**English Phonology**

**Articulatory Phonetics I - Consonants**

***Articulatory Phonetics***

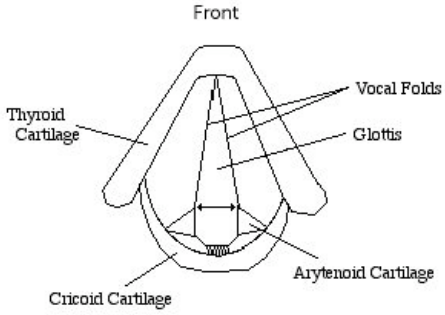
- Articulatory phonetics is the study of speech sounds
- We are interested in how they are made (speech) and how they are perceived (hearing)
- In order to understand the nature of sound systems, it is important to first understand the apparatus employed to produce the sounds

***Making Sounds***

- How do we make sounds? Basically, sounds involve sound waves that travel through the air to reach our ears
- This requires a source of air movement
- The sub-glottal component deals with inhalation (air in) and exhalation (air out)
- All physiological aspects of speech serve other purposes also
- Our focus is on the language-specific aspects of physiology

***The Subglottal Region***

- this is the area below the glottis
- The diaphragm is a large muscle that can raise or lower
- This compresses and expands the lungs, pushing the air out or pulling it in
- The air passes by way of the bronchi




***The Laryngeal Component***

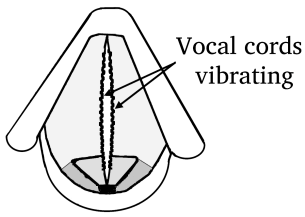
- The sub-glottal component supplies air to the larynx, located in the windpipe, between the lungs and the mouth
- The larynx is like a valve, which controls the air flow from the lungs
- The opening in the larynx is called the glottis
- The larynx is made of cartilage

***Manner of Articulation***

- involves manipulation of the vocal tract to produce certain vocal qualities
- these voice quality properties include: 1. Voicing; 2. Stops/plosives; 3. Fricatives, 4. Nasals; 5. Liquids; and 6. Semivowels

***Voicing***

- Voicing involves vibrating of the vocal chords, similar to the vibration of a guitar string
- Produces a contrast between voiced and voiceless and is a characteristic of both consonants and vowels
- You can feel the vibration if you place your fingers on your larynx and say *zzzzz*
- now compare this with *ssssss*: there is less vibration with [s], since it is voiceless
- voiced segments include [b], [m], [ j] and [a]
- Voicing is a significant factor in the sound systems of most languages




***Stops/Plosives***

| | Degree of Closure | Manner |
|---|---|---|
| 1. | complete closure | stop/plosive |
| 2. | close approximation | fricative |
| 3. | open approximation | approximant |

- stops or plosives involve an interruption in the airflow via the oral cavity, followed by a release with accompanying burst of air
- air may pass through the nasal cavity while there is a stoppage in the oral cavity = a nasal stop
- English stops include the first sound in the words *pot*, *bought*, *tot*, *dot*, *cot* and *got*
- 'stop' is more common in North America and refers to the interruption of air, i.e. the air *stops* flowing through the oral cavity
- the term 'plosive' refers to the release phase of the articulation, when the air ex*plodes* from the oral cavity

***Fricatives***

- Fricatives involve the continuation of air along a narrow passage within the oral cavity, causing turbulence and noise
- similar to the spray that occurs when you restrict the flow of water from a hose by putting your finger over the end
- fricatives constitute a particularly large class of sounds in English
- this includes the last sound in each of the following words: *tough*, *have*, *bath*, *bathe*, *toss*, *nose*, *dish*, and *rouge*
- [h], as in *high* or *help*, is also considered a fricative by most linguists
- Korean has far fewer fricatives than English: only [s], [s'] and [h] in the standard variety; only [s] and [h] in some dialects

***Affricates***

- Affricates are complex segments involving two main parts: 1. full closure like a stop, and 2. subsequent partial opening like a fricative
- this results in the production of a complex, two-part sound

- the IPA recognizes this complexity and describes such sounds by means of the two symbols that represent the different parts of the complex sound
- a combination of [t] and [s], as in the first sound in the German word *Zeit* 'time' is represented as [ts]
- Similarly, a combination of [t] and [ʃ], which appears in the first sound of the English word *chip*, is realized as [tʃ]
- English has two affricates: [tʃ], as in *church, choose, chip and* [ʤ], as in *judge, join, gym*
- Korean has three distinct affricates: [tʃ], as in 잘 'good' [tʃal], [tʃʰ], as in 친구 'friend' [tʃiŋgu], [tʃ'], as in 쪽 'page' [tʃ'ok]

***Nasals***

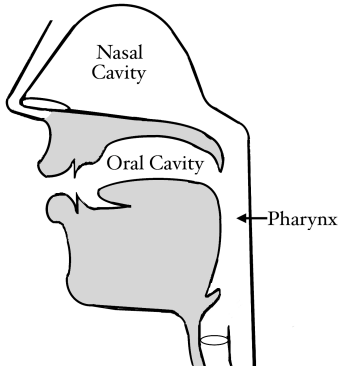
- Nasals constitute a special class of stops, involving a stoppage of the airflow at some point in the oral cavity
- allows the air to continue to pass through the nasal cavity
- almost all languages have nasal consonants
- English has the three nasals found at the end of the words *comb* [m], *fan* [n], and *tongue* [ŋ]
- Korean has the same three nasals in the same position, e.g. kɔ[m] 검 'sword', pʰa[n] 판 'board', to[ŋ] 동 'East'

***Liquids***

- Rhotics are r-like sounds that occur in several types: *flapped*, as in Korean 사람 [saɾam] 'person'; *trilled*, as in Spanish *perro* [pɛro] 'dog'; or *bunched*, as in English *hair* [hɛɹ]
- The usual English rhotic is described as 'bunched', i.e. the tongue is squeezed up into a bunch in the mouth
- other linguists have described English r as 'retroflex'
- the most common lateral is the alveolar lateral approximant, [l], found in English words like *luck, lemon, leaf*, etc.
- English also has another lateral, referred to as *dark l* or *velarized l* that appears in words like *dull, tall, whole*, etc.
- It is represented by the symbol [ɬ]
- The Korean lateral in words like 쌀 [s'al] 'rice' or 발 [pal] 'foot' is more like a retroflex [ɭ]
- Retroflex [ɭ] is made with the tongue curled up to the hard palate
- Korean has both rhotic and lateral approximants phonetically, but there is only a single contrastive liquid, represented by the grapheme ㄹ, which varies between the two liquids according to the environment

***Semivowels***

- Semivowels or glides are approximants that behave as mediators between consonants and vowels
- They share most of their features with vowels, but appear in the position of consonants
- the same sound can alternate between being a consonant and a vowel




***The Supra-glottal Component***

- The supra-glottal vocal tract is the area *above* the glottis
- It is responsible for producing the variation in sounds that is necessary for language
- Different sounds are made by changing the shape of the oral cavity
- The nasal cavity may also be involved, producing nasal sounds

***The Vocal Tract***

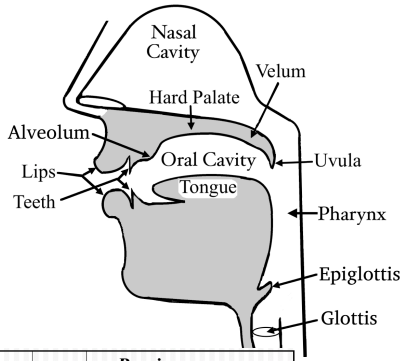
- The vocal tract consists of three parts: 1. Pharynx, 2. Oral cavity, and 3. Nasal cavity

***The Pharynx***

- air moves through the pharynx up to the oral and nasal cavities
- the pharynx doesn't move, but the tongue can move back towards the rear wall of the pharynx
- This makes pharyngeal sounds like ħ and ʕ

***The Oral Cavity***

- The oral cavity is responsible for the majority of variation in sounds produced in any language
- An important aspect of this production is the use of various articulators, which make contact or come close to different parts of the oral cavity
- Depending on where the articulators make contact, different sounds are produced




***Place of Articulation***

- Place of Articulation refers to the position within the oral cavity where one articulator makes contact or near contact with another
- Each combination produces a different sound represented in the IPA chart
- Some combinations are not possible, e.g. lips with pharynx, tongue and glottis, etc.

***IPA Places of Articulation***

- The IPA divides the vocal tract into 11 different places:
  - 1. Bilabial
  - 2. Labiodental
  - 3. Dental
  - 4. Alveolar
  - 5. Postalveolar
  - 6. Retroflex
  - 7. Palatal
  - 8. Velar
  - 9. Uvular
  - 10. Pharyngeal
  - 11. Glottal

| *Active* | | *Passive* |
|---|---|---|
| Lower lip | | Upper lip |
| Tip of the tongue | | Teeth |
| Blade of the tongue | | Hard palate |
| Back of the tongue | | Alveolar ridge |
| Root of the tongue | | Velum |
| | | etc. |