Where am I?

- HUL242: **Fundamentals of Language Sciences**
- **Phonetics (Lecture-2)**
- Thursday, Jan 9

Announcements

- Tutorial
  - Thursday, 6:30-7:30 pm, in two parallel sessions, LH318 & LH316

Recap

- In Phonetics, we study a language by examining the **inventory** and **structure** of the speech sounds, also called **phones/segments/sounds.**

- The sound-producing system
  - Lungs, Larynx, Pharynx, Oral cavity, Nasal cavity

- Three major classes of sounds in Modern English
  - Consonants, Vowels, Glides

Recap

- Three parameters for describing consonants
  - Place of articulation
    (Bilabial, Labiodental, Dental, Postalveolar, Palatal, Velar, Glottal etc.)
  - Manner of articulation
    (Plosives/stops, Nasals, Taps or flaps, Fricatives, Approximants etc.)
  - Phonation
    (voiced, voiceless)

Recap: The IPA chart for English consonants

Place of Articulation															
		Bilabial		Labio-dental		Inter-dental		Alveolar		Alveo-palatal		Palatal		Velar		Glottal
Manner of Articulation	Stop	p	b					t	d					k	g	?
	Fricative			f	v	θ	ð	s	z	ʃ	ʒ					h
	Affricative									tʃ	dʒ					
	Nasal		m						n						ŋ	
	Flap								ɾ							
	Lateral Approximant								l							
	Retroflex Approximant								ɹ							
	Glide		w										j			

State of the Glottis	
Voiceless	Voiced

Recap: The IPA chart

- The *International Phonetic Alphabet*, or **IPA** is a standardized orthography for speech sounds.
- The *same alphabet for all the languages* across the board.
- This system of transcription attempts to represent *each sound of human speech with a single symbol*.
- Symbols are *enclosed in brackets* [ ] to indicate that the transcription is phonetic and does not represent the spelling system of a particular language.
- [p] is not an English letter 'p' but a bilabial, stop, voiceless sound found in languages such as English, Hindi and many other languages.
- The use of a standardized phonetic alphabet with a one-to-one correspondence between sound and symbol enables linguists to *transcribe languages consistently and accurately*.

Today

- Glides
- Vowels

The Glides

Glides

- **Glides** are produced with the vocal tract open.

- Glides show properties of both consonants and vowels and are also called semivowels or semiconsonants.
  - Vowel like articulation – with the open vocal tract
  - Pattern like consonants - can not form the nucleus of a syllable.

- There are two glides in American English:

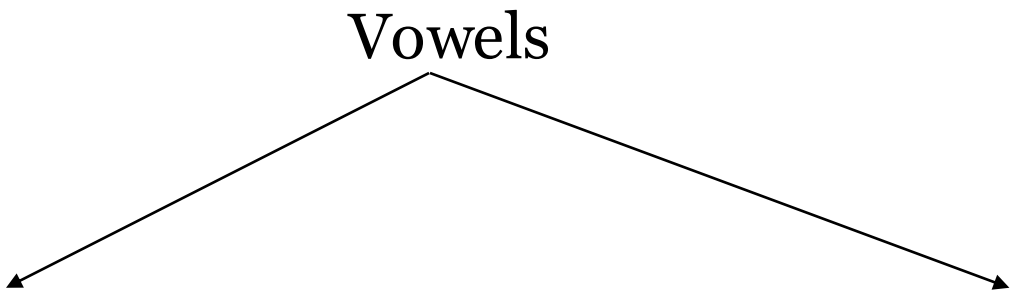
  [j]: The first sound of *yes* and the last sound of *boy*
  - The tongue is raised to the palate (described as alveo-palatal as well)

  [w]: The first sound of *wet*
  - The tongue is raised and pulled back near the velum, with the lips projecting or rounded.

The Vowels

Vowels

- A speech sound that is made without the obstruction of the airflow in the vocal tra
  - Pronounced with an open vocal tract
  - longer in duration



Monophthong/Single vowel

- Only one vowel articulated
- No change in the quality

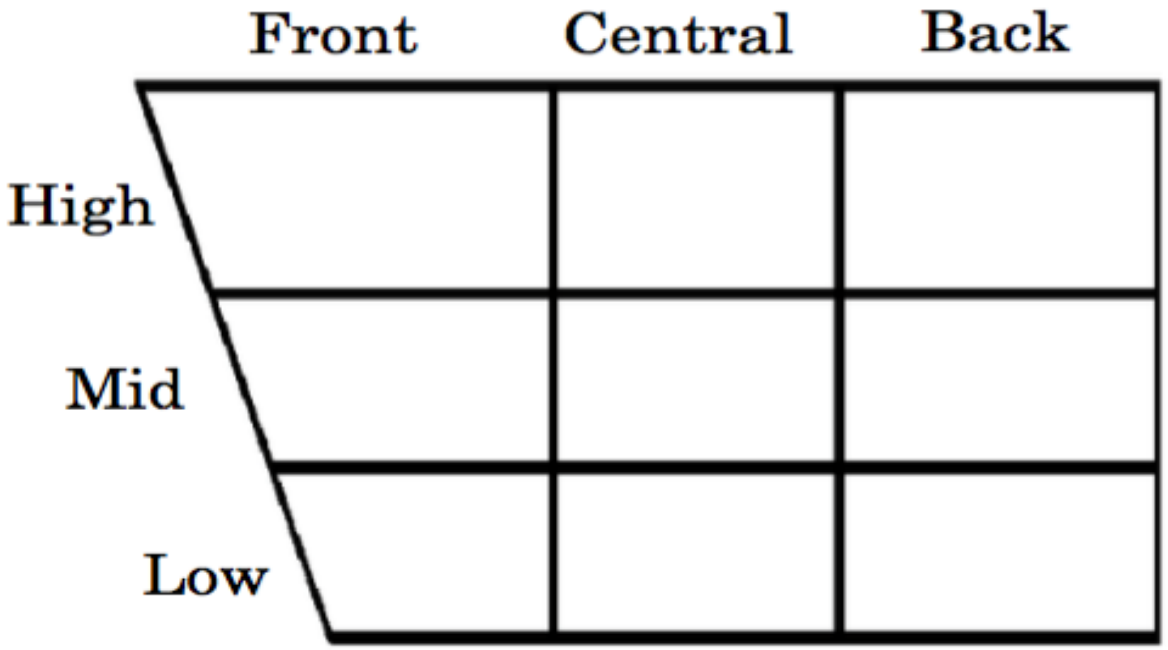
Diphthong

- The tongue moves from vowel articulation towards a glide
- Change in quality

Vowels: 4 Parameters

- VOWELS vary along 4 parameters:
  - Tongue Position: Front, Central and Back
  - Tongue Height: High, Mid and Low
  - Lip rounding: Rounded vs. Unrounded
  - Degree of vocal tract constriction: Tense vs. Lax

Abstract representation of vowel space



- The trapezoid roughly corresponds to **the space within which the tongue moves**, which is **wider at the top** of the oral cavity and **more restricted at the bottom**.

Parameters 1 and 2: Tongue height and position

Say the following words

seat = [sit]
heat = [hit]

Sue = [su]
blue = [blu]

mad = [mæd]
bat = [bæt]

bart = [bɑrt]
cart = [kɑrt]

bite = [bajt]
tight = [tajt]

loud = [lawd]
bout = [bawt]

fate = [fejt]
mate = [mejt]

met = [mɛt]
bet = [bɛt]

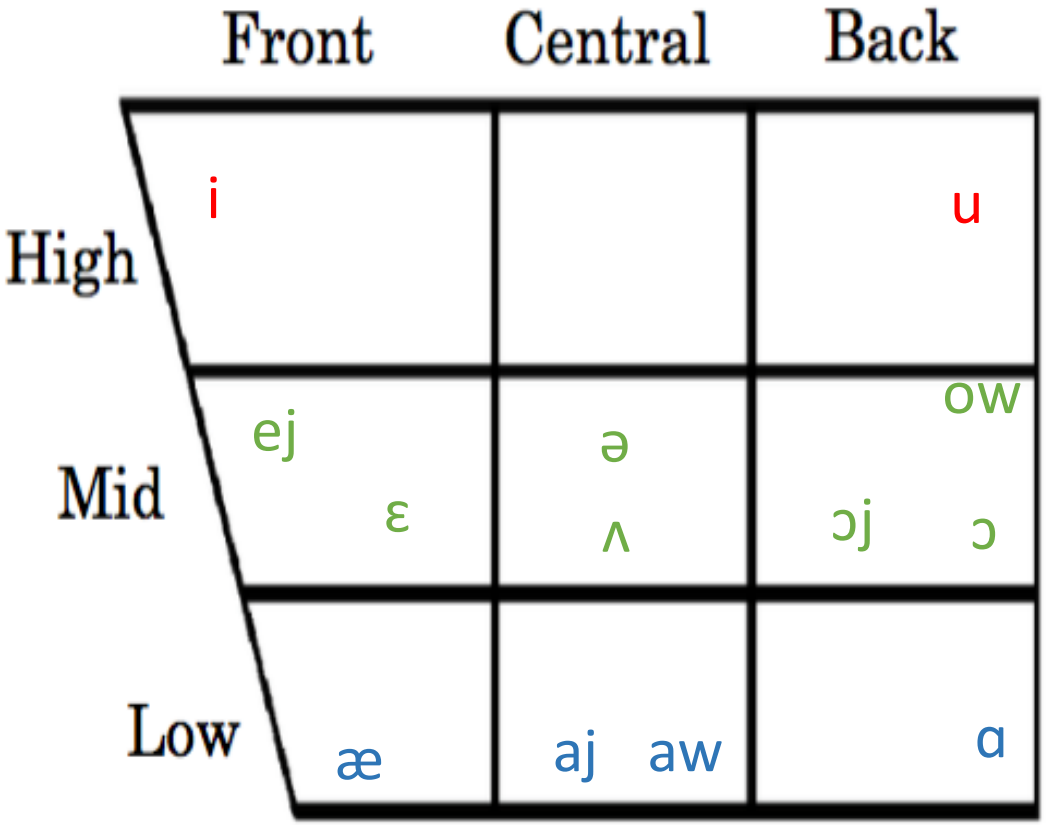
caught = [kɔt]
job = [jɔb]

boy = [bɔj]
toy = [tɔj]

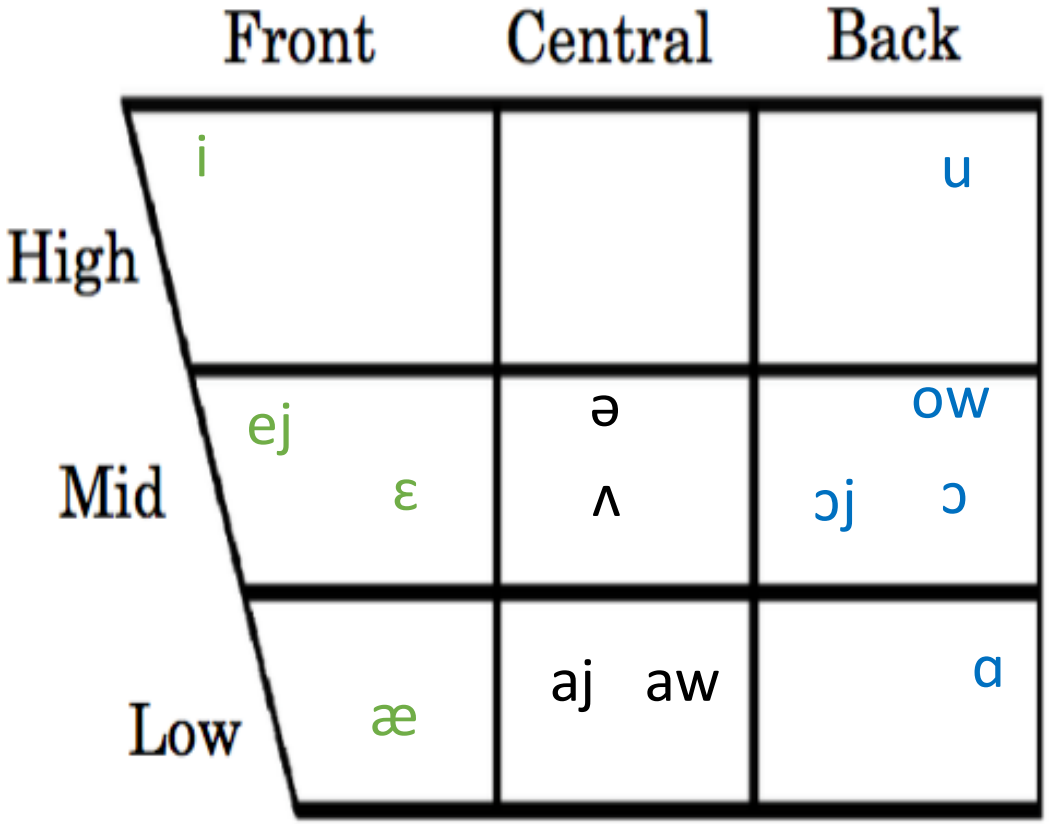
boat = [bowt]
goat = [gowt]

but = [bət]

sun = [sʌn]
cut = [cʌt]



Tongue position: Frontness and Backness



- The tongue is advanced or pushed forward for all the front vowels.
- The tongue is retracted or pulled back for the back vowels.
- The arrangement of the vowels inside the grid tells you their **precise articulation conditions** inside the mouth.

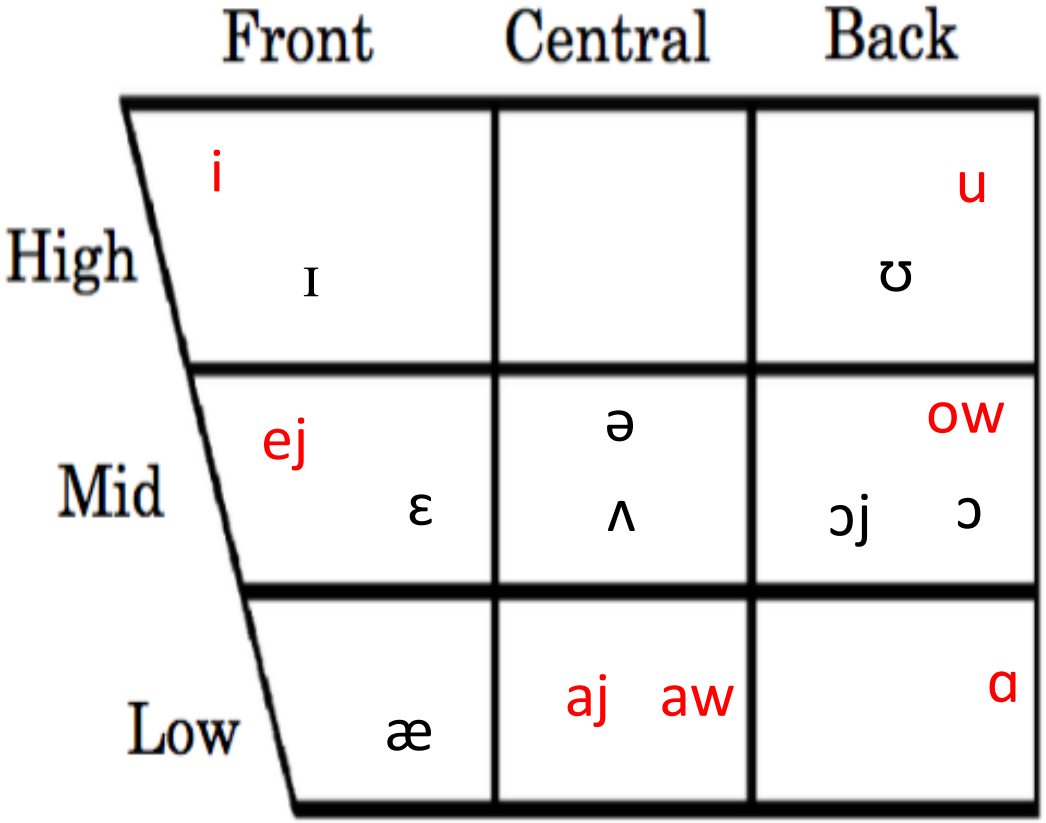
Parameter: Tense vs. lax vowels

- TONGUE ROOT POSITION
  - In the articulation of tense vowels, the root moves more forward.
- LIP POSITION
  - Tense vowels are more rounded, or the lips are more spread.
- TONGUE BODY POSITION
  - Tense vowels are articulated with the tongue in a higher position.

Examples:

[fud] ‘food’ vs [bʊk] book or [ʃʊd] ‘should’
[bit] ‘beat’ vs [bɪt] ‘bit’

Parameter: Tense vs. lax vowels



Note

- Tense vowels are in red.

Vowel IPA symbols and sounds

• shoot	[u]	High back rounded tense
• should	[ʊ]	High back rounded lax
• coat	[ow]	Mid back rounded tense
• lock	[ɑ]	Low back unrounded tense
• lies	[aj]	Low central unrounded tense
• hit	[ɪ]	High front unrounded lax
• heat	[i]	High front unrounded tense
• zap	[æ]	Low front unrounded lax
• yet	[ɛ]	Mid front unrounded lax
• though	[ow]	Mid back rounded tense

Vowel IPA symbols and sounds

• ought	[ɔ]	Mid back rounded lax
• cut	[ʌ]	Mid central unrounded lax
• about	[ə]	Mid central unrounded lax
• loud	[aw]	Low central unrounded lax
• boy	[ɔj]	Low central unrounded lax

Phonetic transcription: Writing based on Pronunciation

- shoot [ʃut]
- should [ʃʊd]
- coat [kowt]
- lock [lɑk]
- lies [lajz]
- hit [hɪt]
- heat [hit]
- zap [zæp]
- yet [jet]
- though [ðow]

Practice: Phonetic transcription

- spit [spɪt]
- bib [bɪb]
- skip [skɪp]
- get [gɛt]
- chip [tʃɪp]
- judge [dʒʌdʒ]
- thick [θɪk]
- sang [sæŋ]
- zap [zæp]
- rough [rʌf]

Speech Production

Speech Production

- So far, we studied speech sounds in isolation.
- However, speech production is not a series of isolated events. Many fine adjustments are carried out very rapidly as we speak.
- Consequently, speech production often results in the articulation of one sound affecting that of another.
- Let's see some common articulatory processes.

Assimilation

- **Assimilation:** when a sound becomes more like an adjacent sound.

- Assimilation for place of articulation is widespread in the world's languages. For example, nasal consonants are likely to undergo this type of place assimilation.

- The nasal sound of the English negative prefix –*In* assimilates to the following stop sound in place.

Possible	→ I**m**possible
Potent	→ I**m**potent
Tolerable	→ I**n**tolerable
Tangible	→ I**n**tangible

Assimilation

- Place assimilation in Hindi.
  - Nasals assimilate to the following stop in place

gə**ŋ**ga: ‘a river’s name’

ʧə**ɲ**ʧəl ‘naughty’

ʧi**n**ta: ‘worry’

gɦə**ɳ**ʈa: ‘hour’

ʧə**m**pa (the name of a flower)’

Assimilation

- In Scots Gaelic, vowels following nasal consonants are nasalized. (~ over a vowel indicates nasalization)

[mõːr]	'big'	[nĩ]	'cattle'
[mũ]	'about'	[nẽːl]	'cloud'

Dissimilation

- **Dissimilation:** when a sound becomes less like an adjacent sound.

Many English speakers pronounce *fifths* as

/fɪfθs/ → [fɪfts]

- Why?
  - [fɪfθs] has three fricatives in a row: [fθs]. Some speakers use dissimilation and change the fricative [θ] to the stop [t].

- In Greek, a voiceless velar stop becomes a fricative before another stop.

/ktizma/ 'building' → [xtizma]

Deletion

- **Deletion** is the removal of a sound.

- In American English, [ə] is deleted before a stressed syllable in the rapid speech.

  'Suppose' /səpʰˈoːz/ → [ˈspoːz]

- In British English /r/ at the end of words is deleted.

  'far' /faːr/ → [faː]

  'river' /rɪvər/ → [rɪvə]

- Note:
  - [ˈ] before a syllable means that the syllable is stressed. We will talk about 'stress' shortly and about "syllables" in the Phonology Module.

Deletion

- In Hindi
  - A schwa [ə] is deleted when it occurs in an unstressed open syllable.

    /titəli:/ → [ˈtitli:]

  - The word-final schwa (available in Sanskrit) is deleted in current Hindi.

    /ra:mə/ → [ra:m]

Insertion/Epenthesis

- Insertion refers to a phenomenon when one or more segments are added to a morpheme or a word.

  ‘school’ /sku:l/ → [əsku:l] or [isku:l]

  ‘stress’ /strɛs/ → [əstrɛs]

  ‘love’ /prem/ → [pərem]

- My native language, Magahi, does not allow consonant clusters at the beginning of a word. So, when Magahi speakers encounter such a word, they insert schwa [ə] or the high front vowel [i] before the consonant cluster or schwa [ə] between the consonants.

- A Punjabi speaker inserts schwa [ə] between the consonants.

  ‘school’ /sku:l/ → [səku:l]

  ‘memorial’ /sma:rak/ → [səma:rak]

Insertion/Epenthesis

- [u] insertion in Tamil
  - /u/ is inserted at the end of stems ending a consonant other than the palatal approximant /j/.

‘to blow’ /u:t̪/ → [u:t̪u]

‘to collect’ /ko:r/ → [ko:ru]

Metathesis

- **Metathesis** is swapping/rearranging the order of two sounds.

Magahi/Hindi

[bəksɑ] -> [bəskɑ] ‘box’

[tosak] -> [tokas] ‘mattress’

English

[æn.ɪ.məl] -> [æmɪnəl]

Summing up: Sounds of (standard) American English

- **The consonants of American English**
  - Core sounds: 22 : [p b t d k g ʔ m n ŋ ɾ f v θ ð s z ʃ ʒ h ɹ l]
  - Affricate: 2: [tʃ dʒ]

- **The vowels of American English**
  - Simple vowel/monophthong: 10: [i ɪ u ʊ ɛ æ ə ʌ ɔ ɑ]
  - Diphthongs: 3: [aj oj aw]

- **The Glides of American English**

  [j w]

Phonological/articulatory processes

- Assimilation
- Dissimilation
- Deletion
- Epenthesis
- Metathesis

Next class

- Superasegmental
- Practical Applications of Phonetics
- Phonology
  - Reference: O'Grady, Williams, et al. 2010. Phonology, in *Contemporary Linguistics. 6th edition*. Boston. New York: Bedford/St. Martin's.
  - Reading: Chapter- 3
  - Sections 1 & 2