	Falling
ē	┘	Mid	ē	↗	High rising
è	┘	Low	è	↗	Low rising
è	┘	Extra low	ẽ	↗	Rising-falling
↓		Downstep	↗		Global rise
↑		Upstep	↘		Global fall

# Common Transcription Mistakes

	Correct IPA	Incorrect/non-IPA
palatoalveolar voiceless fricative	[ʃ]	[š]
palatoalveolar voiceless affricate	[tʃ] or [tʃ̺]	[č]
palatoalveolar voiced affricate	[dʒ] or [dʒ̺]	[j] [j̺]
interdental voiceless fricative	[θ]	[th] [tʰ]
alveolar (central) approximant	[ɹ]	[r]
palatal nasal	[ɲ]	[ñ]
long vowels	[o:]	[ō]
mid lax back unrounded vowel (stressed syllables)	[ʌ]	[ə]
palatal approximant	[j]	[y]
high front off-glide diphthong	[aɪ]	[ay] [aj]
alveolar apical vowel	[ɹ]	[ɿ]
retroflex apical vowel	[ɻ]	[ɻ̌]

# Reading Transcriptions

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Find the mistake in each of the following English transcriptions.

<i>Word</i>	<i>Transcription</i>
magnify	[ 'mægnifaɪ]
traffic	[ 'tɹæfɪc]
simplistic	[ 'sɪmplɪstɪk]
irrigate	[ 'ɪrɪgeɪt]
improvement	[ɪm 'prʊvmənt]
demonstrate	[ 'dəmənstreɪt]
human being	[hʌmən 'biɪŋ]
appreciate	[ə 'preʃieɪt]
joyful	[ 'dʒɔɪfʊl]
wondrous	[ 'wɒndrəs]



# Interactive IPA Charts

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Ladefoged & Johnson online materials (uses QuickTime):

<http://www.phonetics.ucla.edu/course/chapter1/chapter1.html>

Paul Meier Dialect Services (uses Flash, user-friendly): [www.paulmeier.com/ipa/charts.html](http://www.paulmeier.com/ipa/charts.html)

U. of Iowa Flash Animation (includes visual aids):

<http://soundsofspeech.uiowa.edu/english/english.html>

U. of Victoria (includes audio explanations, uses QuickTime):

[web.uvic.ca/ling/resources/ipa/charts/IPAlab/IPAlab.htm](http://web.uvic.ca/ling/resources/ipa/charts/IPAlab/IPAlab.htm)

# IPA Character Pickers

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Select, copy, and paste IPA symbols from here to Canvas or other sites/programs

Weston Ruter's:

<http://westonruter.github.com/ipa-chart/keyboard/>

Richard Ishida's:

<http://rishida.net/scripts/pickers/ipa/>

# Phonetic Transcription

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WRITTEN SYMBOLS FOR SPEECH SOUNDS

READ LADEFOGED & JOHNSON, CHAPTER 2

adapted from slides by Richard Wright and Dan McCloy

# Transcription

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*Transcription* is the use of a set of agreed upon written symbols to accurately describe sounds of a spoken language.

- *Phonemic transcription* describes spoken language using only contrastive sounds (phonemes). Phonemic transcription is often called *broad transcription*.
- *Narrow transcription* notes the allophonic nuances. There are many levels of detail in narrow transcription.
- A *phonetic transcription* is the narrowest, noting all of the detail in an individual's pronunciation of speech.

Depending on the language being transcribed, a given alternation (e.g., aspiration) may or may not mark a phonemic contrast and thus may or may not be included in a broad transcription.

# Transcribing Variation

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Variation in speech may be noted in a transcription by using different phonetic symbols, or by using diacritics to modify symbols.

In practice, it is very difficult to perform phonetic transcription without the use of recordings and software tools. Most transcription is *impressionistic*, meaning it involves listening to speech and noting as much of the detail as possible.

# Choosing a Transcription Method

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The goal of the research determines the appropriate level of transcription. The most widely used level is what Ladefoged refers to as “fairly broad,” which notes systematic allophonic variation, but not speaker-dependent variation or suballophonic variation (such as that caused by fatigue, random variation, or even detailed intonational effects).

In this class we will concentrate on “fairly broad” transcription:

- We will note things like aspiration, nasalization, flapping, voicing/devoicing...
- But not some of the harder to hear effects like vowel shortening or unreleased stops.

# Reminders

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Do HW 1

Read Ladefoged & Johnson chapter 8