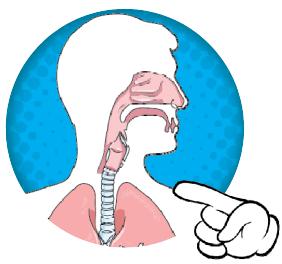


# Introduction to fənɜːrɪks

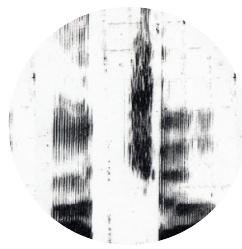
## Phonetics: The Study of Speech Sounds

Studying the raw materials of language

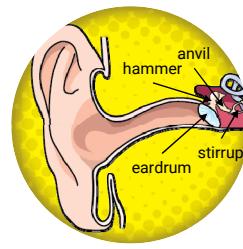
*Phones (sound)*



Articulatory  
production (source)



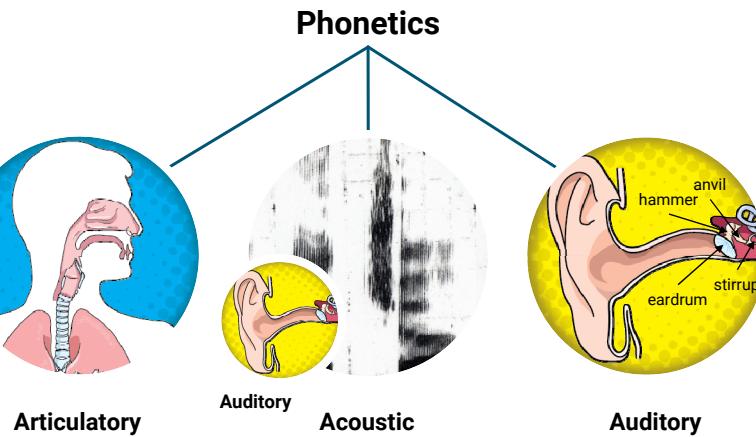
Acoustic  
waveform



Sound  
reception

Head, ear: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998; Sound waves: Randy Harris; Finger: Noedelhap/iStock/Thinkstock

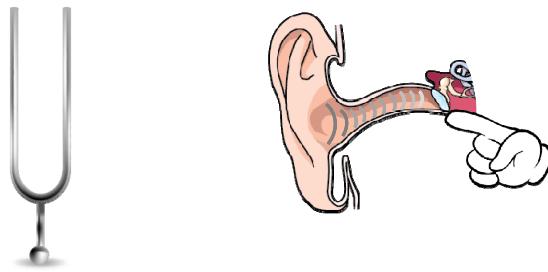
## Modes of Phonetic Analysis



Head, ear: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998; Sound waves: Randy Harris; Finger: Noedelhap/iStock/Thinkstock

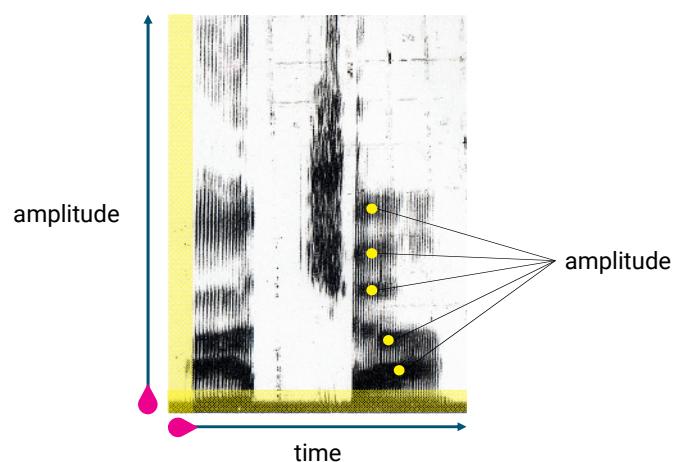
## Acoustic Phonetics

Tuning Fork: Arkela/iStock/Thinkstock; Ear: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998; Finger: Noedelhap/iStock/Thinkstock



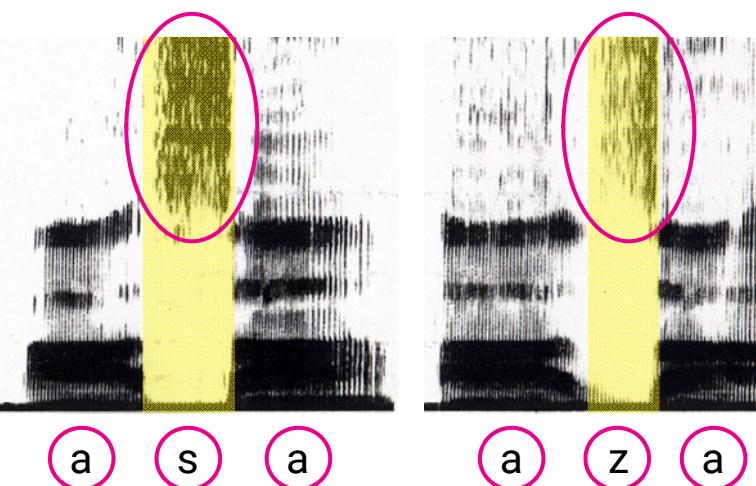
## Acoustic Phonetics

Sonogram



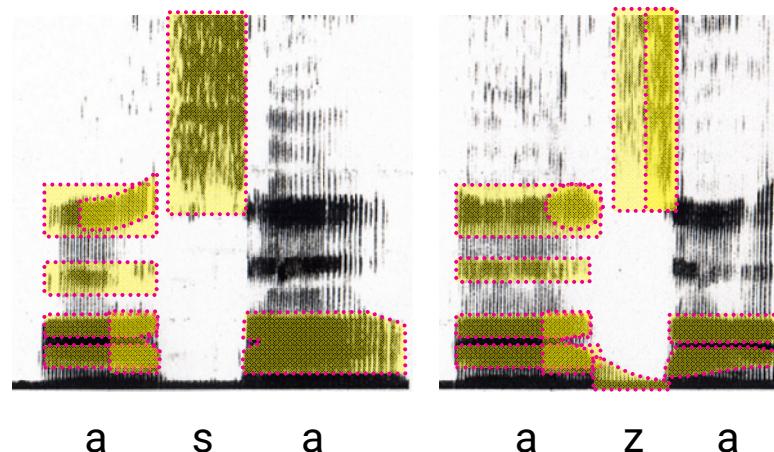
Randy Harris

## Acoustic Phonetics



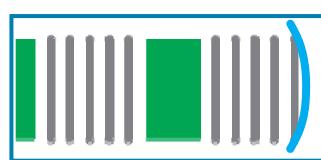
Sound waves: Randy Harris; Finger: Noedelhap/iStock/Thinkstock

## Acoustic Phonetics

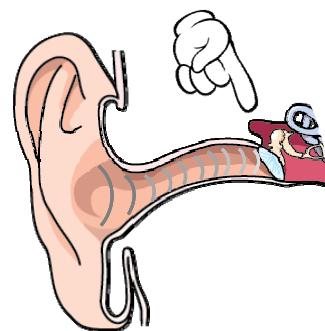


Sound waves: Randy Harris; Finger: Noedelhap/iStock/Thinkstock

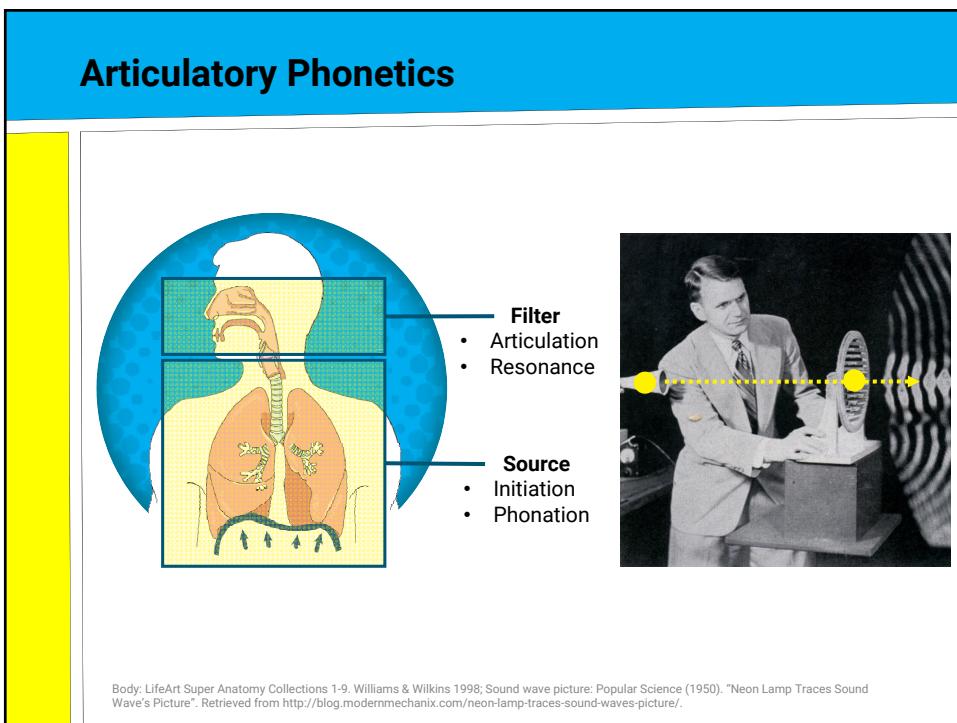
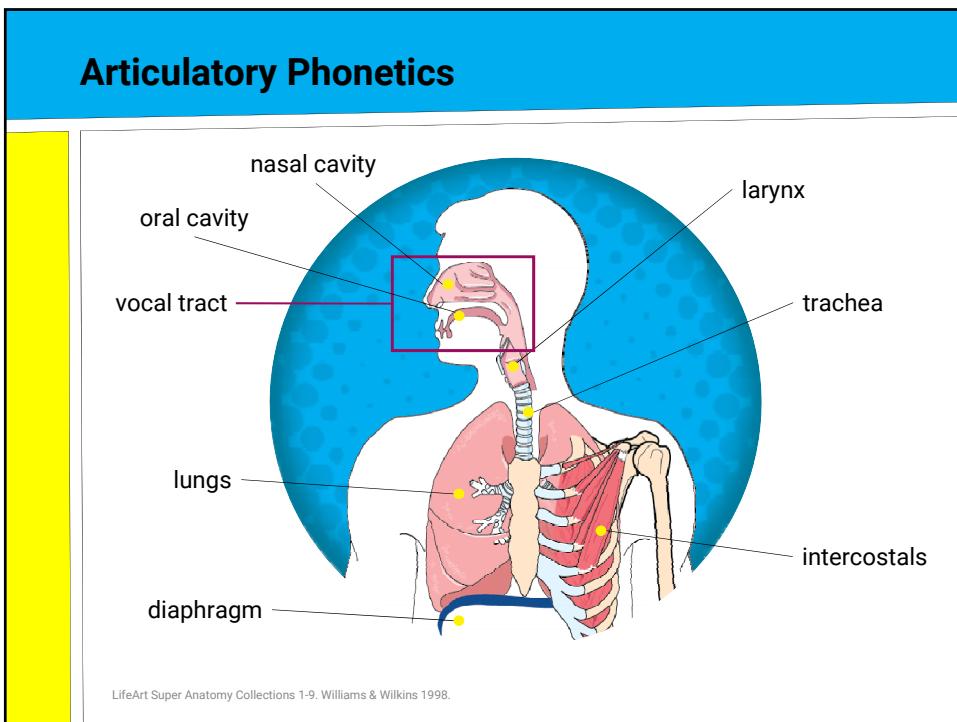
## Auditory Phonetics



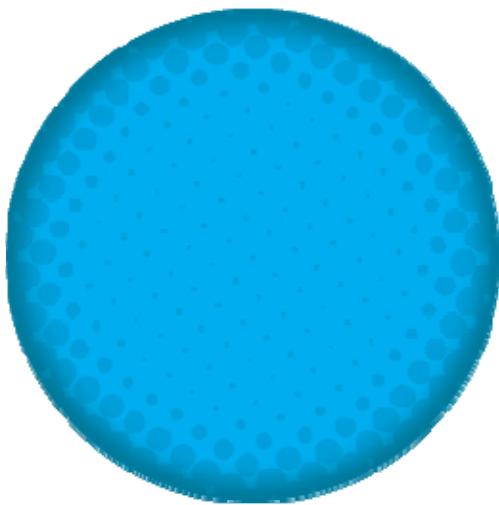
Ear drum



Ear: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998; Finger: Noedelhap/iStock/Thinkstock



## Articulatory Phonetics



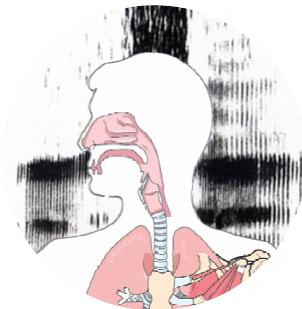
Body: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998; Glottis, Vocal cords: University of Waterloo; Hand: Noedelhap/iStock/Thinkstock

# Phonetic Transcription

## Motivations for Phonetic Transcription

[fənɛrɪk tʰrænskrɪpʃən] (phonetic transcription)

- Isolating speech sounds for study.
- Representing speech sounds consistently.

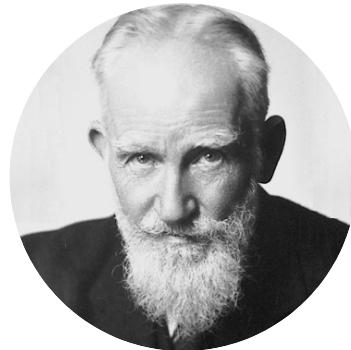


Body: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998; Waveform: Randy Harris

## What About Spelling?

Transcribing Sounds

**ghoti**



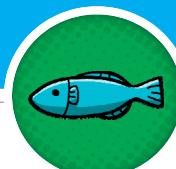
George Bernard Shaw

Shaw: Nobel Foundation/Wikimedia Commons/Public Domain

## What About Spelling?

Transcribing Sounds

English spelling? nope.



George Bernard Shaw

**ghoti**

tough  
w<sup>m</sup>en  
assocation

IPA System (international phonetic alphabet)

[ fɪʃ ]  
tough  
w<sup>m</sup>en  
assocation

Shaw: Nobel Foundation/Wikimedia Commons/Public Domain; Fish: wenchiawang/iStock/Thinkstock; Hand: Noedelhap/iStock/Thinkstock

## What About Spelling?

- I take it you already know
- Of tough and bough and cough and dough?
- Others may stumble but not you,
- On hiccough, thorough, laugh and through?
- Well done! And now you wish, perhaps,
- To learn of less familiar traps?
  
- Beware of heard, a dreadful word
- That looks like beard and sounds like bird,
- And dead; it's said like bed, not bead –
- For goodness sake don't call it 'deed'!
- Watch out for meat and great and threat  
(They rhyme with suite and straight and debt.)

Text: Attributed to T.S Watt (1954) *The Guardian*.

## What About Spelling?

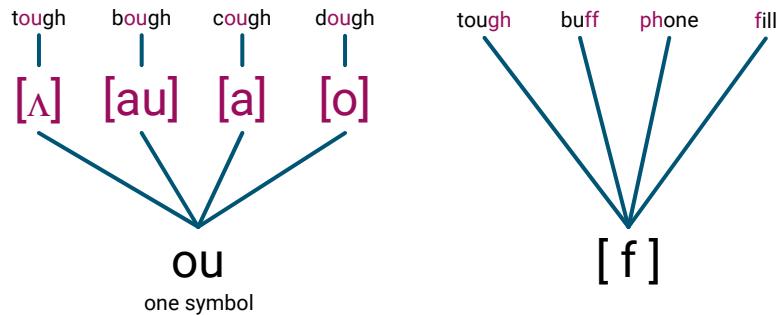
- A moth is not a moth in mother
- Nor both in bother, nor broth in brother,
- And here is not a match for there
- Nor dear and fear for bear and pear
- And then there's dose and rose and lose –
- Just look them up – and goose and choose.
  
- And cork and work and card and ward,
- And font and front and word and sword,
- And do and go and thwart and cart –
- Come, come, I've hardly made a start!
- A dreadful language? Man alive!  
I'd mastered it when I was five.

Text: Attributed to T.S Watt (1954) *The Guardian*.

## What About Spelling?

Several problems with spelling:

- One/many problem
- Many/one problem
  - We need a phonetic transcription system



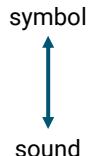
Hand: Noedelhap/iStock/Thinkstock

## What About Spelling?

Several problems with spelling:

- One/many problem
- Many/one problem
- We need a phonetic transcription system.

A one-to-one map:



## The Detail Problem

pan



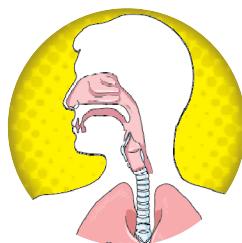
[p<sup>b</sup>æn]

Pan: wenchiawang/iStock/Thinkstock; Hand: Noedelhap/iStock/Thinkstock

# Articulatory Phonetics 1: Consonants and Manner

## Two Dimensions of Categorical Analysis: Place and Manner

Articulation



Place



Manner



Body: William & Wilkins (1998); Blender: wenchiawang/iStock/Thinkstock; Slide whistle: University of Waterloo; Mouth: Vector Story/iStock/Thinkstock; Hand: Noedelhap/iStock/Thinkstock

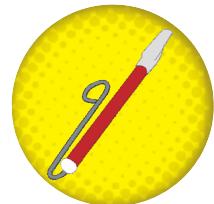
## Consonants: Manner of Articulation

Articulation

Manner

Consonants	Vowels
------------	--------

somewhat arbitrary  
disjunction



Blender: wenchiawang/iStock/Thinkstock; Slide whistle: University of Waterloo; Hand: Noedelhap/iStock/Thinkstock

## Consonants: Manner of Articulation

Consonants

Manner

Obstruents			Sonorants
Stops	Affricates	Fricatives	

[t] [ts] [s] Voiceless

[d] [dz] [z] Voiced

Voiceing  
(second manner of articulation)

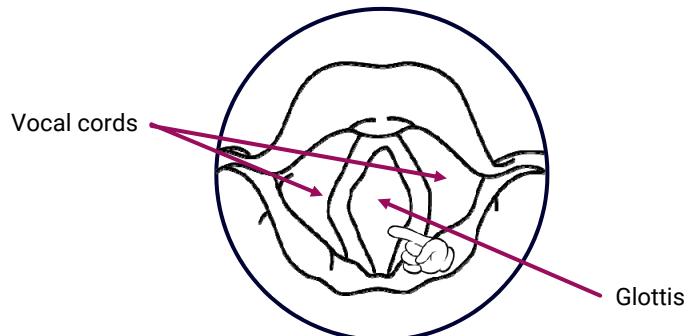
Hand: Noedelhap/iStock/Thinkstock

## Consonants: Manner of Articulation

Consonants

voicing = phonation

Manner



Glottis: University of Waterloo; Hand: Noedelhap/iStock/Thinkstock

## Consonants: Manner of Articulation

Consonants

Manner

Phonation

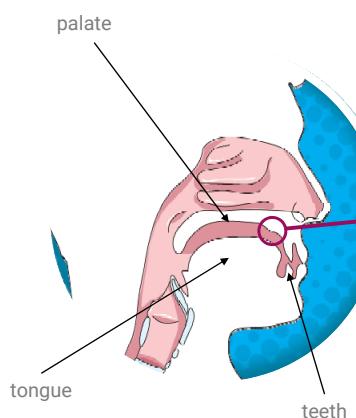
Obstruents			Sonorants	
Stops	Affricates	Fricatives	Nasals	Approximants

[t] [ts] [s] Voiceless

[d] [dz] [z] Voiced [n] [l]

# Articulatory Phonetics 2: Consonants and Place

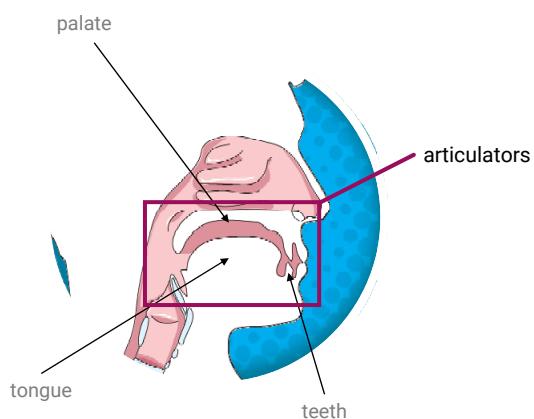
## Analyzing Speech Sounds by their Place of Articulation



[t]	[ts]	[s]
[d]	[dz]	[z]
[n]		[l]

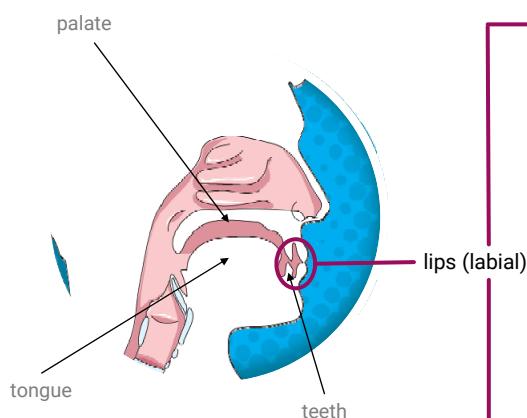
Body: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998.

## Labial



Body: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998.

## Labial



bilabial  
[m] [w]

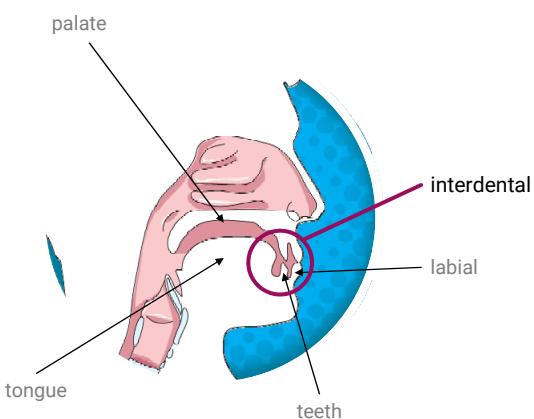
[p] [b]

[f] [v]

labiodental

Body: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998.

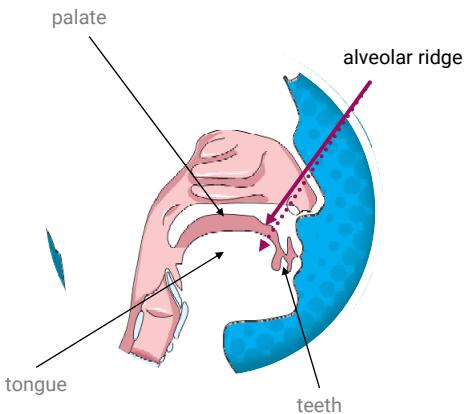
## Dental



thin	[θ]
theta	eth
[s]	[z]
[t]	[d]

Body: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998.

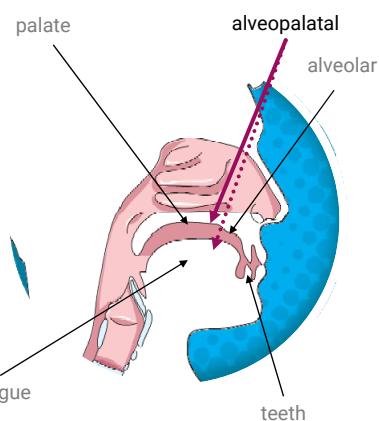
## Alveolar



[t]	[ts]	[s]
[d]	[dz]	[z]
[n]		[l]
[r]		
[ɾ]		

Body: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998.

## Palatal



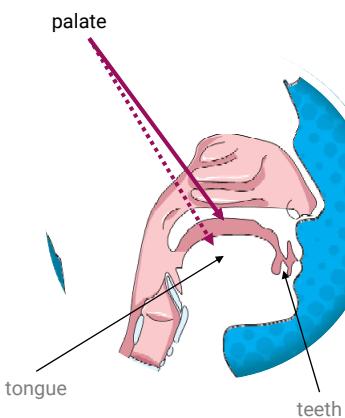
[ʃ] [ʒ]

[tʃ] [dʒ]

voiceless  
voiced

Body: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998.

## Palatal

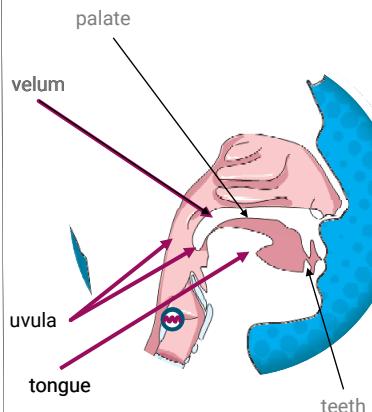


approximant (glide)

[j]  
yes

Body: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998.

## Uvula



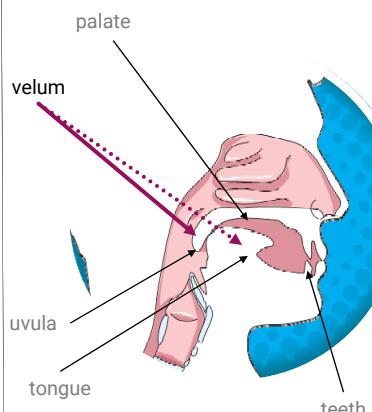
[m]

[n]

[ŋ]

Body: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998; Hand: Noedelhap/iStock/Thinkstock

## Velum



Voiceless [k] kick  
kill  
crush

Voiced [g] gill  
guppy  
gone

[ŋ] bring  
fling  
flung  
spring

Body: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998.

## Glottis

[h] hop  
happy

[?] oh-oh  
ah-ah

allophone of  
a phoneme

kitten = [k<sup>h</sup>i?n]

Body: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998; Hand: Noedelhap/iStock/Thinkstock

## Glottis

[h] hop  
happy

[?] oh-oh  
ah-ah

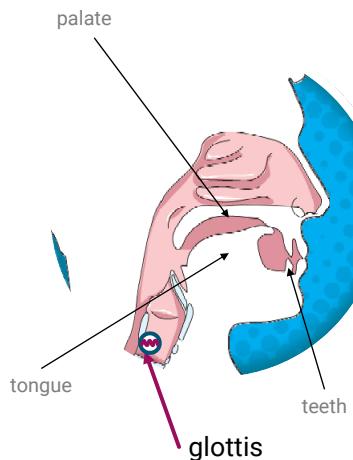
allophone of  
a phoneme

Recall that orthographic representation (spelling) corresponds much more closely to the psychological dimension of speech production.

[həpi] ("happy")

Body: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998; Hand: Noedelhap/iStock/Thinkstock

## Glottis



[h] hop  
happy

[?] oh-oh  
ah-ah

allophone of  
a phoneme

Recall that orthographic representation (spelling) corresponds much more closely to the psychological dimension of speech production.

[?æpɪ] ("apple")

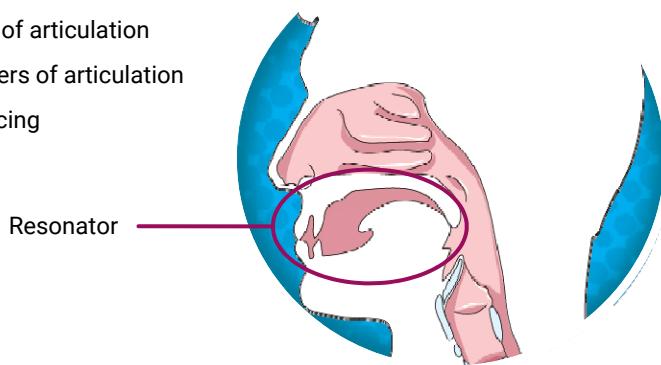
Body: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998; Hand: Noedelhap/iStock/Thinkstock

# Articulatory Phonetics 3: Vowels and Place

## Adopting the Articulatory Model for Analyzing Vowels

We've looked at:

- Consonants
  - Place of articulation
  - Manners of articulation
  - Voicing



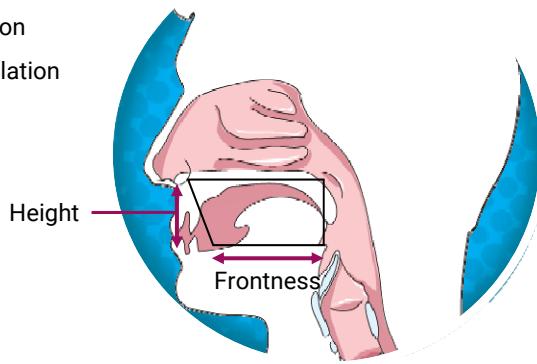
Let's look at vowels in the same general way.

Head: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998; Hand: Noedelhap/iStock/Thinkstock

## Adopting the Articulatory Model for Analyzing Vowels

We've looked at:

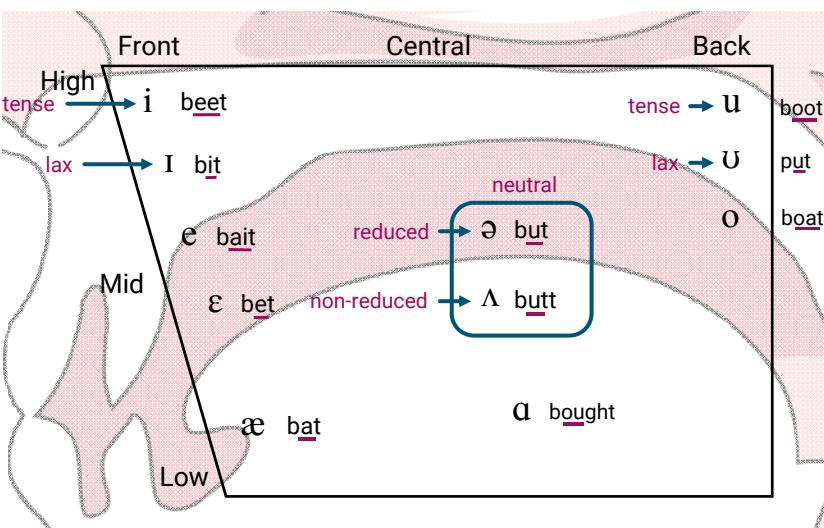
- Consonants
  - Place of articulation
  - Manners of articulation
  - Voicing



Let's look at vowels in the same general way.

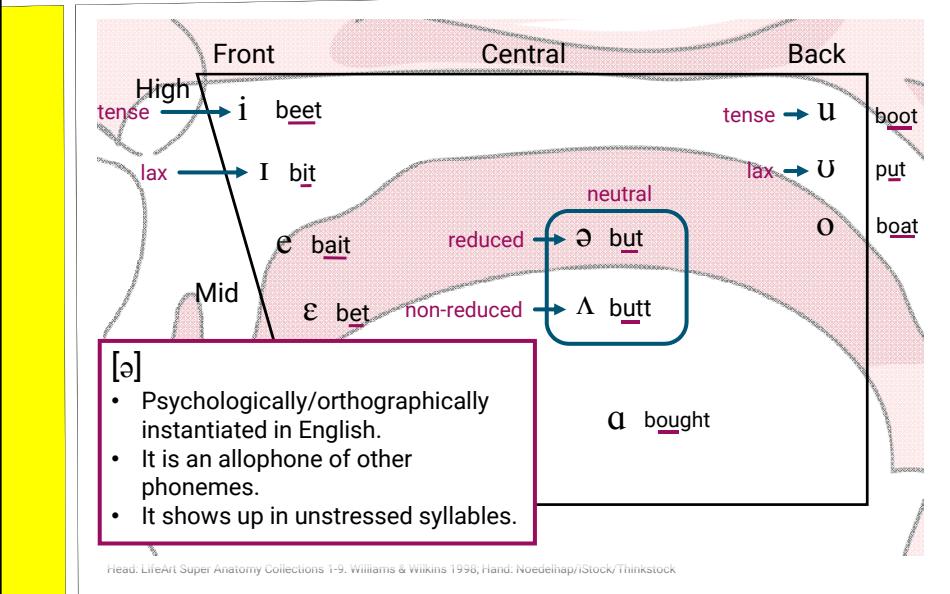
Head: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998; Hand: Noedelhap/iStock/Thinkstock

## Charting the Vowels

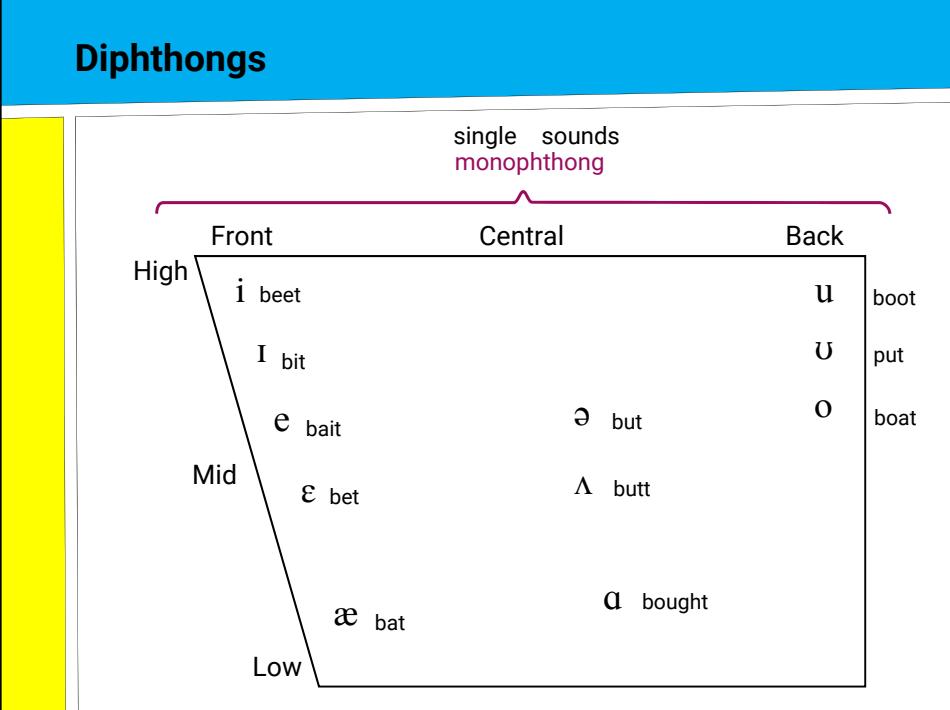


Head: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998; Hand: Noedelhap/iStock/Thinkstock

## Charting the Vowels



## Diphthongs



## Diphthongs

double sounds  
**diphthong**

- A special kind of vowel.
- Two vowels occupying one vowel space.

[ɔ]



boy → [bɔɪ]

[a]



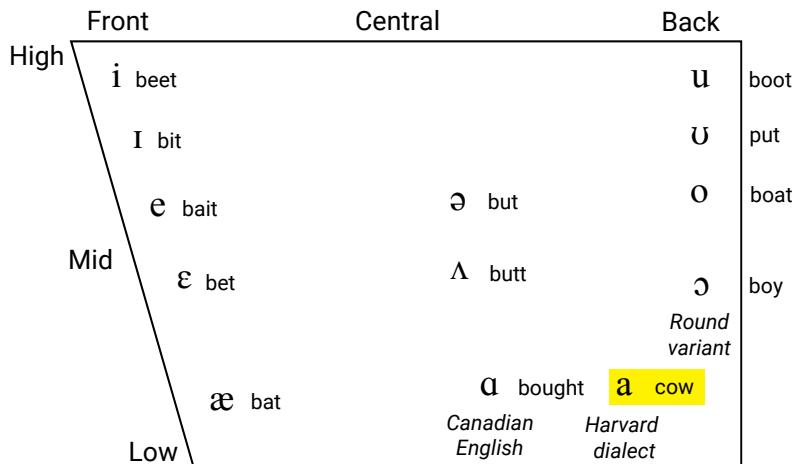
cow → [kau]



bike → [baɪk]

Boy: Kharlamova/iStock/Thinkstock; Cow: VectorGift/iStock/Thinkstock; Bicycle: wenchiawang/iStock/Thinkstock

## Diphthongs



Hand: Noedelhap/iStock/Thinkstock

## Diphthongs

- A special kind of vowel.
- Two vowels occupying one vowel space.



boy → [bɔɪ]

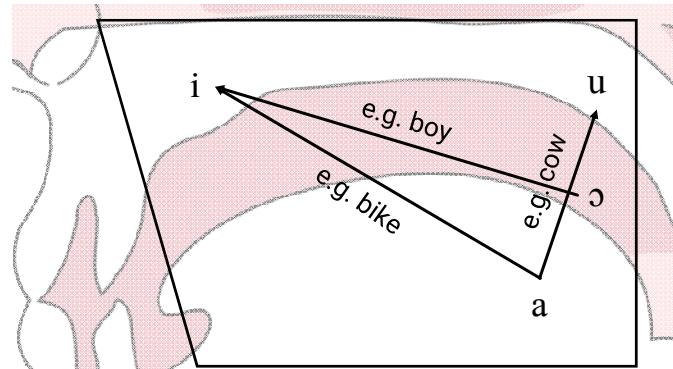
cow → [kau]

bike → [baɪk]

Boy: Kharlamova/iStock/Thinkstock; Cow: VectorGift/iStock/Thinkstock; Bicycle: wenchiawang/iStock/Thinkstock; Hand: Noedelhap/iStock/Thinkstock

## Diphthongs

- A special kind of vowel.
- Two vowels occupying one vowel space.
- Travelling vowels:



Closeup of head: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998; Hand: Noedelhap/iStock/Thinkstock

# Applying What You've Learned

## Transcription Exercise 1: 'Pot' and 'Nose'

Write down the transcription of the word:

pot

nose

Sally

Once you have filled out your phonetic transcription of these three words, you may continue to the next slide.

## Transcription Exercise 1: 'Pot' and 'Nose'

Write down the transcription of the word:

1. Figure out how many sounds there are.

2. Represent each sound with a phonetic symbol (segment).

pot → [p<sup>h</sup>at]

nose → [noz] [nowz] [fēnərɪks]  
/fʌnalʌdʒi/

Sally → [Sæli]

Hand: Noedelhap/iStock/Thinkstock

## Phonological Transcriptions

The way native speakers think of their own language.

pot                    [Phonetics]                    /Phonological/  
                        [p<sup>h</sup>at]                          /pat/

kitten                [k<sup>h</sup>I?n̩]                    /kiten/

actual sounds

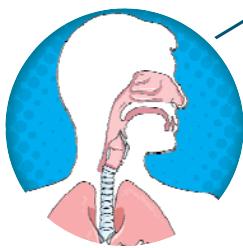
psychological  
representation

Hand: Noedelhap/iStock/Thinkstock

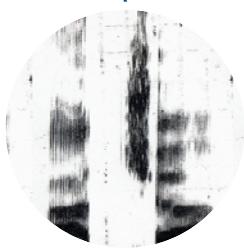
# Review

fənɛtɪks

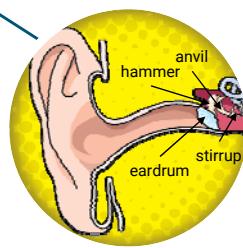
## Phonetics



Articulatory



Acoustic

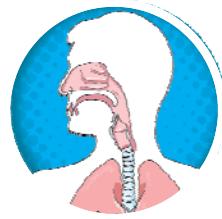


Auditory

Head, ear: LifeArt Super Anatomy Collections 1-9. Williams & Wilkins 1998; Sound waves: Randy Harris; Hand: Noedelhap/Stock/Thinkstock

## fənətrɪks

- Phonetic transcription
- Articulatory
  - Manner and place
  - Consonants
  - Vowels



Place



Manner

Body: William & Wilkins (1998); Blender: wenchiawang/iStock/Thinkstock; Slide whistle: University of Waterloo; Hand: Noedelhap/iStock/Thinkstock