



Phonetics & Phonology

Articulatory Phonetics



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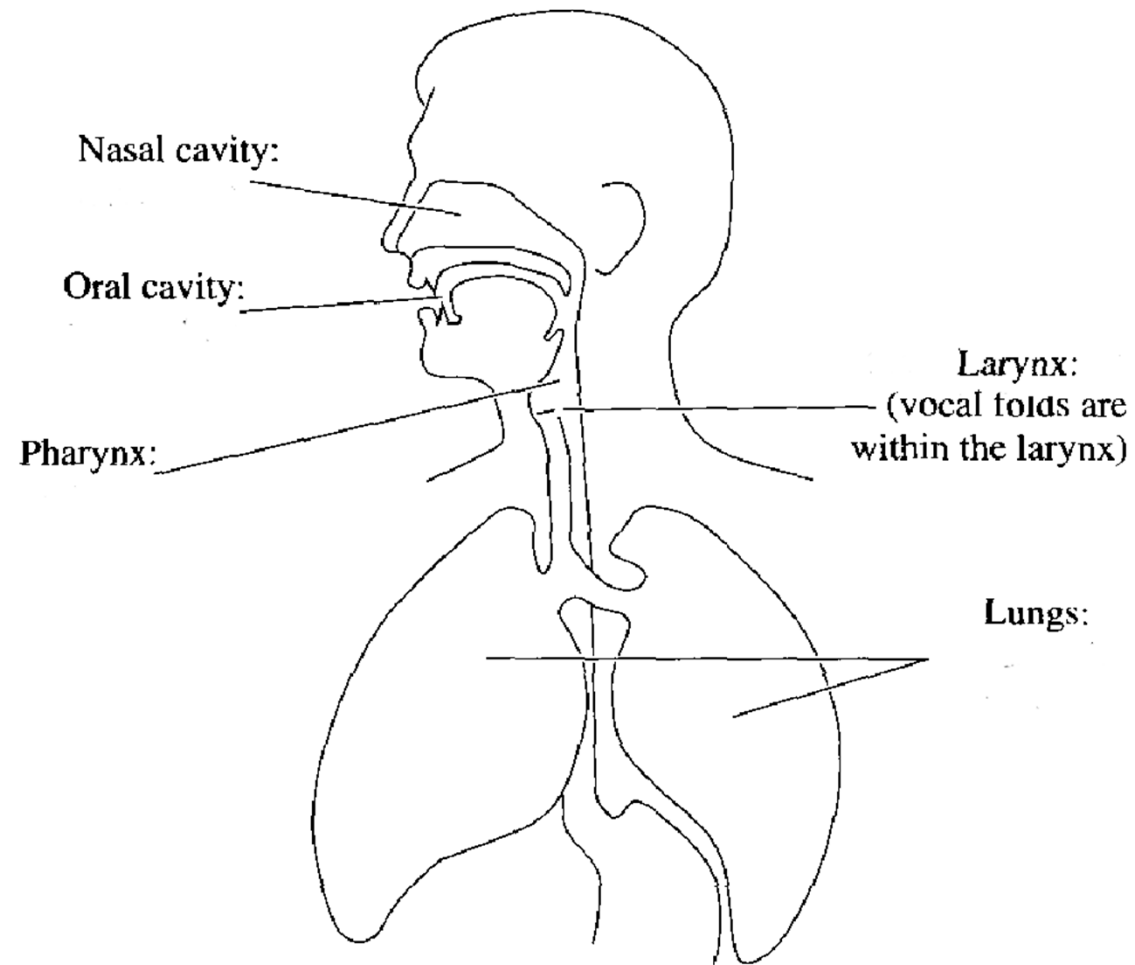
- Airstream mechanism
- Phonation
- Articulation
 - Place
 - Manner



Organs of Speech

- Lungs
- Trachea (wind pipe)
- Larynx (voice box)
 - Vocal folds or vocal cords
 - Glottis
- Supraglottal organs
 - Lips
 - Teeth
 - Tongue
 - Palate
 - Pharynx

Organs of Speech





Airstream Mechanism

- All sounds are made with some movements of air
- Three ways to move air in vocal tract
 - With the lungs (pulmonic airstream mechanism)
 - With the glottis (glottalic airstream mechanism)
 - With the tongue (velaric airstream mechanism)



Air Stream Mechanism

- Pulmonic egressive- all human languages
- Pulmonic ingressive- not found
- Glottalic egressive- e.g. Navajo
 - Ejectives are represented by means of a small superscript comma after the symbol: e.g. [pʼ].
- Glottalic ingressive- e.g. Sindhi
 - implosives In the IPA, implosives are marked by a hook at the top of the symbol: e.g. [ɓ]
- Velaric egressive- not found
- Velaric ingressive- e.g. Zulu
 - Clicks e.g. tsk! tsk!



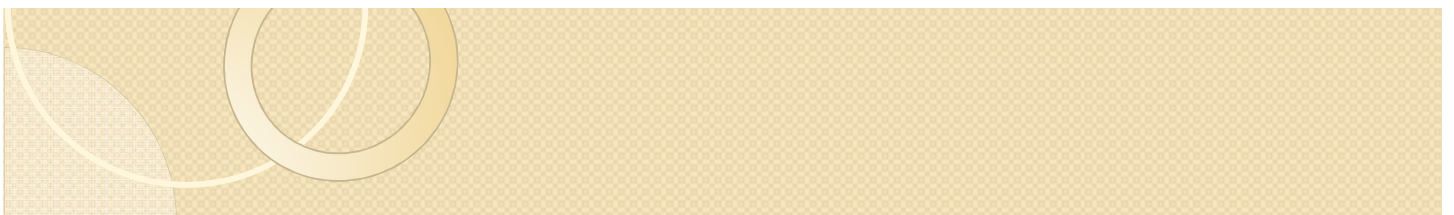
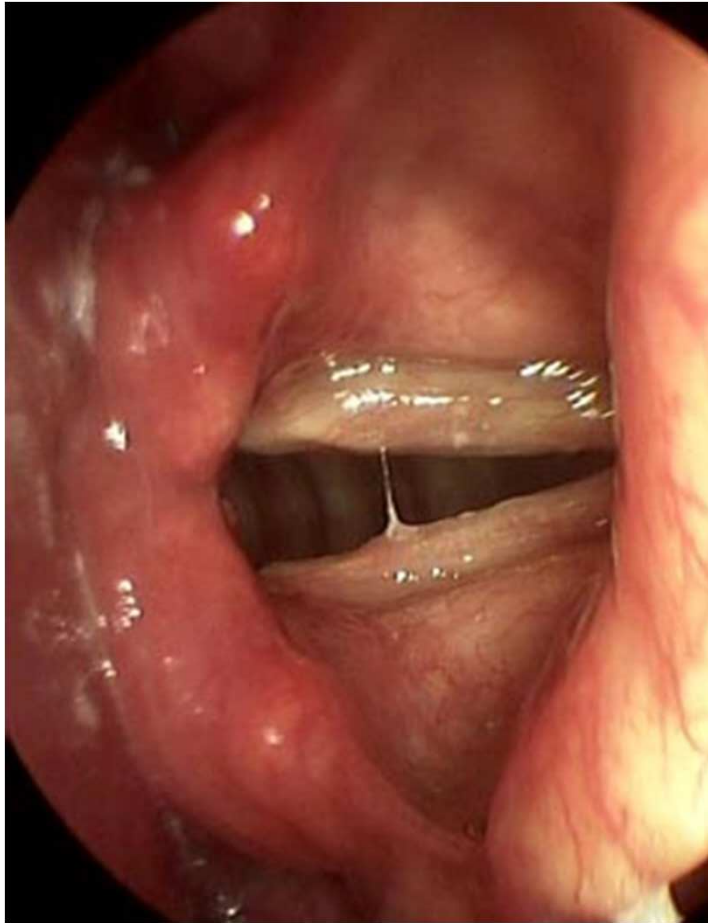
Modes of Phonation

- Voiceless
- Breathy or murmur
- Whisper
- Voiced
- Creaky

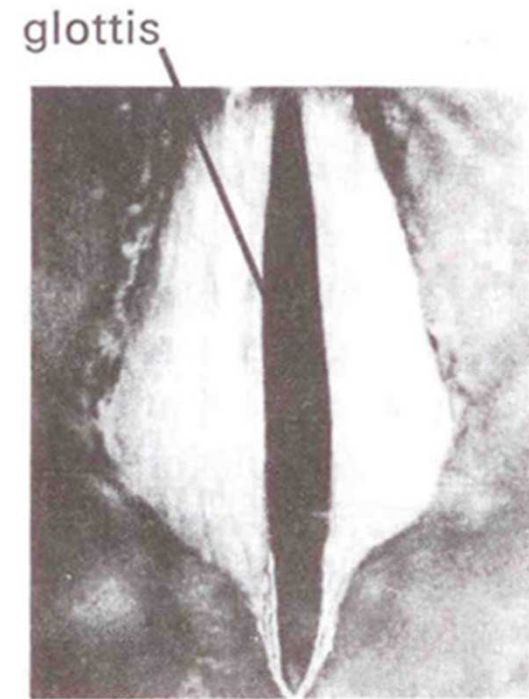
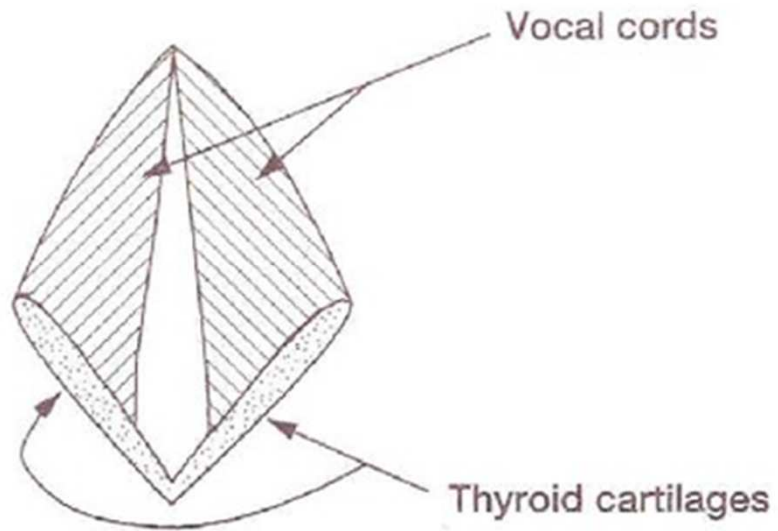


Vocal cords

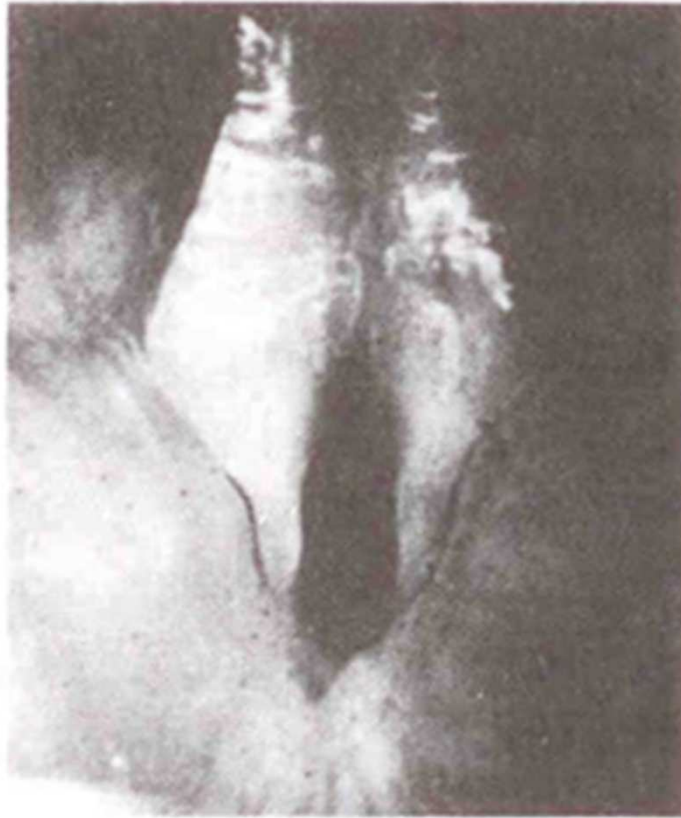
- Their outer edges are attached to muscle in the larynx while their inner edges are free.
- If the back end of the vocal folds are held apart, a triangular space opens up between them.
- The space is called *glottis*.



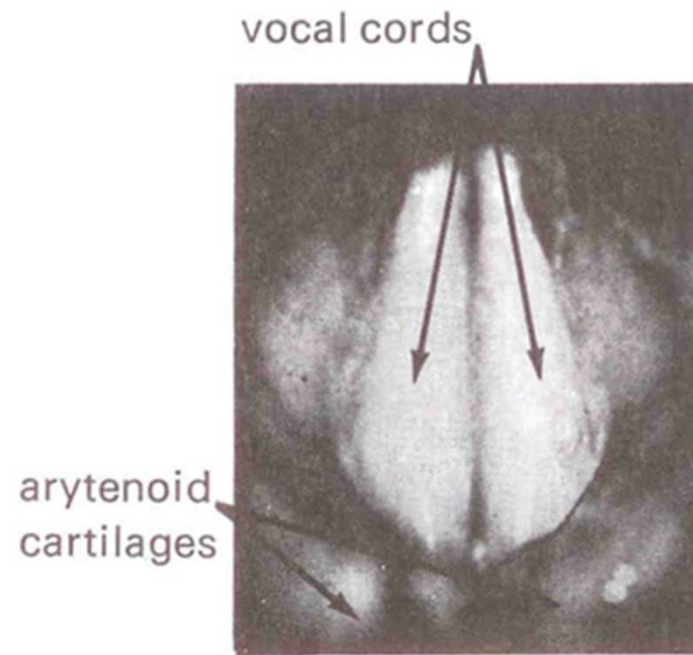
Voiceless



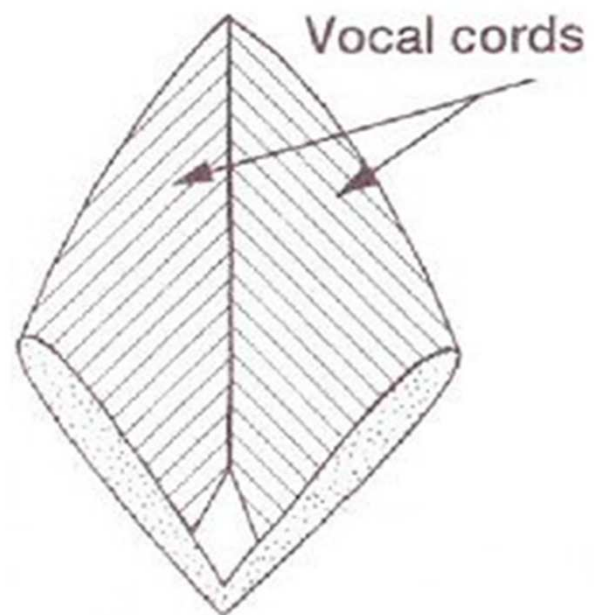
Breathy



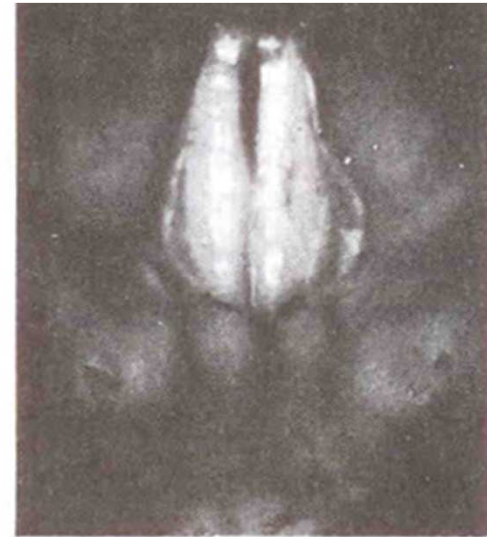
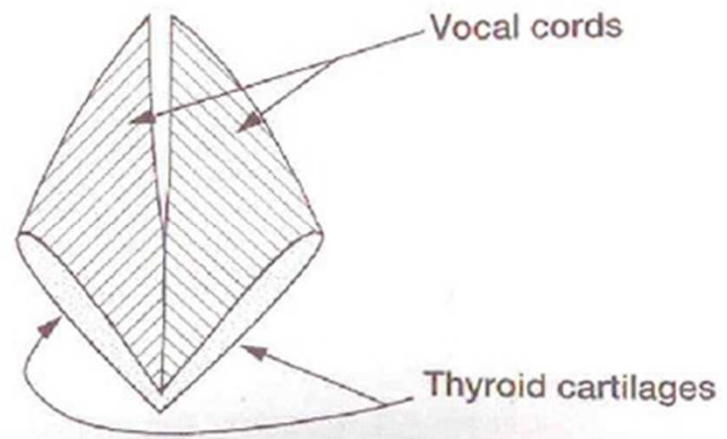
Voiced



Whisper



Creaky

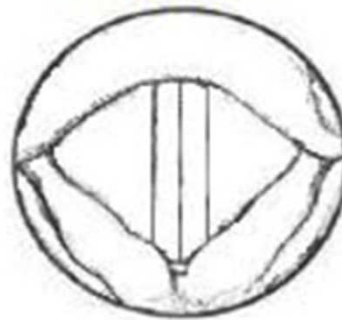


Voiced, unvoiced and aspirated

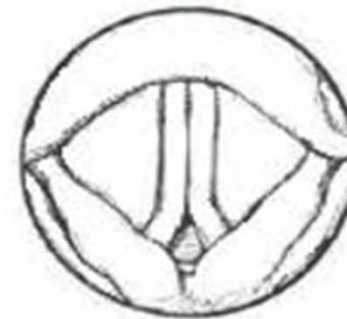
inhalation



normal phonation



aspiration

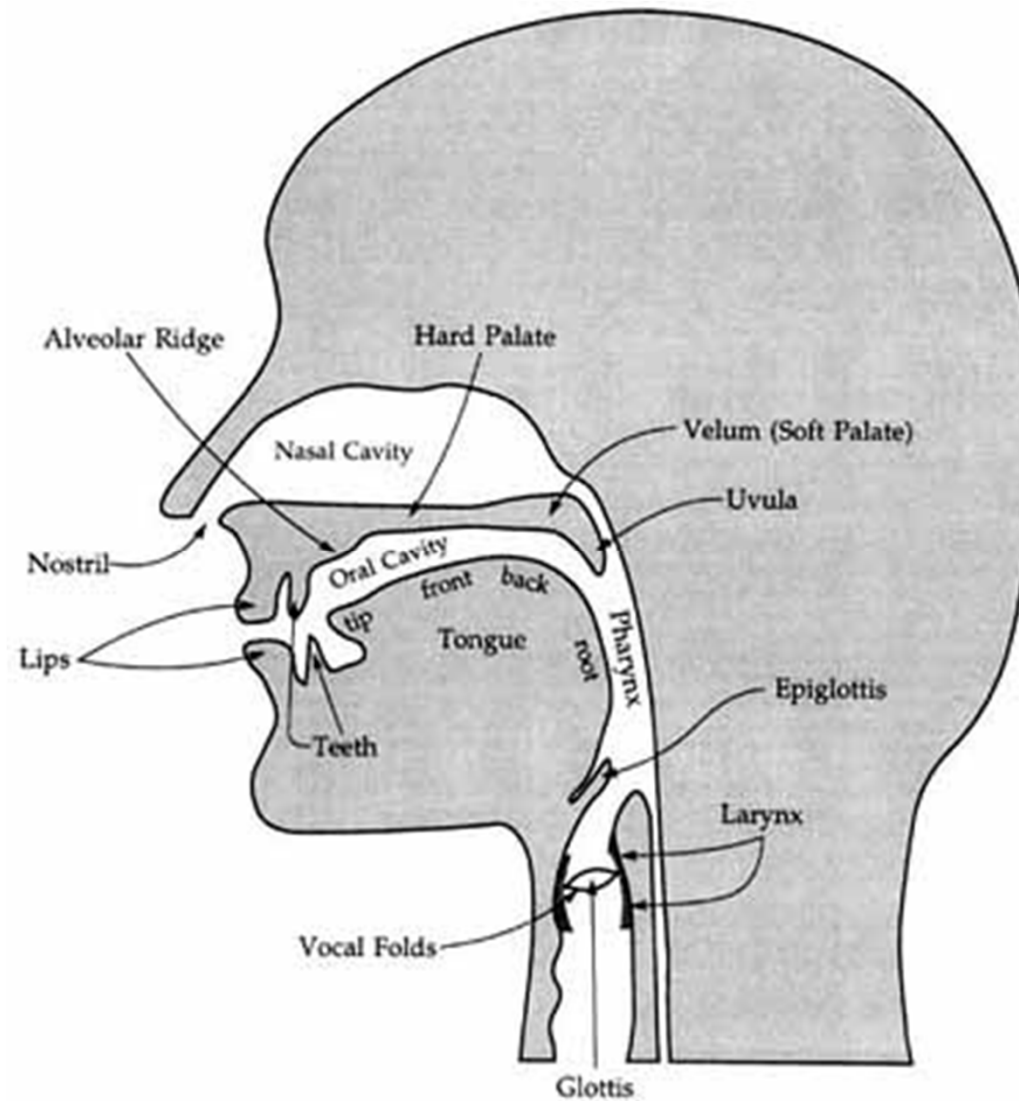




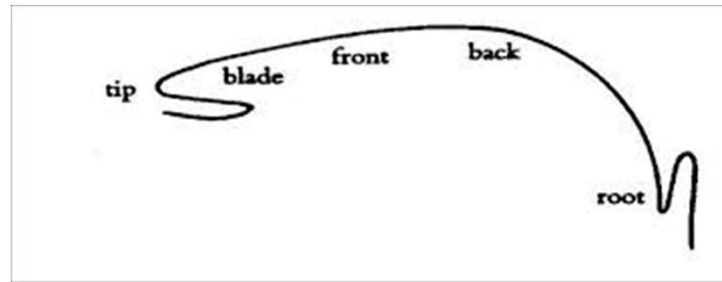
Articulation

- Place of articulation
- Manner

Vocal Tract



Tongue





Place of Articulation

- **Bilabials**
 - the articulation involves both lips
- **Labiodentals**
 - the articulation involves the lower lip and upper teeth
- **Dental**
 - the tongue is placed against or near the teeth
- **Interdental**
 - the tongue is placed between the teeth
- **Alveolar**
 - the tongue is placed near the alveolar ridge or touches it



Place of Articulation

- **Palatal**
 - the tongue is on or near the palate
- **Velar**
 - the tongue is on or near the velum
- **Uvular**
 - the tongue is on or near the uvula
- **Pharyngeal**
 - the airflow is modified by tongue retraction in this area, or by constricting the pharynx
- **Glottal**
 - articulation of vocal folds



Manner

- Stops
- Fricatives
- Affricates
- Nasals
- Tap/flap
- Trill
- Approximant

Stops / Plosives

- consonants made with a complete closure either in the oral cavity or in the glottis.
- This blockage is followed by an explosive sound as the air is released. The period of blockage is called the closure and the explosion is called the release.
- Oral stops: complete closure in the oral cavity and the velum is raised.
 - Oral stops: [p, t, k, b, d, g]
 - Glottal stop: [ʔ] complete closure in the glottis.
 - Always voiceless
- Nasal stops: complete closure in the oral cavity, but the velum is raised. Air escapes through the nasal passage.
 - Nasal stops: [m, n, ŋ]
 - More sonorous than other stops (louder, more intense): airflow is not as restricted.
 - Always voiced



Fricatives

- Fricatives, airflow is constricted but not cut off completely. The turbulent airflow that results from the constriction produces a characteristic “hissing” sound.
- Can be held for a long period of time
- Can be voiced or voiceless
- Fricatives: [f, v, θ, ð, s, z, ʃ, ʒ, h]
 - [s, z, ʃ, ʒ] are known as sibilants



Affricates

- **Stops** that are followed immediately by fricatives are called **affricates**
- [tʃ, dʒ]



Trill

- The airstream is interrupted several times as one of the organs of speech (usually the tip of the tongue or the uvula) vibrates, closing and opening the air passage.
- [r]



Tap/flap

- A tap or flap is a quick motion of the tongue against the alveolar ridge.
- Similar to a trill, but involving just one brief interruption of airflow
- [ɾ]

Approximants

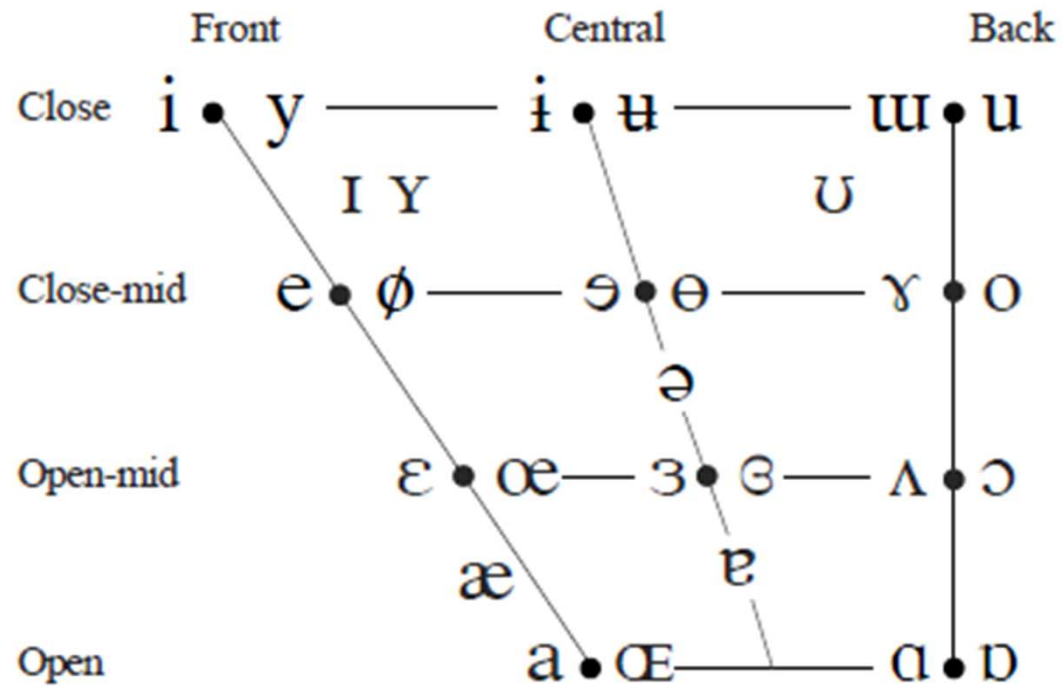
- In **approximants**, the two articulators are **close together but not close enough to cause turbulent airflow**. In English [y] (*yellow*), *the tongue moves close to the roof of the mouth but not close enough to cause the turbulence that would characterize a fricative*.
- [l] is formed with the tip of the tongue up against the alveolar ridge or the teeth, with one or both sides of the tongue lowered to allow air to flow over it. [l] is called a **lateral** sound because of the drop in the sides of the tongue.



Vowels

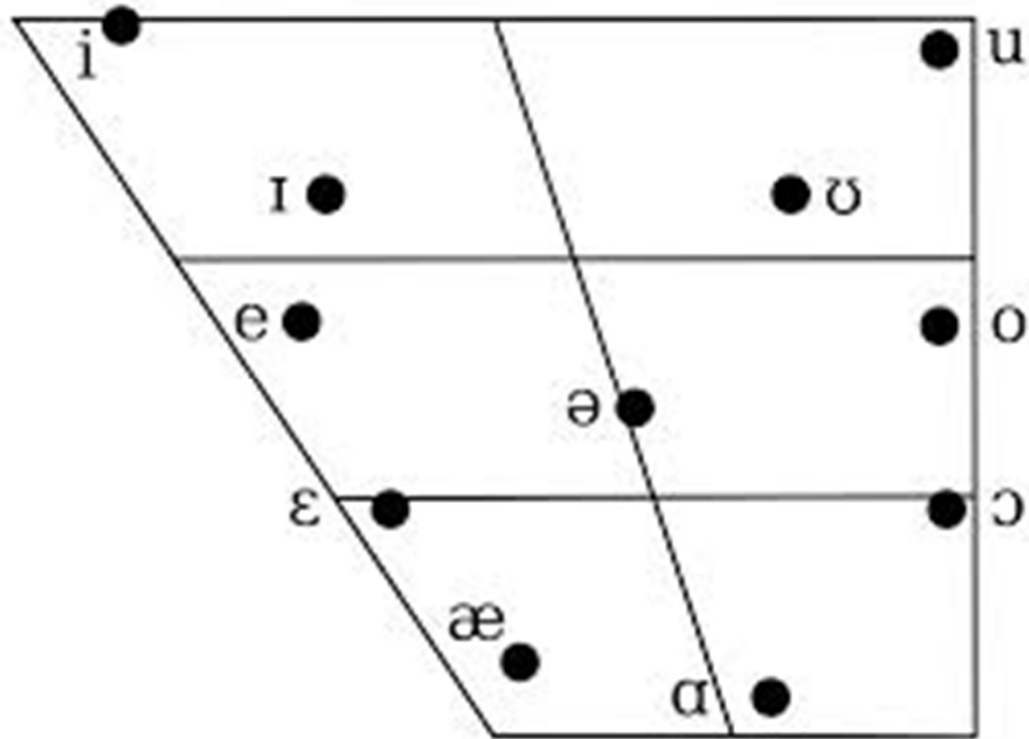
- Length / duration
- Open vs. close
- Low vs. high
- Rounded vs. unrounded
- Nasality

Vowels



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

Urdu Vowels





References

- <http://www.uiowa.edu/~acadtech/phonetics/english/frameset.html>