

The Speech Mechanism



- Speech is an overlaid function
 - there are no organs whose primary function is to produce speech
- Articulators - parts of the speech mechanism that serve to produce different configurations which make up different sounds

Four Parts of the Speech Mechanism



- Oral Cavity
- Nasal Cavity
- Pharynx
- Larynx

Oral Cavity (oro/oral)

- Lips (labio/labial) - bounded by the cheeks, chin, and nose
 - orbicularis oris - “lip muscle” that can contract to round, protrude, or spread the lips to make various speech sounds
 - philtrum - grooved indentation in the center of the upper lip
 - vermilion - adaptation of the mucous membrane that lines the mouth; reddish color
 - sounds produced at lips
 - bilabial /p, b, m, w/
 - labio-dental /f, v/

Oral Cavity (con't)



- Teeth (dento/dental)- important for sounds involving “lip & teeth” and “tongue & teeth”
 - labio-dental sounds /f, v/ (“lip + teeth”)
 - lingua-dental sounds /t, d/ (“tongue + teeth”)
 - Dental occlusion - how the teeth fit together when you bite down
 - abnormal bite is a “malocclusion”
 - neutroclusion (normal jaw relationship)
 - distocclusion (retruded mandible)
 - mesiocclusion (protruded mandible)

Oral Cavity (con't)



- Alveolar ridge (alveolo/alveolar) - gum ridge
 - sounds made at alveolar ridge -
 - /t, d, l, n, s, z/

Oral Cavity (con't)



- Hard palate (palato/palatal) - anterior roof of mouth
 - bone covered with membrane
 - sounds made at hard palate
 - /tʃ, dʒ, j, ʃ, ʒ/

Oral Cavity (con't)



- Velum (velo/velar) - soft palate
 - movable fold of mucuous membrane that is continous with hard palate
 - divides oral cavity from nasal for non-nasal sounds --> is LOWERED for nasal sounds
 - sounds made at velum - /k, g, ŋ/
 - uvula - "little grape"
 - serves little function in humans

Oral Cavity (con't)



- Tongue (lingua/lingual) - most important of the articulators
 - muscular organ capable of intrinsic (finer shapes) and extrinsic movements (responsible for up/down; backward/forward)
 - divided into parts:
 - tip
 - front or blade - beneath alveolar ridge
 - middle - beneath hard palate
 - back - beneath velum
 - root - most posterior part of tongue

Oral Cavity (con't)



- Mandible (mandibulo/mandibular) - lower jaw
 - regulates the size of opening beneath teeth
 - tongue is connected to mandible by the *lingual frenum* which attaches tip and blade of tongue to floor of mouth

Oral Cavity (con't)



- Facial muscles - important in controlling cheeks and size of mouth
 - aids in building intra-oral breath pressure

Nasal Cavity (naso/nasal)



- Extends from the nostrils (nares) to pharynx (throat)
- important in resonance by opening or closing of velopharyngeal port
 - velopharyngeal valve or port is formed by the soft palate making contact with the pharyngeal wall
 - must be closed for vowels and non-nasal consonants

Pharynx

(pharyngo/pharyngeal)



- Throat
- extends from the posterior portion of the nasal cavity downward through the back of the oral cavity to the larynx
- pharynx is a vertical tube with 3 parts

Pharynx (con't)

- Nasopharynx - continuation of the nasal cavity
 - uppermost part of pharynx; directly behind nasal cavity
 - nasopharynx can be closed off from the oropharynx where they join at the velopharyngeal port
- Oropharynx - continuation of the oral cavity
 - opens to mouth
 - very versatile in assuming a variety of configurations
- Laryngopharynx - area just above larynx
 - vibrating mechanism that houses the vocal folds
 - sits on top of trachea

Larynx



- Two purposes of larynx
 - Prevent food from going into trachea
 - epiglottis -- leaf-like cartilage below root of tongue and at junction of oropharynx and laryngopharynx
 - covers glottis during eating and drinking to prevent food and liquids from going into lungs
 - Create a constriction in vocal tract which produces a sound source for communication

Anatomy of Larynx



- cricoid cartilage - bottom ring of larynx that sits on top of trachea
 - looks like a signet ring
- arytenoid cartilages - mobile, paired, pyramid-shaped cartilages that sit on top of cricoid cartilage
 - they attach to the vocal folds so that movement of the arytenoid cartilages moves the vocal folds

Anatomy of Larynx (con't)

- thyroid cartilage - largest structure of larynx
 - shield-shaped cartilage that protects vocal folds
 - referred to as "Adam's apple"
- hyoid bone - only bone in body not connected to other bones
 - attached to muscles and ligaments involved in swallowing and phonation
 - is a horse-shoe or "U"-shaped bone just above thyroid cartilage

Anatomy of Larynx (con't)

- Vocal folds - mucous membranes that attach separately to the arytenoid cartilages in back of larynx and come together in front at angle of thyroid cartilage
- Positions of vocal folds
 - open (abducted) - for normal inhalation/exhalation
 - closed (adducted) - for phonation

Anatomy of Larynx (con't)

- Glottis -- opening in the vocal folds
 - two sounds produced at level of glottis /h, ʔ/
- vocal folds vibrate to produce voicing
- middle of vocal folds vibrate to produce voicing