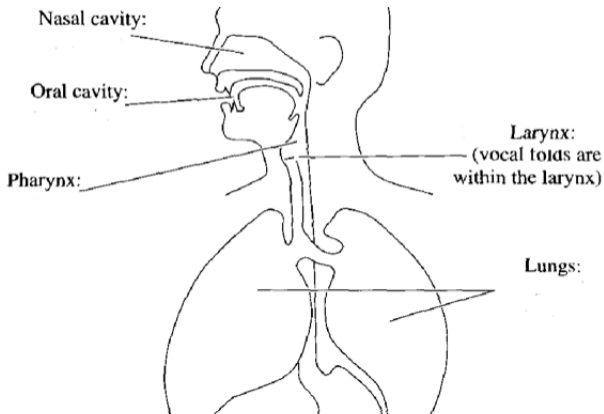


Ling 105
Sounds of Language

Thursday, September 5, 2024

Kevin Ryan

Vocal tract



- Usual **egressive pulmonic** airflow:
lungs → trachea → pharynx → oral and/or nasal cavities

Egressive pulmonic airflow

- Ingressive pulmonic speech is rare
e.g. Swedish *Jamen då tar vi om den ja* ʘ (Annika Voss)
- Ingressive non-pulmonic phones (clicks, implosives) are fairly common, but not in English

Larynx, vocal folds, & phonation

- Larynx & epiglottis prevent food inhalation
- Glottis
- Vocal folds adducted: creates voicing (phonation)
- Vocal folds abducted (spread) or sealed: voiceless phones

e.g. [s] vs. [z]
 [f] vs. [v]
 [θ] vs. [ð]

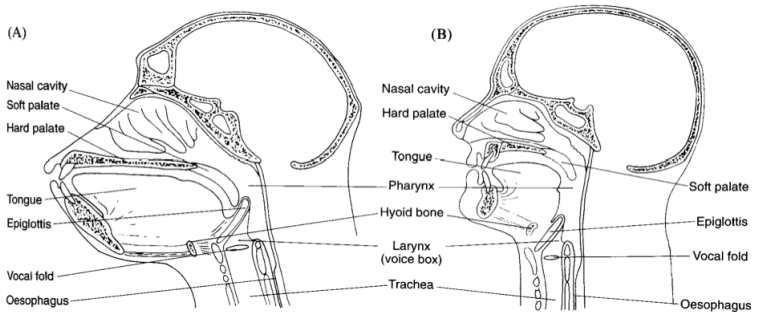
The larynx

Laryngeal Videostroboscopy
Dana Slocumb

(Dana Slocumb)

Position of the larynx

- **Descended** in adult humans relative to babies & other primates



The oro-nasal process

- **Nasal**: velum lowered, opening the **velo-pharyngeal port**

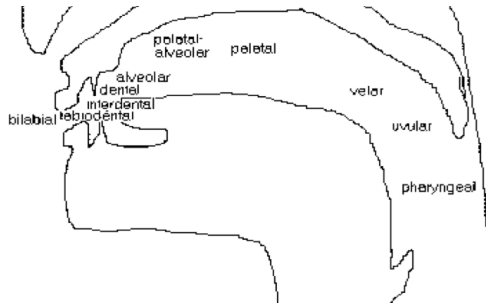


- **Oral**: velum raised
- [m] vs. [b]
- Velum is usually raised during speech, lowered at rest

Place of articulation

Active & passive articulators

- **Active:** lower lip, tongue (underside, tip, blade, body, root)
- **Passive:** upper lip, teeth, alveolar ridge, palate(s), uvula
- Midsagittal section:



Major place: labial

- Major place = active articulator
- Minor place = passive articulator (along top)
- **Bilabial**: [m, p, b]
- **Labiodental**: [f, v]

Major place: coronal

- **Interdental:** [θ, ð]
- **Alveolar:** [n, t, d, s, z, ɾ, l, ɹ*]
*English *r* is often grouped with the alveolars, but it can also be palatal or retroflex
- **Palato-alveolar:** [ʃ, ʒ, tʃ, dʒ]

Major place: dorsal (or labio-dorsal)

- **Palatal**: [j] (as in *yes*)
- **Velar**: [k, g, ŋ]
- **Labiovelar**: [w] (and [ɰ] for some)

Major place: laryngeal

- In English, **glottal stop** and *h*: [ʔ, h]

Place of articulation: summary

- Major places = active articulators (lip, crown, body, etc.)
- Minor places = passive articulators (locations along top)
- Putting them together:
 - **Labial**: bilabial through labiodental
 - **Coronal**: interdental through palato-alveolar
 - **Dorsal**: palatal through uvular
 - (**Pharyngeal**: pharynx, e.g. epiglottal)
 - **Laryngeal**

Manner of articulation

Manner (slide 1 of 2)

- From most to least constriction
- Still considering only English phones
- **Stop**: total obstruction of **oral** airflow
 - **Plosive**, [p, b, t, d, k, g, ʔ]
 - **Nasal stop**, [m, n, ŋ]
- **Fricative**: close, turbulent obstruction
 - [f, v, θ, ð, s, z, ʃ, ʒ, h]
 - **Sibilants** (“s-sounds”) among them: [s, z, ʃ, ʒ]
- **Affricate** (plosive + fricative in one phoneme)
 - *ch* = [tʃ], *j* = [dʒ]
 - In English, all affricates are also sibilants

Manner (slide 2 of 2)

- **Approximant:** [w, j, ɹ, l, r] (and all vowels)
 - [w, j] are **glides** (colloquially, semivowels)
 - [ɹ, l] are **liquids**
 - [ɹ] is a **rhotic** (as is trilled [r])
 - [l] is a **lateral**
 - [r] is **flap** or **tap**

Manner: sonority

- Bifurcation of manners
 - **Sonorant**: open aperture, relatively loud
(nasals, liquids, glides, vowels)
 - **Obstruent**: little to no aperture
(plosives, fricatives, affricates)
- In English, voicing contrasts are possible only for obstruents
- Sonorants tend to be “spontaneously voiced”
- **Sonority** is sometimes also treated as a continuum of aperture/loudness (e.g. [l] is more sonorous than [n])

Summary: five characteristics of consonants

- Phonation
For now, voiced vs. voiceless
- Place of articulation
Bilabial, labiodental, interdental, dental, alveolar, palato-alveolar, palatal, velar, glottal (etc.)
- Manner of articulation
Stop, fricative, affricate, approximant, trill, flap (etc.)
- Nasality
Oral vs. nasal release
- Laterality
Central vs. lateral release

Place: summary

- Place (with English examples)
 - Labial: bilabial (p b m)
labiodental (f v)
+ velar = labiovelar (w ʍ)
 - Coronal: interdental (θ ð)
dental
alveolar (t d n s z ɹ l r)
palato-alveolar (ʃ ʒ tʃ dʒ)
retroflex
 - Dorsal: palatal (j)
velar (k g ŋ)
uvular
 - Pharyngeal
 - Laryngeal: glottal (h ʔ)

Top of the IPA chart (complete)

	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			

Top of the IPA chart (English)

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b		t d					k g			ʔ
Nasal	m		n					ŋ			
Trill											
Tap or Flap			ɾ								
Fricative		f v	θ ð	s z	ʃ ʒ						h
Lateral fricative											
Approximant			ɹ				j				
Lateral approximant			l								

Top of the IPA chart (non-English)

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive						t d	c ɟ		q ɢ		
Nasal		m				ɳ	ɲ		ɴ		
Trill	ʙ		r						ʀ		
Tap or Flap		ⱱ				ɽ					
Fricative	ɸ β					ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ʁ
Lateral fricative			ɬ ɮ								
Approximant		ʋ				ɻ		ɰ			
Lateral approximant						ɭ	ʎ	ʟ			

Remaining IPA consonants (almost all non-English)

CONSONANTS (NON-PULMONIC)

Clicks	Voiced implosives	Ejectives
◌◌ Bilabial	◌◌ Bilabial	◌' Examples:
◌ Dental	◌d Dental/alveolar	◌p' Bilabial
◌! (Post)alveolar	◌f Palatal	◌t' Dental/alveolar
◌≠ Palatoalveolar	◌g Velar	◌k' Velar
◌ Alveolar lateral	◌G Uvular	◌s' Alveolar fricative

OTHER SYMBOLS

◌M Voiceless labial-velar fricative	◌ç ɸ Alveolo-palatal fricatives
◌W Voiced labial-velar approximant	◌ɹ Voiced alveolar lateral flap
◌ɥ Voiced labial-palatal approximant	◌ɟ Simultaneous ɟ and ɣ
◌ħ Voiceless epiglottal fricative	
◌ʕ Voiced epiglottal fricative	Affricates and double articulations can be represented by two symbols joined by a tie bar if necessary.
◌ʡ Epiglottal plosive	