



UCL

Phonetics I: Consonants

Reading: FRH Ch. 5

PLIN0006: Introduction to Language



What is Phonetics?

- **Definition:**

The study of human speech sounds.

- **Subfields of Phonetics:**

- **Articulatory Phonetics:**

The study of how speech sounds are **produced**.

- **Auditory Phonetics:**

The study of how speech sounds are **perceived**.

- **Acoustic Phonetics:**

The study of the **physical properties** of speech sounds.

Outline

- Today, we'll discuss:
 - The transcription of speech sounds
 - The articulation of speech sounds
 - The grouping of individual speech sounds into classes of speech sounds

The Chaos

4

Dearest **creature** in **creation**,

Study English pronunciation.

I will teach you in my verse

Sounds like **corpse**, **corps**, **horse**, and **worse**.

I will keep you, **Susy**, **busy**,

Make your **head** with **heat** grow **dizzy**.

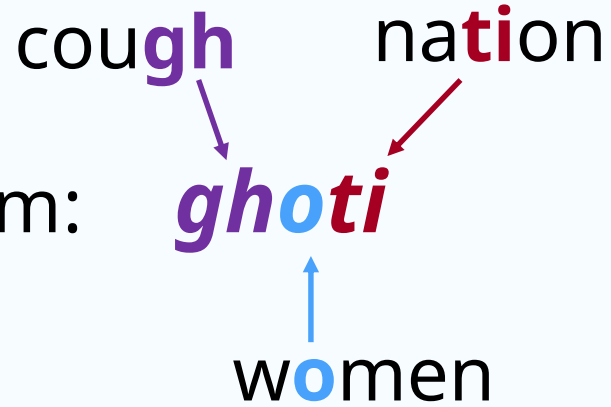
Tear in eye, your dress will **tear**.

So shall I! Oh hear my **prayer**.

...

(Gerard Nolst Trenité. Full text: https://en.wikisource.org/wiki/The_Chaos)

Spelling Bee



• English problem:

• International problem:

• **Vlies** vs **fleece**

• **Whisky** vs **whisky** vs ウイスキー



Do you see a problem here?

Letters ≠ Sounds



Requirements of a Transcription System

The method of transcription must be:

1) Unambiguous

- One Symbol \leftrightarrow One Value

2) International

- To ensure “one symbol, one value” desideratum
- Having multiple systems would get in the way of scientific progress

THE INTERNATIONAL PHONETIC ALPHABET (revised to 2005)

CONSONANTS (PULMONIC)

© 2005 IPA

	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				r					ʀ		
Tap or Flap				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			
Alveolar approximant				ɻ		ɻ	ʎ	ʎ			

Where symbols appear in pairs, the one to the right represents a voiced consonant. Shaded areas denote articulations judged impossible.

CONSONANTS (NON-PULMONIC)

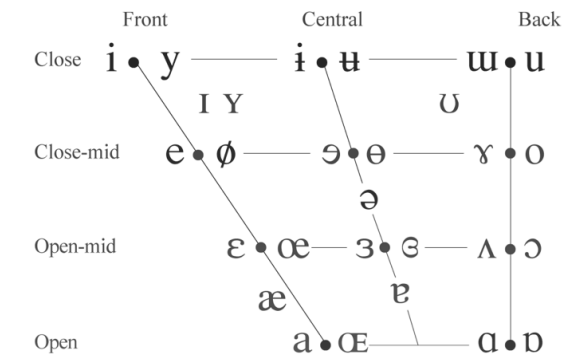
Clicks	Voiced implosives	Ejectives
ɔ	ɓ Bilabial	ʼ Examples:
	ɗ Dental/alveolar	p' Bilabial
ɥ	ɟ Palatal	t' Dental/alveolar
	ɠ Velar	k' Velar
	ʄ Uvular	s' Alveolar fricative

ʃ ʒ Alveolo-palatal fricatives

ɾ Voiced alveolar lateral flap

ɸ and β

VOWELS



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

SUPRASEGMENTALS

ˈ Primary stress

ˌ Secondary stress

Solution:

The International Phonetic Alphabet (IPA)

Transcribing English: The Task Ahead

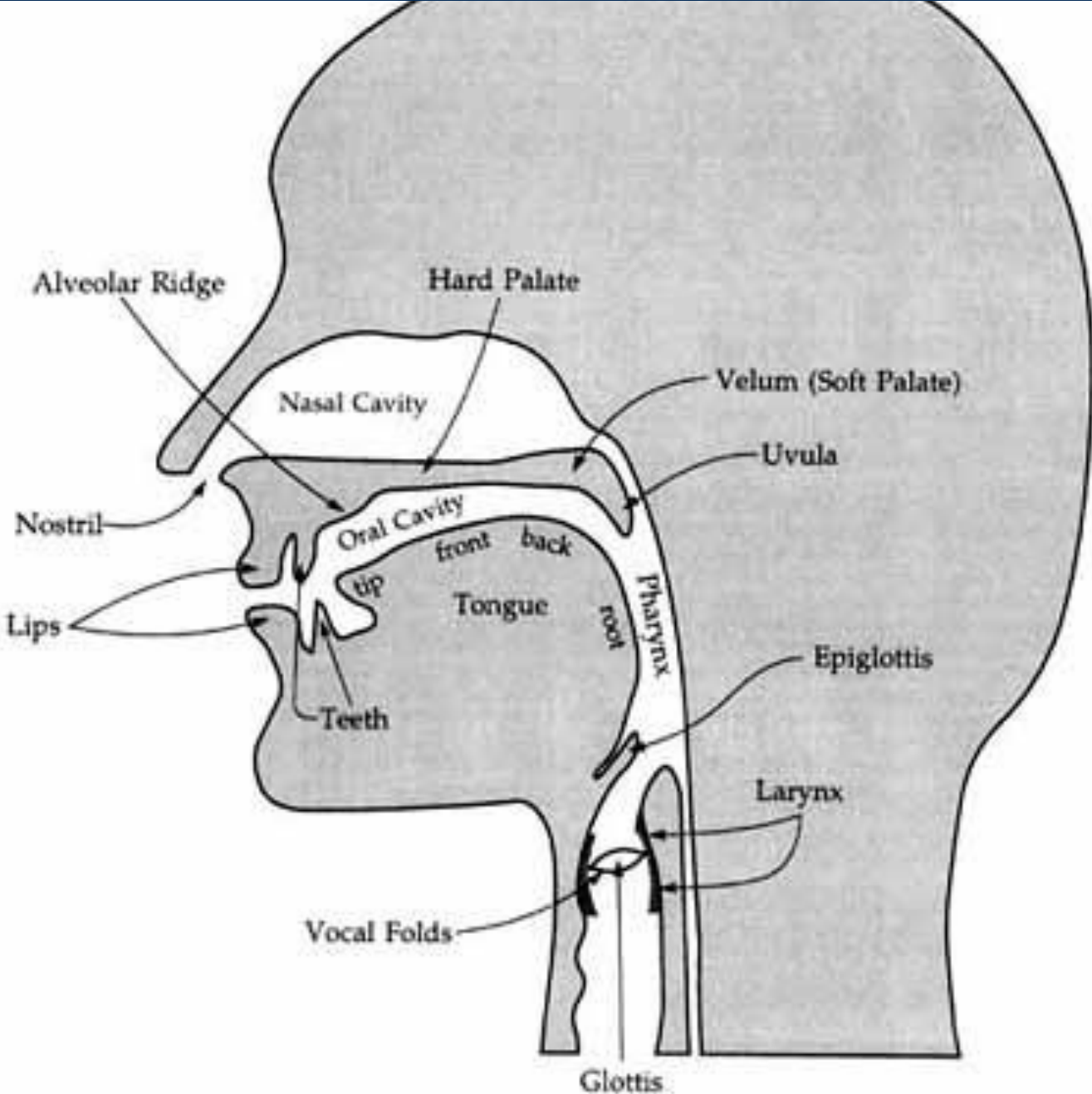
Consonants:

- English has around 24 consonant sounds
- These include: {p, b, t, d, k, g, l, r, ...}

Vowels:

- English has around 12 vowels
- These include: {a, i, u, e, o, ...}

The Vocal Tract

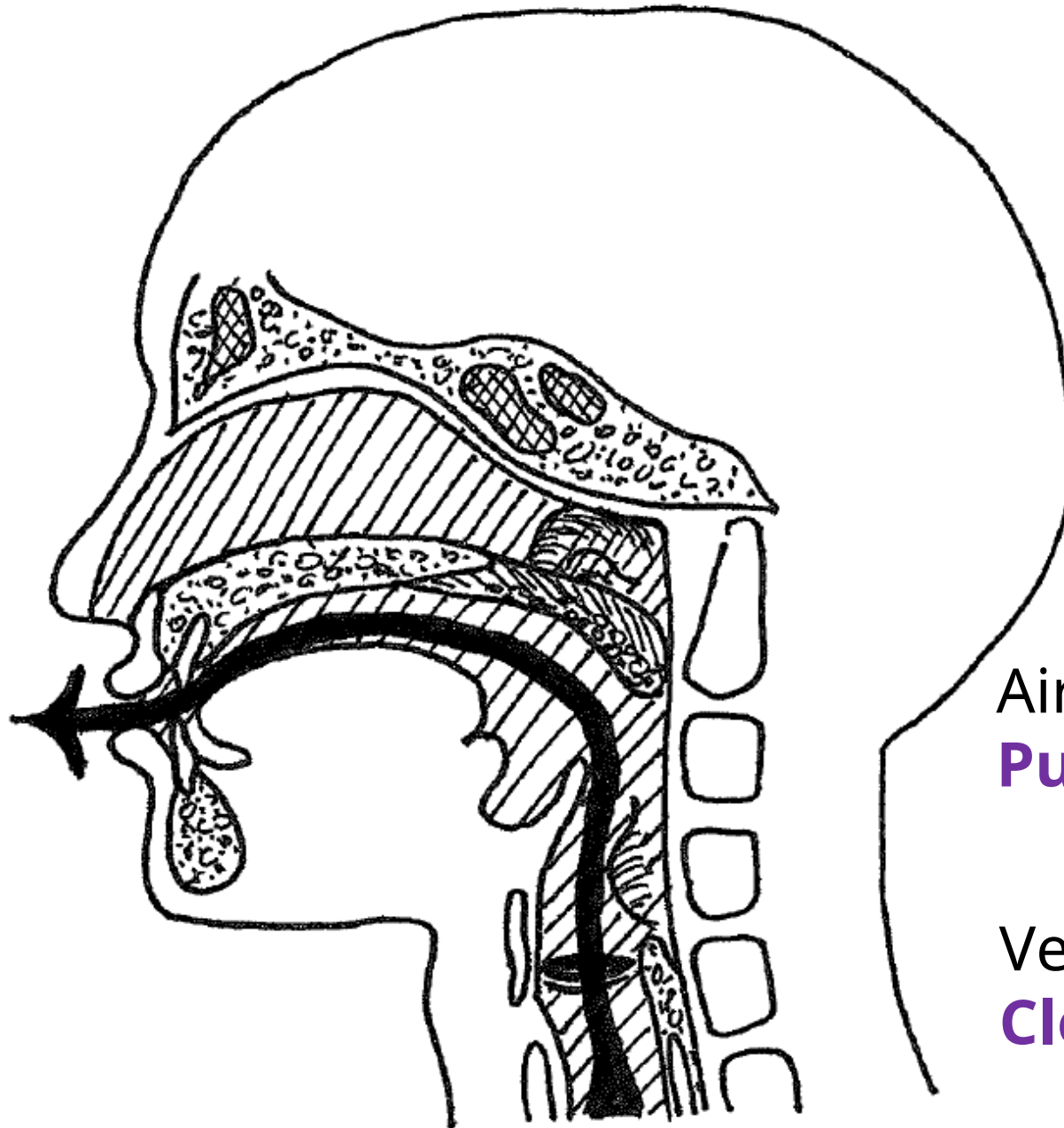


Consonants

Consonants are **classified** according to five main factors:

- 1) Phonation (**voiced vs voiceless**)
- 2) Place of Articulation (**PoA**)
- 3) Laterality (**central vs lateral**)
- 4) Nasality (**oral vs nasal**)
- 5) Manner of articulation

Oral Stops



Airstream Mechanism:
Pulmonic Egressive

Velo-Pharyngeal Port:
Closed

English Voiceless Oral Stops

[p] peak paper pot Peter aspiration
[p^hɪk] [p^heɪ.pə] [p^hɒt] [p^hɪtə] [as.pɪ.reɪ.ʃn]

[t] time tattoo photo articulation prince
[t^haɪm] [t^hə.tu:] [fəʊ.təʊ] [ɑ.t^hɪk.jʊ.leɪ.ʃn] [pɪnts]

[k] coat cough Fromkin discourse consonants
[k^həʊt] [k^hɒf] [frɒm.kɪn] [dɪs.kɔ:s] [k^hɒn.sə.nənts]

[ʔ] uh-oh (for some speakers: bottle button)
[ʌ.ʔəʊ] [bɔ.ʔəl] [bʌ.ʔn]

Plosives

English Voiced Oral Stops

[b] beak boat better syllables vibration
[bɪk] [bəʊt] [bɛ.tə] [sɪ.lə.bls] [vʌɪ.breɪ.ʃn]

[d] dime due made ride Rodman
[daɪm] [dju:] [meɪd] [raɪd] [rɒd.mən]

[g] goat segments girl bugs fingers
[gəʊt] [sɛg.mənts] [gɜ:l] [bʌgz] [fɪŋ.gəz]



Plosives

Phonation

- **Voicing:**

Vibration of the vocal folds.

[b, d, g]

Voiced

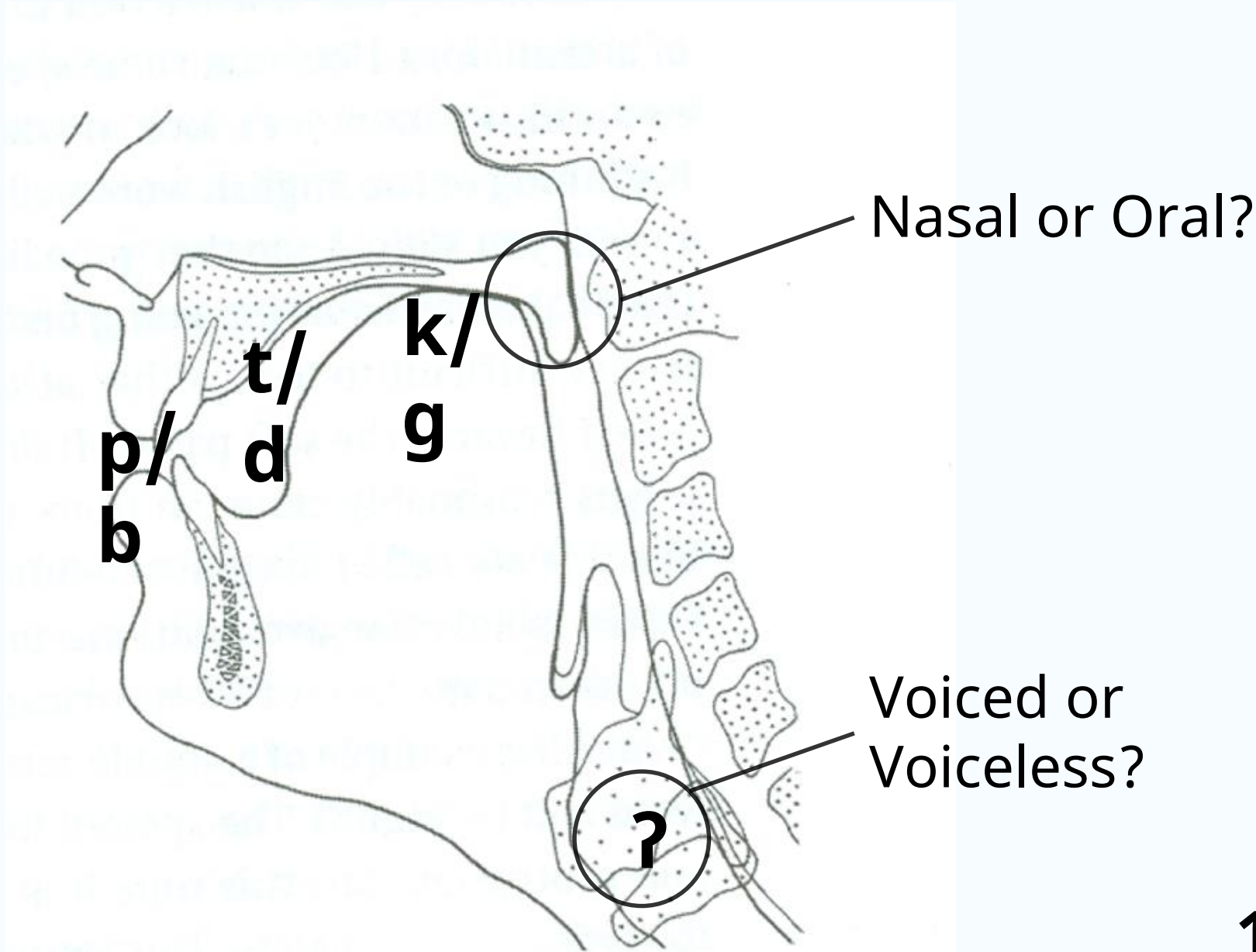
[p, t, k]

Voiceless



(Source: <https://bit.ly/36usHeU>)

Review: Oral Stops



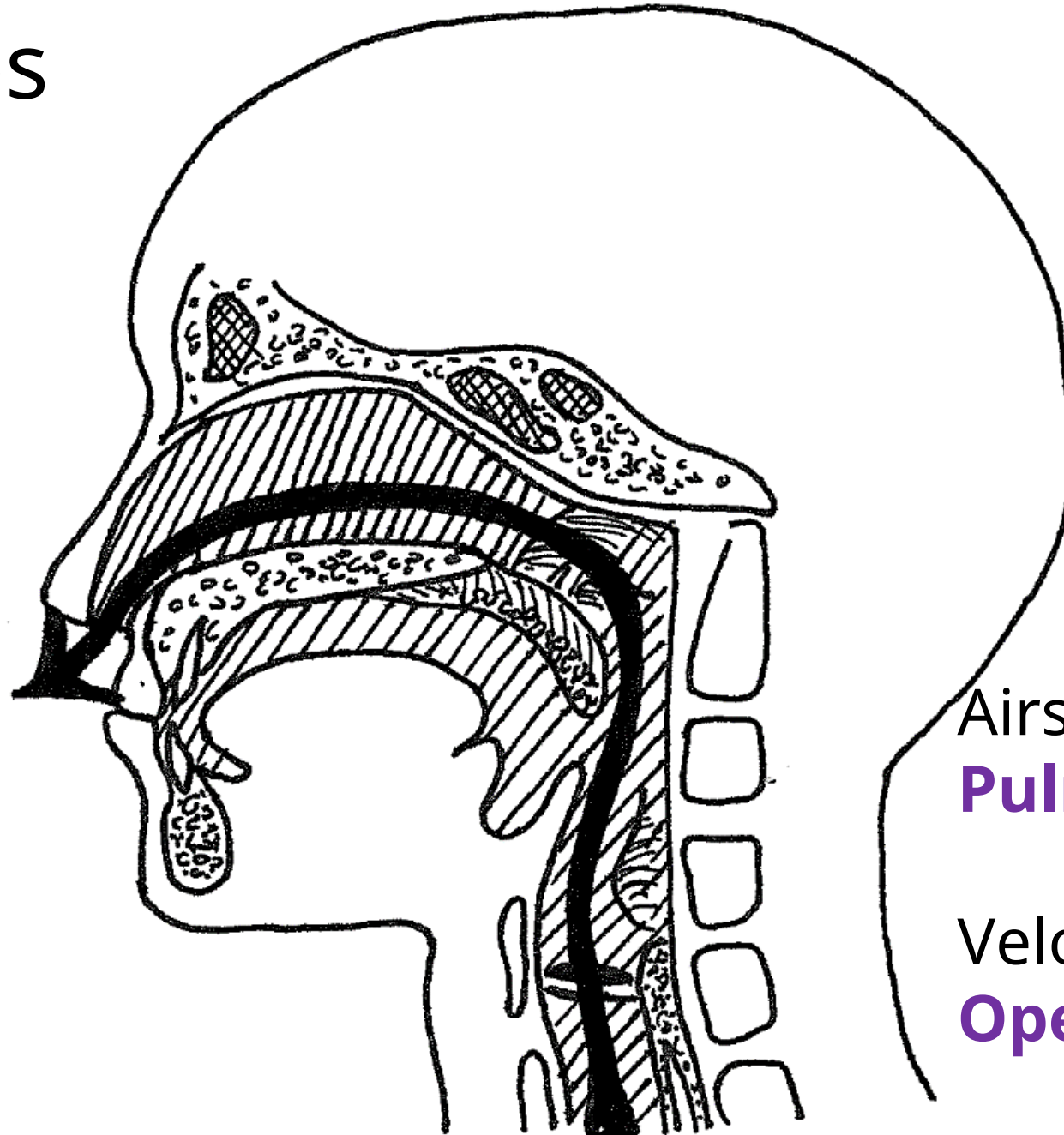
Oral Stops in the IPA

	Bilabial	Labio-dental	Dental	Alveolar	Palatal	Velar	Glottal
Plosive	p b			t d		k g	ʔ

Stop
(not plosive)

(Impossible)

Nasal Stops



Airstream Mechanism:
Pulmonic Egressive

Velo-Pharyngeal Port:
Open

English Nasal Stops

[m] see**m** co**mb** **m**other i**m**plicate

[sɪ**m**] [kəʊ**m**] [**m**ʌ.ðə] [ɪ**m**.plɪ.keɪt]

[n] si**n** no**t** sy**n**tax so**n** uni**n**ation

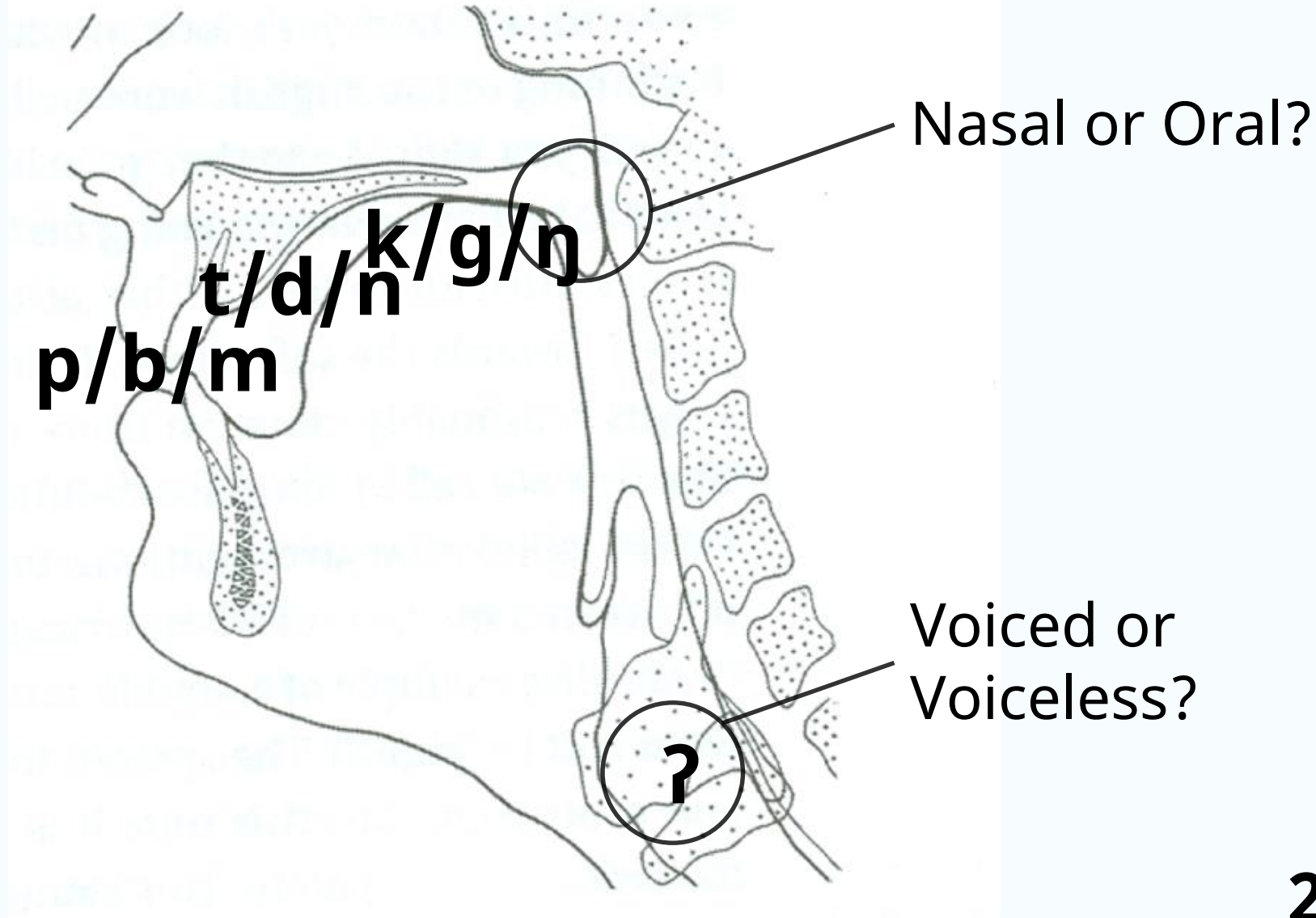
[sɪ**n**] [**n**ɒt] [sɪ**n**taks] [sʌ**n**] [jʊ**n**i] [**n**eɪ.ʃ**n**]

[ŋ] si**ng** thi**nk** fi**ng**er ba**ng** li**ng**uistics

[sɪ**ŋ**] [θɪ**ŋ**k] [fɪ**ŋ**.gə] [bæ**ŋ**] [lɪ**ŋ**.gwɪs.tɪks]

Nasal stops in English are typically all voiced.

Review: Nasal + Oral Stops



Nasal Stops in the IPA

Stops



	Bilabial	Labio-dental	Dental	Alveolar	Palatal	Velar	Glottal
Plosive	p b			t d		k g	ʔ
Nasal		m				ŋ	

English Fricatives

[f] fine, **f**abulous, alph**h**abet, lif**e**, **f**orm

[v] **v**ine, liv**e**, **v**alue, av**v**ian, **v**oice, **V**enus

[θ] thigh, through, ether, thimble, absinth

[ð] thy, mother, either, weather, their

[s] sip, pat**s**, cat**s**, most**s**, fast

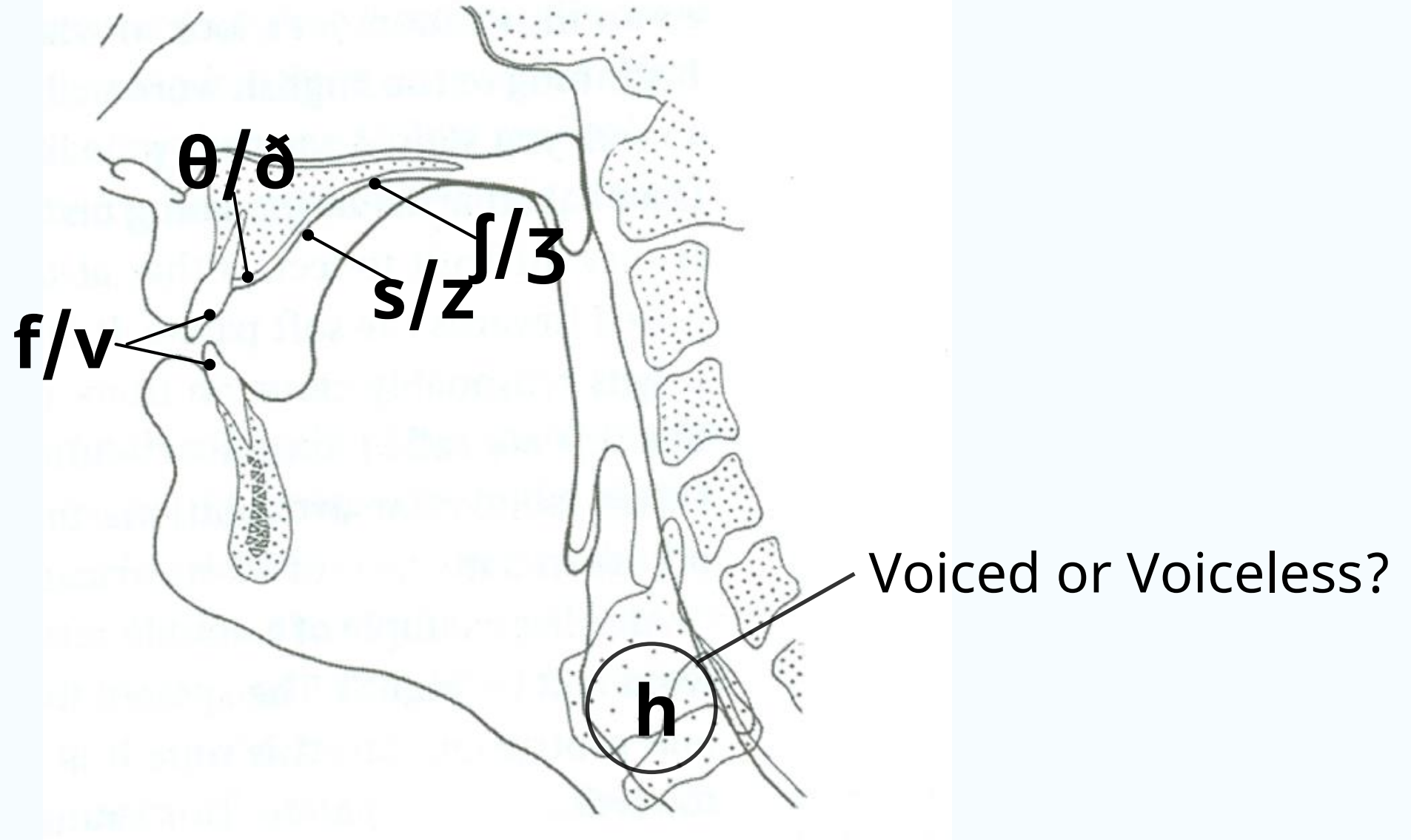
[z] zip, jazz, dog**s**, xerox, lazy, maize

[ʃ] **sh**oe, miss**ion**, nati**on**, fish**h**, **s**ure

[ʒ] mea**s**ure, visi**on**, cas**ual**, deci**sion**, rou**ge**

[h] **h**at, **wh**o, **h**ouse, pre**h**istory, re**h**ash, **h**and

Review: Fricatives



Fricatives in the IPA

	Bilabial	Labio-dental	Dental	Alveolar	Palatal	Velar	Glottal
Plosive	p b			t d		k g	ʔ
Nasal		m			n	ŋ	
Fricatives		f v	θ ð	s z	ʃ ʒ		h

English Liquids

[l] leaf, lord, call, single, include

[ɹ] reef, rate, (for some: fear, core, butcher)

Like nasals, liquids are typically voiced in English. Voiceless liquids can be found in some positions though, e.g. play [p^hleɪ].

[l] is a **lateral** liquid

[ɹ] is a **central** liquid

English Glides

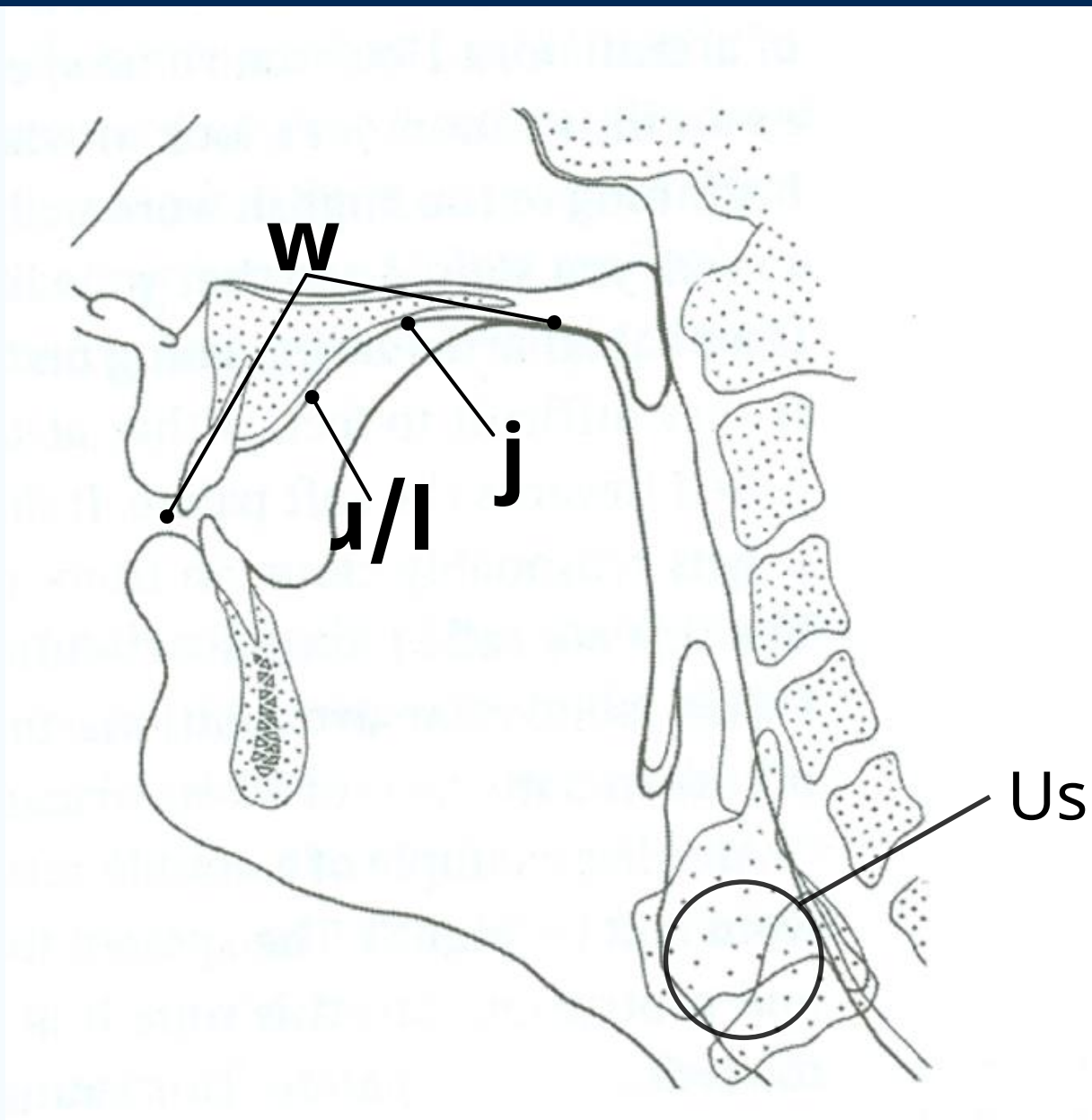
[j] you, **y**es, **u**nit, **u**se

[w] **w**itch, **sw**im, q**u**een

[ʍ] (for some: **wh**ich, **wh**ere, **wh**ale)

Glides are usually voiced by default, but voiceless variants do occur, including in some English varieties.

Review: Liquids + Glides



Liquids and Glides in the IPA

	Bilabial	Labio-dental	Dental	Alveolar	Palatal	Velar	Glottal
Plosive	p b			t d		k g	ʔ
Nasal		m			n		ŋ
Fricative		f v	θ ð	s z	ʃ ʒ		h
Approximant	(ɹ) w			ɹ l	j	(ɹ) w	
Lateral Approximant							

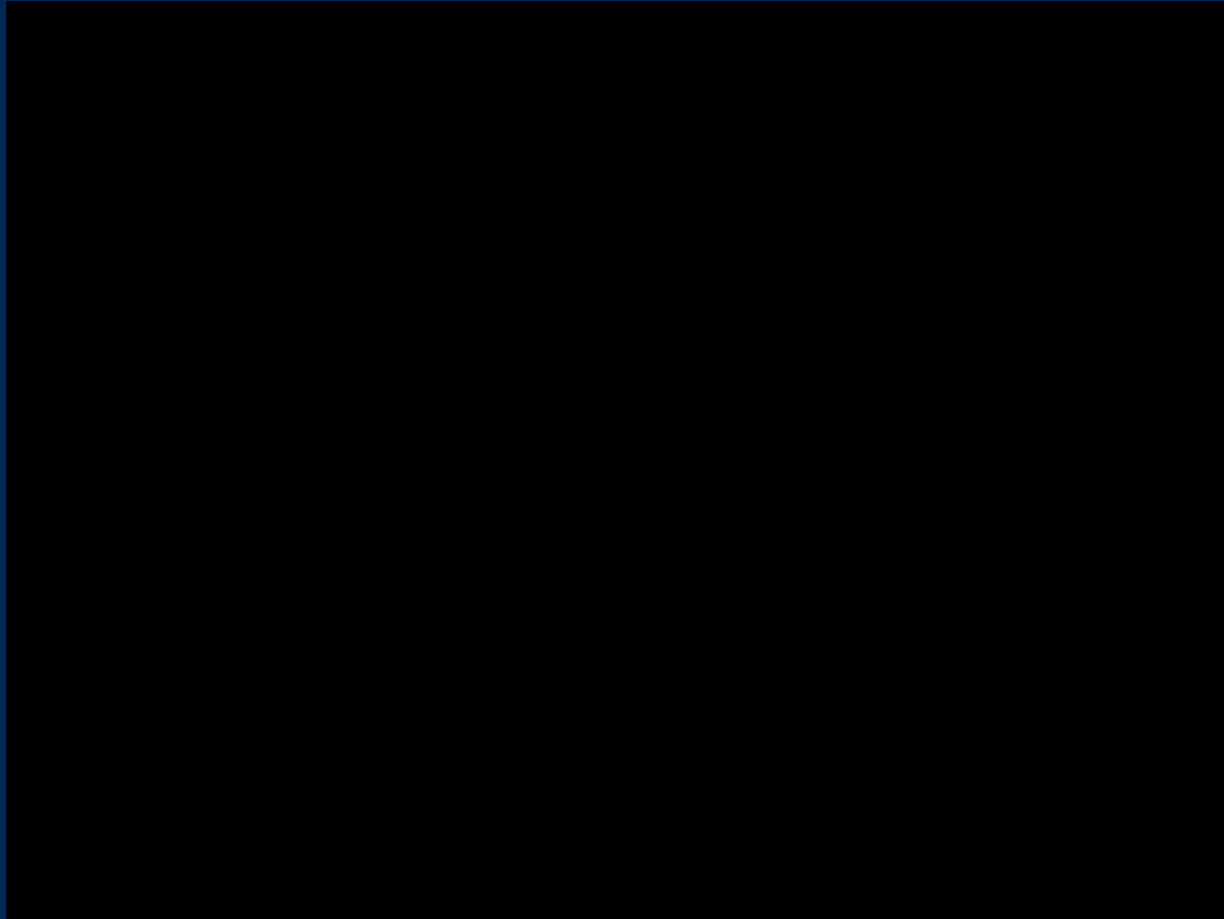
Central

Lateral

Liquids

Glides

Contrast Matters



(Source: <https://youtu.be/VSdxqIBfEAw>)

Summary

➤ Transcription:

- We saw why transcription must be unambiguous and international.

➤ Articulation:

- We saw how individual consonants are produced

➤ Classification:

- We saw that consonants can be systematically classified according to their articulatory settings