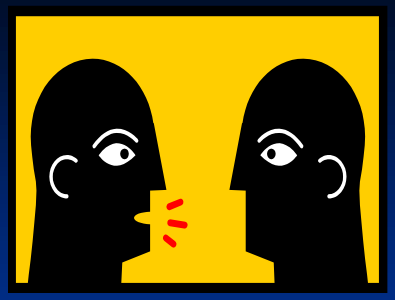
APPROACHES TO LANGUAGE

Lecture 2:

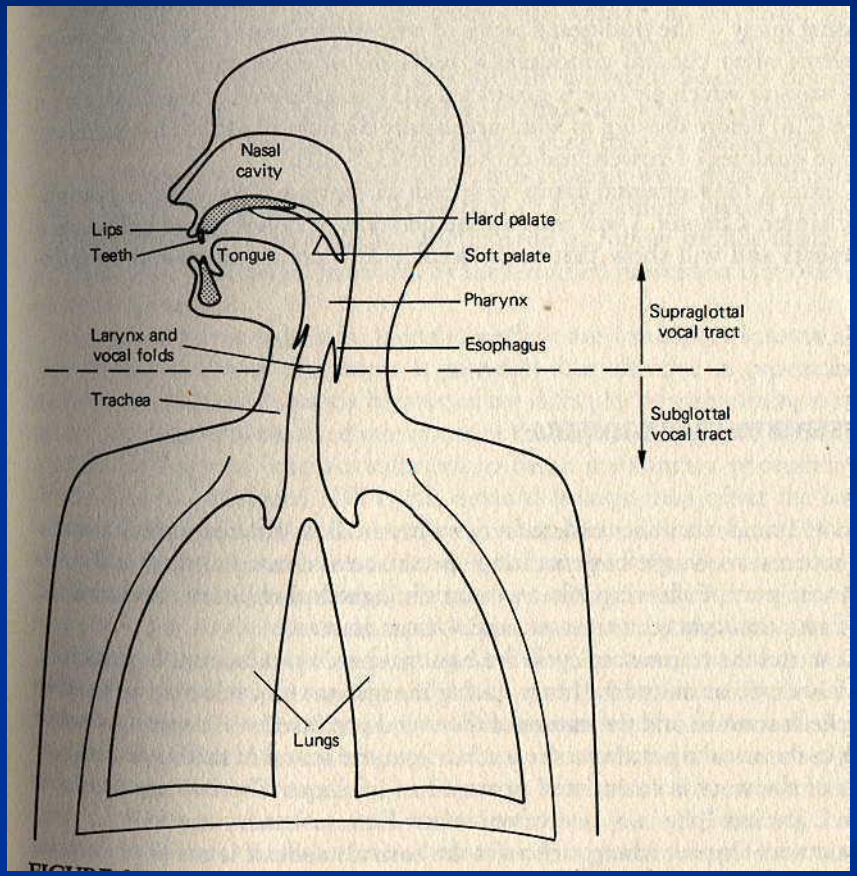
The Sound System



- **Phonetics** – describes how speech sounds are formed and articulated: how the vocal tract produces the sounds of languages.

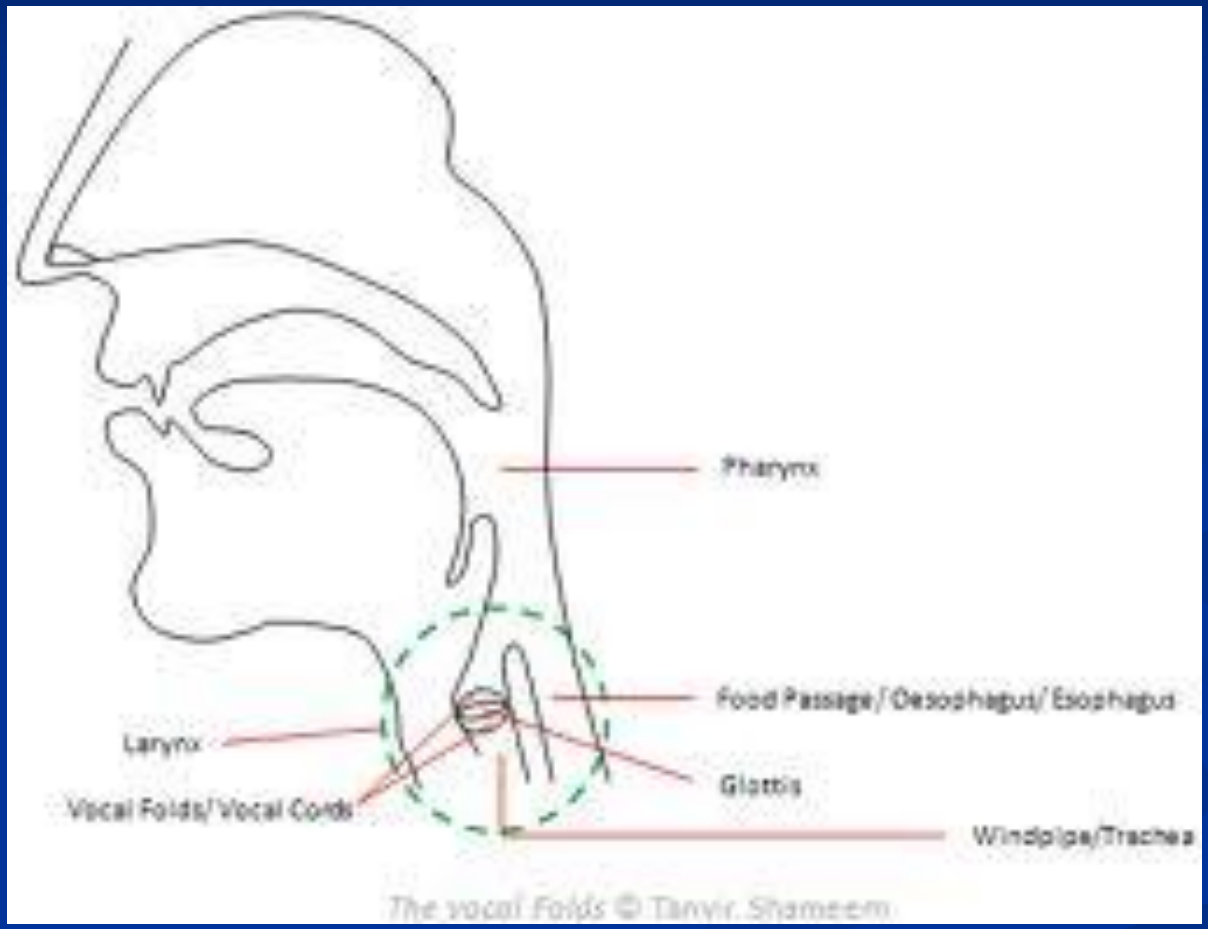
- **Phonology** – investigates the relationship between speech sounds and meanings; how speech sounds are organised into systems in languages.

How do we make speech sounds? The vocal tract



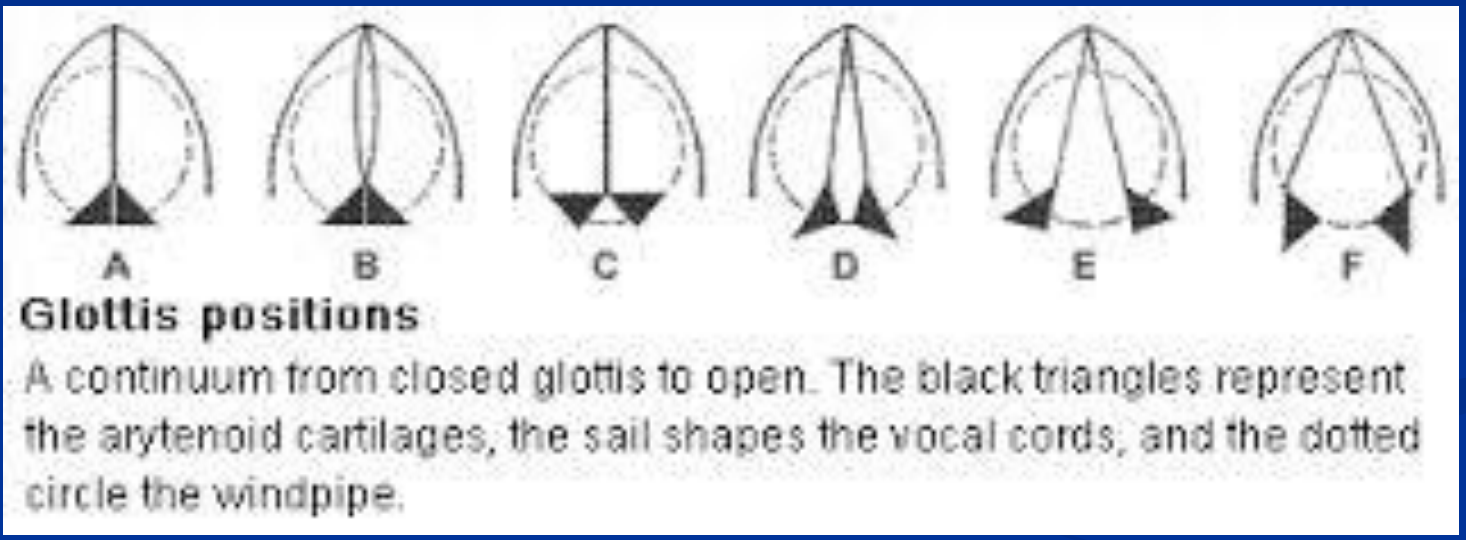
The production of sounds involves the movement of air: lung air is pushed through the vocal cords and the throat, into the mouth or nose.

The glottis



Glottis: the opening between the vocal cords

The glottis

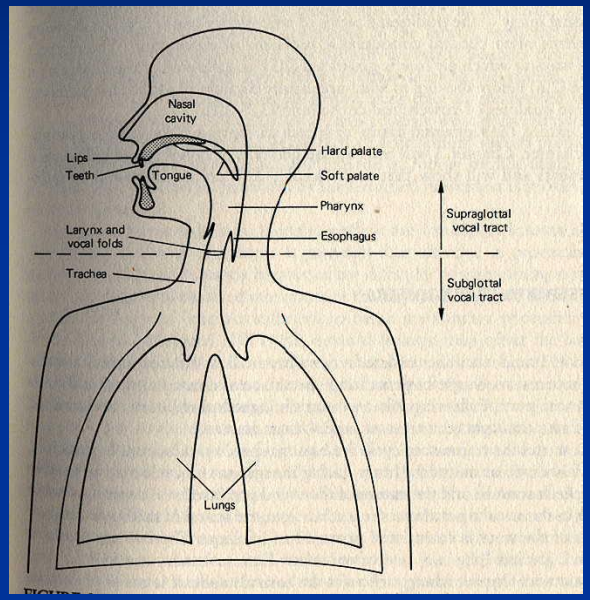


Glottis positions

A continuum from closed glottis to open. The black triangles represent the arytenoid cartilages, the sail shapes the vocal cords, and the dotted circle the windpipe.

Glottis positions

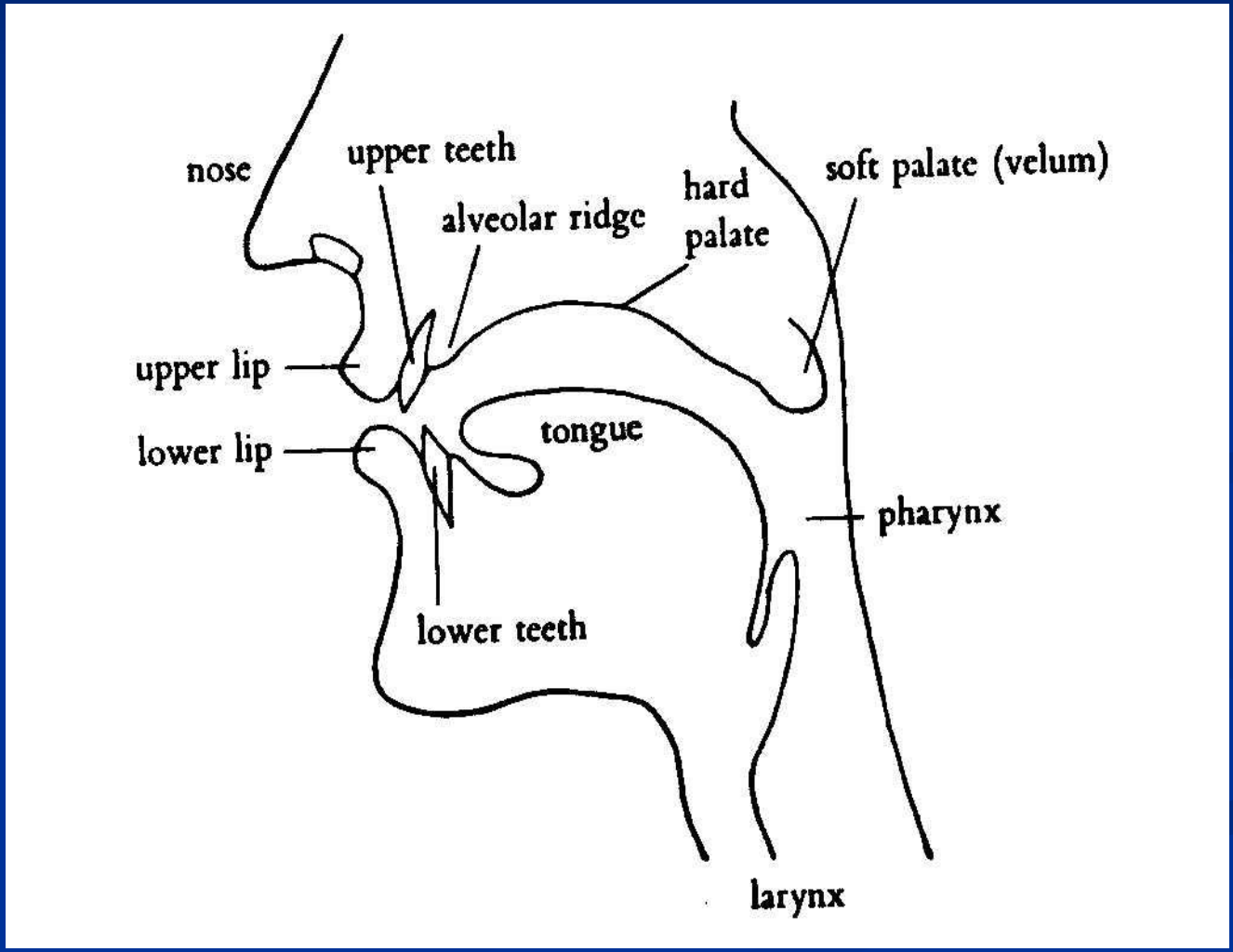
Pulmonic egressive airstream



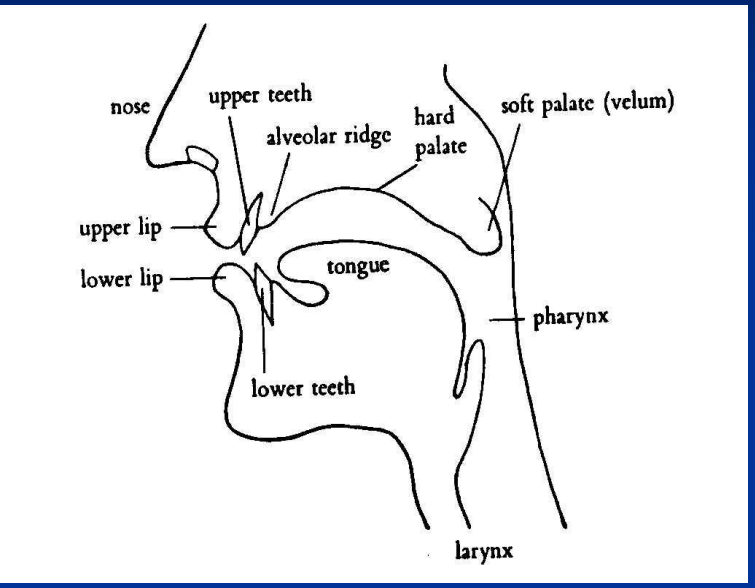
Pulmonic egressive sounds: the air coming into the vocal tract is generated by the lungs; These are sounds made by manipulating air as it is exhaled from the lungs.

Pulmonic egressive sounds are found in all human languages.
English: all of the sounds are pulmonic egressive.

Active/passive articulators



Active/passive articulators

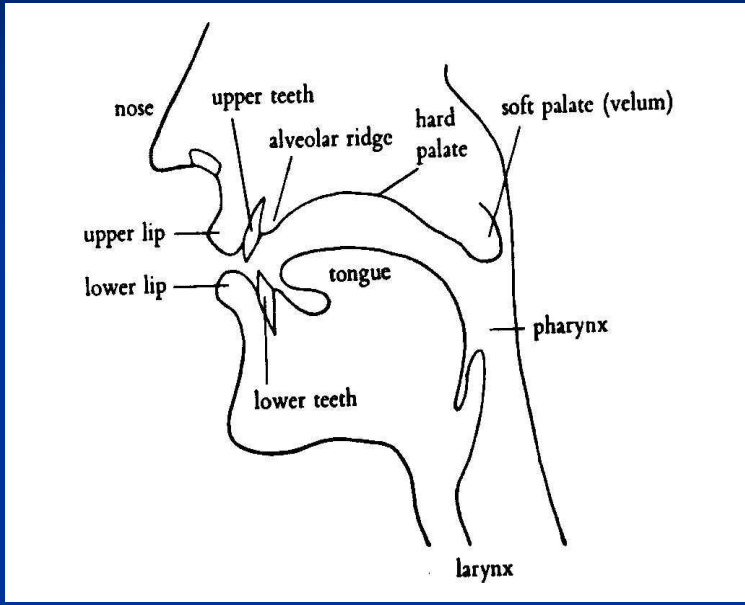


The active articulator usually moves in order to make the constriction. The passive articulator usually just sits there and gets approached.

Examples of passive articulators:

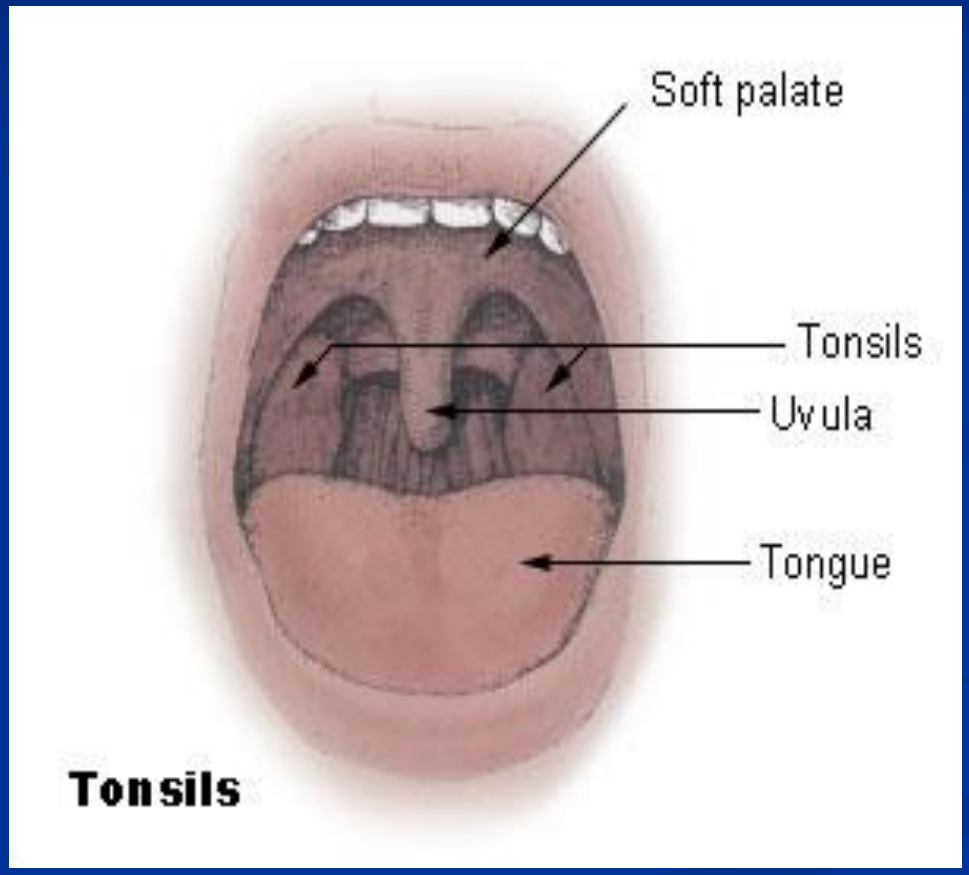
- Upper lips
- The upper teeth, (*dental*)
- The alveolar ridge, just behind the teeth (*alveolar*)
- The back of the alveolar ridge (*post-alveolar*)
- The hard palate on the roof of the mouth (*palatal*)
- The soft palate further back on the roof of the mouth (*velar*)
- The uvula hanging down at the entrance to the throat (*uvular*)

Active articulators



Tongue: the most important active articulator.
Lower lip: [f] & [v]

Articulators



What are the benefits to linguists (and non-linguists) in describing speech sounds?

How do linguists describe speech sounds?

- The air stream: pulmonic egressive sounds

- The vocal cords – voicing and glottal stop: voiced vs. voiceless sounds; glottal stop: the air is stopped completely at the glottis (vocal cords are tightly closed and then released)

- The soft palate or velum: oral vs. nasal sounds

Oral sounds: Velum is up, the air can escape through the mouth, [p]

Nasal sounds: Velum is down, air escapes through the mouth and nose, [m]

How do linguists describe speech sounds?

- The place of articulation: where in the vocal tract the airflow restriction occurs; combination of a *place of active articulation* and a *place of passive articulation,* e.g. labiodental, [f], touch the bottom lip to the upper teeth)

- The manner of articulation: how is the airstream affected as it flows from the lungs? Blocked or partially blocked; The vocal cords may vibrate or not (voiced vs. voiceless sounds).

KEY DESCRIPTORS FOR CONSONANTS

- **PLACE OF ARTICULATION** – primary articulation (the place of maximum obstruction)/main closure/narrowing is made e.g. lips /b/(both lips come together); hard palate e.g. /s/(the sides of the front of the tongue are raised towards the hard palate)

KEY DESCRIPTORS FOR CONSONANTS

- **MANNER OF ARTICULATION** –

  types of movement/constriction that takes place at the site of articulation e.g. /m/ complete closure; the airstream is completely blocked in the oral cavity.

- **VOICING -** +/- voice

a. Voiced sounds: the vocal cords are together, the airstream forces its way through and causes them to vibrate, [z]

b. Voiceless sounds: the vocal cords are apart and the air flows freely through the glottis into the oral cavity, [p]

KEY DESCRIPTORS FOR VOWELS

- **PLACE OF ARTICULATION**: how forward or backward in the mouth is the tongue?

front/middle/back of mouth (which part of the tongue is involved/raised?) front/back, e.g. /i/ vs. /u/

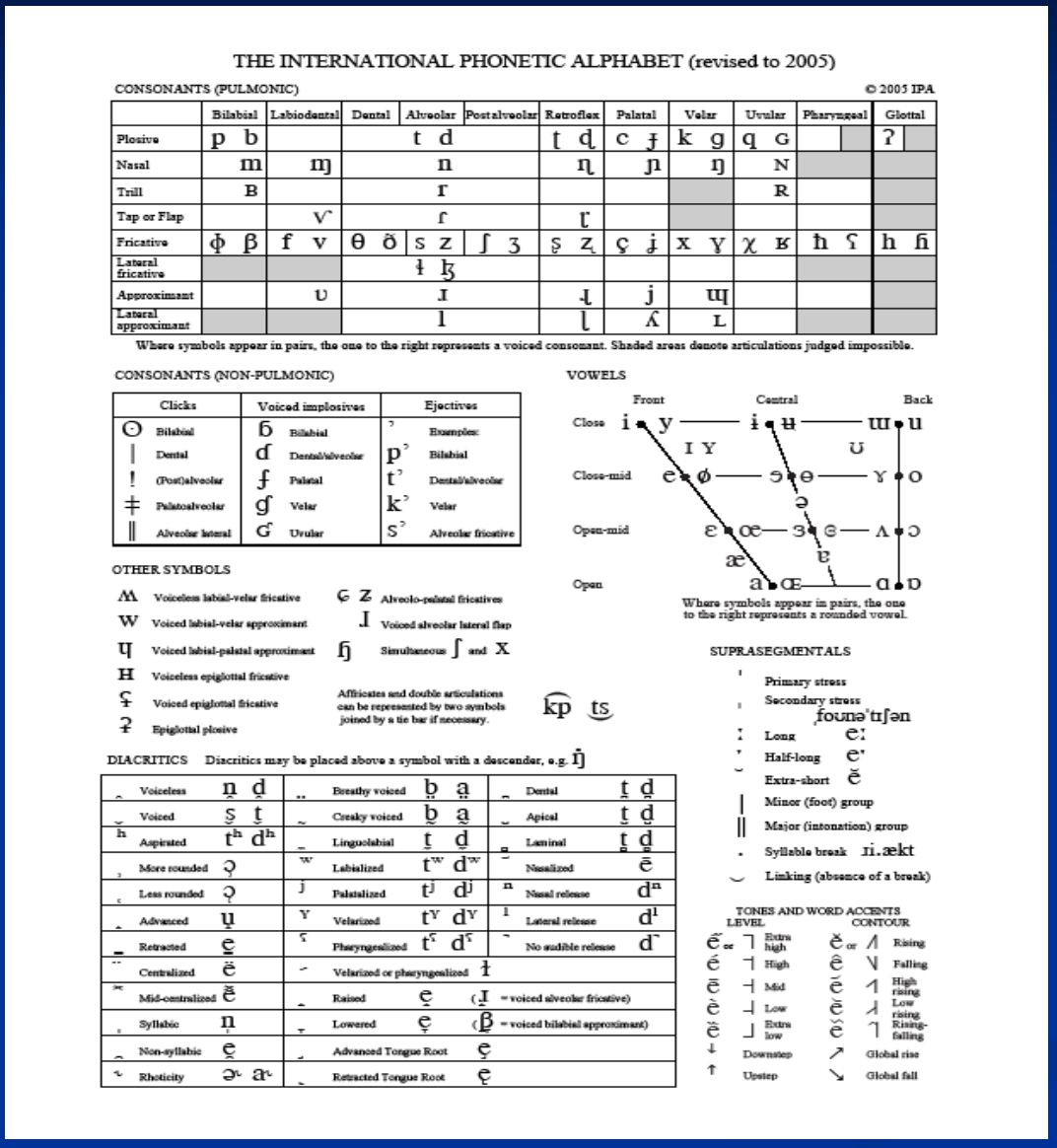
- **TONGUE HEIGHT**: How high/low in the mouth is the tongue?
  high/low e.g. /i/ - high; /a/ - low

KEY DESCRIPTORS FOR VOWELS

- **ARE THE LIPS ROUNDED OR SPREAD?**

Rounded, e.g. /u/, b**oo**t

IPA: International Phonetic Alphabet



THE INTERNATIONAL PHONETIC ALPHABET (revised to 2005)

CONSONANTS (PULMONIC) © 2005 IPA

	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			

Where symbols appear in pairs, the one to the right represents a voiced consonant. Shaded areas denote articulations judged impossible.

CONSONANTS (NON-PULMONIC)

Clicks		Voiced implosives		Ejectives	
ʘ	Bilabial	ɓ	Bilabial	ʼ	Examples:
ǀ	Dental	ɗ	Dental/alveolar	pʼ	Bilabial
ǃ	(Post)alveolar	ʄ	Palatal	tʼ	Dental/alveolar
ǂ	Palatoalveolar	ɠ	Velar	kʼ	Velar
ǁ	Alveolar lateral	ʛ	Uvular	sʼ	Alveolar fricative

OTHER SYMBOLS

ʍ	Voiceless labial-velar fricative	ɕ ʑ	Alveolo-palatal fricatives
w	Voiced labial-velar approximant	ɺ	Voiced alveolar lateral flap
ɥ	Voiced labial-palatal approximant	ʧ	Simultaneous ʃ and x
ʜ	Voiceless epiglottal fricative		
ʢ	Voiced epiglottal fricative		
ʡ	Epiglottal plosive		

Affricates and double articulations can be represented by two symbols joined by a tie bar if necessary. k͡p t͡s

DIACRITICS Diacritics may be placed above a symbol with a descender, e.g. ŋ̊

◌̥	Voiceless	n̥ d̥	◌̤	Breathy voiced	b̤ a̤
◌̬	Voiced	s̬ t̬	◌̰	Creaky voiced	b̰ a̰
◌ʰ	Aspirated	tʰ dʰ	◌̼	Linguolabial	t̼ d̼
◌̹	More rounded	ɔ̹	◌ʷ	Labialized	tʷ dʷ
◌̜	Less rounded	ɔ̜	◌ʲ	Palatalized	tʲ dʲ
◌̟	Advanced	u̟	◌ˠ	Velarized	tˠ dˠ
◌̠	Retracted	e̠	◌ˤ	Pharyngealized	tˤ dˤ
◌̈	Centralized	ë	◌̴	Velarized or pharyngealized	ɫ
◌̽	Mid-centralized	e̽	◌̝	Raised	e̝ (ɹ̝ = voiced alveolar fricative)
◌̩	Syllabic	n̩	◌̞	Lowered	e̞ (β̞ = voiced bilabial approximant)
◌̯	Non-syllabic	e̯	◌̘	Advanced Tongue Root	e̘
◌˞	Rhoticity	ə˞ a˞	◌̙	Retracted Tongue Root	e̙

VOWELS

SUPRASEGMENTALS

ˈ	Primary stress
ˌ	Secondary stress ˌfoʊnəˈtɪʃən
ː	Long eː
ˑ	Half-long eˑ
◌̆	Extra-short ĕ
|	Minor (foot) group
‖	Major (intonation) group
.	Syllable break ɹi.ækt
‿	Linking (absence of a break)

TONES AND WORD ACCENTS

LEVEL		CONTOUR	
˥ or ◌̋	Extra high	˩˥ or ◌̌	Rising
˦ or ◌́	High	˥˩ or ◌̂	Falling
˧ or ◌̄	Mid	˧˥ or ◌̌	High rising
˨ or ◌̀	Low	˨˩ or ◌̌	Low rising
˩ or ◌̏	Extra low	˩˥˩ or ◌̌	Rising-falling
↓	Downstep	↗	Global rise
↑	Upstep	↘	Global fall

1888, Member of the International Phonetic Association: Phonetic alphabet to symbolize the sounds of all languages.

Vowels & consonants

- **Consonants** – phonetic definition: sounds which are made by closure or narrowing in the vocal tract – air escapes with audible friction

- **Vowels** – phonetic definition: sounds that escape vocal tract with limited restriction

Consonants/vowels

- **Consonants** – phonological definition: sound units that often occur at the edges of syllables e.g. CVC – *map*
- **Vowels** – phonological definition: sound unit in the centre of a syllable, e.g. m*a*p
- [l], [r], [w], [j]- approximants: the articulators approximate a frictional closeness but not actual friction occurs; little obstruction of the airstream in the mouth
  [w] [j] = 'semi-vowels'; minimal restriction of the airflow in articulation, vowel-like sounds

Place of Articulation

- Bilabial – e.g. [p], [b], [m]
- Labiodental – e.g. [f], [v]
- Dental – e.g. in 'thin' [θ]
- Alveolar –e.g. [t], [s]
- Post-alveolar or palato-alveolar – e.g. in '**sh**ip'
- Retroflex – e.g. retroflex 'r' in Somerset English
- Palatal – e.g. as in German 'ich' or a palatal sound in English is the approximant [j]
- Velar – e.g. [k], [g]
- Glottal – e.g. [h], [ʔ] (glottal stop).

Manner of Articulation

- Consonants that make total closure:
  i. plosives e.g. [p] [b]
  ii. nasals e.g. [m] [n]
  iii. affricates e.g. ‘ch’

- Consonants that make partial closure; some obstruction of the airstream
  i. Laterals e.g. [l]

- Consonants with a narrowing; severe obstruction that causes friction, narrow passage allows the air to escape
  i. fricatives e.g. [f] [z]

- Consonants with an intermittent closure
  i. flaps e.g. ‘d’ in ‘madder’; a flick of the tongue against the alveolar ridge

English Vowel Symbols

ɪ bit; e bet; æ bat; ʌ cut; ɒ cot; ʊ put;
ə about, China

iː eat; ɑː palm; ɜː earn; ɔː paw; uː too

eɪ day; aɪ die; ɔɪ boy; aʊ how; əʊ go; ɪə fear; eə air; ʊə poor

English Consonant Symbols

p pin; t tin; k kin; b bin; d din; g girl

f fin; θ thing; s sing; ʃ shoe; h how; tʃ chin;
v van; ð this; z zoo; ʒ measure; dʒ gin

m more; n no; ŋ sing; l low; r red; w wet; j yet

Try to write the phonetic symbol for the first sound in these words

1. Jip
2. Call
3. Three
4. Sugar
5. Phonetics
6. Apple
7. Children
8. Psychology

1. dʒ +v palato-alveolar plosive
2. K –v velar plosive
3. Θ –v dental fricative
4. ʃ –v palato-alveolar fricative
5. f –v labiodental fricative
6. æ front low vowel
7. tʃ –v palato-alveolar affricate
8. s –v alveolar fricative

Write the phonetic symbol for the sound at the end of the word

1. High
2. Cough
3. Thing
4. Reach
5. Tooth
6. Mirror
7. Crash
8. flag

1. aɪ
2. f
3. ŋ
4. tʃ
5. ϴ
6. ə
7. ʃ
8. g

Now write your name

Phonology

- Concerned with how we organise speech sounds in languages & how this organisation affects meanings in different languages; what sounds are in your language and which sounds are foreign?

- Phonetic features used for word identification in languages,

pat vs. *bat* : voicing in English is important to identifying a word

Summary

- Phonetics – focus > articulatory phonetics
- Described how speech sounds (phonemes) are produced & classified.
- Considered why this might be important to Applied Linguists.

What do these sounds have in common and how do they differ? Use the IPA chart

- ra***t*** – rai***d***
- ***sh***ip – mea***s***ure
- sh***ee***p – sh***i***p
- ***m***eat – mea***n***
- ***th***is - ***th***in

- [t] versus [d] – both alveolar plosives;
  - [t] = voiceless [d] = voiced
- [ʃ] versus [ʒ] – both post-alveolar fricatives
  - difference in voicing
- [iː] versus [ɪ] – both front high vowels
  - differ in length
- [m] versus [n] – both nasal (manner) + voiced
  [m] = bilabial [n] = alveolar
- [ð] versus [θ] – both dental fricatives
  [ð] is voiced; [θ] is voiceless

Transcribe these in your accent:

- Grass
- Moat
- Ship
- Circumstance
- Fellow
- Rake
- Lumpy
- Butter

Post-class reading & references

- Fromkin, Rodman & Hyams, Chapter 6 & 7
- Crystal, Chapters 4,5,9,10,11
- Nunan, Chapter 2

- Some diagrams taken from Setter (University of Reading, 2008)

Concepts Introduced

- Active/passive articulators
- IPA – International Phonetic Alphabet
- Phonetics
- Phonology
- Pulmonic egressive airstream
- Vocal folds
- Vocal organs
- Vocal tract