Introduction to Linguistics
LIN101
Lecture 3: Consonants

Fall 2024, University of Toronto, St. George

Angelika Kiss

Announcements

Announcements

- New course email: lin101.utsg@course.utoronto.ca
- Experiment participation opportunities have opened! Take a look at it on Quercus.
- Homework 1 will be published today by midnight.
- Due by next week's Tuesday at midnight.

Place of articulation

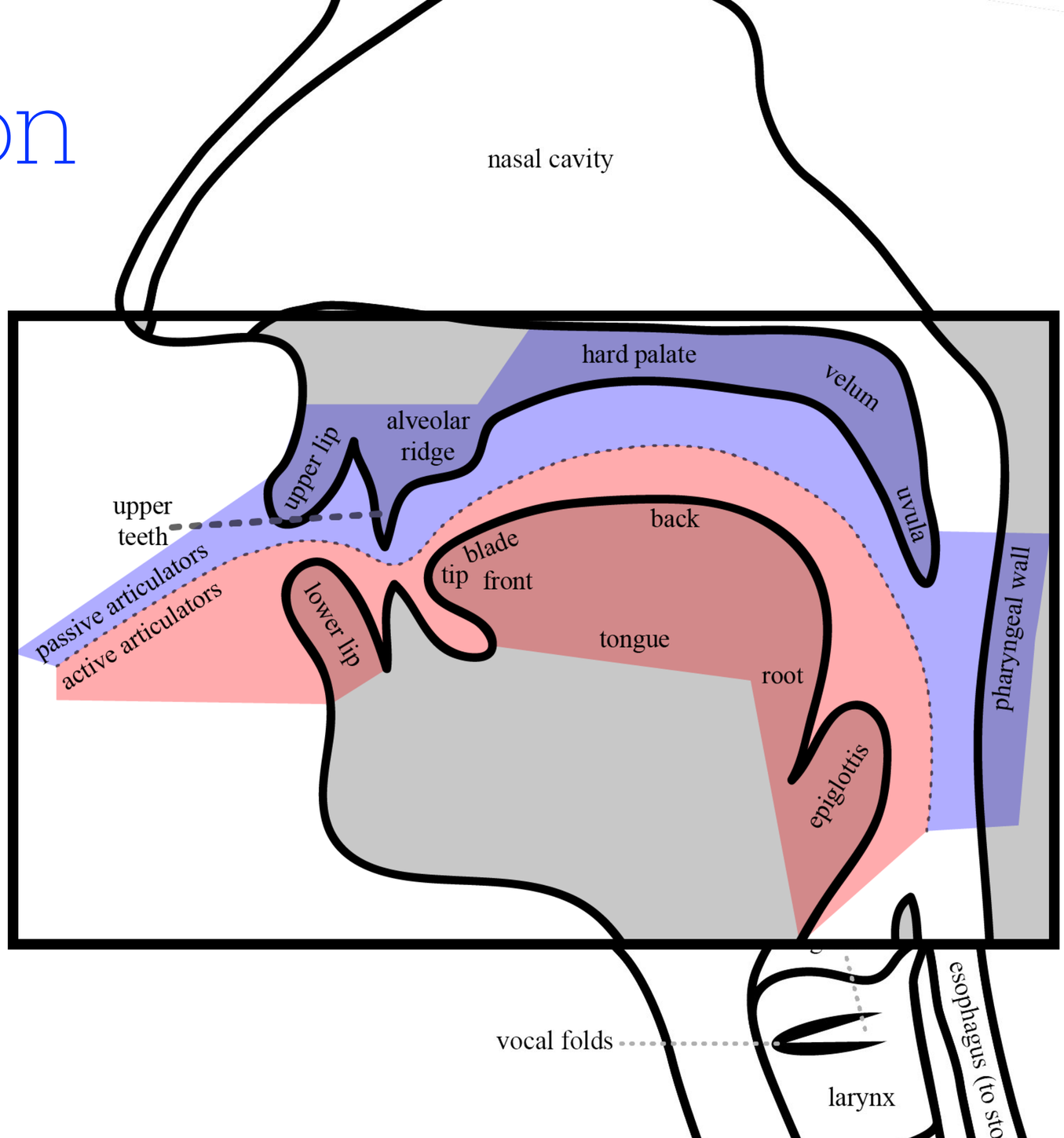
Place of articulation

- Consonants: sounds that are produced with a relatively narrow constriction or even a complete closure in the vocal tract.
- The articulation usually involves moving one articulator towards another
- This can be described by several parameters:
  - place of articulation
  - phonation type
  - manner of articulation

Place of articulation

active articulators

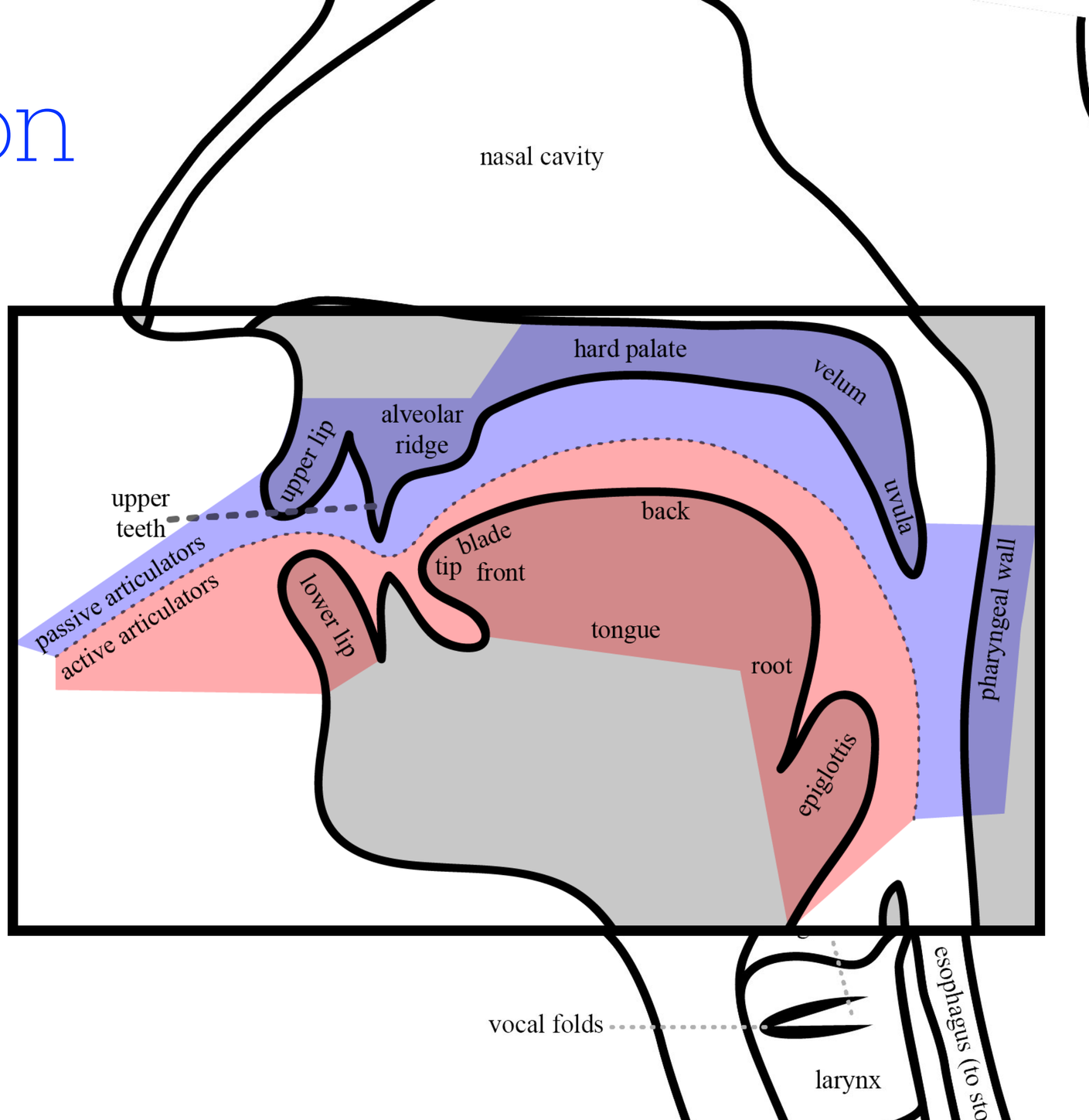
- aka lower articulators: the moving articulator, along the bottom of the oral cavity and the front of the larynx.
- lower lip
- tongue tip
- tongue blade
- tongue front
- tongue back
- tongue root
- epiglottis



Place of articulation

passive articulator

- aka upper articulator: the target articulator along the top of the oral cavity and back of the pharynx.
- upper lip
- upper teeth
- alveolar ridge
- postalveolar region
- hard palate
- velum
- uvula
- pharyngeal wall



Place of articulation

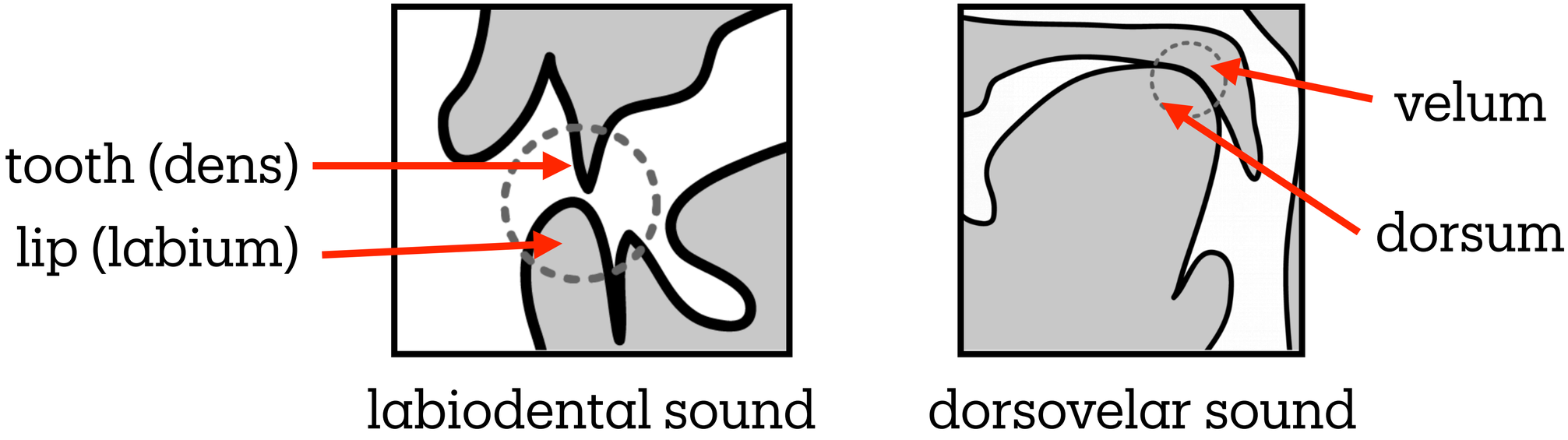
- labial = articulated with the lower lip (Lat: labia oris)
- dental = articulated at the upper teeth (Lat: dens)
- apical = articulated with the tongue tip (Lat: apex)
- laminal = articulated with the tongue blade (Lat: lamina)
- coronal = articulated with the tongue front (Lat: corona)
- alveolar = articulated at the alveolar ridge
- postalveolar = articulated at the back wall of the alveolar ridge
- dorsal = articulated with the tongue back (Lat: dorsum)
- palatal = articulated at the palate
- velar = articulated at the velum
- uvular = articulated at the uvula
- radical = articulated with the tongue root (Lat: radix)
- pharyngeal = articulated at the pharyngeal wall
- epiglottal = articulated with the epiglottis

Place of articulation

- All consonants have two articulators, so either of the two relevant adjectives could be used.
- The first sound of *shin* could be called
  - a laminal consonant (active articulator: lamina)
  - postalveolar (passive articulator: postalveolar region)
- The first sound of *tin* could be called
  - an apical or coronal consonant (active articulator: apex or corona)
  - an alveolar consonant (passive articulator: alveolar ridge)
- The first sound of *pin* could be called
  - a labial consonant (active & passive articulator: lips) aka "bilabial"
  - and nothing else :)
- etc.

Place of articulation

- Since sounds normally are associated with two places, their place of articulation is often described by a compound adjective
- The first consonant of *fin* is labial + dental = labiodental
- The first consonant of *kin* is dorsal + velar = dorsovelar



labiodental sound dorsovelar sound

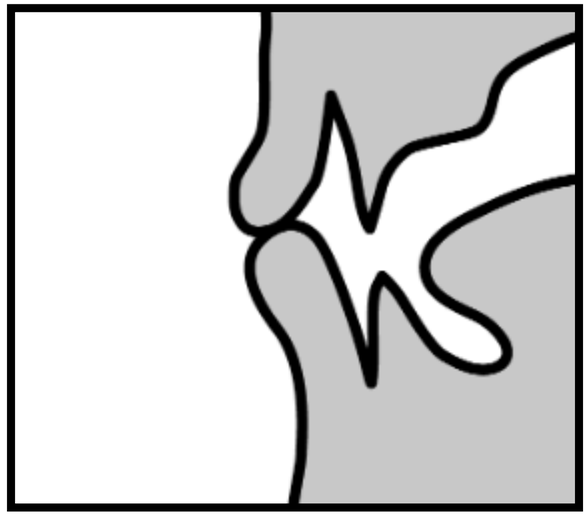
Place of articulation

- Some combinations are not physically possible
  - for example tongue root + upper lip?
- Some combinations are physically possible but do not seem to be used for any sound in any known language
  - tongue tip + velum
- We don't always have to mention both articulators
  - dorsovelar > velar

Place of articulation

bilabial sounds

- Bilabial = both lips move toward each other
- Examples: the first sound of *pill*, *bill*, or *mill*

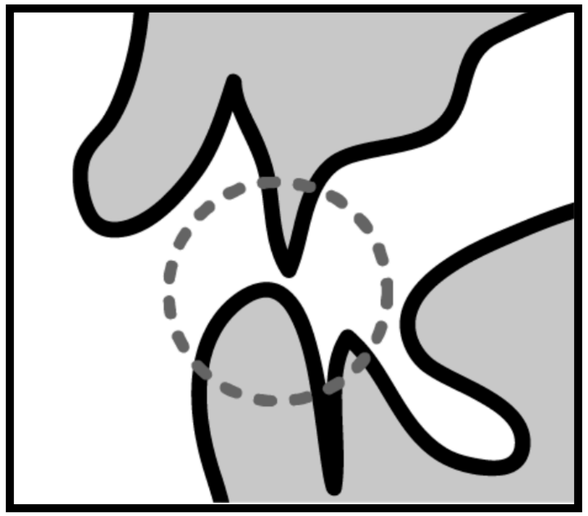


bilabial sound

Place of articulation

labiodental sounds

- Labiodental = lower lips + upper teeth
- Examples: the first sound of *fine* or *vine*

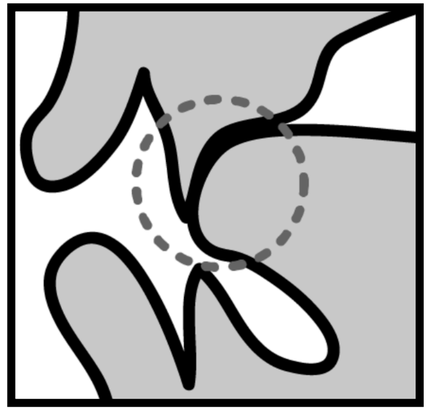


labiodental sound

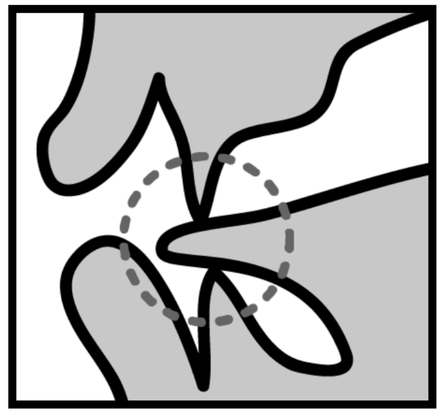
Place of articulation

dental sounds

- When articulating dental sounds, the tongue touches the upper teeth
- In laminodental sounds, the active articulator is the tongue blade
- In interdental sounds, the tongue moves between upper & lower teeth (as in *thin* or *this)*



laminodental sound

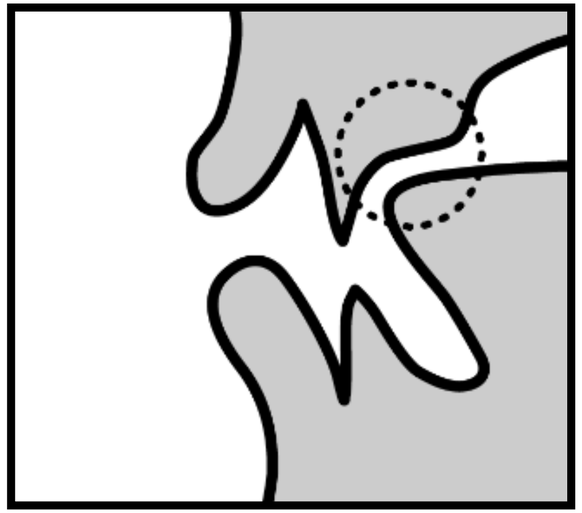


interdental sound

Place of articulation

alveolar sounds

- In alveolar sounds, the tongue moves towards the alveolar ridge
- Examples: the first sounds of *node*, *toad*, *load*, or *soap*
- Apicoalveolar is default for alveolar and usually doesn't need to be specified with "apico-", we just use "alveolar"
- Note that laminoalveolar is possible, it exists in Basque, for example (but not common among languages)

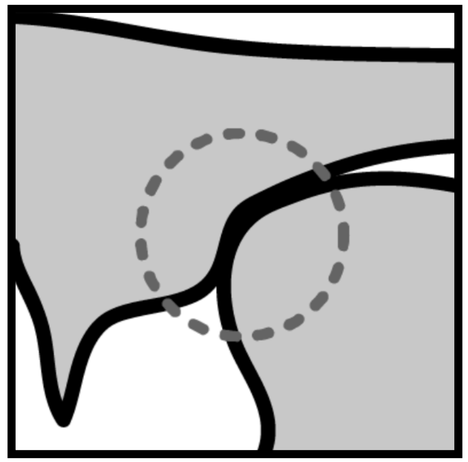


alveolar sound

Place of articulation

postalveolar sounds

- In postalveolar sounds, the tongue moves towards the back wall of the alveolar ridge (i.e., the postalveolar region)
- Examples: the first sound of *shimmer* or *jam*
- These are lamino-postalveolar sounds, apico-postalveolar sounds are quite rare, so we just use "postalveolar"

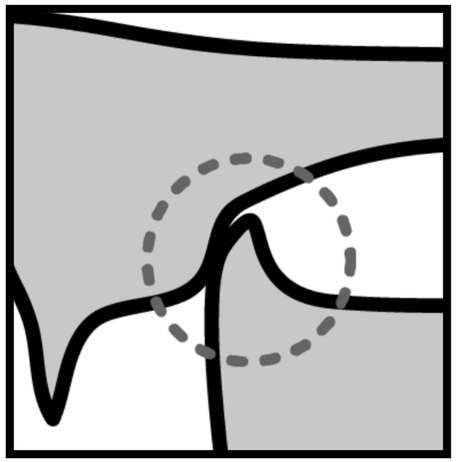


postalveolar sound

Place of articulation

retroflex

- The subapical part (lower side) of the front of the tongue touches the back wall of the alveolar ridge
- Examples: *run*, *ridge*
- *T*he term "retroflex" refers to the tongue being curled back in the mouth



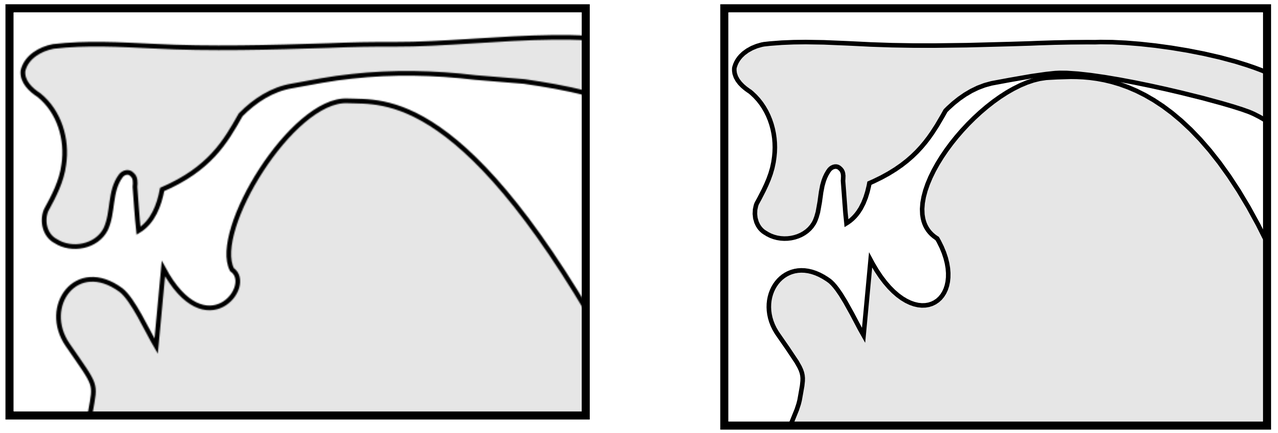
retroflex sound

Place of articulation

palatal

- Tongue front and back move toward hard palate
- The tongue tip technically moves with tongue blade, but tongue blade is what gets close to hard palate, so palatals are considered laminal
- English examples include the frist sounds of *yes* or *news*

yes



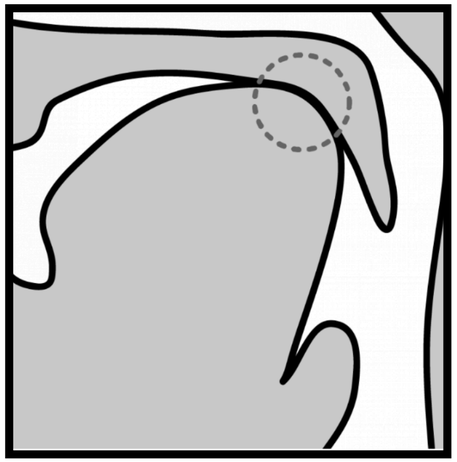
news

palatal sounds

Place of articulation

velar

- Tongue moves back toward velum
- Examples: the first sounds of *cut*, and *gut*, and the last sound of *tongue*, or the first and last sounds of *king*

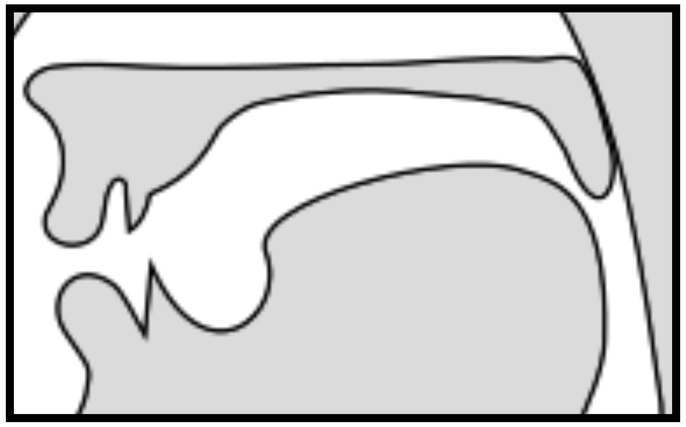


velar sound

Place of articulation

uvular

- The back of the tongue moves towards the uvula
- Not used in English, but French and German are known for the uvular "r" as in *rond* ('round' in French) or *rund* ('round' in German)



uvular sound

Place of articulation

pharyngeal

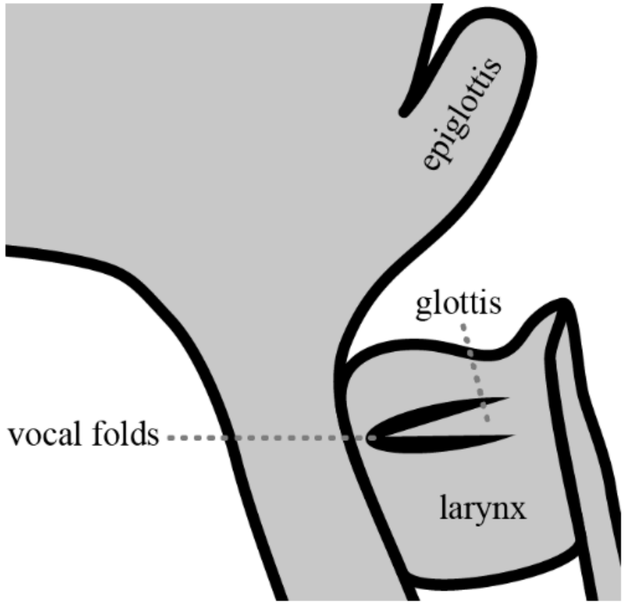
- The back of the tongue moves towards the pharyngeal wall
- Not used in English, but is found in Maltese and Arabic

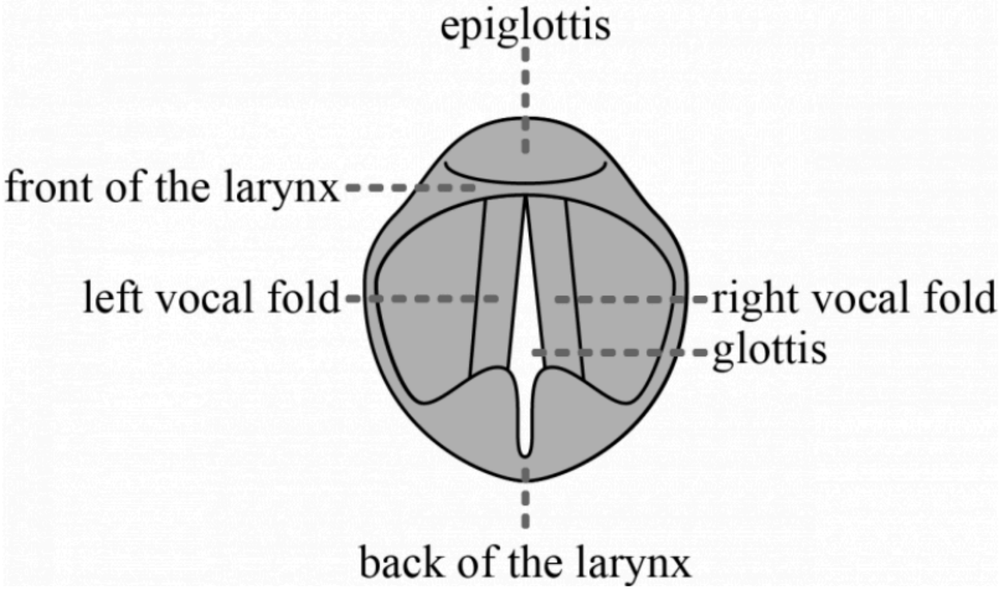
pharyngeal sound

Place of articulation

glottal

- The first sound of *he* or *who* in English is articulated solely by the vocal folds / the larynx

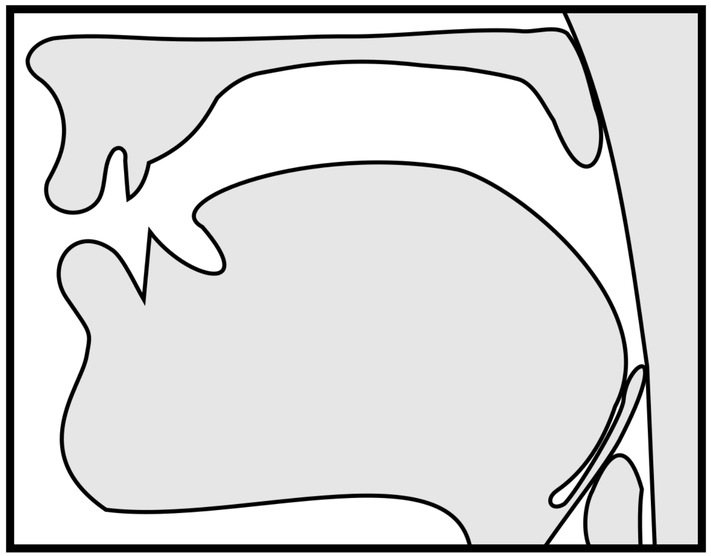




Place of articulation

epiglottal

- The epiglottis moves towards the pharyngeal wall
- Not used in English, but is found in Haida



epiglottal sound

Phonation

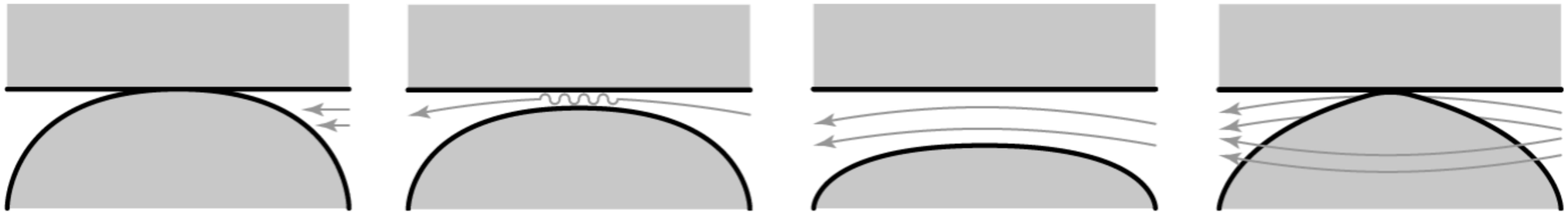
Phonation

- Besides place of articulation, phonation is another parameter used in characterizing speech sounds, particularly consonants
- Air can pass through the glottis in a way that the vocal folds vibrate or in a way that they do not
- When the vocal folds vibrate, the sound produced is voiced
- Test it: produce a long zzzzzzzzz sound and touch your larynx
- When the vocal folds do not vibrate, the sound is voiceless
- Test it: produce a long sssssssss sound and touch your larynx

Manner of articulation

Manner of articulation

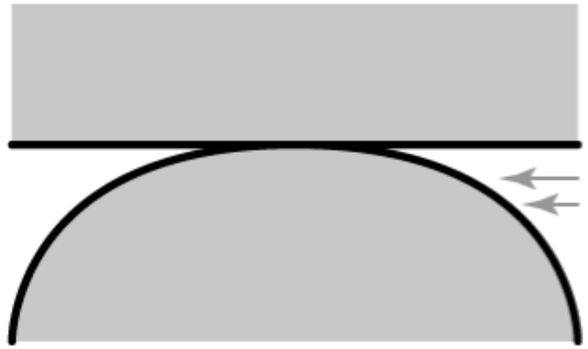
- Consonants are defined as constrictions
- There are various types of constrictions - this is called manner



Manner of articulation

stops

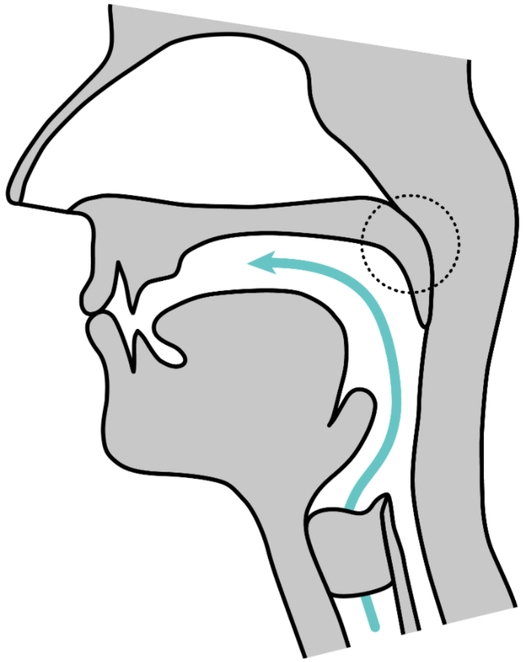
- A full closure is formed in order to completely block the airflow coming from the lungs
- One of the most common sounds cross-linguistically, also the first sounds to be acquired by children



Manner of articulation

stops

- **oral stop**: the airflow is blocked by the lips and also by the velum
- Pressure increases in the inside until it is finally released in a burst: **plosives**
- English examples: first sound of *tear*, *dear*, *peer*, *beer*, *Keir*, *gear*
- These sounds are examples of **pulmonic** oral stops as air comes from the lungs
- **ejectives**: air is pushed up by raising the vocal folds
- **implosives**: air is sucked in (think of a kiss)
- **clicks**: air is sucked in by quickly lowering the tongue



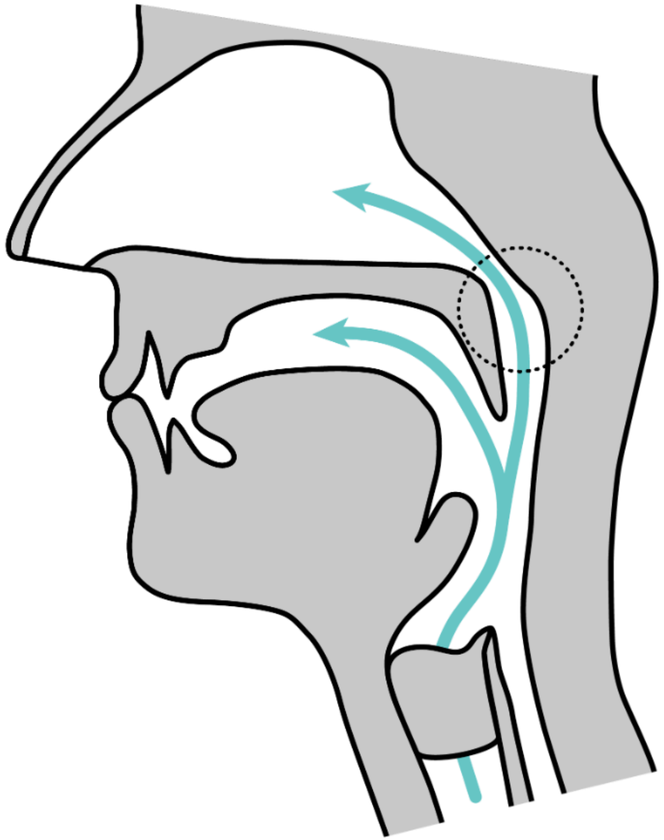
oral stop

} **non-pulmonic**

Manner of articulation

stops

- **nasal stop** : the airflow is blocked by articulators in the oral cavity but the airflow can come out through the nasal cavity
- With nasal stops, the airflow is continuous, not sudden (there is no burst, i.e., nasals aren't plosives)
- English examples: first sound of *might* and *night*, last sound of *king*

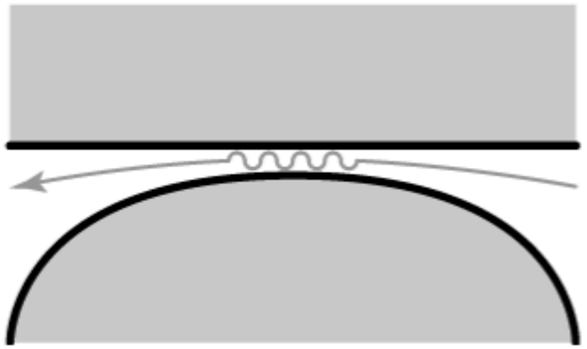


nasal stop

Manner of articulation

fricatives

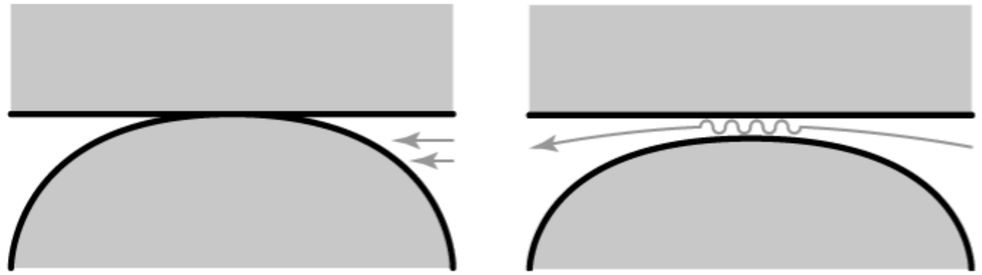
- When producing fricative sounds, the articulators get very close to each other but they don't touch
- A narrow opening with very highly random and turbulent airflow
- "Noisy" sounds
- English examples: first sounds of *think*, *sink*, *zinc*, or *hint*



Manner of articulation

affricates

- A full stop is followed by a slow fricative-like release (and not by the sudden release heard in plosives)
- English example: first sound of chunk
- May be hard to tell affricates apart from a sequence of a true stop and a true fricative: *ratchet* vs. *rat shit*

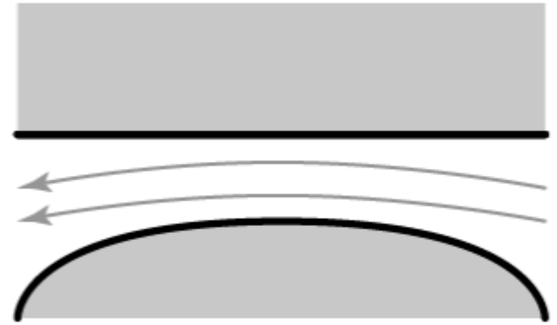


stop phase release phase

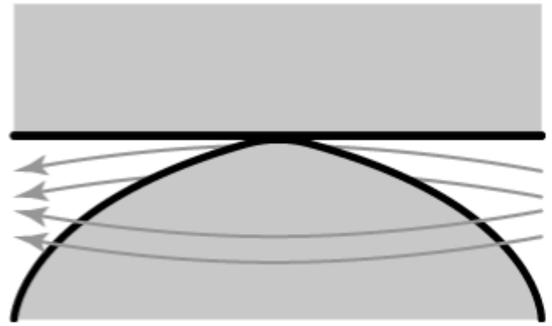
Manner of articulation

approximants

- A manner of articulation that leaves a wide enough gap between the articulators to have little or no turbulence in the airflow
- **central approximants**: let air flow through the middle of the oral cavity
- Examples: first sounds of *wet* and *yet*
- **lateral approximants**: the tongue blocks the middle of the oral cavity but air can pass it along the sides
- Examples: first sound of *let*



central approximant



lateral approximant

Manner of articulation

tap / flap

- One very brief closure
- Example: the first consonant of *atom*

trill

- Two or more very brief closures
- Example: *Ca**rr**amba* in Spanish

Further categories of consonants

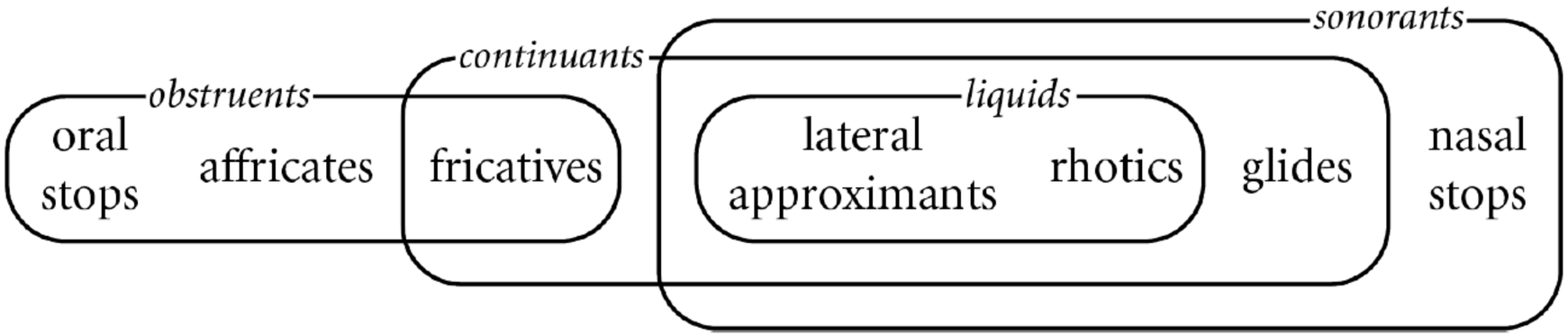
Manner of articulation

rhotic

- A weird group with no phonetic consistency!
- The label comes from the Greek letter ρ (rho)
- Their place can be alveolar, postalveolar, retroflex, or uvular
- Their manner can be fricative, central approximant, tap, or trill
- English has so-called 'rhotic' and 'non-rhotic' dialects
  North-American English is mostly rhotic
  British English: non-rhotic, the rhotic is present in *rose*, but not in *bar*

Further categories of consonants

- obstruents : oral stops, fricatives, and affricates
- sonorants : everything besides obstruents
- continuants : fricatives and approximants
- liquids : rhotics, lateral approximants
- glides / semivowels : non-rhotic central approximants

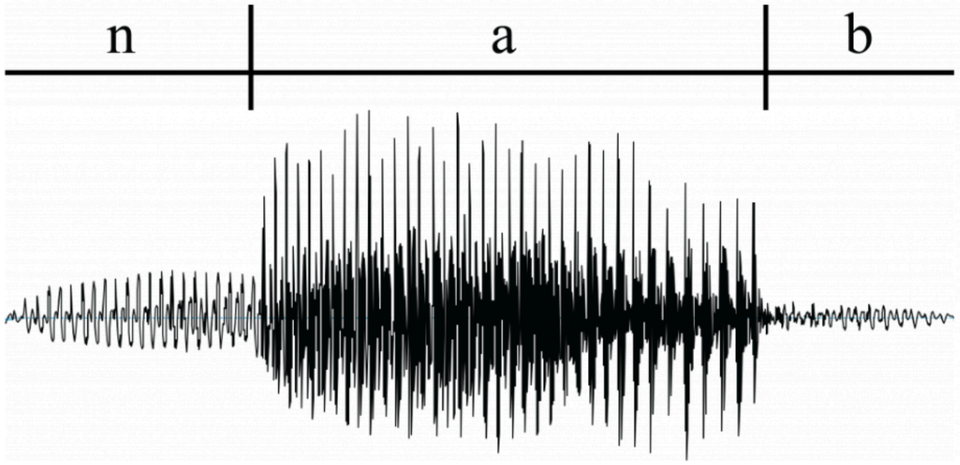


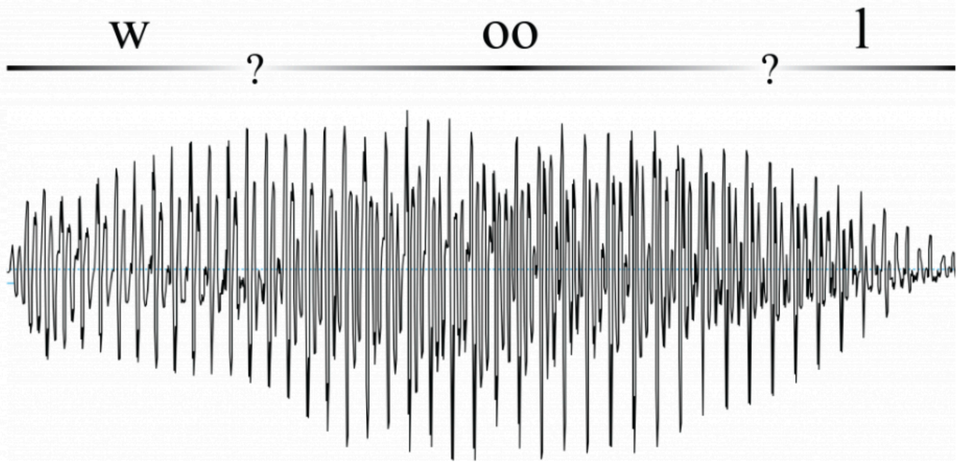
Transcription of consonants

Transcription of consonants

Segmentation

- Spoken words are perceived as a sequence of speech sounds
- The individual sounds can also be called **segments**
- **waveforms** : graphic representations of the air vibrations caused by sound waves





Transcription of consonants

The IPA

- Transcription allows linguists to represent the form of words in a way that is consistent across languages
- Speech segments / speech sounds have their own special symbols
- Orthography in general is not reliable.
- The same letter can be used to vastly different sounds across languages, consider <r>:
  borrow (English) / Traum (German) / pirarrã (Br. Portuguese)
- The same sound can be represented by multiple different ways even within the same language: relief / laugh
- Parsimony: one to one mapping between sounds & symbols in IPA

Transcription of consonants

The IPA

CONSONANTS (PULMONIC)

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	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			

Symbols to the right in a cell are voiced, to the left are voiceless. Shaded areas denote articulations judged impossible.

https://www.ipachart.com/

Transcription of consonants

The IPA

- Transcriptions can be broad or narrow, depending on the level of phonetic detail
- Diacritics: further small marks appended to IPA symbols to slightly change them
  - **tie-bar**: [͡] represents affricates: t͡s for the first sound in *tsar (царь)* The tie-bar thus conjoins a plosive with a fricative
  - **aspiration**: [ʰ] represents an additional "h-sound" (a "puff") after plosives. To transcribe the word tea, the narrow transcription would be [tʰi].
- Diacritics will be further discussed in the next lecture.

Transcription of consonants

English consonants in the IPA

	beginning	*middle*	*end*
[p]	pan	rapid	lap
[b]	ban	rabid	lab
[t]	tan	atop	let
[d]	den	adopt	led
[k]	can	bicker	lack
[g]	gain	bigger	lag
[ʔ]	—	uh-oh	—

Transcription of consonants

English consonants in the IPA

	beginning	*middle*	*end*
[m]	man	simmer	ram
[n]	nun	sinner	ran
[ŋ]	—	singer	rang
[f]	fan	wafer	leaf
[v]	van	waver	leave
[θ]	thin	ether	truth

	beginning	*middle*	*end*
[ð]	than	either	smooth
[s]	sin	muscle	bus
[z]	zone	muzzle	buzz
[ʃ]	shin	Haitian	rush
[ʒ]	genre	Asian	rouge
[h]	hen	ahead	—

Transcription of consonants

English consonants in the IPA

	beginning	*middle*	*end*
[t͡ʃ]	chin	batches	rich
[d͡ʒ]	gin	badges	ridge
[l]	lane	folly	ball
[r]	run	sorry	bar
[j]	yawn	vacuum	—
[w]	won	awake	—

Transcription of consonants

Explore the IPA

- Interested in other sounds?
- Checkout the IPA at:
  https://www.ipachart.com/
  or at
  https://www.seeingspeech.ac.uk/ipa-charts/?chart=1&datatype=3&speaker=1

End of lecture 3