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PROGRAMME FOR PRIVATE SCHOOL TEACHERS**



Ministry of Finance



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Institute of Education, UCC

EBS313: PHONETICS AND PHONOLOGY

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THE INTERFACE BETWEEN GRAMMAR AND PHONOLOGY

What is Grammar?

Grammar is a ‘set of formal patterns in which words are arranged to convey meaning’ or ‘a branch of linguistic science...concerned with the description, analysis and formulization of formal language patterns.

Grammar, in a narrow sense, is the study of the **rules/principles** governing the use of a language or *a combination of **morphemes** to form larger units which can express more complex messages than the individual morpheme can.

Traditionally, a distinction is made between **morphology**: the rules for combining morphemes to form words, and **syntax**: the rules for combining words to form sentences. Syntax is a science which studies sentences, their structure, arrangement, and the relationship among words in a sentence.

Syntax has to do with how words are put together to build phrases, with how phrases are put together to build clauses or bigger phrases, and with how clauses are put together to build sentences’ (Miller, 2002). It is the study of how words combine to form sentences and the rules which govern the information of sentences (Richards, Platt, Weber, 1987).

The definition takes into account, meanings and functions these sentences have in the overall system of language... it may or may not include the description of the sounds of language (Richards, 1992).

Grammar is a theory:

descriptive grammar

functional grammar

traditional grammar

competence grammar

performance grammar

universal grammar

WHAT IS A TEXT?

When people speak or write, they produce text: produced by writing and speech; and **text** is what **listeners** and **readers** engage with and interpret. The term ‘text’ refers to any instance of language, in any medium, that makes sense to someone who knows the language; we can characterize text as **language functioning in context** (Halliday & Hasan, 1976; 1; Halliday, 2010).

Language is, in the first instance, a resource for making meaning; so text is a process of making meaning in context.

To a grammarian, text is a rich, many-faceted phenomenon that ‘means’ in many different ways.

What distinguishes the **texts** is the way these resources are deployed.

*Constituency

Grammatical Constituents

RANK/UNIT

Upwards



Bottom

clause



group/phrase



word



morpheme

PHONOLOGICAL CONSTITUENCY

(1) phonological is perhaps the most **noticeable** dimension of language is its compositional structure, known as ‘constituency’: larger units of language **consist of** smaller ones and smaller units are **constituents** of bigger units.

The patterns of any sub-system of language such as the sub-system of sounding, or phonology, are distributed across units of **varying size**, ranging from the largest units of that sub-system to the smallest.

Units of different sizes carry different kinds of pattern; for example, in phonology, the largest units carry melodic patterns/intonation, and the smallest units carry articulatory patterns/phonemes.

If we listen to any texts in its **spoken** form we will hear continuous melody with rising and falling pitch, and with certain moments of prominence marked by either relatively rapid pitch changes or extended pitch intervals (cf. Halliday & Greaves, 2008).

PHONOLOGY

Rhythm



Intonation



Stress



Syllable



Phoneme

PHONETICS AND PHONOLOGY

• **Phonetics:** ‘The scientific study of **speech**, the discovery of how speech sounds are produced, how they are used in spoken language, how we can record speech sounds with written symbols, and how we hear and recognize different sounds’.

Phonology: ‘The study of the sound **systems** of **languages**. The most basic activity in phonology is **phonemic** analysis, in which the objective is to establish what the phonemes are and arrive at the phonemic inventory of the language”.

Roach (1992:81)

Phonetics is the study of the allophonic manifestation, how the sounds of speech are actually made.

Phonology is “the study of phonemes and their relations in sound systems”.

Widdowson (1996:42)

‘The study of pronunciation consists of two fields, namely phonetics and phonology.

Phonetics refers to the study of sounds. A phonetician usually works in one or more of the following areas: physiological phonetics, articulatory phonetics, acoustic phonetics, auditory phonetics and perceptual phonetics.

If phonetics deals with the physical reality of speech sounds then phonology is concerned with how we interpret and systematize sounds. Phonology deals with the system and pattern of the sounds which exist with particular languages”.

Kelly (2000:9)

‘Phonetics is the general study of the characteristics of speech sounds’ whereas, phonology, ‘... is essentially the description of the system of patterns of speech sounds in a language. It is, in effect, based on a theory of what every speaker of a language unconsciously knows about the sound patterns of that language.’ He continues (ibid),” because of their theoretical status, phonology is concerned with the abstract or mental aspect of the sounds in language rather than with the actual physical articulation of speech sounds.

Yule (2006:30-43)

They introduce phonology as the “the science of speech sounds and sound patterns. This means when we say “a sound pattern”, we mean:

- 1) the set of sounds that occur in a given language,
- 2) the permissible arrangement of these sounds in words, and
- 3) (3) the processes of adding or changing sounds’.

Sloat, Taylor & Hoard (1978:1)

SIMILARITIES

Comparing the above definitions, there are some **similarities** and **dissimilarities** between phonetics and phonology. Roach (1992), Widdowson (1996), Kelly (2000), and all the others share one idea regarding this topic.

They almost all agree that: both phonetics and phonology are (i) the study of **sounds systems**".

(ii) sub-disciplines of Linguistics: a scientific study of language, with different branches; e.g. **phonetics, phonology**, morphology, syntax, semantics, pragmatics, sociolinguistics, etc.

(iii) study the prosody of language (rhythm, stress and intonation which are properties of the syllable).

DIFFERENCES

Phonology is the study of speech sounds in a **particular** language’.

Phonetics is the study of the inventory of all **SPEECH SOUNDS**, which humans are capable of producing, the speech sounds of all human languages (universal).

Phonetics provides a more practical/physical way of describing and analyzing these features.

Phonology uses theories.

Feller (2007)

- ▶ Phonetics is the study of the sound themselves
- ▶ Looks at the **physical** knowledge and presents it
- ▶ Allows a person to know about the sound which s/he produces
- ▶
- ▶ Studies the ways in which speech sounds form systems and patterns
- ▶ Looks at **mental** knowledge and describes it
- ▶ Allows speakers of a language to
- ▶ produce meaningful sounds or to
- ▶ recognize a foreign language

Anderson (2005)

- ▶ It deals with the properties of the sounds from independent point of view.
- ▶ It is concrete.
- ▶
- ▶ Constitutes the study of the sound structure of units within individual languages
- ▶ To elucidate the systems of distinctions in sound which differentiate such units within a particular language
- ▶ Studies invariant of sounds structure and of the variation
- ▶ Abstract
- ▶

lingual links library

- ▶ It provides the basis for phonological analysis
- ▶ Analyses the production of all human speech sounds, regardless of the language.
- ▶ Provides the basis for further work in morphology, syntax, discourse and anthropology design
- ▶ analyses the sound patterns of a particular language by determining which phonetic sound are significant , and explains how these sounds are interpreted by the native speaker

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- ▶ The study of the production, perception, and physical properties of speech sounds
- ▶ The study of how sounds interact in various languages and discusses topics such as segmental phenomena, phonemic inventories and allophones, sound-change rules of ordering
- ▶ Suprasegmental phenomena:
- ▶ syllabification, prominence, tones, intonation

- ▶ With reference to the above, one can infer that phonetics and phonology are two different sub-fields in linguistics. Though both study the speech of language, the way each one of them studies/introduces them is entirely different from one another.
- ▶ Phonetics is the **basis** for phonological analysis, while Phonology is the basis for a further work in morphology, words, syntax...etc.
- ▶ This suggests that phonetics and phonology are entirely related to each other. Phonology starts from where phonetics ends. Since Phonetics studies of how the sounds are produced or articulated, the job of Phonology is to complete what phonetics has started.
- ▶ This is determined by how sounds are” combined, organized and convey meaning in particular languages”.

PHYSIOLOGY OF SPEECH

- ▶ **Speech** is made by human beings and not animals; animals do not make speech. Both man and animals make sounds. Humans are able to make speech because they have a well-defined vocal tract system that is capable of modifying the sounds into speech, which animals do not have.
- ▶ These sounds are made through the use of *organs*; but their primary physiological functions are not for communication. They have their basic functions which are not for speech production. Thus, they are **adopted** for speech production.
- ▶ The production of speech begins from the lungs; a stream of air is generated in the lungs, which undergoes some modifications in the upper parts of the respiratory tract before it acquires the quality of speech sound we hear.
- ▶ Speech begins by inhalation (breathing in). Before speech is made, there must be an **inhalation** (breathing in).

- ▶ The inhaled air enters into the **lungs**, from the **lungs** it enters the **trachea** or the wind pipe (Adam's apple), where it passes through the **larynx** (located below the trachea) and then into the **vocal tract** (where it is **modified**).
- ▶ Within the larynx, there are two spongy-like tissues called vocal folds,
- ▶ its opening (glottis).
- ▶ That is the production of speech involves the **lungs**, **vocal folds** and **vocal tract**.
- ▶ Speech can thus be seen as a *controlled breathing*.

- ▶ The ***Larynx*** is a box-like structure composed of two ***Cartilages*** and inside these cartilages are two tissues called the ***Vocal Folds*** (**vocal cords**). The gap between the vocal folds is called the ***GLOTTIS***.
- ▶ ***Larynx/vocal folds/glottis***
- ▶ Articulation
- ▶ Articulatory system: *larynx and vocal tract

INITIATION

Respiratory system: breathing (lungs, muscles, bronchial tubes, trachea, etc.);

PHONATION

Phonatory system: consists of the bronchial tubes; end in the windpipe-known as the trachea.

At the top of the trachea is the larynx /læriŋks/, (the engine of phonatory system) and plays a very significant role in phonation/voicing).

The Phonatory System

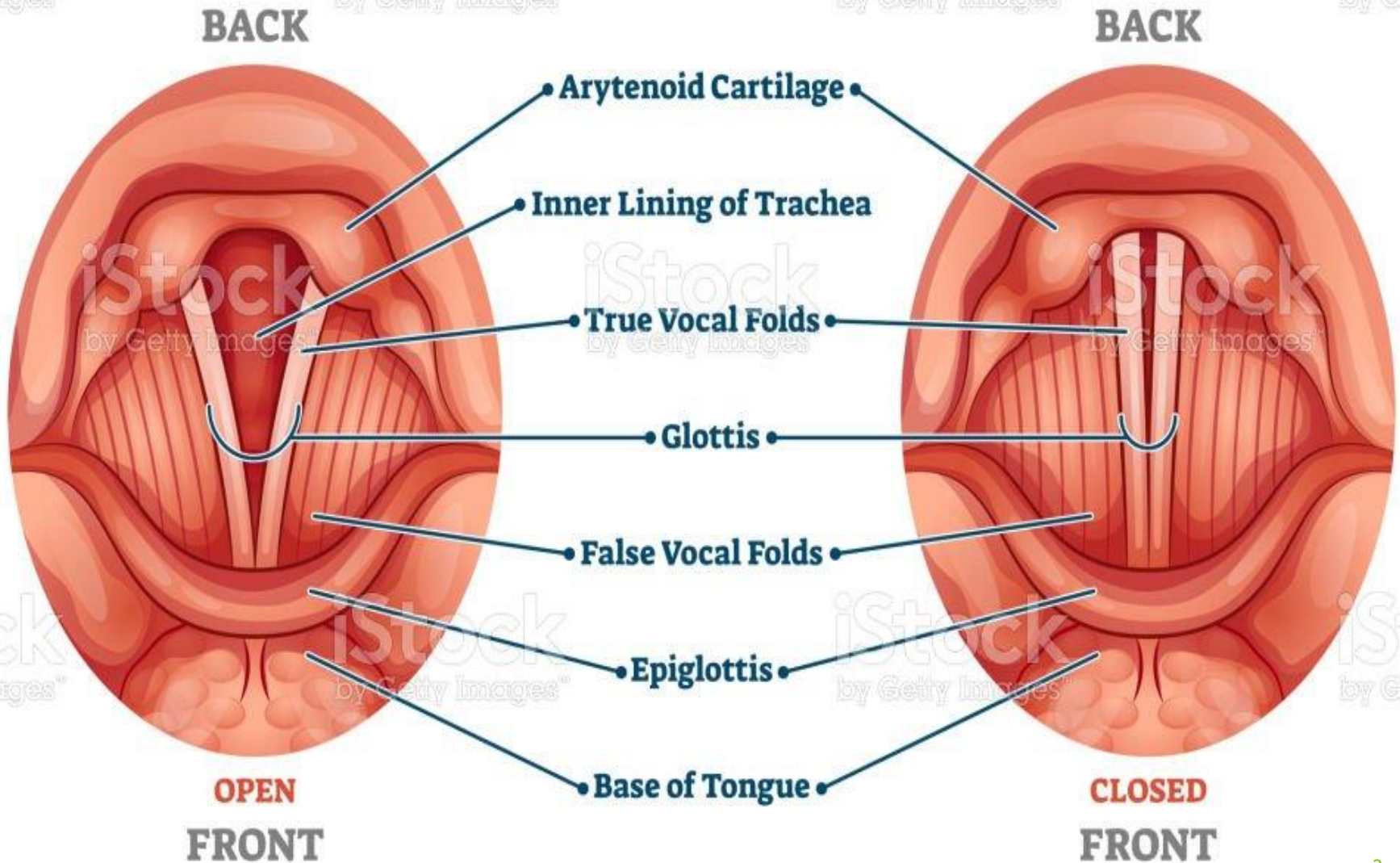
LARYNX

Located within the anterior aspect of the neck. The larynx is composed of 3 large, unpaired cartilages (cricoid, thyroid, epiglottis); 3 pairs of smaller cartilages (arytenoids, corniculate, cuneiform); and a number of intrinsic muscles.

FUNCTIONS

- ▶ Its **primary** function is to protect the lower airway by closing abruptly via a mechanical stimulation, to halt respiration and prevent the entry of foreign materials into the airway.
- ▶ The larynx/vocal folds control **voicing/phonation**.
- ▶ Voicing is controlled by the position of the glottis:
- ▶ The vocal folds (glottis) can assume different states/positions; each of them producing different phonation/voicing,
- ▶ E.g. voiced, voiceless, breathy, creak, etc.
- ▶ Phonation
- ▶ Pitch
- ▶ Speech production /h/ and [ʔ].

VOCAL CORDS



▶ The **state** of the glottis:

▶ (i) It can be ***Wide Apart**: the air passes through freely for normal breathing. Sounds made with a wide glottis are called-**Voiceless sounds**.

▶ E.g. English voiceless sounds: [p, f, θ, t, s, tʃ, ʃ, k, h]

▶ (ii) **Narrowed**; this is similar to a whispered vowel. The sound produced with a narrowed glottis is called **voiceless glottal fricatives**, e.g. /h/.

▶ (iii) **Tightly Closed**; the glottis can be firmly pressed together so that air cannot pass between them. The sound made with this state of the glottis is called glottal stop,

▶ e.g.[ʔ]

- ▶ **(iv) Touching or Nearly Touching each other;** the glottis can be pressed together so that the edges are touching or nearly touching each other. At this state the air passing through the glottis causes the folds to vibrate.
- ▶ The compressed air from the lungs **forces** the folds apart to allow air to escape. Sounds made with this state of the glottis are called voiced sounds,
- ▶ E.g. English voiced sounds: **[b, m, v, ð, d, n, r, ɹ, l, z, ʃ, ʒ, j, g, ŋ]**
- ▶ **Voiced sounds in other languages: [ϕ, β (v), ŋ, ʒ, ʀ, d, ŋ, j, ɲ, ɣ, L, ʉ, G, N, R, B]**

Functions of the Vocal Folds

- ▶ The rate of vibration of the vocal folds is called *Frequency*; this is perceived as pitch. The higher the frequency the higher the pitch is perceived by the listener.
- ▶ The vocal folds can be tensed or relaxed. When they are *TENSED* they produce high pitch, when they are *RELAXED*, they produce low pitch. A change in pitch can result to a change of meaning of words in Tone languages.
- ▶ Pitch in English is the basis of intonation (non-tone language).
- ▶ **Longer and larger folds produce slower vibrations.** Hence men generally produce lower pitch than females because they have larger vocal folds than women.
- ▶ Note: the larynx helps in producing pitch, sounds, and control voicing.

The ARTICULATORY SYSTEM

- ▶ (i) ***Larynx**
- ▶ (ii) ***Supra-glottal vocal tract**, abbreviated as **Vocal Tract**.
- ▶ The **vocal tract** consists of the passage from the **pharynx** through to the **lips**.

▶ **Articulation:-** articulation is used to refer to the **narrowing** or **constriction** of the vocal tract during the production of speech sounds.

▶ There are **mostly** two articulators in speech production, a **passive** articulator, which does not move (dormant), and an **active** articulator, which always moves **towards** the passive articulator.

▶ The **passive** articulator (the upper part of the vocal tract)

▶ The **active** articulator is most often some part of the tongue.

▶ Note: for some speech sounds, both articulators move so that distinction between the passive and active cannot be maintained.

There are different kinds of articulation.

Organs of Speech

- ▶ The Larynx, together with the vocal tract is known as **ORGANS OF SPEECH**.
- ▶ **Three resonating cavities can be distinguished:**
- ▶ Pharyngeal cavity located in the pharynx (throat, contains uvula)
- ▶ Oral cavity: mouth contains velum/soft palate, hard palate, teeth, alveolar ridge, and the tongue.
- ▶ Nasal cavity contains the nose

The Pharynx

- ▶ The pharynx is located directly above the **larynx**. At the upper end, its passage splits **into two**; one portion leading to the nasal cavity and the other to the oral cavity. Both the oral and pharyngeal cavities are together known as oral cavity.

Why the split?

- ▶ The position of the **soft palate** determines whether the air will pass through the **nasal cavity** or the **oral cavity**.
- ▶ The **soft palate or velum** can be **raised** to direct the airstream through the oral cavity or **lowered** to direct the airstream into the nasal cavity.
- ▶ Most speech sounds are oral, made with velic closure (soft palate raised to close the nasal cavity).
- ▶ Sounds made in the oral cavity are termed ***Oral Sounds***,
- ▶ ***e.g. [p, f, θ, t, s, ʃ, k, h, ð, d, ɹ, l, z, ʒ, j, ɟ]***
- ▶ Sounds made in the nasal cavity are called ***Nasal Sounds***,
- ▶ ***e.g. [m, n, ŋ]***

- ▶ **The Lips:-**very important organs of speech; can be moved, rounded or protruded to produce speech.
- ▶ **The Teeth:-**The term normally applies to sounds made by the tongue-tip against or close to the front teeth, e.g. English /θ, ð/.
- ▶ **Alveolar Ridge:-**The alveolar ridge is the part just after the upper front teeth; the ridge immediately behind the upper front teeth.
- ▶ **The Palate:-**The palate is the roof of the oral cavity. It is divided into two: hard and soft

- ▶ The **soft palate/velum** is the smooth part of the roof of the oral cavity.
- ▶ The **hard palate** is the hard part of the roof of the oral cavity.
- ▶ **The Uvula:-**located below the velum or the soft palate.
- ▶ **The Pharynx:-**located below the uvula; it is the cavity leading down to the larynx and the lungs.
- ▶ **The Nasal Cavity:-**This is located above the roof of the mouth.

The Tongue

- ▶ It is divide it into **five** parts:
- ▶ **The Tip:-** can be moved against a passive articulator to make a speech sound.
- ▶ **The Blade:-**the part of the tongue which lies below the alveolar ridge when the tongue is at rest.
- ▶ **The Front:-**lies below the hard palate when the tongue is at rest.
- ▶ **Back:-**lies below the soft palate when the tongue is at rest.
- ▶ **Root:-**faces downwards the rear wall of the pharynx

A

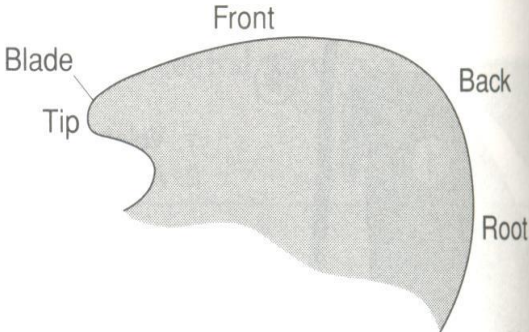


Figure A4.14 Divisions of the tongue

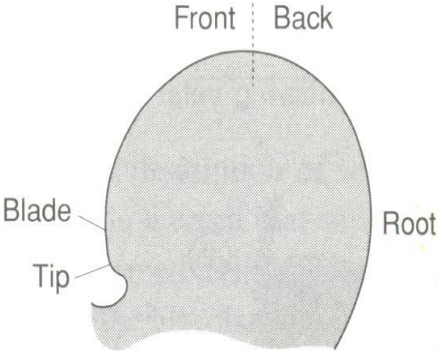
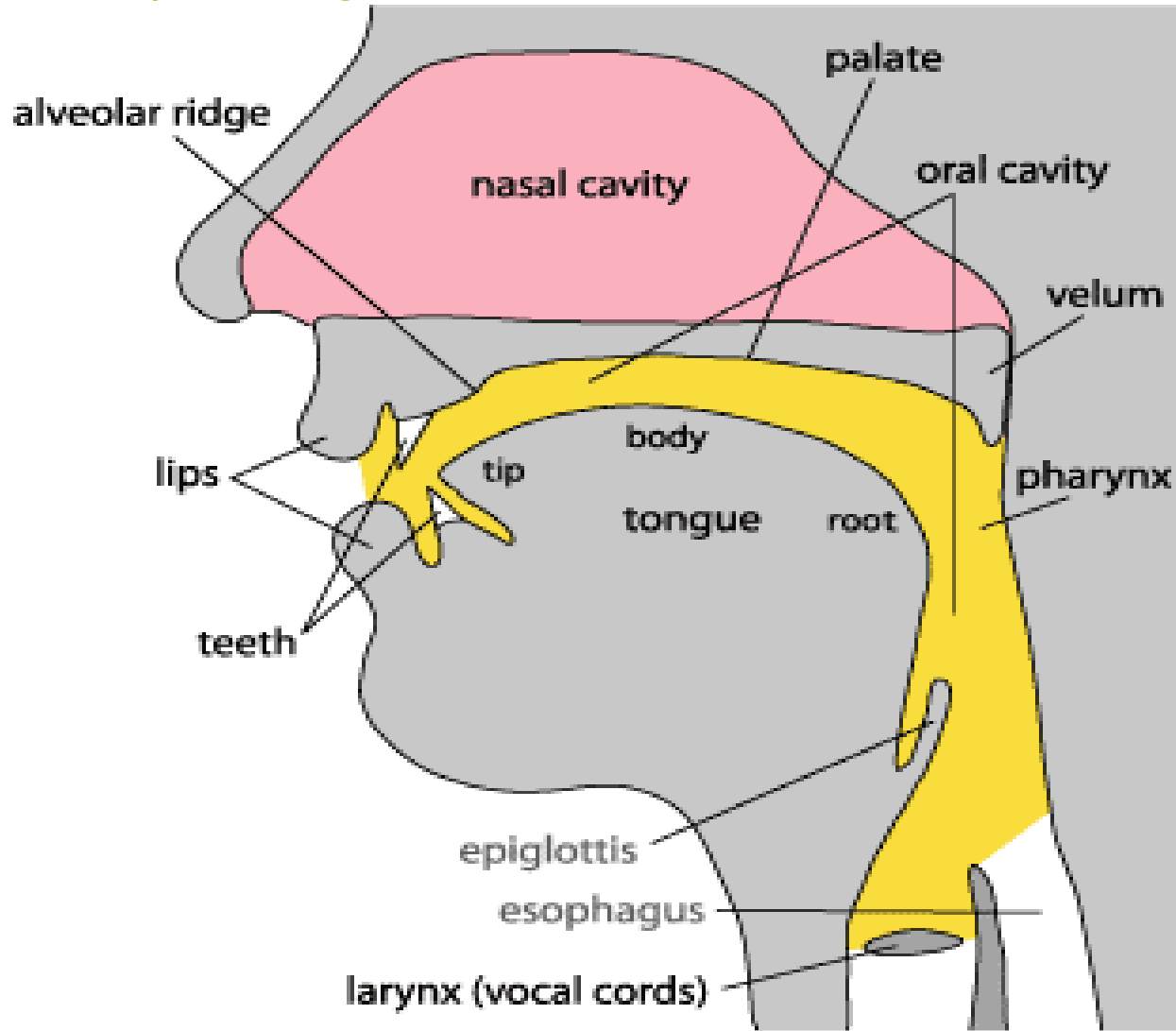


Figure A4.15 Tongue body raised, with tip and blade lowered, articulations

The Speech Organs



Airstream Mechanism/Sources of Energy

- ▶ Sounds can differ from one another depending on the type of airstream used in their articulation.
- ▶ E.g. some sounds are made by a **body** of air from the **lungs** as their source of power. **Majority of** sounds in the world's languages are made with a movement of air **out of the lungs**.
- ▶ **Pulmonic Airstream Mechanism.** The source of air for the production is from the lungs.
- ▶ Air from the lungs constitutes the major **source of energy of** speech production.
- ▶ There are some sounds that are made independent of **lung-air** (air moving out of the lungs). These are known as **non-pulmonic** airstream. The production is independent of lung-air.

- ▶ The air can be moved **outward: Egressive**
- ▶ **or**
- ▶ **Inward:** as if we are breathing in.
- ▶ **Types of sources of air or Airstream Mechanisms**
- ▶ **Egressive Pulmonic** Airstream Mechanism
- ▶ **Ingressive Pulmonic** Airstream Mechanism
- ▶ **Egressive Glottalic** Airstream Mechanism
- ▶ **Ingressive Glottalic** Airstream Mechanism
- ▶ **Ingressive Velaric** Airstream Mechanism.

Egressive Pulmonic Airstream Mechanism

- ▶ The movement of air **outward** of the lung for speech production.
- ▶ (the lung air is **pushed out** to empower speech production, we say an ***egressive pulmonic airstream mechanism*** is used/egressive or outward moving pulmonic airstream).
- ▶ All English sounds are made with **egressive** pulmonic airstream.
- ▶ E.g. **[p, f, θ, t, s, ʃ, k, h, ð, d, ɹ, l, z, ʒ, j, g, m, n, ŋ, etc.]**

Ingressive Pulmonic Airstream Mechanism

- ▶ used in the production of sounds when we are **breathing in**, or as if we are out of breath. Common with speech defects.
- ▶ Some may occur as extra-linguistic features,
- ▶ E.g. in English a common way of expressing surprise or pain involves Ingressive Pulmonic Airstream Mechanism.

▶ Egressive Glottalic Airstream Mechanism

- ▶ **Source of power** for the production of sounds is independent of lung-air. (non-pulmonic airstream mechanism).
- ▶ Instead of air moving out of the lungs, the glottis is **closed**, two articulators form a closure in the **oral** cavity.
- ▶ The air is **compressed** in the **oral** and the **pharyngeal** cavities, and **below** the glottis. The closed glottis is raised moving the larynx up.
- ▶ Pressure in the pharynx is increased. The oral closure is finally released with **explosion**.
- ▶ This process is **egressive glottalic** because: Air is moved outward. The glottis is always **tightly closed** during their production (always voiceless).

◀ Ejectives: e.g. stops /p', t', k'/,

▶ affricates [ts', tʃ', tɬ']

▶ Fricatives, [s', x']

► <https://youtu.be/UEDqwSQ64VA>

Ingressive Glottalic Airstream Mechanism

- ▶ The airstream is **modulated** in the **oral** cavity independent of the lungs (non-pulmonic airstream mechanism).
- ▶ The **glottis** is **closed**. There is a complete **closure** in the oral cavity. Instead of the larynx being **raised**, it is **lowered** and the air in the mouth and the pharynx rarefies. Outside air is sucked in as the oral closure is released.
- ▶ The air in the lungs is still being pushed out, and some of it passes between the closed vocal folds, keeping them in motion so that the sound is voiced. Sounds made with Ingressive Glottalic Airstream Mechanism are known as **Implosives**.
- ▶ Implosives are the reverse of ejectives and are always voiced.
- ▶ They can be found in languages such as Sandi, an Indo-European languages spoken in India and Pakistan etc.
- ▶ E.g. [ɖ, ɓ, ɠ, ɣ]

Ingressive Velaric Airstream Mechanism

- ▶ This is a movement of the body of air in the mouth (non-pulmonic airstream mechanism).
- ▶ produced by a manoeuvre that takes place entirely in the mouth leaving the lungs, larynx, pharynx and the nasal cavity free to act independently.
- ▶ There is a closure in the **oral cavity**; the active articulator moves against the passive articulator.
- ▶ A small volume of air is trapped between the two articulators.
- ▶ While the closure is maintained, the body of the tongue moves downwards enlarging the volume of air between the articulators. The pressure is reduced.
- ▶ The closure is finally released and air rushes in, producing a **click**.

▶ **Clicks:** are always made with the **back of the tongue** raised also with a movement of air **inward**.

▶ E.g. bilabial click [ɔ̥],

▶ dental click [ǀ],

▶ lateral click [ǁ],

▶ alveolar click [ǃ].

ANALYSING SPEECH

▶ DOING PRAAT

▶ **WHAT IS PRAAT?**

▶ PRAAT means talk (Dutch)

▶ PRAAT is a free computer software package for speech analysis in ***PHONETICS**. It is a freeware program for the analysis and reconstruction of **acoustic speech signals** developed by Paul Boersma and David Weenink of the University of Amsterdam.

▶ PRAAT can be used to record **mono** and **stereo** sounds and to edit and analyse sounds regarding **intensity**, pitch height, duration and formants.

▶ **WORKING WITH PRAATB.** Working with PRAAT

Install the programme

▶ Open the program, two windows will appear:

CLASSIFICATION OF SPEECH SOUNDS

Consonants

- ▶ — sounds articulated with **some** degree of constriction in the vocal tract.
- ▶ —described in relation to their position in syllables, and also to a large extent, their phonetic nature (articulations involving the obstructions or narrowing, which produce **acoustic** noise components).
- ▶ There are 24 consonants in English, classified according to (1) place, (2) manner (stricture) and voicing.
- ▶ **Voicing**
- ▶ A classification according to the **state** of the **glottis** during sound production, e.g. as voiced or voiceless.
- ▶ Voiced sounds are made with the vocal folds slightly touching each other so that the air passing through them causes the vocal folds to vibrate.

▶ E.g. in English: [b, m, v, ð, d, n, ɹ, l, z, ʒ, dʒ, j, g, ŋ]

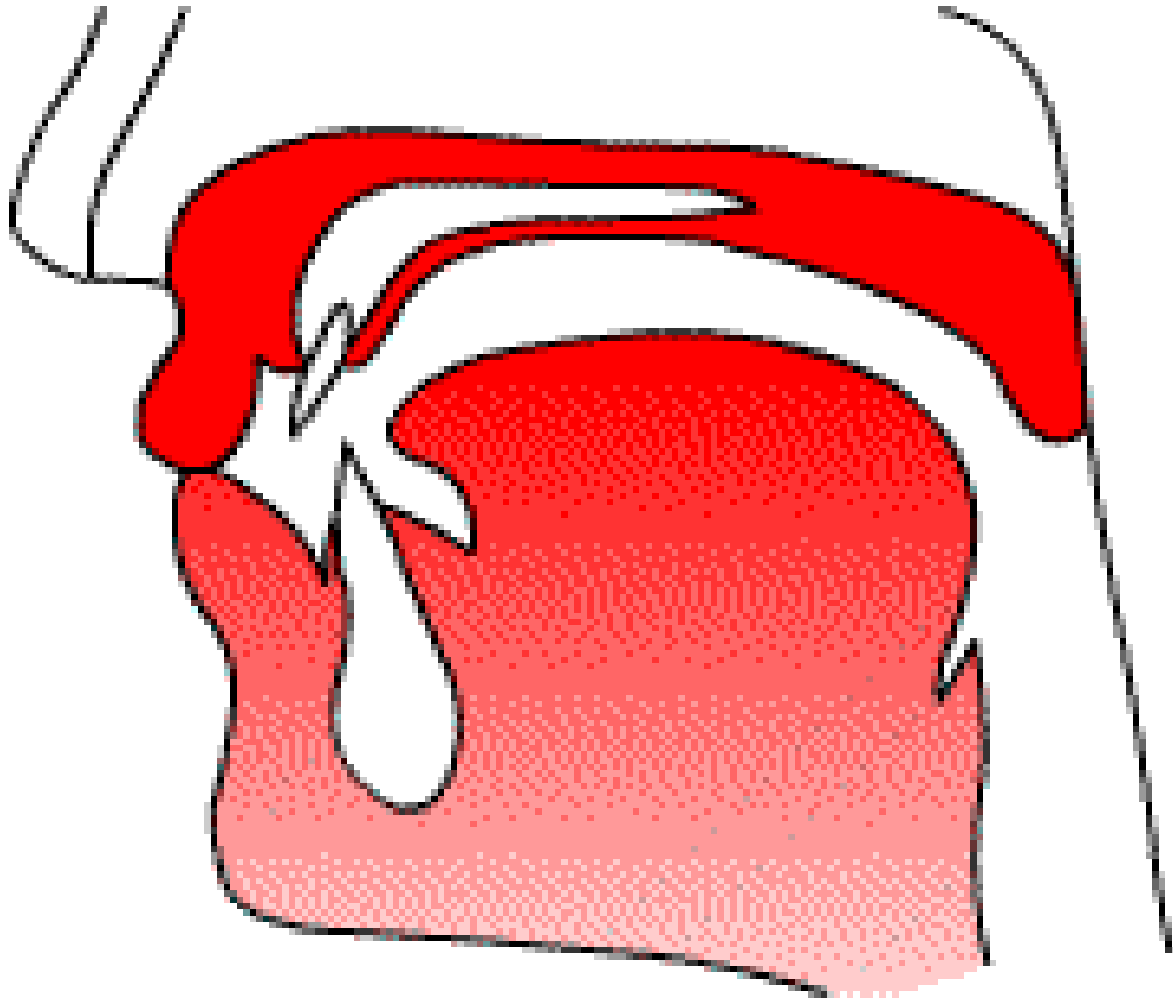
▶ **Voiceless Sounds:** are made with an open glottis (vocal folds are wide apart) so that the air passes through without causing the vocal folds to **vibrate**.

▶ e.g. in English [p, f, θ, t, s, ʃ, tʃ, k, h, ʔ]

Place of Articulation

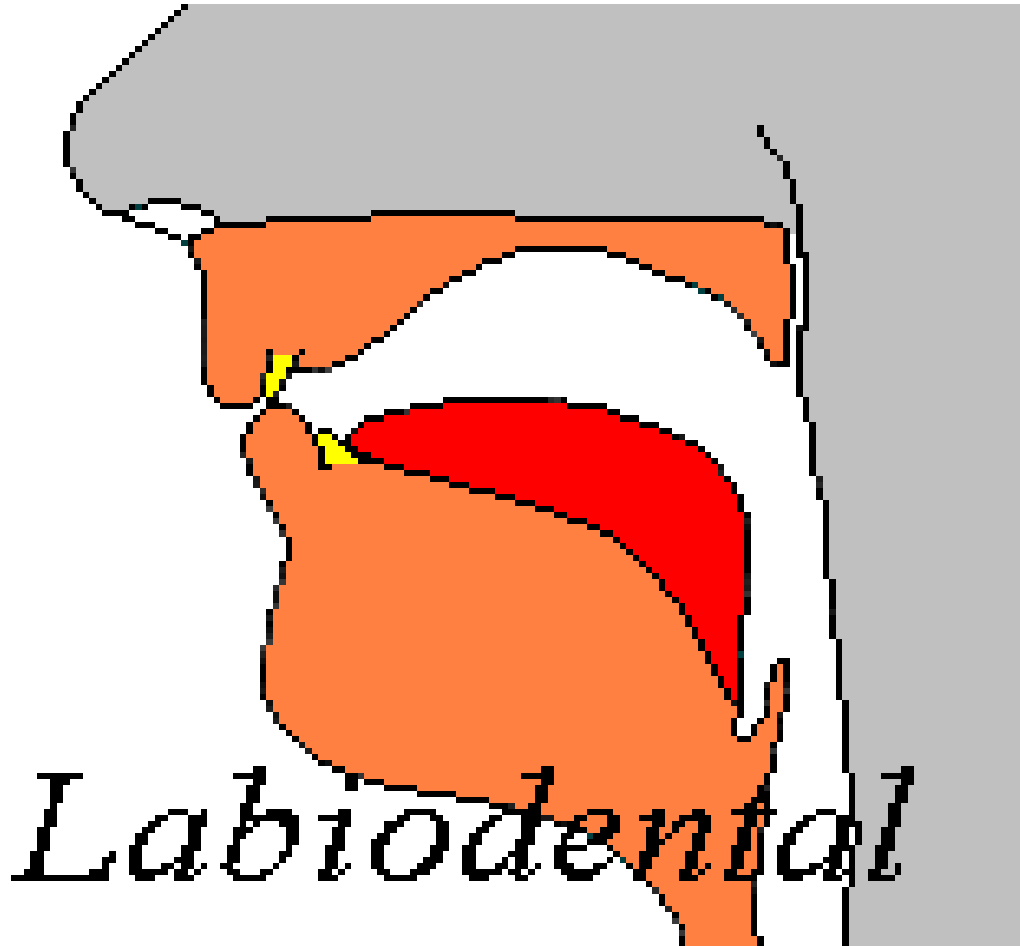
- ▶ **Place of Articulation:** the **location** in the **vocal tract** where an articulation or a constriction occurs.
- ▶ For most articulation the term used to describe the place of articulation is based on the name of the **passive** articulator concerned.

Examples,

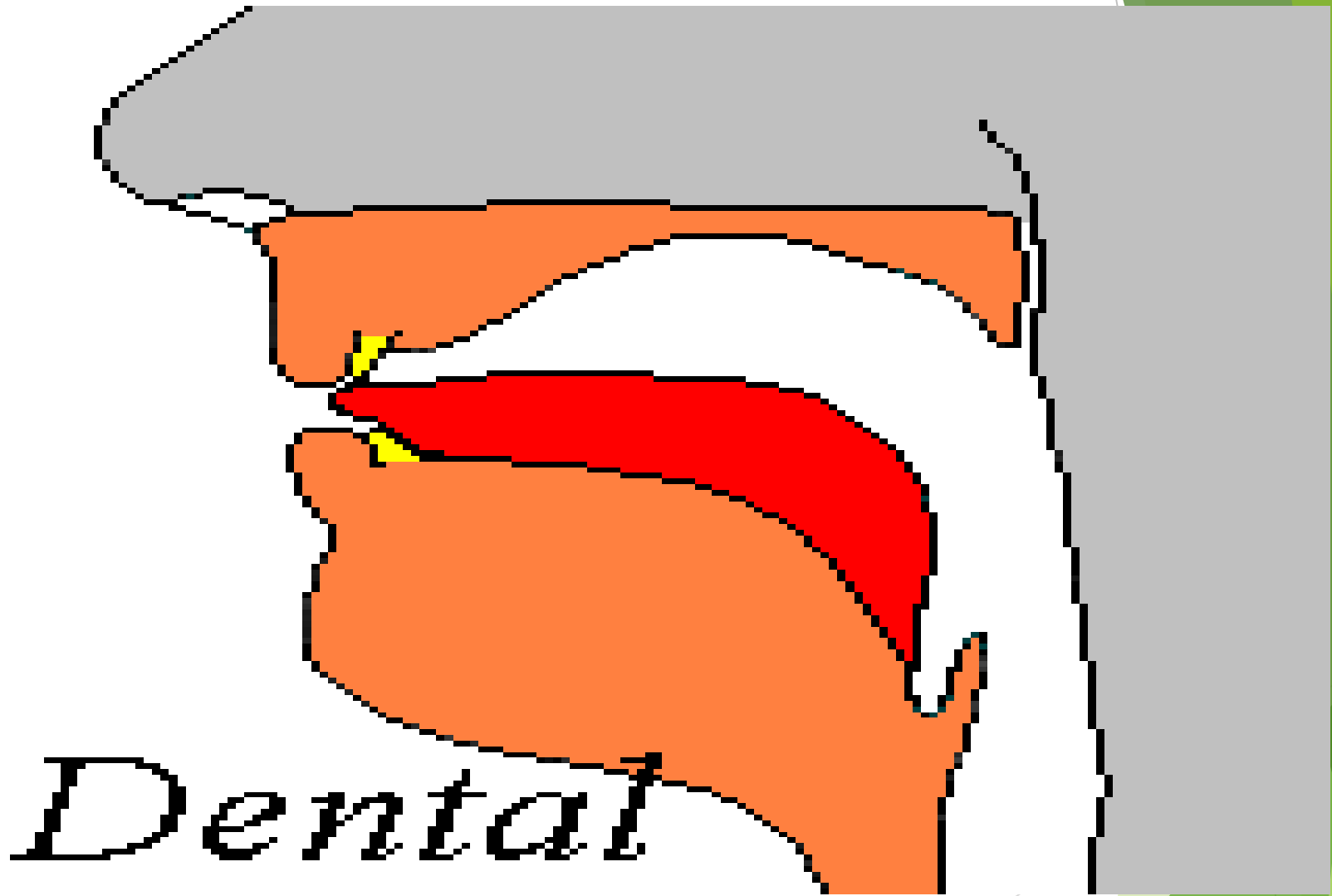


- ▶ **Bilabial:**-both the upper and the lower lips are active articulators for this place. In their articulation, the two lips come together causing some degree of constriction to the flow of air in the vocal tract.
- ▶ E.g. in English /p, b, m/
- ▶ [β, φ, ʙ] in some other languages.

The labiodental

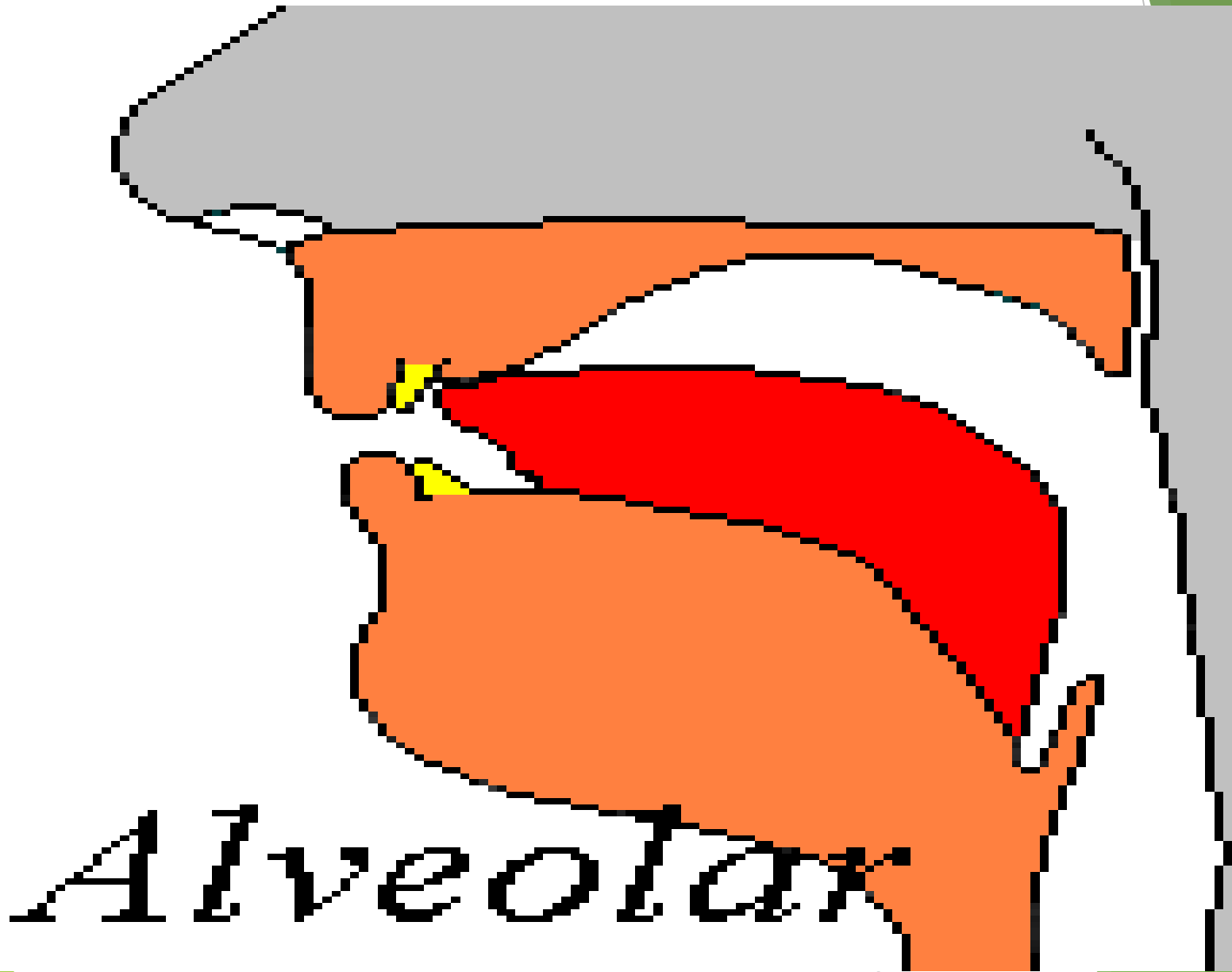


- ▶ **Labiodental:**-the **active** articulator is the **lower lip** and the **passive** articulator is the edge of the **upper front teeth**.
- ▶ The lip moves up towards the upper front teeth, they could make a **firm** contact or **not** depending on the kind of articulation, (whether is a stop or a fricative).
 - ▶ e.g. in English /f, v/ and [m]



- ▶ **Dental:**-the active articulator is the **tongue tip** or the **blade** and the passive articulator is the **edge** of the **upper front teeth**.
- ▶ The tip of the tongue moves up against the upper teeth but does not make a firm contact with the teeth.
- ▶ E.g. /θ, ð/

- ▶ **Alveolar**:- the active articulator is the **tip** or the **blade** of the tongue and the passive articulator is the **alveolar ridge**,
- ▶ The tip of the tongue moves against the alveolar ridge.
- ▶ E.g. in English /t, d, n, ɹ, l, s, z/
- ▶ Other languages [r, ɾ, ɻ, ʒ]



▶ **Retroflex**:- the active articulator is the **tongue tip** and the passive articulator is the *hard palate*. The tongue is curled back so that it approaches the roof of the mouth behind the alveolar ridge.

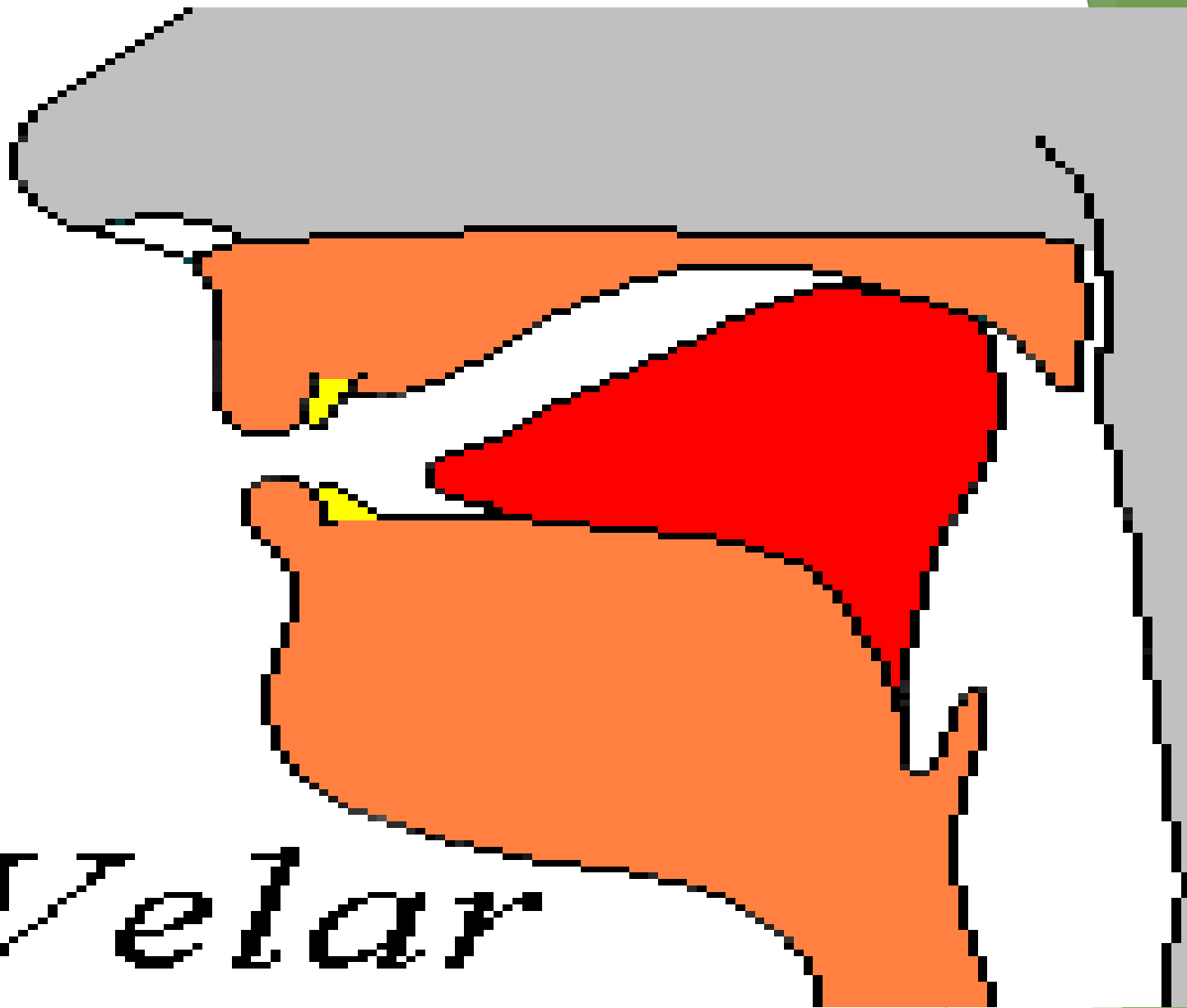
▶ Non-existence in English, but exist in languages such as India, Ewe etc. e.g. [ʂ ʐ ɽ ʈ ɖ ɳ].

▶ **Palatal**:-the active articulator is the **front** of the tongue and the passive articulator is the **hard palate**. The front of the tongue moves against the hard palate,

▶ e.g. in English /j/ and

▶ [ɕ, ɟ, ɟ͡ɰ, ɟ͡ɰ] in other languages.

Velar



▶ **Post-alveolar**:-active articulator is the **blade** and the passive articulator is the **place immediately behind the alveolar ridge**,

▶ E.g. /ʃ, ʒ, tʃ, dʒ/

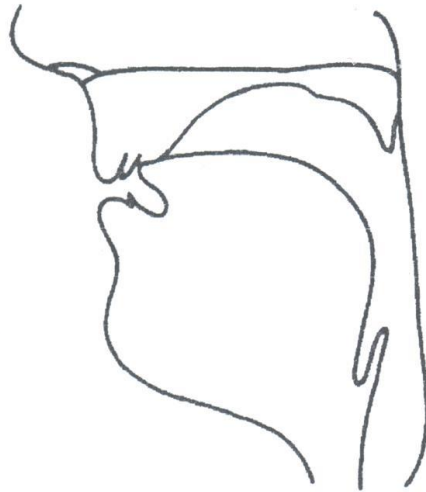
▶ **Velar**:- the active articulator is the **back** of the tongue and the passive articulator is the **soft palate**.

▶ E.g. in English /k, g, ŋ/

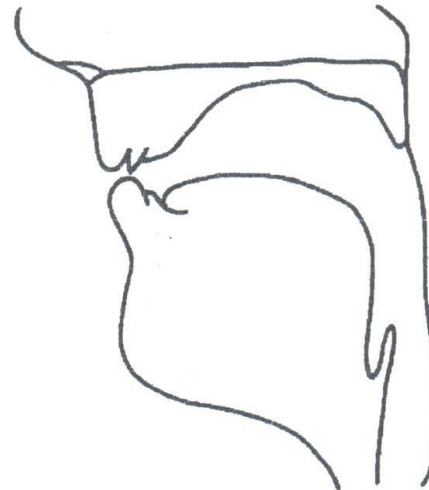
▶ and [x, ɣ, ɮ, ʍ] some other languages.

Figure 3. Vocal tract outlines (after Ladefoged (2001) *A course in phonetics*, page 18)

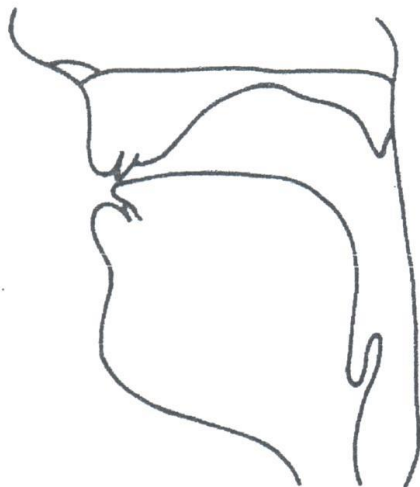
alveolar



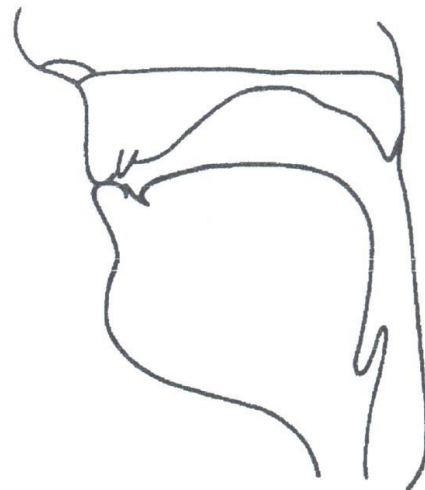
labiodental



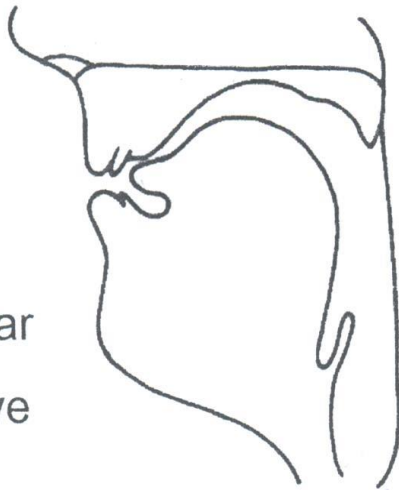
dental



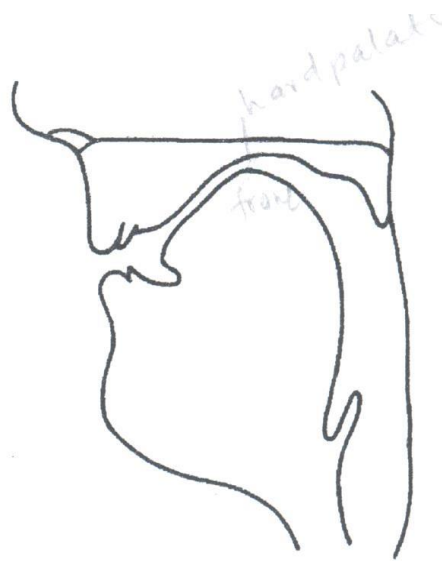
bilabial



alveolar
fricative



postalveolar
fricative



velar



▶ **Pharyngeal:-** the active articulator is the *root* of the *tongue* and the passive articulator is the **rear wall** of the **pharynx**. No English sound is made at the pharynx. It is however used by some other languages,

▶ e.g. [ħ, ʕ].

▶ **Uvula:-** the active articulator is the *back of the tongue* and the passive articulator is the **rear wall of the pharynx**.

▶ English does not have uvula sounds, but they exist in some other languages of the world,

▶ e.g. [q ɢ ŋ ʁ χ ʁ].

▶ **Glottal:-** the articulators are the vocal folds, both of which are active.

▶ E.g. [ʔ, h, ħ].


Summary of place of articulation

Active Articulator

Passive Articulator

Place of Articulation

▶ Bilabial	upper and lower lip	none
▶ Labiodental	lower lip	upper front teeth
▶ Dental	tongue tip	upper front teeth
▶ Alveolar	tongue tip or blade	alveolar ridge
▶ Post-alveolar	tongue tip or blade ridge	rear of alveolar

- 
- ▶ Retroflex tongue tip hard palate
 - ▶ Palatal tongue front hard palate
 - ▶ Velar tongue back soft palate
 - ▶ Pharyngeal tongue root rear wall of pharynx
 - ▶ Glottal vocal folds none

Manner of Articulation (Stricture)

- ▶ Consonants are also described according to the **degree** of **constriction** in the vocal tract; the **degree** of obstruction to the flow of air.
- ▶ The obstruction to the flow of air differs depending on the type of consonant that is being made.

Narrowing with Friction/Close Approximation

▶ This is a stricture formed with a **narrowing** in the vocal tract, which causes **friction**. Two organs come together to obstruct the air, but the obstruction does not cause a total blockage to the flow of the airstream.

▶ The small passage is created thereby allowing air to pass through with an **audible friction**,

▶ e.g. English /f, v, θ, ð, s, z, ʃ, ʒ, h/ and [ʍ]

▶ Other languages [ϕ, β, ç, x]

Partial Closure/Open App/Narrowing without Friction

- ▶ This is a type of articulation that involves a partial or a narrowing in the vocal tract **without friction** or noise.
- ▶ These sounds are called **Approximants**,
- ▶ e.g. /l, j, w, **ɹ**/.
- ▶ **Lateral approximant** -articulators form partial but firm **closure** at the alveolar ridge; the airstream is allowed to escape laterally through one or both sides of the tongue, e.g. /l/
- ▶ **Central approximant** -articulators form partial **closure** at some point in the oral cavity; the airstream is allowed to escape through the central part of the tongue, e.g. /j, w, **ɹ**/

INTERMITTENT CLOSURE

▶ **Trill or Roll-** is made with series of rapid intermittent closures by the tongue tip against the roof of the mouth.

▶ e.g. [r]

▶ the tongue tip **trills** against the alveolar ridge as in Spanish perro, or [R] where the uvula trills against the back of the tongue, as in the French word 'rouge'.

▶ *English does not have a trill.

▶ **Tap-**is made with a **single** tap made by the tongue tip against the roof of the mouth as in many Scottish pronunciations of the English /r/.

▶ e.g. [ɾ] also in American English

TOTAL/COMPLETE CLOSURE

- ▶ This type of stricture involves a **complete** closure; there is a complete blockage of the airstream; the two articulators are in firm contact for an appreciable amount of time.
- ▶ Sounds articulated with a **complete** blockage in the vocal tract are called stops.
- ▶ The air is stopped **completely**, hence the term **stop**. The blockage can occur between the two lips, (producing bilabial stops), between the lower lip and the alveolar ridge (producing alveolar stops), between the back of the tongue and the velum (producing velar stops).

▶ There are three types of stops:

▶ (i) oral stops (plosives)
affricates

(ii) nasal stops (nasals), (iii)

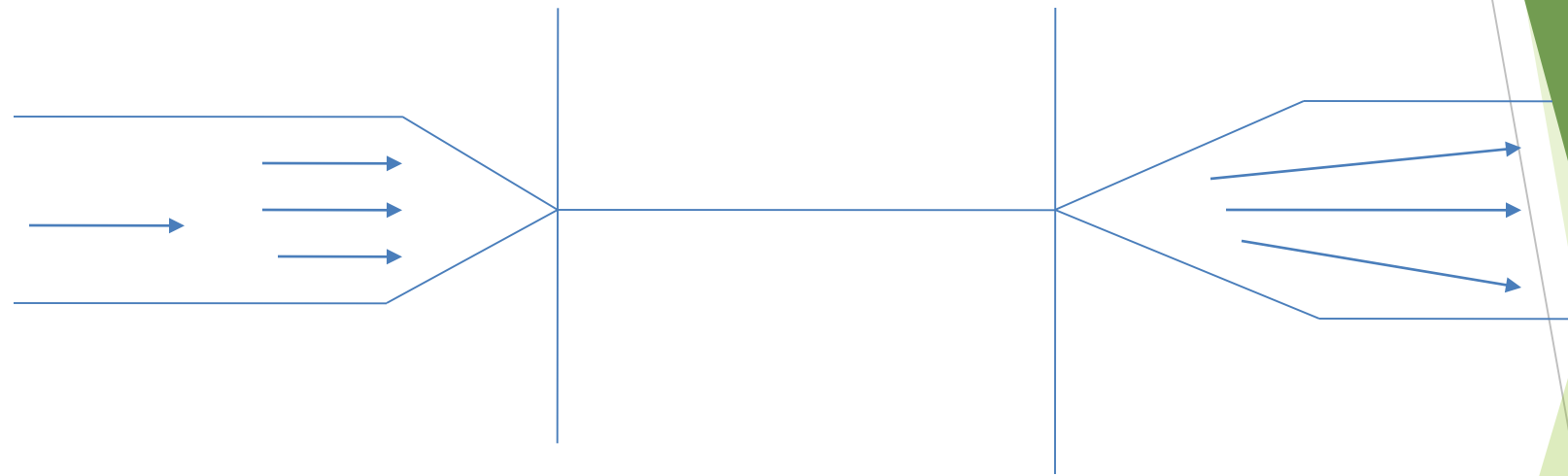
▶ * **Oral Stops/Plosives:** have a complete closure at some point in the vocal tract, behind which air pressure builds up and is released **explosively**.

▶ The soft palate is raised to allow the air to escape through the oral cavity; the compressed air is released through the mouth/oral cavity.

▶ The articulators part quickly, releasing the air with explosive force (termed **plosion**), e.g. [p, b, t, d, k, g].

Stages of Plosives Articulation

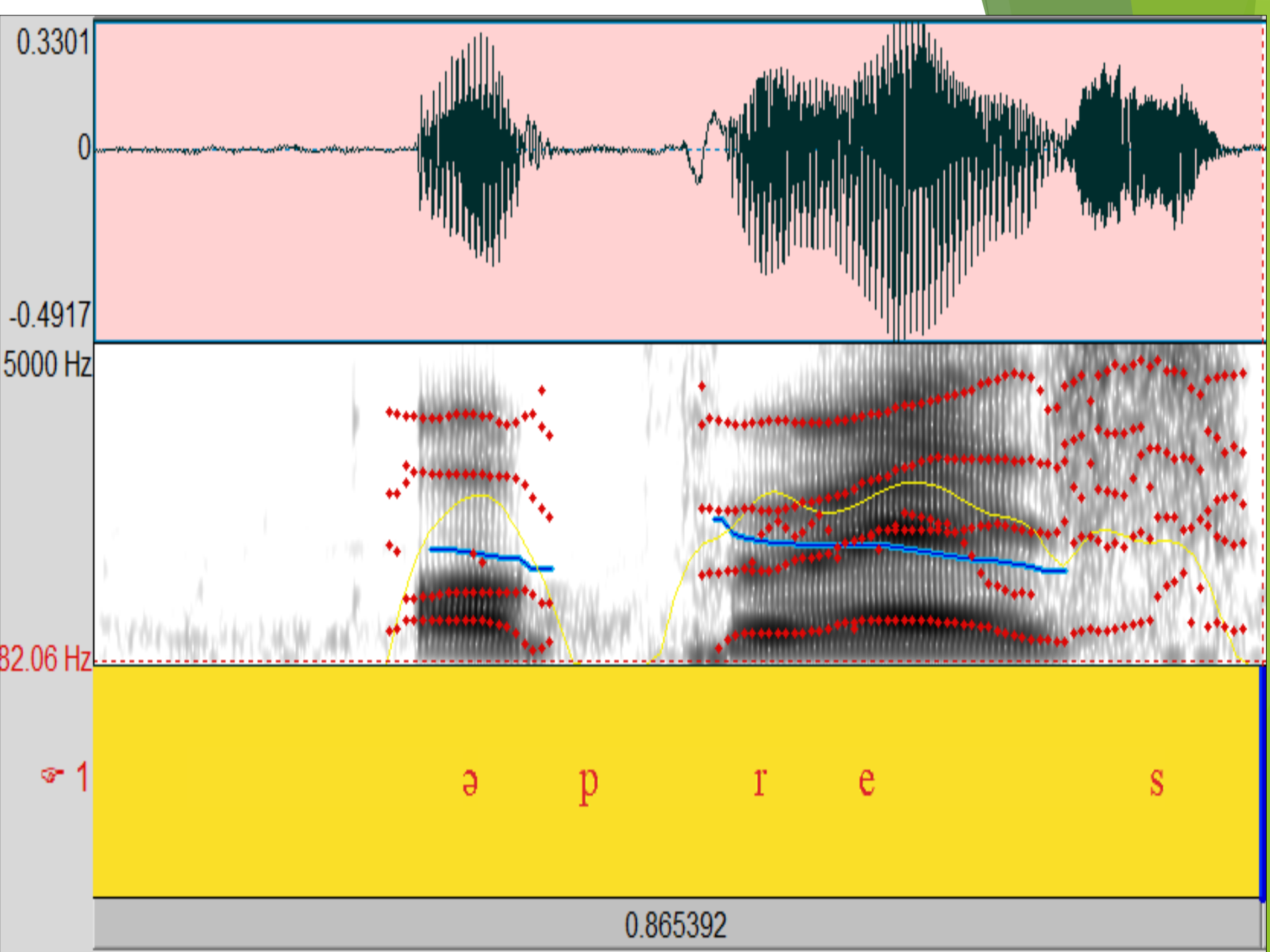
- ▶ **1. Approach** phase:-when the articulators come together to form a closure at some point in the VT.
- ▶ **2. Hold/compression** phase:-when the air is completely stopped and the pressure rises in the VT (stop gap)
- ▶ **3. Release** phase:-when the articulators part and the compressed air is released (burst).



1. approach phase

2. Hold phase

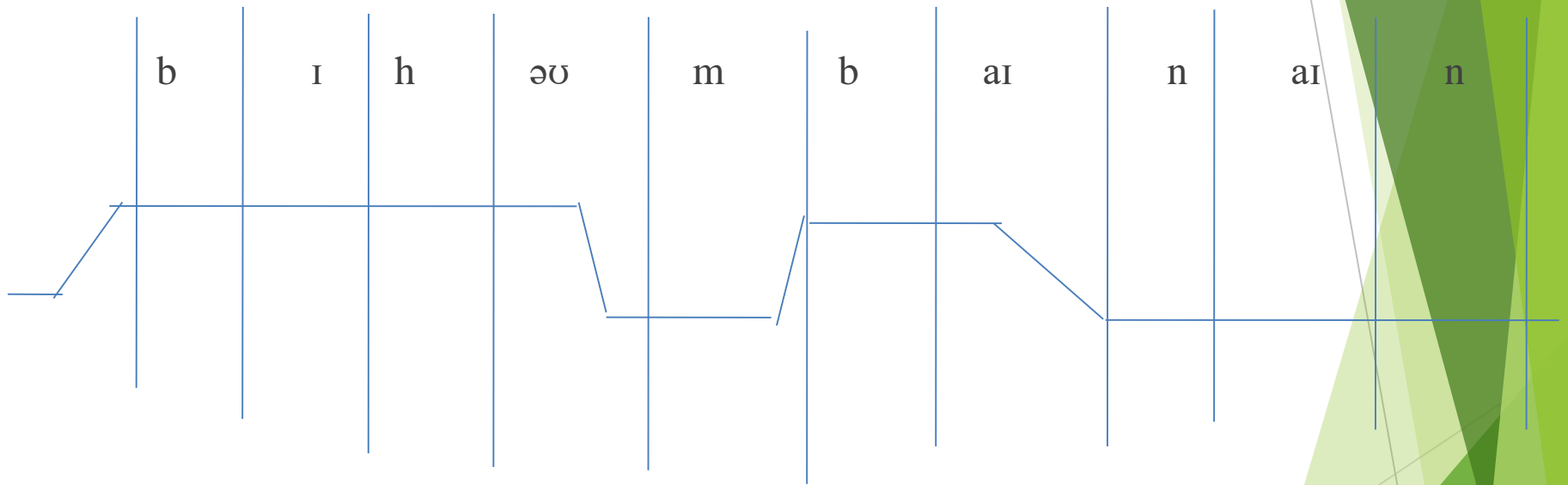
3. Release phase



- ▶ **Nasals:** - also stops; they are made with a stricture with a complete closure in the oral cavity, but in their case the soft palate is **lowered** allowing the airstream to escape through the nasal cavity.
- ▶ e.g. /m, n, ŋ/ in English. They are continuants and are **almost** always voiced and have **no noise** component.
- ▶ There are voiceless nasals in e.g. Burmese, Welsh and Icelandic.
- ▶ Voiceless nasals are represented with the nasals [m n ŋ] with the diacritics [° ˘] either at their top or at their bottom.

Voiceless Nasals contrasting Voiced Nasals in Burmese

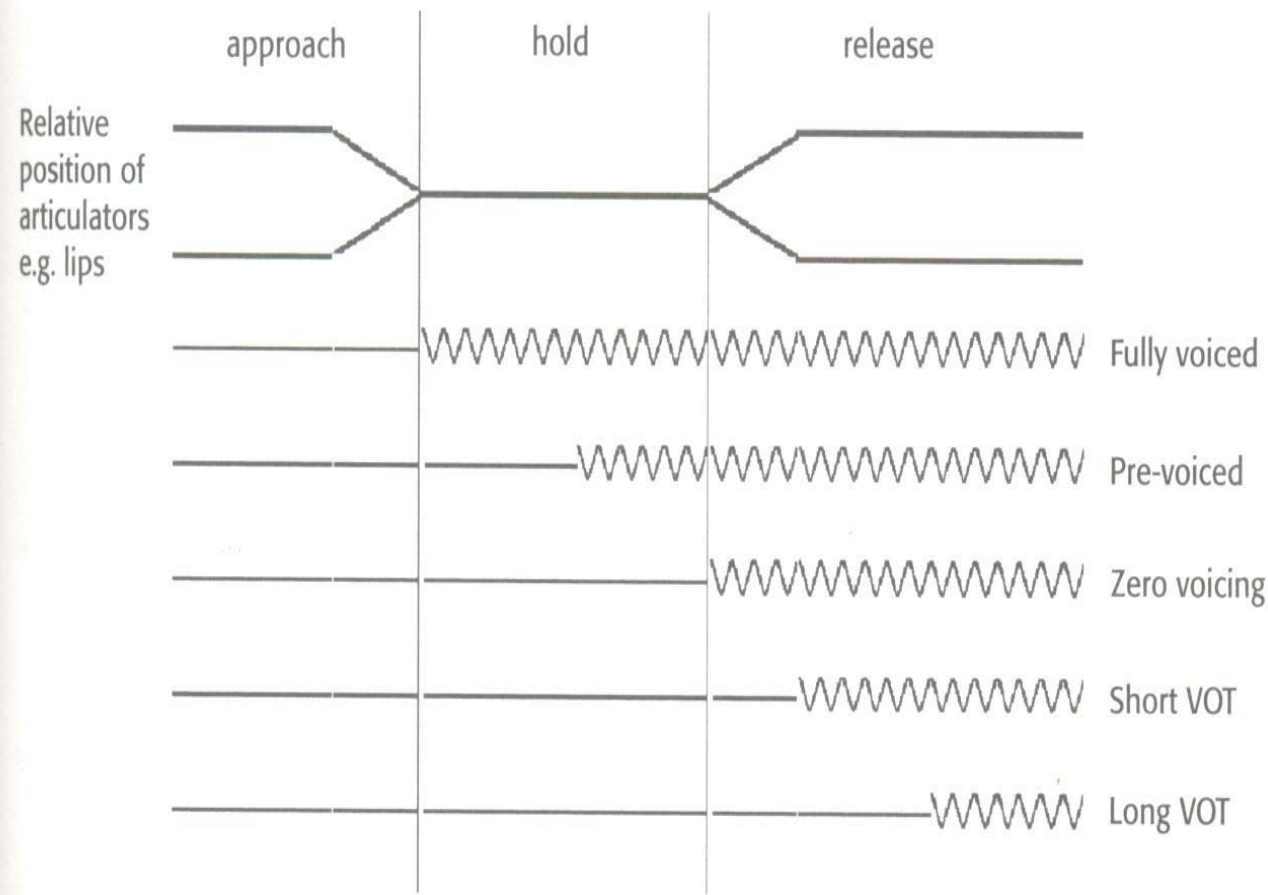
NASALS	BILABIAL	DENTAL	PALATAL	VELAR
VOICELESS	m̥ã 'from'	ṇã: 'nasal'	ɲã: 'considerate'	ŋã 'borrow'
VOICED	mã 'lift up'	nã: 'pain'	ɲã: 'right'	ŋã 'fish'



Affricates

- ▶ Also stops; their articulation involves the same approach as that of plosives.
- ▶ They also involve a complete closure at some point in the oral cavity, behind which a complete closure is made.
- ▶ They have the same kind of hold phase in the oral cavity, air pressure builds up behind the closures; but the release is slower compared to that of plosives, the air rushing between the two articulators makes hissing noise so that more extended friction is a characteristic of the second element of the sound,
- ▶ e.g. [dʒ, tʃ].

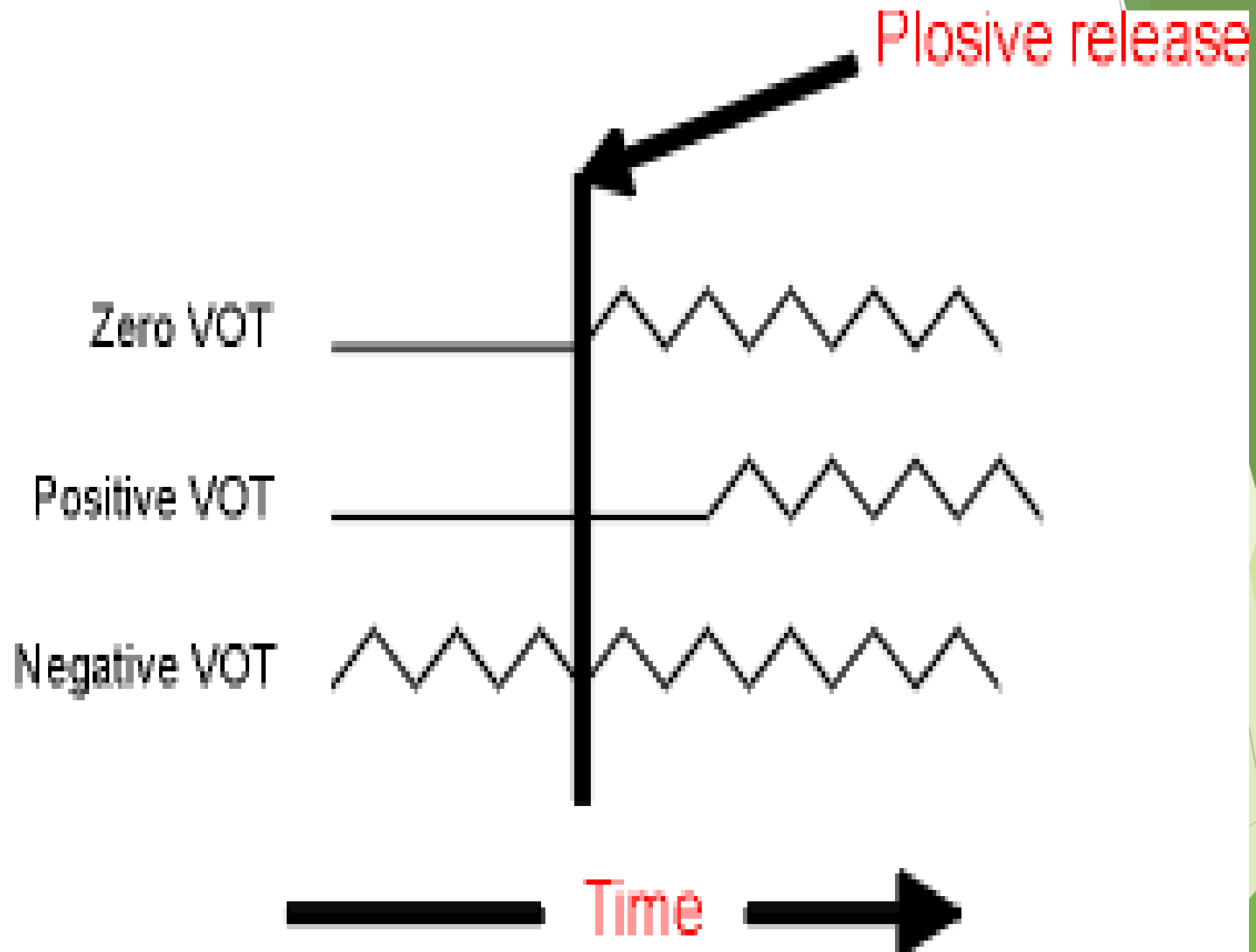
showing their accurate perception of the neutralisation.



VOT = time from release of plosive to onset of voicing

FIGURE 6.3 Schematic parametric representation of the three phases of plosive production, with five different VOT possibilities.





▶ DESCRIPTION OF ENGLISH CONSONANTS

► Oral Stops

► There are three sets:

► bilabial /p, b/,

► alveolar /t, d/

► velar /k, g/.

◀ In their articulation, two articulators come together to form a closure at some point in the oral cavity. At the same time the velum is raised to shut the nasal resonator. The lung-air is compressed behind the closure, during which stage the vocal folds are held wide apart or slightly touching depending on the sound being made.

◀ Note that the position where the closure is formed varies according the type of the stop being made.

◀ E.g. for bilabials /p, b, m/, the two lips come together to form a closure to the flow of the airstream.

► ----for alveolar, /t, d, n/, the tip or the blade of the tongue which is the active articulator moves against the alveolar ridge causing a **complete closure** between the tongue tip and the alveolar ridge.

► for velar /k, g, ŋ/, the back of the tongue moves against the velum causing a complete closure between the back of the tongue and velum for the velar e.g. /k, g/.

- ▶ The compressed lung-air escapes suddenly with a forceful ***explosion** upon the release of the oral closure.
- ▶ Note that the articulation of nasals /m, n, ŋ/ is the same as the **oral stops/plosives**, however in their case the airstream is diverted through the nose by lowering of the soft palate.
- ▶ All the nasal stops occur in all three positions of words except /ŋ/ which occurs at **syllable final** position **only**.

▶ A Three-way Description of The Consonants

▶ /p/ voiceless bilabial stop/plosive,

▶ spelt, e.g.

← ‘p’ or ‘pp’, pen, speak, people, apple, approve, etc.

← also *gh* in hiccough /'hɪkʌp/

▶ It is silent in ‘pneumonia, psychology, psalm, ptarmigan, receipt, cupboard, raspberry, coup, etc.

▶ /b/ voiced bilabial stop/plosive,

▶ spelt e.g.

▶ b, in bag, bad, bib, about,

▶ bb ebb,

▶ Note: it is silent in limb, bomb, thumb, debt, subtle, doubt, comb, plumb, etc.

- ▶ /t/ voiceless alveolar stop/plosive,
- ▶ spelt: e.g.
- ▶ t- or tt ten, table, took, little, etc.
- ▶ in some rare cases **th** e.g. in thyme, posthumous, Thames, Thomas, Esther, etc.
- ▶
- Pronounced as /t/ with
- ▶ **-ed** participle in verbs ending with voiceless consonants, e.g.
- ▶ e.g. jumped /dʒʌmp**t**/, looked, laughed, guessed, pushed, kissed, passed, etc.
- ◀ It's silent in 'castle, hasten, *often, Christmas, mort**g**age, duvet**t**, listen, etc.
- ◀ /d/ voiced alveolar stop/plosive, spelt;
- ◀ d, dog, mad, order, etc.
- ▶ dd, ladder, bladder, etc.
- ▶ silent in e.g. sand**w**ich, hand**s**ome, landsc**a**pe, grand**f**ather, groundnut, handkerchief, Wednesday, pledge, grudge, cad**g**e, etc.

- ▶ **/k/ voiceless velar stop/plosive, spelt**
- ▶ **k**—— king, keep, revoke, bank, turkey, etc.
- ▶ **c**—— carpet, cord, caught, cow, coconut, etc.
- ▶ **qu, que, qu** —— conquer, unique, banquet, bouquet, mosquito, quite, quilt, inquire, queer, quest,
- ▶ **cc**—— accused, occur, accommodation, account, occasion, etc.
- ▶ **ch-** stomach, chemist, choir, chorus, echo, **orchid**, character etc.
- ▶ **ck-** **chicken**, neck, buttocks, hemlock, creaky, etc.
- ▶ **Note:** the silent **c** or **k** in muscles, knew, knit, knife, knowledge, knot, knuckle, knock, etc.

- ▶ /g/- voiced velar stop/plosive, spelt:
- ▶ **g-** go, gourd, geese, agree, dragon, organ, wagon, etc.
- ▶ **gg-** egg, aggravate, aggressive, etc.
- ▶ **gh-** ghost, dinghy, ghastly, spaghetti, etc.
- ▶ **gu, gue-** rogue, guilt, vague, guitar, guess, league, etc.
- ▶ note silent in **gnaw, gnat, diaphragm, sign, reign, foreign,**
- ▶ campaign, **gnome, gnash, sign, etc.**

▶ **/m/ voiced bilabial nasal, e.g. spelt**

▶ **m-** morning, my, man, gum, sample, amber, etc.

▶ **mm-** summer, summary, committee, immoral, ammonite, etc.

▶ **mb-** comb, bomb, lamb, climb, womb, plumber, numb, etc.

▶ **/n/ Voiced Alveolar nasal,**

▶ **e.g. spelt:**

▶ **n-** now, noon, number, new, keen, barn, etc.

▶ **nn-** funny, sinner, connect, annoy, innocent, innate, inn, etc.

▶ **gn-** gnaw, gnats, gnat, campaign, champagne, reign, alignment

▶ **kn-** know, knife, knob, knot, acknowledgement, knuckle, knickers,

▶ **pn-** pneumonia, pneumonic, etc.

▶ **Note,** silent in autumn, column, solemn, hymn, damn, condemn, tc.

- ▶ /ŋ/ **Velar Nasal, spelt:**
- ▶ **ng-** sing, singer, singing, finger, bangle, tongue single, angle, nightingale, hang, among
- ▶ **nk** -sink, ankle, tinker, monkey, donkey, wrinkle, rank, chunk, monk, etc.
- ▶ **nc** -uncle, income, anchor, distinct, conclude, encourage, concrete, etc.
- ▶ **nq/nx** banquet, conquer, anxious, enquiry, etc.

▶ Glottal Stop [ʔ]

▶ It is made in the glottis. An obstruction to the airstream is formed by the closure of the vocal folds, thereby interrupting the passage of air into the vocal tract.

▶ The air pressure below the glottis is released by a sudden separation of the vocal folds. It is voiceless; no vibration of the vocal folds.

▶ The glottal stop replaces the voiceless plosives /p, t, k/,

▶ E.g.

▶ **words:** cat, pat, cat, sat, mat, light, flight, put, take, make, trip, report, report, etc.

▶ **Multisyllabic** words: stoplight, apartment, backseat, assortment, workload, upbeat.

▶ **phrases:** right now, talk back, cook the books, hate mail, fax machine, back-breaking.

▶ ARTICULATION OF FRICATIVES

- ▶ two articulators come together to form a **narrow** gap at **some point** in the oral cavity. The soft palate/velum is raised *shutting the nasal resonator off. The vocal folds are either wide apart or nearly touching depending on whether the sound being made is voiced or voiceless.
- ▶ Air from the glottis escapes through the constricted vocal tract thereby causing **audible friction**.
- ▶ There are four pairs in English: labiodental /**f**, **v**/, dental /**θ**, **ð**/, alveolar /**s**, **z**/,
- ▶ post alveolar /**ʒ**, **ʃ**/, and the glottal fricative /**h**/
- ▶ **Note** that the place where the constriction occurs will depend on the type of fricative being made.
- ▶ The position of the glottis will also depend on whether it is voiced or voiceless fricative that is being made.

- ▶ The vocal folds will be wide apart for e.g. /f, θ, s, ʃ/
- ▶ But may or may not vibrate for /v, ð, z, ʒ/ depending on the context.

▶ Three-Way Description

▶ /f/ voiceless labiodental fricative, spelt;

▶ f- fork, friend, fried, fat, feet, fit, fowl, etc

▶ ff- off, office, cliff, afford, offend, coffee, effect, suffer, etc.

▶ ph- physics, phonology, diaphragm, epitaph, nephew, etc.

▶ gh- enough, rough, cough, laugh, etc.

▶ /v/ voiced labiodental fricative,

▶ e.g. spelt:

▶ v- voice, vote, view, veer, savage, seven, deliver, ever, rive, novel, etc.

▶ ve- live, active, wave, love, glove, save, etc.

▶ e.g. spelt;

▶ th- **three** /θri:/

three/free [tri:] [fri:]

▶ both /bəʊθ/

boat [bəʊt]

▶ thank /θɪŋk/

tank [tæŋk]

□ third /θɜ:d/

ted [ted]

□ think / θɪŋk/

]

□ health /helθ/

held [helt]

□ north /nɔ:θ/

not/knot [nɒt]

□ truth /tru:θ/

□ toothbrush

□ thing /θɪŋ/

□ through /θru:/

□ thick /θɪk/

true [tru:]

tick /tɪk/

▶ thought /θɔ:t/

taught [tɔ:t]

▶ something /sʌmθɪŋ/

□ third /θɜːd/

□ thousand /'θaʊzənd/

□ nothing /'nʌθɪŋ/

□ anything /'eniθɪŋ/

□ method /'meθəd/

□ mouth /maʊθ/

□ cloth /klɒθ /

□ path

□ teeth

□ tenth

month /mʌnθ/

throw /θrəʊ/

author /'ɔːθə/

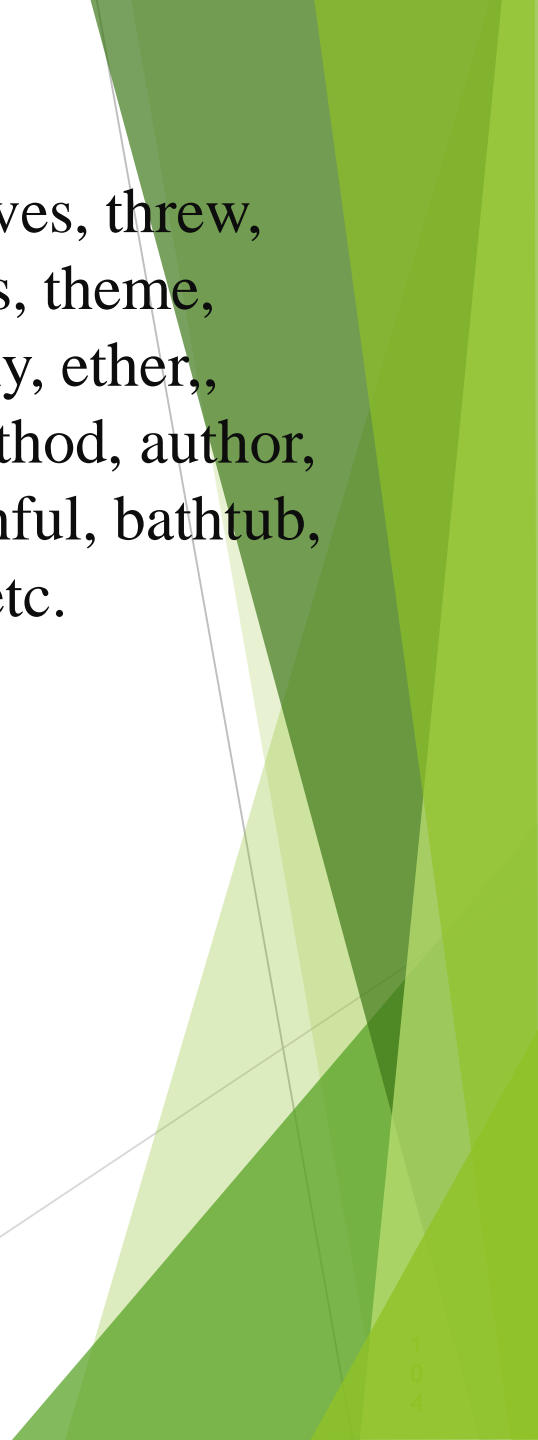
health /helθ/

clot [klɒt]

pat

teat

tent



- ▶ bath, death, eighth, fifth, thief, fourth, ninth, thieves, threw, thread, thrill, thrust, truth, thin, thumb, ether, ethics, theme, Seth, Smith, lethal, method, author, anthem, lengthy, ether,, cloth, birth, month, thumb, ether, ethics, lethal, method, author, anthem, lengthy, health, birth, anthem, author, faithful, bathtub, python, thunder, thrilling, Thursday, threatening, etc.

- ▶ **/ð/ Voiced dental fricative**
- ▶ **spelt**
- ▶ **-all function words beginning with th**
- ▶ e.g. there, this, then, the, though, thy, they, although, though, their, these, them, themselves, those, this, that, nonetheless, worthy, heather, either, neither, etc.
- ▶ **the** - seethe, breathe, lathe, clothe, clothing, **tithe**, **writhe**, bathe,
- ▶ Also- breathing, leather, father, mother, northern, southern, gather, either, neither, soothe, bother, brother, clothing, breathing, rhythm, farther, father, feather, further, northern, gather, gathering, weather, leather, etc.

▶ /θ/ /ð/

breath (n) breathe (v)

mouth (n) mouth (v)

bath (n) bathe (v)

cloth (n) clothe (v)

worth (n/adj) worthy (adj)

▶ /t/

▶ Thames /temz/

thyme /taim/

Thomas /'tɒməs/

Think about **this**. /θɪŋk/ /ðɪs/

That's a **thought**. /ðæt/ /θɔ:t/

They **thank** you very much. /ðeɪ/ /θæŋk/

Breathe a normal **breath**. /bri:ð/ /breθ/

They caught **the thief** with his **teeth** open.

I sat in **the third** row at **the** movie **theater**.

The **thunder** scared me, **Theo**.

I was **thankful** my coffee was in a **thermos**.

He **threw** to **third** base in a hurry.

The king sat at his **throne** as he ate **Thanksgiving** dinner.

/ʃ/ Voiceless Post Alveolar Fricative

▶ spelt e.g.

▶ **sh** shoe, sham, ashes, luscious, rashly, douche,

▶ **ch, chs** machine, fuchsia, brochure, sachet, chalet,

▶ **s, ss** sure, sugar, assure, etc.

▶ **ti, sci, ci, ce,** nation, mansion, conscious, conscience, ocean,

▶ **/ʒ/ Voiced Post Alveolar Fricative, spelt**

▶ **g** gigolo, genre, measure,

▶ **si---** vision, revision, confusion, occasion, provision, allusion, conclusion, television, division, decision, etc.

▶ **s, z, ss** casual, pleasure, azure, exposure, etc.

▶ **ge** beige, garage, sabotage, bourgeois, etc.

▶ **/z/- VOICED Alveolar Fricative,**

▶ **spelt:**

▶ **ss-** scissors, possess, dessert, dissolve, etc.

▶ **s-** reason, prison, please, choose, result, raised, design, doesn't, bosom, etc.

▶ **z-** zoo, zeal, zero, zip, quiz, wizard, zebra, cozy, etc.

▶ **zz-** dizzy, blizzard, buzz, buzzard, dazzled, jazz, nuzzle, etc.

▶ **x-** exact, anxiety, exaggerate, exempt, exhaust, exist, auxiliary, etc.

▶ **-s** is realised as **/z/**



▶ when after voiced sounds, e.g. bars, dogs, plays, news, boys, feels, feeds, etc.

- ▶ /s/- **Voiceless Alveolar Fricative, spelt;**
- ▶ s, se- so, sun, sound, seek, soon, soul, etc.
- ▶ ss- pass, kiss, class, discuss, cassava, cassette, embarrass,
witness, bless, embassy, etc.
- ▶ ss- class, cross, discuss, assist, bless, etc.
- ▶ c, ce, receive, **December**, decimal, advice, sauce, etc.
- ▶ sc- science, descend, scent, obscene, etc.
- ▶ x- axe, climax, axle, reflex, etc.

- ▶ /tʃ/ Voiceless Post Alveolar Affricate,
 - ▶ spelt:
 - ▶ ch chain, choose, choose, change, etc.
 - ▶
 - ▶ tch wretched, merchant, aitch (letter h),
 - ▶ ti question, suggestion,
 - ▶ tu nature, statue, furniture, virtue, concerto,

- ▶ /dʒ/ **Voiced Post Alveolar Affricate**, spelt;
 - ▶ j jam, juice, enjoy, jostle, etc.
 - ▶ g digital, gem, village, knowledge, gesture, etc.
 - ▶ dg lodge, edge, badge, etc.
 - ▶ dj adjacent, adjunct, exaggerate, grandeur, arduous, etc.

- ▶ The approximants:
- ▶ Also known as **semi-vowels**. In their articulations, two articulators come together to form a **narrow** gap at **some point** in the oral cavity. The soft palate/velum is raised shutting the nasal resonator off. The vocal folds are nearly touching. Air from the glottis escapes through the constricted vocal tract. But unlike fricatives, there air escapes without any **audible friction**.
- ▶ /j/ voiced palatal central approximant
- ▶ [ɹ] voiced alveolar central approximant,
- ▶ /l/ voiced alveolar lateral approximant
- ▶ /w/ voiced labial-velar central approximant
- ▶ */ʍ/ voiceless labial-velar central approximant

Description of Vowels

- ▶ Vowels are sounds made **without** any **obstruction** to the flow of air in the vocal tract. They occur at the centre of syllables (form nucleus or peak) of syllables.
- ▶ They are articulated with wide approximation and are all voiced except in some languages. Acoustically, they have defined formants, more energy, and are more sonorous than consonants.
- ▶ Their quality varies according to the **part** of the tongue that is used in their articulation.
- ▶ They are therefore described in relation to (i) Tongue Height, (ii) Lip Posture and (iii) Position of the Tongue.

Vowel Height

- ▶ The height of a vowel refers its relation to the highest point of the tongue and the roof of the oral cavity.
- ▶ A *close* or *high* vowel is said to be made if the tongue is raised so high that it is close to the roof but does not touch it, e.g. /ɪ, ʊ, i:, u:.
- ▶ If the tongue is only slightly raised, so that there is a *wide gap* between its highest point and the roof of the oral cavity, then an open or low vowel is produced, e.g. /a, ɒ, æ].

- ▶ Vowels produced with tongue position between **high** and **low** are called mid vowels.
- ▶ Vowels between **close** and **mid** are called half-close (half-high).
- ▶ Vowels between **open** and **mid** are called half-open (half-low).
- ▶ Vowels can also be described in relation to their formants (the value of F1 (formant 1) and F2 (formant 2) can be used to determine how high a vowel is or how central it is.
 - ▶ 1. The height of a vowel is determined by F1 value while its centrality is determined by F2.
 - ▶ A high F1 value signifies a low vowel, while low F1 values signify a high vowel.
 - ▶ 2. A high F2 value signifies a front value, while a low F2 value signifies a back or a central vowel.

Vowel Location

- ▶ The location of a vowel refers to the part of the tongue which is highest in the production of the vowel.
- ▶ Vowels are therefore described as **Front, Central or Back** depending on the part of the tongue that is raised towards the roof of the tongue.
- ▶ **Front vowels** are produced by raising the front of the tongue towards the hard palate.
- ▶ **Back vowels** are produced by raising the back of the tongue towards the soft palate.
- ▶ Central vowels are produced with the centre of the tongue raised towards the roof of the tongue.

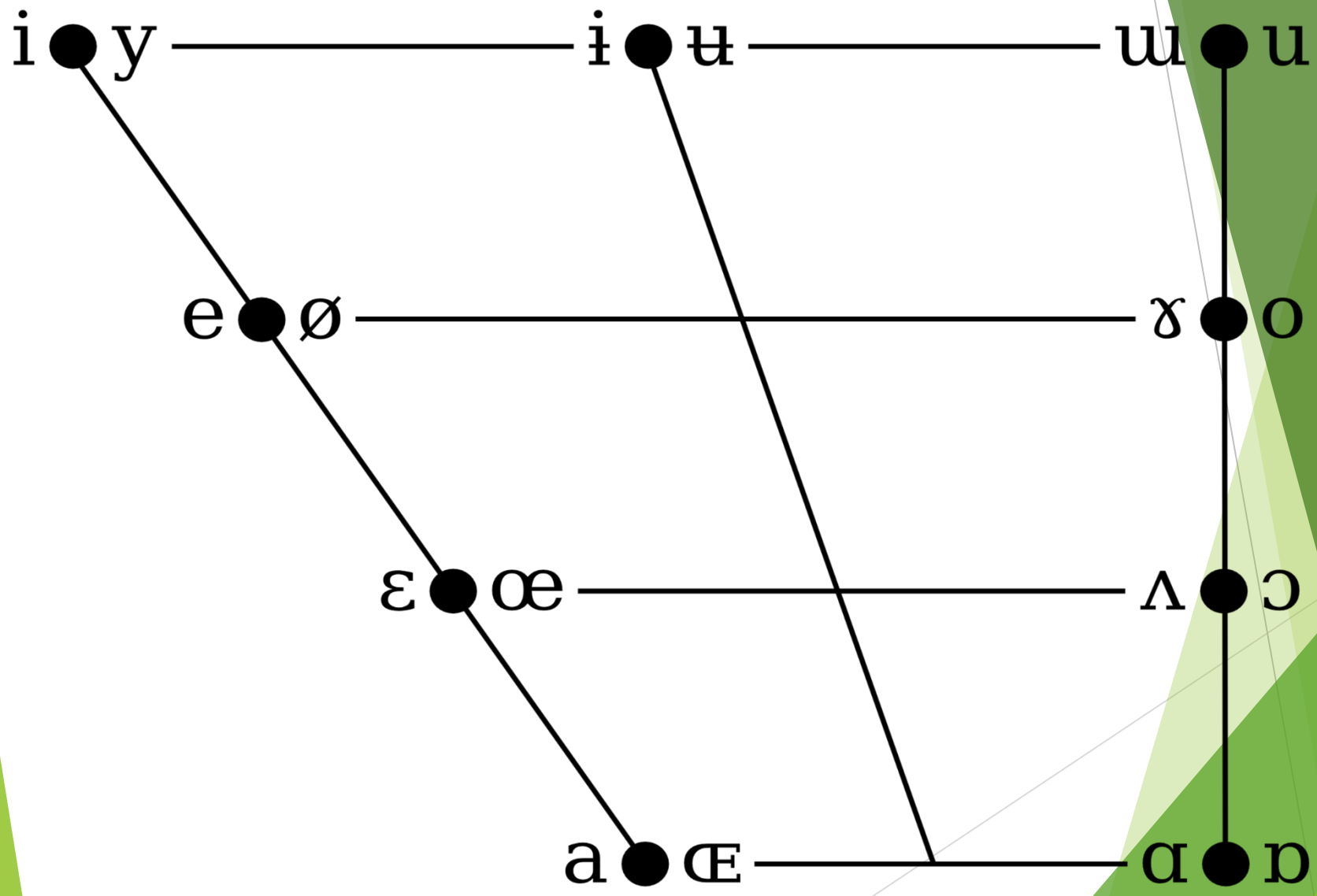
Lip Position

- ▶ **Rounded:-** the corners of the lips are brought towards each other and the lips pushed forwards. Vowels that are articulated with added lip rounding are known as Rounded vowels, e.g. all English back vowels are made with lip rounding.
- ▶ **Spread lip:-** the lips are neither rounded nor neutral, but the corners are moved away from each other, as for a smile. This is most clearly seen in cardinal vowel no.
- ▶ **Neutral,** where the lips are not noticeably rounded or spread, e.g.

CARDINAL VOWELS

- ▶ It is said that no language can say exactly a cardinal vowel.
- ▶ The cardinal vowels are located on a four sided figure (quadrilateral) representing the shape of the tongue. All front cardinals are unrounded while the back ones are rounded.
- ▶ But for secondary cardinals, the front ones are rounded while the back ones are unrounded.
- ▶ All vowels are described in relation to cardinal vowels; cardinal vowels serve as a set of reference points in which vowels of the worlds are described.

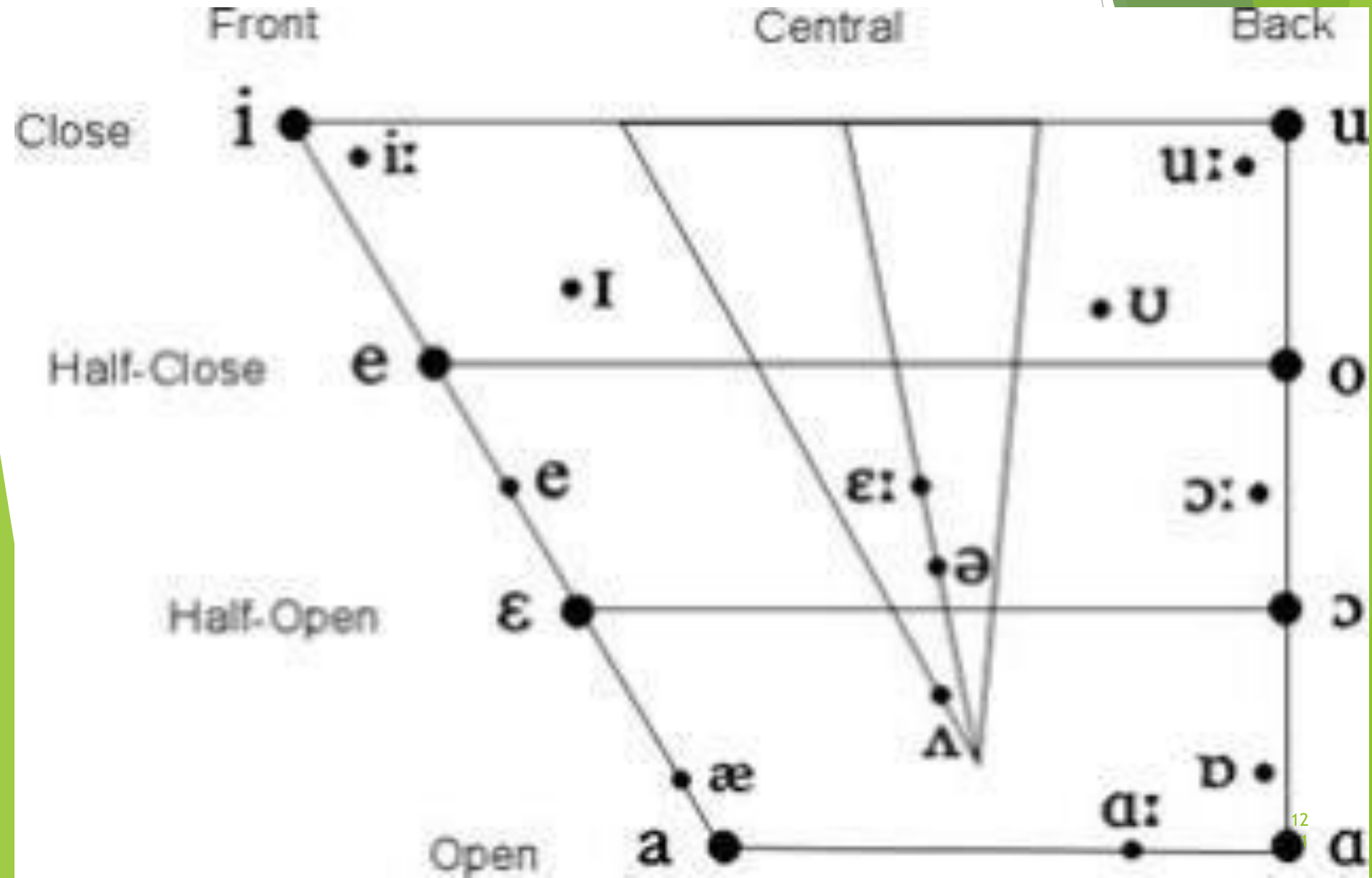
► Primary & Secondary Cardinal Vowels



Description of Vowels

- ▶ English vowels are described in relation to the cardinal vowels. English has up to 20 + 5 vowels described in relation to the cardinal vowels.
- ▶ There are different sets: monophthongs, diphthongs and the *controversial* triphthongs
- ▶ Monophthongs/pure vowels have two types:
 - ▶ Short vowels, represented by the symbols [ɪ e ʌ ə ʊ æ ɒ].
 - ▶ Short vowels are only relatively short.

The English Vowel Chart Plus Cardinal Vowels



▶ Vowel 2— /ɪ/ or KIT vowel-

- ▶ it is a short close front vowel like cardinal vowel no.1, but made with part of the tongue nearer to the centre than to the front, raised just above the closed-mid position.
- ▶ The lips are loosely spread; the tongue is lax. It does not occur in final open syllables.

▶ Its spellings

- ← *i-* fifth, rich, sit, kit, pit, with, market, etc.
- ← *y-* city, rhythm, symbol, etc.
- ← *e-* pretty, needed, wicket, wicked, except, etc.
- ← *ie-* ladies, cities, etc.
- ← *a-* village, manage, etc.

- ▶ Also build /bɪld/, Sunday /sʌndɪ/, business /bɪznɪs/,
← women /wɪmɪn/, minute /mɪnɪt/, England /ɪŋlənd/

▶ Vowel 3—/e/ of DRESS-

- ▶ it is a short front close-mid vowel made with the tongue raised between the closed-mid and open-mid positions.
- ▶ the lips are loosely **spread** and are slightly apart than for /ɪ/; the tongue may have more tension than in the case of /ɪ/ the side rims making a light contact with the upper molars. It is between C[e] and C[ɛ].
- ▶ /e/ does not occur in **final open** syllables.
- ▶ *It is spelt:-e-----*bed, dress, set, pet, kept, went, let, etc.
- ▶ ea-breath, dead, head, spread, bread, many, etc.
- ▶ Also, says, said, Geoffrey, Leicester, friend, ate, etc.

▶ Vowel 4— /æ/ or TRAP vowel

- ▶ It is a short front open vowel made with a more open mouth than for /e/;
- ▶ the front of the tongue is raised to a position midway just above open.
- ▶ The lips are *neutrally open*. It is now more open and closer to C[a] than previously
- ▶ It is usually spelt: It does not occur in final open syllables.
- ▶ -a hand, man, map, cat, sat, marry, carry, pat, fact, sat, etc.

▶ **No.5 /ɒ/ CLOTH vowel**

- ▶ It is a back short low vowel articulated with wide open jaws and slight open lip rounding.
- ▶ The back of the tongue is in the fully open position, no contact is made between the tongue and the upper molars. It has a quality similar to that of C[ɑ].
- ▶ It does not occur in final, open syllable.
- ▶ **It is usually spelt:**

▶ o— dock, lot, cloth, holiday, dog, sorry, gone, etc.

▶ a--- following /w/- e.g. was, what, swan, want, want, etc.

also in quality, squash, quarrel, and yacht, etc.

▶ ou, ow— cough, through, knowledge, Gloucester, etc.

▶ au— because, sausage, laurel, Australia, cauliflower, bureaucracy, etc.

▶ **Vowel no.9 /ʊ/ PUT vowel**

- ▶ It is a short back rounded vowel made with part of the tongue nearer to the center than to the back raised just above the close-mid position; it has a symmetrical relationship with the front short high vowel /ɪ/.
- ▶ The tongue is laxly held, no firm contact is made between the tongue and the upper molars. The lips are rounded.

▶ **It is usually spelt:**

- ▶ u- put, butcher, cellular, cushion, full, sugar, etc.
- ▶ oo- book, good, wood, wool, etc.
- ▶ o- bosom, wolf, woman, etc.
- ▶ ou- could, courier, should, would, etc.

- ▶ Vowel no. 12 /ə/ lettER vowel.
- ▶ It is a short central vowel also called schwa.
- ▶ It is made with the central part of the tongue raised between open-mid and close-mid.
- ▶ It has a very high frequency of concurrencies in unaccented/unstressed syllables.
- ▶ It is made with neutral lip position.

▶ It may be spelt, e.g.



▶ *i* possible,

▶ *e* gentlemen,

▶ *a* woman, probability

▶ *o* oblige, oppose, *formula*,

▶ *u* suppose, support, surrender,

▶ *ar* particular, ladder, later, formula,

▶ *er*, father, mother, teacher, scooter,

▶ *or* doctor, mentor, mayor, sailor,

▶ *ou* famous, callous,

▶ *our* colour,

▶ *ure* figure

▶ Long Vowels

- ▶ Long in English are: /i:, ɔ:, ɜ:, u:, ɑ:/.
- ▶ They are longer than their short counterparts in similar environments/contexts.
- ▶ They are not only different in length from the short vowels but also in quality.
- ▶ All the long vowels have symbols which are different from those of short vowels; the long and the short vowels would still be different from each other even if the length mark is omitted.

- ▶ **Vowel No. 1 i:- FLEECE vowel:**
- ▶ **It is** a long front vowel nearer to the cardinal vowel no. 1.
- ▶ It is more close and front than the vowel of KIT.
- ▶ The lips are slightly spread.
- ▶ It is made with the front of the tongue raised, to a height slightly below and behind the front close position.
- ▶ It does not occur in a syllable closed with /ŋ/.

- ▶ It is usually spelt:
- ▶ ee----tree, cheese, canteen, see, feel, peel, seed; e-complete, be, these, thesis, ea- leaf, reason, sea, leave, meat, seat, least, league, ceased;
- ▶ *ie, ei-* piece, field, siege, receive, receipt
- ▶ *i-*machine, police, prestige, suite Note quay, people

- ▶ **Vowel No. 11 ɜ:- NURSE vowel-**
- ▶ It is a long central vowel articulated with the centre of the tongue, raised between the tongue and the molars.
- ▶ The lips position is neutral.
- ▶ It is mostly spelt –
- ▶ er serve, preserve, verse, merge, emerge, e.g.
- ▶ ur **purse**, turn, curve, curse, nurse, curve, curl, disturb, etc.
- ▶ ir bird, first, third, etc.

▶ **Vowel No. 5 /ɑ:/- PALM vowel**

- ▶ It is a long unrounded back vowel made with a wide jaw and neutral lips.
- ▶ It has a quality nearer to C[ɑ]. It does not occur before /ŋ/.
- ▶ **It is usually spelt:**
- ▶ a—— pass, after, bath, tomato, father, branch, camouflage, moral, etc.
- ▶ ar- part, car, march, park, fart, Carl, etc.
- ▶ ear- heart, hearth, etc.
- ▶ er- clerk, Derby, **ser**geant, etc.
- ▶ al- calm, palm, half, talk, etc.
- ▶ au- aunt, laugh, etc.

▶ **Vowel No. 6, /ɔ:/- THOUGHT vowel**

- ▶ It is a relatively long back vowel articulated with lip rounding.
- ▶ The back of the tongue is raised between the open-mid and close-mid positions; no contact is made between the tongue and the upper molars.
- ▶ It is almost fully back and has quite a strong lip-rounding.

▶ **It is usually spelt:**

- ▶ **ar, or-** war, quart, cord, horse, sword, etc.
- ▶ **ore** – before, more, lore, f ore, etc.
- ▶ **our-** court, four, course, pour, sour, etc.
- ▶ **oar, oor-** oar, board, door, floor, etc.
- ▶ **au,** fault, cause, daughter, etc.
- ▶ **a-** all, talk, salt, water, etc.
- ▶ **aw-** saw, lawn, jaw, yawn, awesome, etc.
- ▶ **au-** bought, ought, etc.

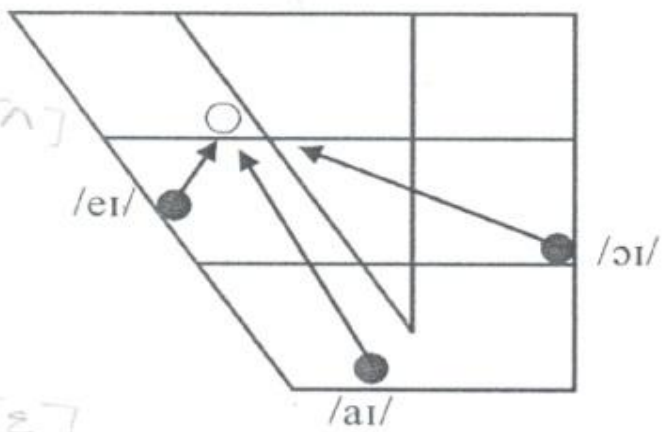
- ▶ **Vowel No. 8 /u:/- GOOSE vowel**
- ▶ It is a close/high back vowel. The lips tend to be closely rounded.
- ▶ Occurs at syllables. It does not occur before /ŋ/.
- ▶ The nearest cardinal vowel to this vowel is no.8 [u]
- ▶ ***It usually spelt:***
- ▶ *u*—— rude, June, crucial, pull, etc.
- ▶ *oo*—— food, soon, moon, spoon, cool, fool, etc.
- ▶ *o*—— do, who, move, lose, etc.
- ▶ *ou*—— group, soup, wound, through, *etc.*
- ▶ *ew*—— chew, flew, threw, askew, etc.
- ▶ *ue, ui, oe*—— blue, juice, shoe, etc.

Diphthongs

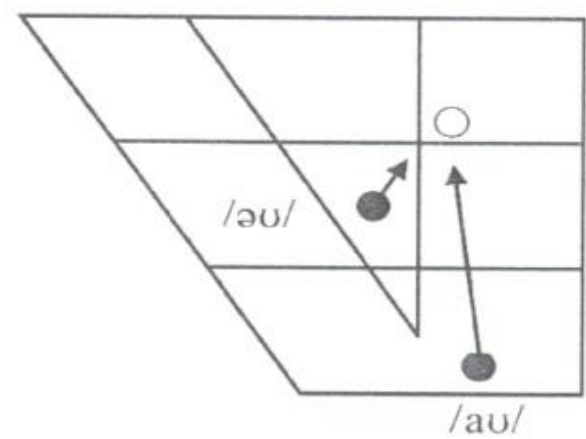
- ▶ Diphthongs are sounds which consist of a movement or a glide from one vowel to another.
- ▶ A vowel which remains constant and does not glide is called **pure vowel**.
- ▶ Diphthongs are long like long vowels.
- ▶ Are never two vowels, but are always considered as single vowels.
- ▶ The glide starts from the first element and ends on the second element. The first element is relatively longer and louder than the second element.

- ▶ They are therefore equivalent to the long pure vowels in terms of length. They do not occur before the velar nasal /ŋ/.
- ▶ there are 8 of them in English. /eɪ aɪ ɔɪ ɪə eə ʊə eʊ aʊ/
- ▶ There are two groups: Centering, where there is a glide towards the centre e.g. /ɪə eə ʊə/
- ▶ Closing; also have two sets: a type that glides towards the front /ɪ/,
▶ e.g. /eɪ aɪ ɔɪ/
- ▶ The types that glide towards the back /ʊ/, e.g. /əʊ aʊ/.

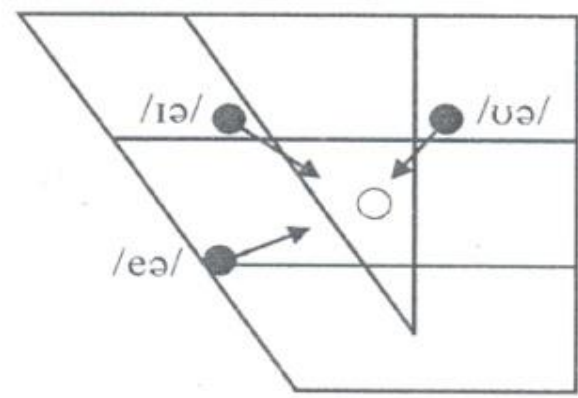
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Diphthongs which close towards /ɪ/



Diphthongs which close towards /ʊ/



Centring diphthongs

- ▶ /ɪə/ NEAR vowel
- ▶ *It is pelt:*
- ▶ *er, ere*---- **hero, interfere, sincere, etc.**
- ▶ *ear, eer-* dear, fear, nuclear, appear, yearly, weary, eerie, career, sneer, deer
- ▶ *ia*--- material, brilliant, media, industrial, familiar
- ▶ *ea*---- cochlea, pancreas, nausea, diarrhea, area
- ▶ *eu, eo*---- museum, theological, creosote
- ▶ *ie*---- soviet, spaniel, fierce, salient, thirtieth
- ▶ *io*---- - period, million, chariot, axiom, opinion,
- ▶ *iou* previous,
- ▶ *iu-* medium, stadium, union, tedium, delirium

- ▶ /eə/ SQUARE vowel
- ▶ It glides from /e/ and moves in the direction of /ə/, The lips are neutrally open throughout.
- ▶ *It is spelt:*
- ▶ *ar, are*—— rarity, care, share, aware, parent welfare, librarian, scarce, etc.
- ▶ *air*—— air, chair, afar, despair, impair, eclair, etc.
- ▶ *ear*—— ear-bear, pear, wear, tear, hare, swear, hair, fair, stare, stair, etc.

- ▶ /ʊə/ CURE vowel
- ▶ It glides from /ʊ/ and moves towards the centre /ə/.
- ▶ It is usually spelt:
 - ▶ *oor-* poor, moor, boor, etc.
 - ▶ *our-* tour, dour, gourd, amour, tournament, bourgeois, etc.
tourist, your, etc.
 - ▶ *ure-* pure, endure, cure, abjure, secure, ensure, insure,
manure, etc.
 - ▶ *iou, u-* curious, spurious, during, security, insurance, furious,
etc.
 - ▶ *ue, ua-* cruel, fluent, puerile, actual, mutual, usual, gradual,
annual, etc.

▶ Closing Diphthongs

▶ /eɪ/ FACE

▶ Its glide begins from close-mid front /e/ position and moves in the direction of RP /ɪ/.,

▶ Spelling

▶ *a-* ape, late, make, lady, waste, base, etc.

▶ *ai-* waist, rail, aim, rain, etc.

▶ *ay-* day, may, crayon, etc.

▶ *ei, ey-* eight, veil, weight, rein, they, whey, etc.

▶ *ea-* great, steak, break, etc.

▶ Note, gauge, gaol, fete, suede, etc.

▶ The region of cardinal vowel no.5 [a], but not as back as this. The lip position is neutral. PALM vowel

▶ /aɪ/ PRICE

▶ It glides from [a], and moves in the direction of the close vowel /ɪ/.

▶ It is spelt:

▶ *i-* time, write, bite, climb, design, ripe, like, ice, etc.

▶ arrive, indict / ɪndaɪkt/, isle /aɪl/

▶ *ie-* die, lie, pie, tried, etc.

▶ *y, ye-* asylum /əsaɪləm/, cry, dry, by, Cyprus, hybrid, tyrant, cycle,
type, dye, etc.

▶ *igh-* high, light, fight, sight, right, bright, etc.

▶ Note eye, height, either, neither, eider, aisle, Buy, maestro, etc.

▶ /ɔɪ/ CHOICE

▶ Its glide begins from /ɔ/, and moves towards /ɪ/. The lips are open rounded for the first element, changing to neutral for the second session.

▶ Spelling

▶ io- boil, noise, oil, point, voice, etc.

▶ oy- boy, oyster, toy, voyage, etc.

▶ Note buoy

▶ /əʊ/ GOAT

▶ The standard lexical set GOAT glides from a central position and moves in the direction of back high RP vowel /ʊ/.

▶ Spelling

▶ *o-* zero, so, old, both, folk, bimbo, clone, close, zero, bone, etc.

▶ *oe-* toe, doe, sloe, foe, cocoa, oboe, etc.

▶ *ow-* know, blow, hallow, pillow, sparrow, meadow, etc.

▶ *oa-* oak, road, foal, toast, soap, hoax, loaf, reproach, etc.

▶ *ou-* soul, though, shoulder, boulder, soldier, etc.

▶ Also mauve, brooch, beau, sew, don't, plateau, bureau, gauche, etc.

- ▶ /aʊ/ MOUTH
- ▶ Its glides begins from /a/ and moves in the direction of RP /ʊ/.
- ▶ **Spelt: e.g.**
- ▶ *ou-* house, sound, out, council, ground, blouse, doubt, etc.
- ▶ *ow-* allow, how, bow, cow, fowl, owls, etc.



PHONEMES

- ▶ The smallest phonological contrastive units of a language. Phonemes are language specific, they differ from language to language. A phoneme in a particular language may not be a phoneme in another language.
- ▶ All languages have a set of phonemes.
- ▶ The slash / / is used when describing a phoneme of a language (broad transcription) and [] when describing detailed phonetic features of the phonemes (narrow transcription).
- ▶ Using a phonemic description, we have 20 + 5 vowels and 24 consonants in English.

- ▶ Phonemes are established through minimal pairs.
- ▶ Minimal pairs: a pair of words which differ from each other in the same environment. A pair of words that have different meanings and which differ in only one phoneme.
- ▶ To prove that two sounds are phonemes of a particular language, there must be a pair of words in the language which differ in only one segment, and in the same position in the words.
- ▶ The two forms must not be alternative pronunciation of the same word- they must not be in free variation such as the pronunciation of either /i:ðə/ or /aɪðə/.

- ▶ E.g. **fussy** [fʌsi] and **fuzzy** [fʌzi] constitute a minimal pair in English;
- ▶ They are two different words with different meaning, they have phonemes which differ only in the same environment /s/ and /z/.
- ▶ **fat** [fæt] and **fart** [fa:t]
- ▶ -differ only with the segments /æ/ and /a:/ in the same environment.

▶ learn	lean
▶	
▶ sit	sat
▶	
▶ farm	fart
▶	
▶ soon	moon
▶	
▶ make	mark
▶	
▶ so	see

▶ ship	sheep
▶ lap	map
▶ how	low
▶ push	pull
▶ man	men
▶ pot	pit

- ▶ **Minimal set:** is three words which differ in a single sound in the same environment. When a group of words can be differentiated, each one from the other, by changing one phoneme (in the same position in the word), we can have a minimal set.

- ▶ E.g. **pat**,
▶ sat
▶ mat
▶ fat
▶ cat

- ▶ In effect two segments are said to be separate phonemes if they contrast in identical environment.

▶ **Secondary Articulation**

- ▶ Secondary articulation involves an addition of another articulatory gesture to the production of a speech sound. It is a **gesture with a lesser degree of closure** occurring at the same time as another (main articulatory gesture) occurs.
- ▶ A sound is said to have a secondary articulatory gesture if in its articulation another articulation is involved in addition to its main articulation.

A sound could be palatalized if it is followed by a high front vowel /i:/, I/ or the palatal /j/. Palatalisation is the addition of a high front tongue gesture like that of [i] to another gesture,

It is symbolized [j].

- ← E.g. /t/ becomes palatalised [tʃ]
- ← as in 'tea' [tʃi:], tune, etc.

- ▶ The velar stop /k/ in **key** [k^ji:] may be said to be palatalised because instead of the velar contact of the kind that occurs in a **car** [ka:], the place of articulation in **key** is changed so that it is near the palatal area.
- ▶ [t^j] is called voiceless palatalised alveolar stop/plosive. The place of articulation of the velar stop is changed to a palatal place.

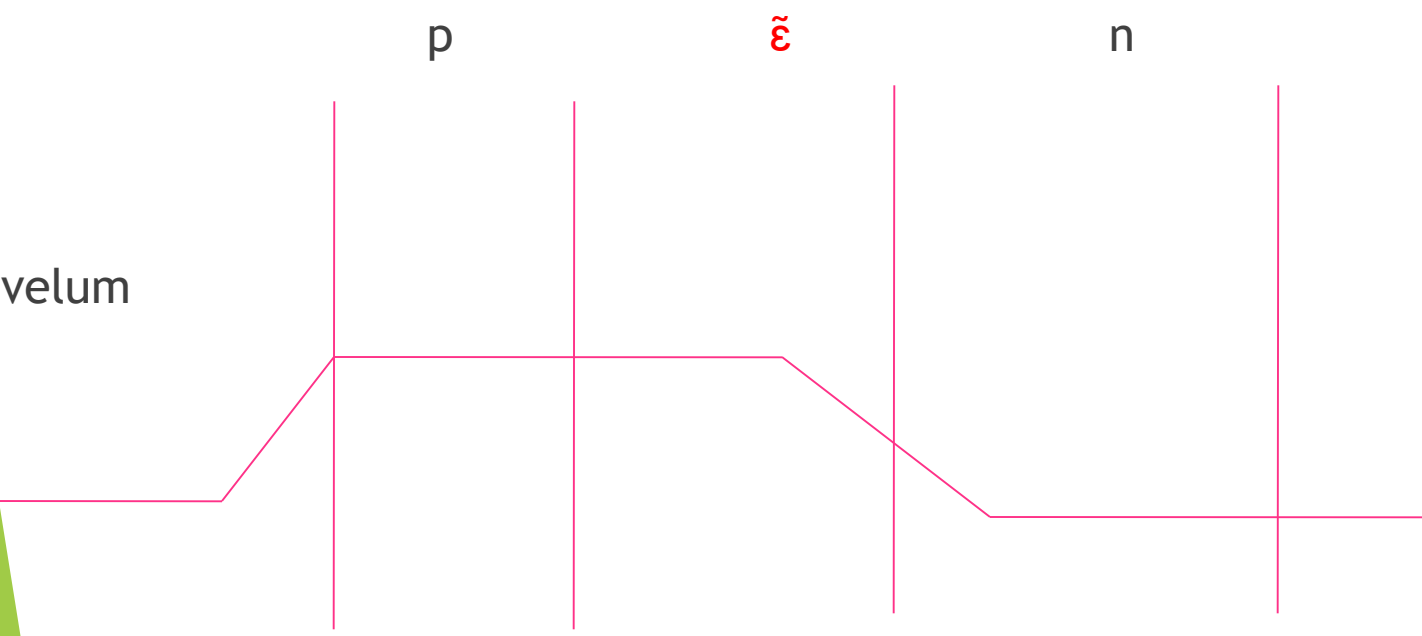
▶ **Velarisation:**

- ▶ It is the raising of the back of the tongue towards the velum during the articulation of a non-velar sound.
- ▶ Velarisation is symbolised by the diacritic [ɤ] or by a dash across e.g. the e.g. [ɫ].
- ▶ this is also known as dark /l/.
- ▶ This happens when /l/ is preceded or followed by consonant e.g. help [helɸ], health [heɫθ], feel [fi:ɫ], foul [faʊɫ] etc.
- ▶ [ɫ] is called voiced velarised alveolar lateral approximant.

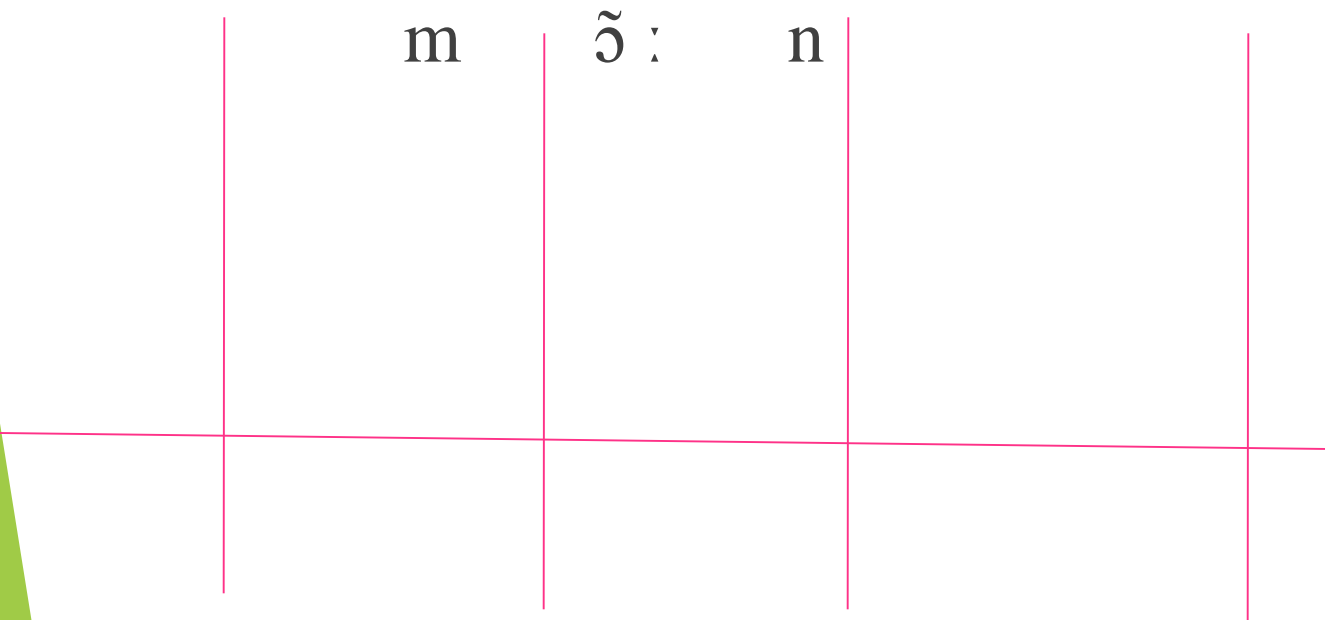
- ▶ **Labialisation:-** adding lip rounding to another articulatory gesture.
- ▶ If it is followed by any of the rounded vowel /u:, ɔ:, ʊ, ɒ/ and /ɔɪ/ as in ‘two’. tore, score, small, put, soil, etc. It occurs when a consonant is followed by any of the following rounded vowels /u:, ɔ:, ʊ, ɒ/ and /ɔɪ/.
- ▶ Labialisation is symbolised [ʷ] since it involves lip rounding.
- ▶ E.g. two [t^w u:], zoo, [z^w u:], call [k^w ɔ:l]
- ▶ tall [t^w ɔ:l] full [f^w ʊl]
- ▶ Labialised [t^w] labialised voiceless alveolar plosive
- ▶ Nasalisation-nasalizing an oral sound when it is followed by a nasal sound.

- ▶ **Nasalisation:**-occurs when the airstream is allowed to flow *simultaneously* through the nose and the mouth.
- ▶ Nasalisation is indicated by the diacritic [ã] over the vowel.
- ▶ English has no nasal vowels, but vowels in the environment of nasal consonants such as /m, n, ŋ/ become nasalised.
- ▶ E.g. pen [pɛ̃n]
- ▶ Mourn [mɔ̃:n]

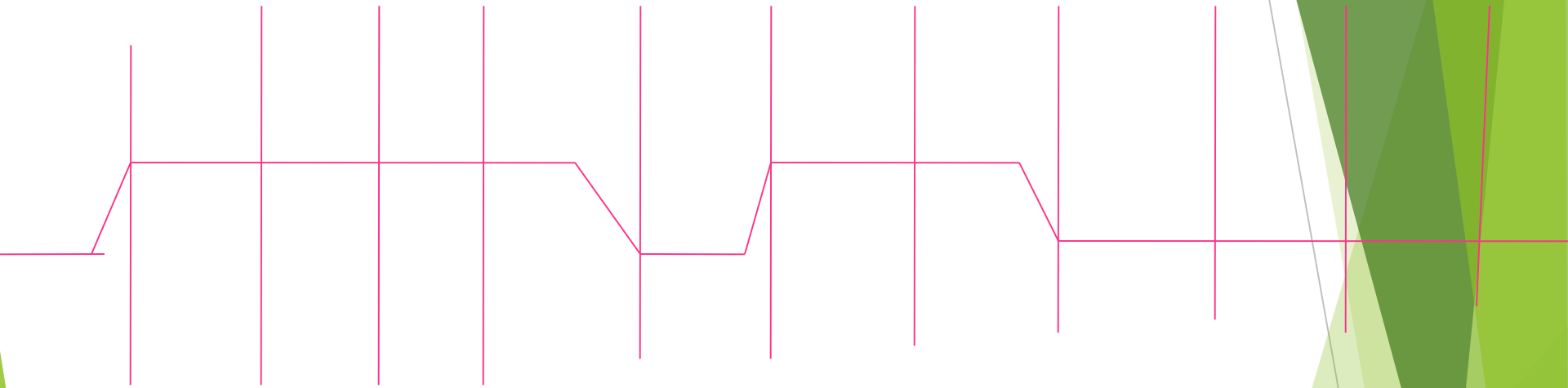
► Pen [pɛ̃n]



► Mourn [mɔ̃ :n]



b i: h əʊ m b aɪ n aɪ n





ALLOPHONES

ALLOPHONES

- ▶ Allophones are different realisations of a single phoneme (different ways in which the same phoneme can be pronounced).
- ▶ One single phoneme can be realised differently in different environments.
- ▶ Allophones are non-contrastive variants of phonemes. A set of sounds that make up a phoneme are known as its allophones.
- ▶ The phoneme in English can be realised (pronounced) in different ways in different environments. The stops /p, t, k, n, m, g/ can be **labialised**.
- ▶ /p/ in ‘port’ [p^wɔ:t], ‘pool’ [p^wu:l], pot [p^wɒt], etc.
- ▶ /m/ in ‘mourn’ [m^wɔ:n], moon [m^wu:n], etc.
- ▶ /t/ in ‘toys’ [t^wɔɪs], took [t^wu:k], etc.
- ▶ /n/ in ‘norm’ [n^wɔ:m], noon [n^wu:n], noise [n^wɔɪs], etc.
- ▶ /k/ in ‘court’ [k^wɔ:t], ‘cot’ [k^wɒt], [k^wu:l], ‘quote’ [k^wəʊt], ‘count’ [k^waʊnt],
- ▶ /g/ good, goose, etc.

- ▶ All the plosives be **palatalised** when followed by any of the following palatal /i: ɪ, j/. e.g.
- ▶ /p/ in ‘peel’ [pʲi:t], ‘pin’ [pʲɪn], etc.
- ▶ /m/ in ‘mean’ [mʲi:n], meat [mʲi:t], etc.
- ▶ /t/ in ‘tea’ [tʲi:], tick [tʲɪk], etc.
- ▶ /n/ in nil [nʲi:l], new [nʲju], etc.
- ▶ /k/ in ‘key’ [kʲi:], ‘kill’ [kʲi:l]
- ▶ → aspirated [tʰ] in *tea* [tʰi:] (initial accented syllable)

▶ The voiceless plosives can be **aspirated** [p^h, k^h, t^h] when any of them is the initial segment of a stressed syllable.



▶ /p/ in ‘port’ [p^hɔ:t], ‘pool’ [p^hu:l], pot [p^hɒt], etc.

▶ /t/ in ‘toy’ [t^hɔɪ], toad [t^həʊd], etc.

▶ /k/ in ‘court’ [k^hɔ:t], ‘cot’ [k^hɒt], [k^hu:l], ‘quote’ [k^həʊt], ‘count’ [k^haʊnt],



▶ Also, in ‘par’ [p^ha:], ‘core’ [k^hɔ:], ‘car’ [k^ha:], ‘tore’ [t^hɔ:], etc.

▶ The voiceless plosives can be **unaspirated** [p, k, t] when any of them is the initial segment of a stressed syllable.

▶ They are however, **unaspiration** [p, k, t] when they occur after the voiceless fricative /s/ as in ‘skill’ [ski:l], ‘skin’ [skɪn], ‘spell’ [spel], ‘star’ [sta:], etc.

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/t/

[t̚] unreleased: pit, bitcoin, etc.

[t^h] aspirated

[ɾ] flap/tap: little, butter, water,

[t] unaspirated (neutral) : stain, stop, stay, steal, etc.

[ʔ] glottal: cat, mat, map, hate, flight, sight, sick, cup, lack, etc

- ▶ /k/ → labialized [k^w] call k^wɔ: t]
- ▶ → aspirated [k^h] in cup, cat, can, income, competent, etc.
- ▶ Glottalised [kʔ] take, make, map, backseat, workload, talk back, back-breaking.
- ▶ Unrelease, at syllable final position or before another stop, etc. make good, back pain, etc.
- ▶ Neutral when preceded by a fricative, e.g. school, scout, etc.

▶ The phoneme /n/ in the prefix un- could have different allophonic variations:

- ▶ **Un**armed, **un**stable, **un**done, [n] neutral
- ▶ **Un**favorable, **in**fant, [m] labio-dentalized
- ▶ **Un**thinkable/**ten**th, (influence of [θ]) [n̪] dentalized
- ▶ ****Un**pleasant, **n**ew, **n**oon [nʷ] Labialized

- ▶ /m/ → labiodental [ɱ] in *nymph, infant* (influence of [f])
- ▶ In fact, emphasis, etc.

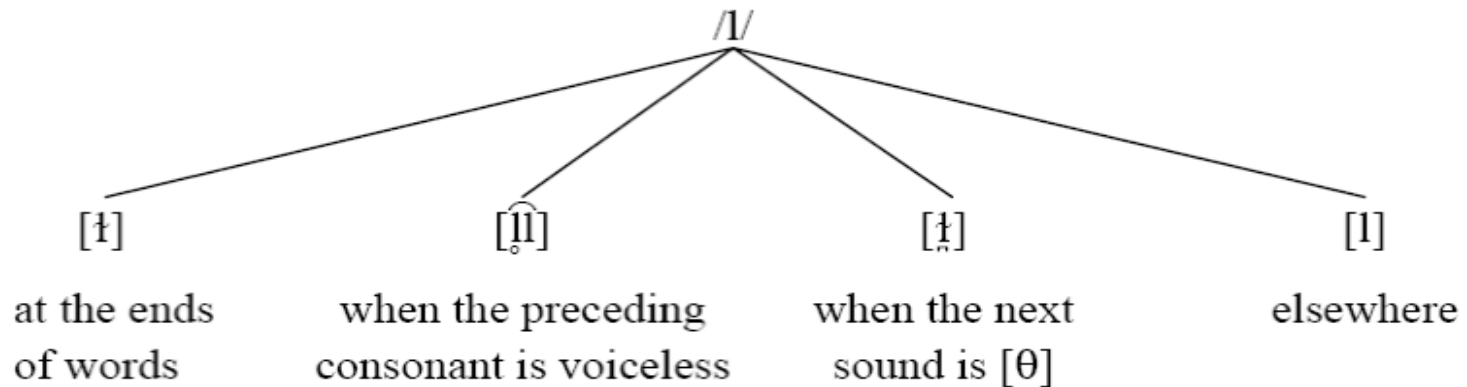
- ▶ /l/ can be velarized [ɫ] when after a vowel, e.g.
- ▶ Heal, hall, meal, peel, etc.

- ▶ After a consonant, e.g.
- ▶ Cattle, mostly,

Allophones of /l/

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file [ˈfaɪɫ]	slight [sɫaɪt]	wealth [ˈweɪɫθ]	listen [ˈlɪsən]
fool [ˈfuɫ]	flight [ˈflaɪt]	health [ˈheɪɫθ]	lose [ˈluːz]
all [ɔɫ]	plow [ˈpləʊ]	filthy [ˈfɪɫθi]	allow [əˈlaʊ]
ball [ˈbɔɫ]	cling [ˈkɪŋ]	tilth [ˈtɪɫθ]	aglow [əˈɡloʊ]
fell [ˈfeɪɫ]	discipline [ˈdɪsəˈplɪn]	stealth [ˈsteɪɫθ]	blend [ˈblend]
feel [ˈfiɫ]			

The pattern turns out to be as follows:



might [maɪ̯t]

neigh [neɪ̯]

rose [rəʊ̯z]

plow [ˈpləʊ̯]

filthy [ˈfɪl̩θi]

allow [əˈləʊ̯]

cling [ˈklɪ̯ŋ]

tilth [ˈtɪl̩θ]

aglow [əˈgləʊ̯]

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▶ Complementary Distribution

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- ▶ Allophones of a phoneme are therefore always in complementary distribution (they do not occur in the same environment).
- ▶ E.g., [t^h] and [t^w] cannot occur in the same environment.
- ▶ Nevertheless, the fact that two sounds occur in complementary distribution, does not guarantee that they are allophones of the same phoneme.
- ▶ E.g. [ʒ] and [ŋ] are in complementary distribution, but they are not allophones of the same phoneme.
- ▶ Also [h] and [ŋ]

- ▶ unique, banquet, bouquet, mosquito, quite, quilt, inquire, queer, quest, voiced
- ▶ velar, go, gourd, geese, agree, dragon, organ, wagon, egg, aggravate,
- ▶ aggressive, morning, my, gum, sample, amber, quite summer, committee,
- ▶ immoral, comb, bomb, lamb, climb, womb, plumber, numb, singer, singer,
- ▶ tongue, nightingale, hanger, among, forkk, friend, fried, feet, fit, fowl, office, cliff,
- ▶ afford, offend, coffee, effect, suffer, physics, phonology, diaphragm, epitaph,
- ▶ nephew, enough, rough, cough, laugh, thief, thick, thoughter, thumb, etherer,
- ▶ ethics, method, author, anthem, lengthy, smith, healther, cloth, birth, road zeal,
- ▶ anxious, ranker, chunk, turn, curve, monther, sham, ashes, luscious, rashly,
- ▶ brochure, sachet, chalet, numb sure, sugar, assure, nation, mansion, conscious,
- ▶ ocean, genre, measure, vision, revision, provision, allusion, conclusion,
- ▶ television, division, decision, casual, pleasure, scissors, possess, dessert,
- ▶ dissolve, question, suggestion, nature, statue, furniture, numb sure, virtue,
- ▶ concerto, house, provision out, council,

► Phonological Processes

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❖ For example, in the pronunciation of the phrase “most people” under normal speech rate, it is difficult to say the ‘t’ in the word ‘most’. This is because ‘t’ is found between two consonants- ‘stp’ and sometimes it is difficult to pronounce three consonants together.

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ALLOPHONES

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- ▶ → aspirated [tʰ] in *tea* [tʰiː] (initial accented syllable)
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/t/

[t̚] unreleased: pit, bitcoin, etc.

[tʰ] aspirated

[ɾ] flap: little

[t] unaspirated (neutral) : stain

[ʔ] glottal: mutton

- ▶ → glottalised [ʔ] in word final position
- ▶ E.g. cat [k^hæʔ], pat [p^hæʔ], [sɪʔ], mat, light, flight, put, apartment, backseat, assortment, upbeat.
- ▶ **phrases:** right now, talk back, hate mail, fax etc.
- ▶ /k/ → could be realised as [k⁺] when followed by a high front vowel [i]. E.g. key, kill, kiss, etc.
- ▶ → retracted [k⁻] call when followed by a back vowel [ɔ:],
- ▶ E.g. call [k⁻ɔ:ɫ] in the same environment as
- ▶ → labialized [k^w] call k^wɔ: ɫ]
- ▶ → aspirated [k^h] in cup, cat, can, income, competent, etc.
- ▶ glottalised, e.g. take, make, map, backseat, workload, talk back, back-breaking.
- ▶ Unrelease, at syllable final position or before another stop, etc. make good, back pain, etc.
- ▶ Neutral when preceded by a fricative, e.g. school, scout, etc.

▶ /n/ → dental in *tenth*

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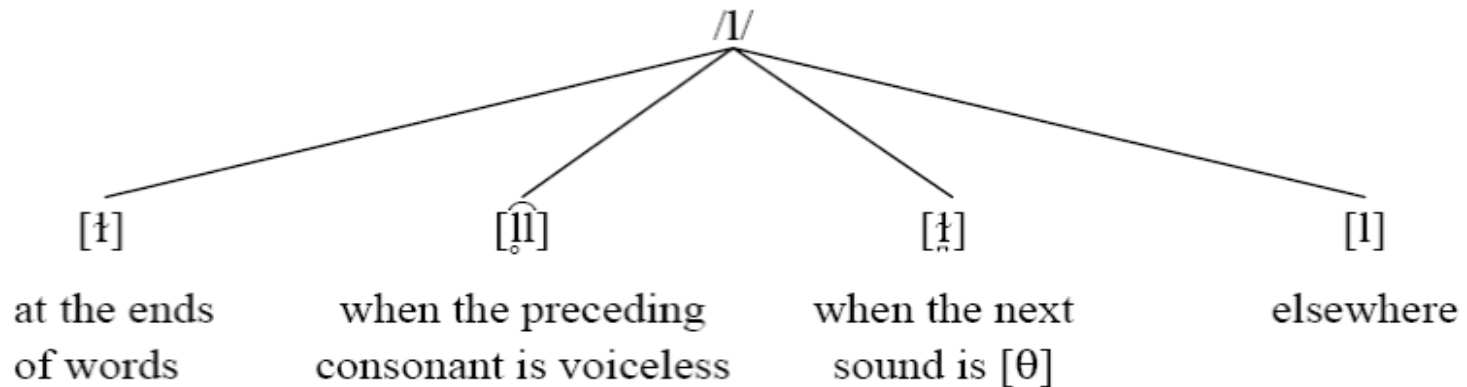
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The pattern turns out to be as follows:



Rules affecting consonants

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- (1) Consonants are longer when at the end of a phrase.
- (2) Voiceless stops (i.e., / p, t, k / are aspirated when they are syllable initial, as in words such as “pip, test, kick” [p^hɪp, t^hɛst, k^hɪk].
- (3) Obstruents – stops and fricatives – classified as voiced (that is, / b, d, g, v, ð, z, ʒ /) are voiced through only a small part of the articulation when they occur at the end of an utterance or before a voiceless sound. Listen to the / v / when you say *try to improve*, and the / d / when you say *add two*.
- (4) So-called voiced stops and affricates / b, d, g, dʒ / are voiceless when syllable initial, except when immediately preceded by a voiced sound (as in *a day* as compared with *this day*).
- (5) Voiceless stops / p, t, k / are unaspirated after / s / in words such as *spew, stew, skew*.
- (6) Voiceless obstruents / p, t, k, tʃ, f, θ, s, ʃ / are longer than their corresponding voiced obstruents / b, d, g, dʒ, v, ð, z, ʒ / when at the end of a syllable.
- (7) The approximants / w, r, j, l / are at least partially voiceless when they occur after initial / p, t, k /, as in *play, twin, cue* [p^hleɪ, twɪn, kju].
- (8) The gestures for consecutive stops overlap, so that stops are unexploded when they occur before another stop in words such as *apt* [æp^tt] and *rubbed* [rʌb^dd].

might [maɪt]

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rose [roʊz]

plow [ˈpləʊ]

filthy [ˈfɪlθi]

allow [əˈloʊ]

cling [ˈklɪŋ]

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Rules affecting consonants

clear how to write a consistent narrow transcription, because the output of these rules must be transcribed. Also, in discussions of English phonology, the list provides many examples for practicing rule formulation. Note, however, that some of these rules are not suitable for a categorical phonological description and are likely phonetic rules of a gradient nature.

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❖ Assimilation

- ▶ It is a process where one sound becomes phonetically similar to an adjacent sound. It is concerned with one sound becoming phonetically similar to an adjacent sound in a word or identical to a neighbouring sound in connected speech.

Examples:

- ▶ One beer /wʌn biə/ → /wʌm 'biə/

▶ / wʌn	biə/	/ wʌm	'biə/
▶ alveolar	bilabial	bilabial	bilabial
▶ nasal	plosive	nasal	plosive
▶ voiced	voiced	voiced	voiced

- ▶ /nju:s/ → /nju:speipə/

- ▶ dogs → /s/ becomes /z/

- ▶ laugh**ed** → /læ**ft**/

▶ **Direction of Assimilation**

▶ **Regressive:** It occurs when the following consonant influences the preceding one. Assimilation can be *regressive* where a sound is influenced by a sound which follows it.

▶ Examples of **regressive** assimilation

▶ **A** is influenced by **B**

▶ /faɪv/ → /faɪ**f** pəns/

▶ /nju:z/ → /nju:**s**peɪpə/

▶ **Progressive:** It occurs when the preceding consonant influences the following one. **Progressive** assimilation occurs in the realization of the plural forming morpheme {s}:

▶ **A** → **B**

▶ The plural morpheme {s} pronounced /s/ in **cats** /kæts/ becomes /z/ in the word 'dogs' /dɒgz/.

E.g. **Bags** → /bæ**gz**/

▶ **Laughed** → /læ**ft**/

▶ /gu:**s**/ → /gu:**z**bəri/

Assimilation is traditionally classified into three main types; Voicing, place and manner

Voicing Assimilation:- occurs where a voiced segment becomes voiceless as a consequence of an adjacent voiceless segment or a voiceless segment becomes voiced as a consequence of an adjacent voiced segment. *When two consonants are in the coda, they have to agree in voicing, either voiced or voiceless.*

Examples: In noun plural markers;

When –s follows any voiced sound (consonant or vowel), it changes to /z/

▶ dogs → /s/ becomes /z/

▶ cats → /s/ becomes /s/

▶ killed → /d/ agrees to /l/

▶ Mapped /d/ becomes /t/

▶ E.g. pushed, licked, jumped, stopped, crashed, matched,

▶ E.g. bags [bægz], dogs [dɒgz], bars [baːz], plugs [plʌgz] etc.

Assimilation of Manner

▶ Manner assimilation:- here one sound changes its manner of articulation to become similar in manner to a neighbouring sound,

▶ Example, manner assimilation occurs in the word *electricity* where the velar stop /k/ in *electric* /ɪlektrɪk/ assimilates to the alveolar fricative /s/ in electricity

/ɪlektrɪsɪti/.

electric /ɪlektrɪk/

electricity /ɪlektrɪsɪti/

▶ Note: there are two types of assimilation taking place here, **place** and **manner**: firstly, **velar** becomes **alveolar** (place) and secondly a **stop** becomes **fricative** manner.

▶ that side → /ðæs saɪd/

good night → /gʊn naɪt/

► **Place Assimilation:**

- This occurs when a segment changes its place of articulation to take on the place of an adjacent segment.
- **Assimilation of place:** When a sound changes its place of articulation to another place.

Types of assimilation of place

► **a) Alveolar stops assimilation**

Examples, /t, d, n/ may become bilabial if followed by bilabial consonant /p, b, m/ or they may become velar stops /k, g/ if they are followed by velars /k, g/.

Examples,

that boy → /ðæt bɔɪ/ → /ðæp bɔɪ/

good pen → /gʊd pen/ → /gʊb pen/

ten players → /ten pleɪəz/ → /tem pleɪəz/

- E.g. the *alveolar* consonants /t, d, n/ become *bilabial* or *velar* when followed by bilabial or velar sound.
- E.g. the word *that* /ðæt/ **may be** realised as /ðæp/ when followed by 'boy' /bɔɪ/.

► b) Alveolar fricatives

In a sequence of two words where the first ends with /s, z/ and the second begins with /ʃ/ or /j/, /s/ becomes /ʃ/ and /z/ becomes /ʒ/

- ▶ When /t, d, n/ are followed by a velar sound /k/, /g / or /ŋ/, they may be realised /k/,
- ▶ e.g. the phrase *that girl* will be realised /ðæk ɡɜ:l/, thus, /t/ assimilates to the velar stop /k/ as a result of the influence of the voiced velar stop /g/.
- ▶ It is a place assimilation because it is only the place of articulation that is influenced, the /t/ maintains its manner and voicing.
- ▶ /k/ before /k, g / e.g. *that cat* /ðæt kæt/, *that goat* /ðæt ɡəʊt/
- ▶ /d/ become /g / before /k, g/ e.g. *good cook*, /ɡʊɡ kʊk/ *good game* / ɡʊɡ ɡeɪm/
- ▶ /n/ becomes /ŋ/ before /k, g/, e.g. *ten cups* /ten kʌps/, *ten geese* /ten ɡi:z/.

- ▶ Note: when the alveolar consonants /t, d, n/ are adjacent in clusters or sequences susceptible to assimilation, they all undergo assimilation.
- ▶ E.g. don't /dəʊmp/ **b**e late, he won't /wɒŋk/ **c**ome; I didn't /dɪŋk/ **g**o.
He found /faʊmb/ both.

► Coalescence / Coalition

► It is a historical process that led /t, d, s, z/ to coalesce/merge to /tʃ, dʒ, ʃ, ʒ/ when followed by the palatal /j/ or /i/. Two adjacent sounds are **merged** to form a new sound.

► **Alveolar sounds** /s, z, t, d/ fuse with palatal glide /j, i/ to become palato-alveolar /ʃ, ʒ, tʃ, dʒ /.

► E.g. *nature* /neɪtʃə/, *mission* /mɪʃən/, *vision* /vɪʒən/

issue /ɪʃu:/ → /ɪʃu:/

misuse /mɪsju:z/ → /mɪʃu:z/

► /t/ + /j/ becomes [tʃ] in ‘what you want’ /wɒtʃu: wɒnt/

Tuesday /tju:sdeɪ/ → /tʃu:sdeɪ/

opportunity /ɒpətju:nɪti/ → /ɒpətʃu:nɪti/

statute /stætju:/ → /stætʃu:/

► Also are: Portugal, question, suggestion, statue, virtue, mature, /d/ + /j/ becomes [dʒ] in ‘would you’ /wʊdʒ u:/

d + j/ → / dʒ /

E.g. in 'would you' /wʊdʒ u:/

educate /edjʊkeɪt/ → /edʒʊkeɪt/

/s/ + /j/ or /i/ becomes [ʃ]

▶ e.g. in case you /ɪŋ keɪs u: /

▶ this shoe /ðɪs ʃu:/ → /ðɪʃ ʃu:/

▶ /z/ becomes [ʒ] before /ʃ, tʃ, dʒ, j, i/ /z/ + /j/

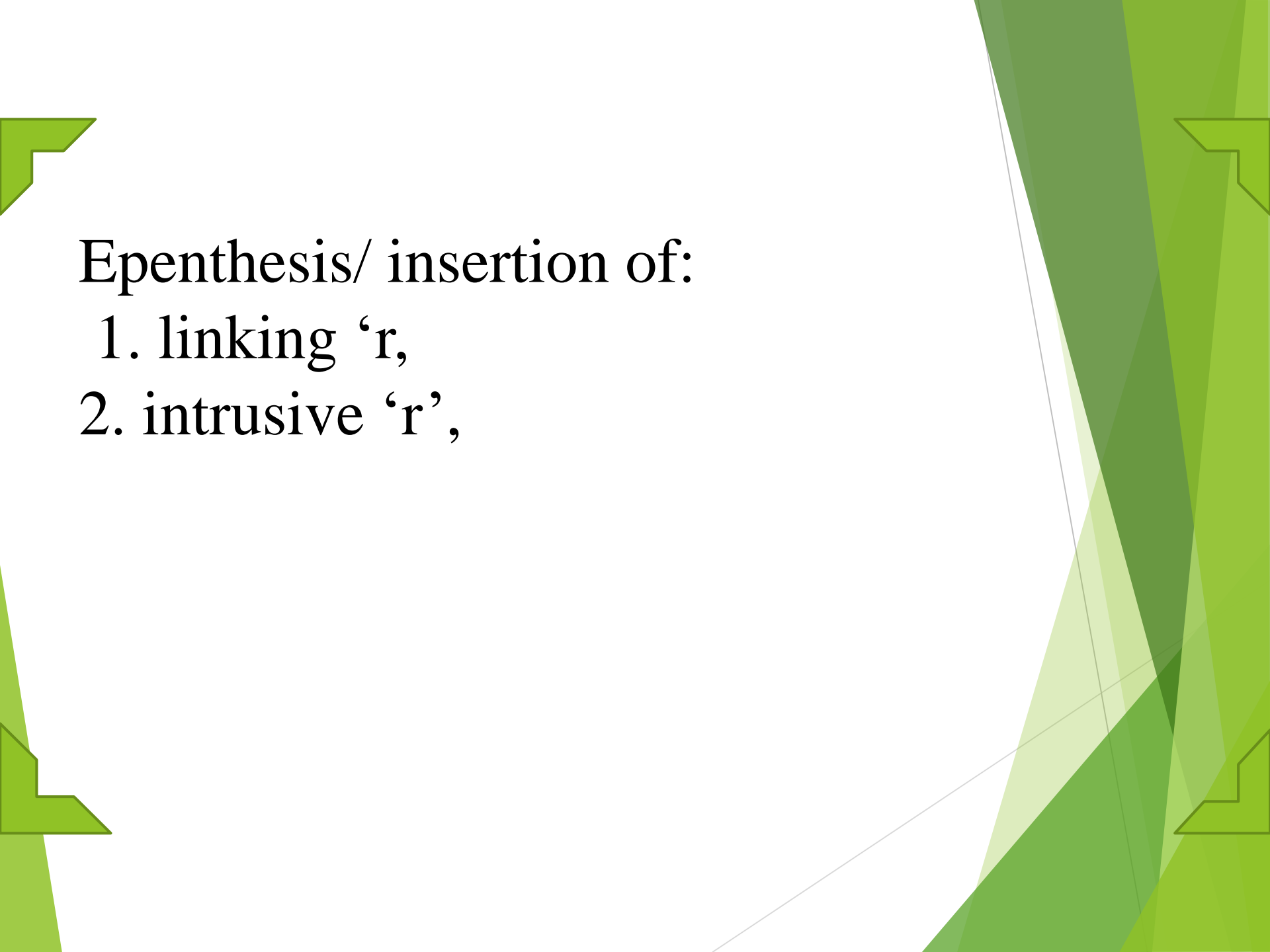
▶ e.g. 'has your letter come?' /hæz jə letə kʌm/ → /hæʒ ə letə kʌm/

those years /ðəʊz jɪəz/ → /ðəʊʒ jɪəz/

▶ those young men /ðəʊz jʌŋ men/ → /ðəʊʒ jʌŋ men/

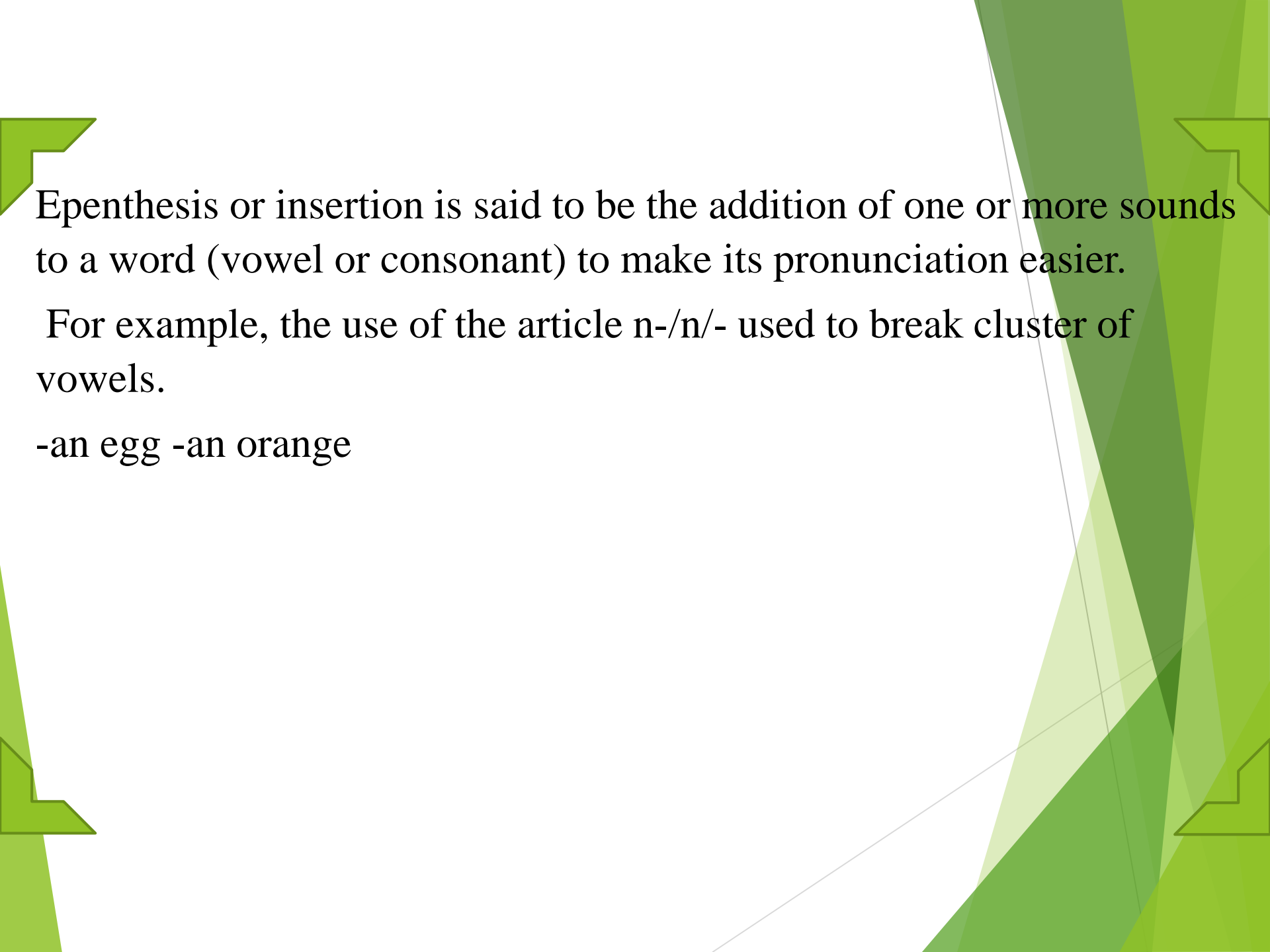
▶ those churches /ðəʊz tʃɜ:tʃɪz/ → /ðəʊʒ tʃɜ:tʃɪz/.

Epenthesis/ insertion



Epenthesis/ insertion of:

1. linking 'r,
2. intrusive 'r',



Epenthesis or insertion is said to be the addition of one or more sounds to a word (vowel or consonant) to make its pronunciation easier.

For example, the use of the article n-/n/- used to break cluster of vowels.

-an egg -an orange

LINKING AND INTRUSIVE /r/

Generally in English Language an /r/ is never sounded after a vowel at the end of a word if and only if a pause follows.

The pronunciation of 'r' distinguishes two major varieties of English: British English and American English. These two varieties are known as Rhotic and Non-Rhotic varieties.

LINKING /r/

In Rhotic accent or variety of English, 'r' is pronounced before a vowel, e.g. red /red/, read /ri:d/, round /raʊnd/, run /rʌn/, brown /braʊn/, etc.

It is also pronounced after a vowel. E.g. in words four /fɔ:r/, more /mɔ:r/, care /keər/, car /ka:r/, etc. That is in rhotic variety of English, 'r' is pronounced before and after a vowel in a syllable.

In a non-rhotic variety, however, 'r' is pronounced before a vowel only. That is, /r/ is sounded only before a vowel.

Examples: lubricate, affricate, abbreviation, broadcast, read, rude, preface, pregnant, pretend, prayer, pressure, premature, barrrister.

The /r/ in a non-rhotic variety of English is however silent when it appears at the end of a word or a syllable which stands alone. The /r/ is silent when it ends a word or a syllable in BrE. Example: far /fa:/ clear /kliə/ tower /taʊə/, tar: /tar/, car/ka:/

Examples: father, her, clear, far, care, hear, etc.

However, if 'r' is doubled, or appears in the middle of a word and is followed by a vowel, it is pronounced in a non-rhotic accent.

Examples: stirring /stɜːrɪŋ/ occurring /əkɜːrɪŋ/ herring /hɜːrɪŋ/ current /kʌrənt/ starry /stɜːri/

It is also pronounced when it is in a phrase and the /r/ ends a word and the next word begins with a vowel. The 'r' is clearly heard.

Examples: father-in-law /fɑːðər-ɪn-lɔː/ far away /fɑːr əweɪ/,

For instance, four eggs, more over, four eight, for it, matter of, care off, cheer up, fear of, far off, four aces, answer it, fur inside, near it, wear out, secure everything, minister of, etc.

e.g. **there** are **four** **owls** in **her** **old** **barn**, **clear** of **Babel**.

after a while [aftɹə 'waɪl],

as a matter of fact ['əz ə mətɹ əv 'fækt],

father and son /fɑ:ðər ən 'sʌn/,

over and above /əʊvər ən ə'bʌv/.

INTRUSIVE /r/

The intrusive 'r' occurs in English Language when there is no tendency of occurrence for the linking /r/ but in order to sound more natural in pronunciation, it is inserted.

Linking /r/ also occurs even in words without /r/ spellings. E.g. This is phenomenon is known as **Intrusive** /r/.

The intrusive 'r', is inserted between two vowels across word boundaries.

Examples:

The idea_of it. /ðɪ aɪdɪər əv ɪt/

America_is a big country. /əmerɪkər ɪz ə bɪg kəntri/

Banana_is a yellow fruit. /bənanər ɪz ə jeləʊ fru:t/

Diana_is a young girl. /dɑ:nər ɪz ə jʌŋ ɡɜ:l /

raw onion /rɔ:r ʌnɪən/

China_and Vietnam are Asian Country.

- ▶ E.g. *Russia and China* /rʌʃər ən 'tʃaɪnə/,
- ▶ *drama and music* /dra:mər əm 'mju:zɪk/,
- ▶ *India and China* /ɪndɪər ən 'tʃaɪnə/,
- ▶ *area of agreement* /eəriər əv ə'gi:mənt/,
- ▶ *law and order* /lə:r ənd 'ɔ:də/
- ▶ *awe-inspiring* /ɔ:r ɪnspaiəriŋ/,
- ▶ *raw onion* /rɔ:r 'ʌnjən/.
- ▶ Note: an intrusive /r/ is a stigmatised accent.
- ▶ Some speakers in an attempt to avoid the use of intrusive /r/ end up using glottal stop or a pause to break the vowel hiatus (two vowel co-occurring).

ELISION / DELETION

It refers to the loss or omission of a sound segment or syllable. Sounds may be so weakly articulated that they no longer have auditory significance or they may be omitted altogether in the stream of running speech, particularly in casual or rapid speech.

Elision occurs in every language. In English elision occurs mostly in the alveolar consonants /t, d/ when they are between two other consonants and in weak vowels such as /ɪ, ə, ʊ/.

The alveolar consonant deletion occurs when they are between two consonants within the same syllable or across word boundaries, or word final position.

Examples;
Within same syllable

Facts /fæk**t**s/ / fæks/

Chest /tʃest/ / tʃes/

Christmas / krist**m**əs/ / krisməs/

Castle /kast**s**əl/ / kasəl/

handsome, sandwich, groundnut, grandmother, hust**l**e, hasten, listen, etc.

End of words: land, planned, fund, canned, can't, etc.

- ▶ **Consonants-** where consonants such as /h/ and the alveolar /t, d/ are deleted.
- ▶ /h/ is lost when initial in words (glottal dropping),
- ▶ e.g. him, he, have, her, etc.

- ▶ The alveolar plosives, /t, d/ are elided when they occur as the middle one of three consonants across word boundaries.

- ▶ e.g. *next day* /nekst deɪ/, *raced back* /reɪsd bæk/, *last chance* /læst tʃæns/,

- ▶ Also, *first light, west region, just one, left turn, soft centres, left wheel, soft roses, mashed potatoes, pushed them, hold tight, cold lunch, loved flowers, etc.*

- ▶ *liked jam, thanked me, liked like, looked fine, picked one, reached pairs, fetched me, reached home, robbed both, rubbed gently, grabbed them lagged behind, dragged down, begged one, urged them, judged fairly,*

Deletion of vowels:

1. Loss of weak vowels after /p, t, k/ the **vowel** in the first syllable may disappear.

The aspiration of the initial plosive takes up the whole of the middle portion of the syllable.

E.g. potato /p^hteɪtəʊ/ , tomato /t^hma:təʊ/,

po**l**ice, to**l**day, po**t**ato, etc.

1. Weak vowel plus /n, l, r/ becomes syllabi consonant

E.g. tonight /tʌɪt/ police /pli:s/

Avoidance of complex consonant cluster

E.g. look back /lʊk bæk/

Loss of final 'v' in 'of' before consonants

lots of them /lʌts ə ðəm/

Believe, dictionary, strawberry, etc.

- | | | |
|--------------------|------------------|---------|
| i. That goal | /ðæk gəʊl/ | [1mark] |
| ii. Those churches | /ðəʊz tʃɜ:tʃɪz/. | [1mark] |
| iii. good might | /gʊb maɪt/ | [1mark] |
| iv. have to | /hæf tu/ | [1mark] |

God and man /gɒd əm mæn/

(1) Name the phonological processes taking place in the following phrases:

- (i) won't /wʊŋk/, place assimilation (ii) /dɒgz/ voicing assimilation, (iii) /fɑ:ðr ən
'sʌn/ linking r/epenthesis/deletion, (1mk each= **3marks**)

[bægz] - bags

b. [p^hiktʃə] - picture

d. [k^wɪk] - quick

e. [skrɪ:m] - scream

f. [kɒtn] – cotton

Sudden

Mission

Nation

Indicate the phonological processes taking place in the following phrases:

(i) thank god /θæŋ ɡɒd/

(ii) most people /məʊs pi:pl/}

(iii) that site /ðæs saɪt/

(iv) that night / ðæn naɪt/

(v) incomplete / ɪŋkəmpli:t/

(vi) 'raw onion' / 'rɔ:ɪ ʌnɪən/

x) raced back /reɪs bæk/,

xi) grammar and more /grɑ:mər əm 'mɔ:/

xii) ɪŋ keɪf u: /

- ii. soon [s^wu:n]
- iii. came [k^heɪm]
- iv. further ['fɜ:ðə]
- v. conclude [kən'k^hlu:d]

Using a phonemic (broad) transcription, transcribe the following words: (*4marks*)

- i. serve
- ii. wanted
- iii. inform
- iv. income

8. Using a phonetic (narrow) transcription, transcribe the following words:

- (i) morning
- (ii) pool

(i) (iii) curse Decrease Preserve Month three thank stricture third
birth something month both king keep

PHONETICS & PHONOLOGY

The Syllable

- In the preceding section we learned that all languages build their words from a finite set of phonemic units.
- These phonemic units come together to form syllables which in turn form words, phrases, clauses and sentences in English grammar.
- Humans need syllables as a way of segmenting the stream of speech and giving it a rhythm of strong and weak beats, as we hear in music.

Definition of Syllable

- Wells (2000) defines a syllable as a group of sounds that are pronounced together.
- Articulatorily, the syllable is the minimal articulatory unit of the utterance.
- Auditorily, the syllable is the smallest unit of perception: the listener identifies the whole of the syllable and after that the sounds which it contains.
- Phonologically, it is a structural unit which consists of a sequence of one or some phonemes of a language in numbers and arrangements permitted by the given language.
- A syllable is not a sound, but an abstract unit of prosodic organisation through which a language expresses much of its phonology.
- The exact shape of the syllable varies from one language to another.
- The organisation of sounds into syllables can take place at a certain level of abstraction.

SYLLABLE STRUCTURE

- The syllable has an internal structure:
- It contains an obligatory peak or nucleus (V) preceded by an optional consonantal onset (On)/(C) (also known as an open margin) and followed by an optional consonantal coda (Co)/(C) (also known as a close/closing margin).
- The peak/nucleus plus coda form a tighter bond than the onset plus nucleus.
- It is subsequently recognised by traditional grammar as additional sub-constituent called the rhyme (rime) (Rh)
 - It is this part of the syllable that plays an important role in the rhyming conventions of poetry – for example in *die – ran, milk silk, mean – seen*
- Phonetically syllables “are usually described as consisting of a centre which has little or no obstruction to airflow and which sounds comparatively loud; before and after that centre (...) there will be greater obstruction to airflow and/or less loud sound.

The sonority Scale

Low vowels (a:, ...)

High vowels (i:, i....)

Semivowels (j, w)

Liquids (l, r)

Nasals (m, n,)

Fricatives (voiced v, z,)

Fricatives (voiceless) (f, θ, s)

Oral stops (voiced) (b, d, g)

Oral stops (voiceless) (p, t, k)

Rules of phonetic (spoken) syllable division

1. A syllable boundary is found wherever there is a word boundary, and also coincides with the morphological boundary between elements in a compound:

Displace /dis 'pleis/

CVCCCVC

become/bi 'kʌm/

CVCVC

Countless /'kaunt.ləs/

CVNCCVC

hardware/'ha:dweə /

CVCCV

Rules of phonetic (spoken) syllable division

2. Consonants are syllabified with whichever of the two adjacent vowels is more strongly stressed.

e.g. farmer /'fa:m.ə /

agenda / ə'dʒend.ə/.

It they are both unstressed, it goes with the leftward one e.g. cinema/'sinəmə /
Delicious /di'liʃiəs /, deliberate/di'lib.rət

Rules of phonetic (spoken) syllable division

3. The English diphthongs are unisyllabic, they make one vowel phoneme, while the so-called triphthongs are disyllabic, because they consist of a diphthong + the neutral vowel/schwa:

table	science	flower
CV-CC	CV-VCC	CCV-V

4. The English affricates / tʃ, dʒ / cannot be split: catching
/ k æ tʃɪŋ /

▶ Phonotactics

▶ Within a syllable, there are constraints not only on the number of segments which can occupy different positions, but also on which segments that can occur, and in what combinations.

▶ These are called **PHONOTACTICS CONSTRAINTS**, and are language specific.

▶ A template of the English syllable is $C_0^3VC_0^4$.

▶ That is, English syllable can have a cluster of up to 3 Cs (consonants) in the onset, and up to 4 in the coda. Only one V is obligatory. Any permutation is possible. Diphthongs are treated as single Vs in the template).

▶ *Monosyllabic word examples:*

▶ V are /ɑ:/

▶ CV so /səʊ/

▶ CCV store /stɔ:/

▶ CCCV spray /spreɪ/

▶ VC eat /i:t/

▶ CCVC stop /stɒp/

▶ CCVCC quest /kwest/, smelt /smelt/, etc.

▶ CCCVCCC strength /strenkθ/

▶ CCCVCCCC strengths /strenkθs/

▶ Empty-onset (V(C)) syllables in southern British English cannot begin with /ʊ/, and /u:/ is very restricted.

▶ **Codas**

▶ Single-C codas (...VC): /h w j/ cannot occur.

▶ Two-term clusters (...VCC); (/smelt, kept, looked, passed, etc....)

▶ /l/ combines very freely with following consonants

▶ C2 is often one of /t d s z θ/.

▶ Clusters of nasal + voiceless plosive are homorganic.

▶ The only coda clusters which are onset clusters involve /s/ + voiceless plosives.

- ▶ Tree-term clusters (...VCCC): C3 (/skʌlp, plɑ:nts, bʌlbs, mɪdst, .../)
- ▶ Four-term clusters (...VCCCC): the last consonant is always a suffix and the final 3 consonants are always voiceless (/ɡlɪmpst, prɒmpts, lenkθs.../).
- ▶ When /p/ is the first consonant of a cluster:
- ▶ In syllable-initial position, it may be followed by /r, l, j/
- ▶ E.g. /pr/ pray /preɪ/
- ▶ /pl/ play /pleɪ/
- ▶ /pj/ pew /pju: /
- ▶ In syllable-final position, it may be followed by /t, θ, s/
- ▶ e.g. /pt/ apt /æpt/
- ▶ /pθ/ depth /depθ/
- ▶ /ps/ cups /kʌps/
- ▶ Syllable-initial 3-consonant clusters in RP
- ▶ The possibilities for initial 3-consonant clusters in English are very limited.

► Stress

- In the previous lecture we looked at how speech sounds are produced, how they may influence each other and how they are organised into syllables.
- **Stress:** refers to the relative degree of prominence on syllables within an utterance.
- Speech is however not just a string of sounds or a number of syllables, but is a whole utterance.
- Such features are called **Suprasegmental** or **Prosodic Features**; features above the segments. These include *lexical stress*, *lexical tone* and *intonation*.

▶ FEATURES OF A STRESSED SYLLABLE

▶ A stress syllable therefore is one that is prominent. A syllable that is said to be prominent has the following characteristics: sound louder, have longer duration, higher pitch and a recognisable vowel quality.

▶ Heavy syllable (syllable with a long vowel closed by at least two syllables),

▶ e.g. the first syllable of *photograph* sounds louder, has longer duration, higher pitch and a long vowel.

▶ **Primary and Secondary Stress**

- ▶ **There are two levels of stress: Primary and secondary.**
- ▶ The syllable with the Primary stress constitutes the most prominent syllable in a word (i.e. it is more sonorous than other syllables).
- ▶ All monosyllabic words, said in isolation are always said with primary stress.
- ▶ Disyllabic words (words with two syllables) carry one primary stress on one of the syllables.
- ▶ In polysyllabic words (words with more than two syllables), however, one or two syllables may bear stress.

- ▶ The syllable that sounds more prominent than the others is called **primary stress**.
- ▶ Primary stress is marked ['] at the beginning of the syllable e.g. *pillow* ['pɪləʊ] and below [bɪ'ləʊ].
- ▶ Any other stress in the same word is called **secondary stress**. This is marked with a lowered marked [,].
- ▶ E.g. indivisibility [ˌɪndɪˌvɪzɪ'bɪləti].
- ▶ Possibility ['pɒsəbəlɪti].

- ▶ Stress could be fixed or variable
- ▶ English is a stress-timed syllable and syllables in English are variable.
- ▶ Many variable stress languages favour syllable of a particular type to bear stress.
- ▶ A **heavy syllable** is the one that contains a long vowel or diphthong, or a short vowel followed by at least two consonants.
- ▶ A *light syllable* is the one that contains a short vowel followed by one consonant or no consonants.
- ▶ In English heavy syllables are stressed and not light syllables.

- ▶ E.g. heavy syllables are the final syllables in *beater, supper, moaning, mighty, under, sixty, mighty, under, sixty*. e.g. of light syllables are: the final syllables of *in horrid, hiccup, city, water*.
- ▶ Placement of stress on syllables in English, though, not fixed, appears to follow a certain pattern:
- ▶ Two-syllable words- either the first or the second is stressed.
- ▶ Verbs- the second syllable of a verb is stressed when it is strong, e.g. *apply* /ə'plai/, *attract* /ə'træk/, *account* /ə'k aʊnt/, *accuse* /ə'kju:z/, *supply* /sə'plai/, *support* /sə'pɔ:t/.

- ▶ The first syllable is however stressed if the second syllable is weak.
- ▶ e.g. enter /'entə/, open /'əʊpən/, envy /'envɪ/
- ▶ Also, the final syllable of a verb with two-syllable words is unstressed if it contains the diphthong /əʊ/, e.g. borrow /'bɒrəʊ/, mellow /'meləʊ/ etc.
- ▶ Stressing adjectives follows the rules as verbs.
- ▶ e.g. lovely /'lʌvli/, correct /kə'rekt/, divine /dɪ'vaɪn/, alive /ə'laɪv/
- ▶ there are however exceptions; e.g. perfect /'pɜ:fekt/ of /'pɜ:fɪkt/
honest, /'ɒnɪst/.

- ▶ The first syllables of nouns are always stressed if the second contains a short vowel, unless it is weak.
- ▶ It will obviously go to the second syllable, e.g. money /'mʌni/, product prɒdʌkt/, larynx /'lærɪŋs/
- ▶ Estate /es'teɪt/, balloon /bə'lu:n/, design /dɪ'zaɪn/.
- ▶ Three-syllable words
- ▶ For verbs, the final syllable is stressed when it is strong
- ▶ e.g. entertain, resurrect
- ▶ if the last syllable is weak, the stress the penultimate syllable takes the stress. Encounter, determine
- ▶ if the second and third syllables are weak, the first syllable carries the stress
- ▶ initial syllable, e.g. parody

- ▶ the penultimate syllable is stressed if the final syllable contains a weak syllable or / /.
- ▶ Potato, disaster, synopsis
- ▶ the first is stressed if the second and the third syllables are weak,
 - ▶ e.g. quantity, cinema emperor, custody
- ▶ if the final syllable is strong, the stress will go on the first syllable
 - ▶
 - ▶ even if the final syllable is strong, the stress will be placed on the first syllable.
- ▶ The last syllable is usually quite prominent so that in some cases it could be said to have secondary stress.
 - ▶ E.g. intellect, alkali, marigold,
 - ▶ Adjectives seems to have the same rules, to produce stress patterns such as: opportune, direct, insolent, anthropoid



INTONATION

- ▶ The **rise** and **fall** of the pitch of the voice.
- ▶ It is equated with ‘**speech melody**’, restricting it to the ensemble of pitch variations in the course of an utterance.
- ▶ It is variation of pitch.
- ▶ ** rhythm of speech, and (in English at any rate) the study of how the interplay of **accented**, **stressed** and unstressed syllables function as a framework onto which the intonation patterns are attached’

- ▶ Languages that alternate syllable rate to maintain roughly equal foot duration are called *stressed-time*, e.g. English is an example. Those that have equal duration of syllables are called *syllable-timed* languages.

Intonation, rhythm, and stress are the three main elements of linguistic prosody.

Intonation patterns in some languages, can lead to fluctuations in pitch, giving speech a **sing-song** quality.

Fluctuations in pitch either involve a **rising** pitch or a **falling** pitch.

- ▶ They are six possibilities under which intonation can be realised.
- ▶ (i) can be described in terms of **high** (H) or **low** (L) target pitches.
- ▶ The term ToBI (**i.e.** tone and break indices) is used to represent these pitch changes.
- ▶ Target tones H* and L* (called H star and L star) are typically written on a line (called a tier) above the segmental symbols that represent stressed syllables.
- ▶ A **high** tone H*, can be preceded by a closely attached **low** pitch, written L+H*, so that the listener hears a sharply rising pitch.

- ▶ L^* can be followed by a closely attached **high pitch**, L^*+H , so that the listener hears a scoop **upward** in pitch before the low pitch at the beginning of the stressed syllable.
- ▶ The pitch of a stressed syllable can be **high** but can contain a small step-down of the pitch.
- ▶ High plus down-stepped high,
- ▶ written $H+!H^*$,
- ▶ A down-stepped high syllable, $!H^*$, can itself be a pitch accent.

► **Forms of Intonation (3Ts)**

▶ **Tonality**

- ▶ Intonation phrase/**word group, tone group, intonation group, or an IP.**
- ▶ The boundaries of an IP are marked with (| and ||)
- ▶ A separate IP, and each of the **IP** must have its **nucleus (Tonic syllable)** and intonation pattern (**Tone**).
- ▶ The **Nucleus** or the **Tonic** syllable is the last accented/stressed syllable in IP.
- ▶ The tone is the **pitch** of the tonic syllable.

► E.g. We don't know who she is ||

(a single IP).

- ▶ **I don't know | who she is. (2 IPs).**
- ▶ **I | don't know who she is. (2 IPs).**
- ▶ **I don't | know who she is. (2 IPs).**
- ▶ **I | don't know | who she is. (3 IPs).**

- ▶ **2. Tonicity:-** accenting important words in the IP.
- ▶ These **words** are therefore **focused** in the **IP**. A focused word is therefore **accented**.
- ▶ The last accented syllable in an IP is called **Nucleus**.
- ▶ An IP has **pre-head, Head, Nucleus** and **Tail**
- ▶ **Head** All syllables extending from the **first accented** syllables just before the nucleus

▶ **E.g. 'give me \those.**

▶ ' Bill 'called me to 'give me \those

- ▶ E.g. in an \hour (no head) but pre-head
- ▶ All unstressed syllables preceding the first stressed or accented syllable are called **pre-head**.
- ▶ Or when there is a head.
- ▶ E.g. in a 'little less than an \hour. (pre-head + head)

▶ Any syllables after the nucleus are called the **Tail**.

▶ \Look at it /what did you say?



► **Types of Nuclear Tone**

- ▶ Falling tone (fall-rise)
- ▶ Rising tone (rise-fall)



▶ E.g.

▶ You 'mustn't' \worry.



▶ A fall is the default tone for statement, exclamations, wh questions and commands.

The background features abstract green geometric shapes in various shades, including lime green, forest green, and olive green, arranged in a layered, overlapping fashion on the right side of the slide.

- ▶ **Exclamation**

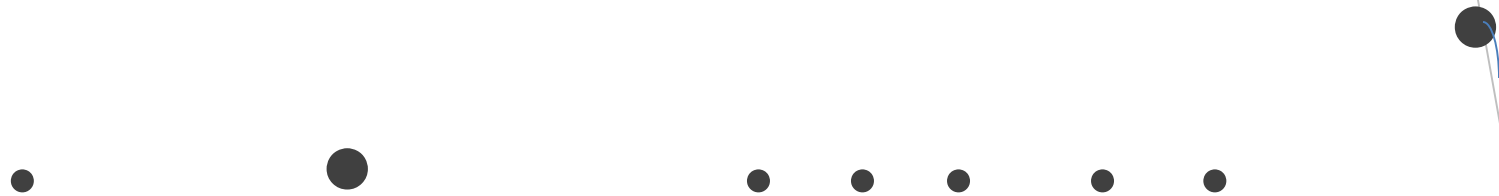
- ▶ It was \great!

\Lovely!

- ▶ It is disgusting!

▶ E.g.

▶ I 'think it was ri\ 'd~~ic~~ulous.



- ▶ A statement can have a **Fall-rise nuclear tone-** shows non-finality.
- ▶ In a fall-rise nuclear tone, the pitch of the voice starts **relatively high** and then moves first downwards and then upwards again
- ▶ **Fall-rise nuclear tone-** shows non-finality.
- ▶ In a fall-rise nuclear tone, the pitch of the voice starts **relatively high** and then moves first downwards and then upwards again

▶ **Rising Nuclear Tones (/)**

- ▶ In a rising nuclear tone, the pitch of the voice starts relatively low and then moves upwards.
- ▶ The starting point may be anywhere from low to mid and the end at any point from mid to high.
- ▶ E.g.

- ▶ Questions are said with a **rising nuclear tone**, though they may have a **fall too**.
- ▶ A falling nuclear tone on yes-no questions shows that the question has been answered and there is nothing more to be said.
- ▶ E.g. \yes, \no
- ▶ A rise on yes or no questions show that there is something more to follow.
- ▶ E.g. excuse me /yes (could mean what do you want?)

▶ E.g.

▶ You 'mustn't /worry.



▶ I 'think it was ri/'dicrous.

●
●

●

▶ ● ● ● ● ●

—

- ▶ Do you know Mr. Aban? /yes
- ▶ A low \ on the yes will however mean a finality.
- ▶ A: you start off on the ring road...
- ▶ B: /yes
- ▶ A: turn left at the first roundabout...
- ▶ B: /yes
- ▶ A: and ours is the third house on the left.

- ▶ Rise-fall
- ▶ This is used to convey feelings of approval, disapproval or surprise.
- ▶ E.g. you wouldn't do an awful thing like that, would you?

▶ B: No

▶ A: isn't she lovely?

▶ B: yes

▶ A: I think you said it was the best so far.

▶ B: yes

▶ Mine



▶ I think it is mine.

▶ Mine, you mean



▶ What did you do next? Well, I opened the door and

▶ Well I opened the door | and....



▶ Who is that? Well I know the face.



Functions of Intonation

▶ **Attitudinal**

▶ Grammatical

Indexical

▶ Focusing

Psychological

▶ Discourse

▶ **Attitudinal**

▶ Used to express our attitudes and emotions-to shows surprise or shock, pleasure or anger, interest or boredom, seriousness or sarcasm etc.

▶ E.g. one single utterance can be used to indicate whether a speaker is:

▶ angry, pleading, sad, happy, patient, proud etc.

▶ The pitch of the voice may be accompanied with facial expressions, gestures, body movements vocal effects such as laughter, sobbing etc.


▶ Fall:

▶ Finality, definiteness:

▶ E.g. That is the end of the \news.

▶ I'm absolutely \certain.

▶ Stop \talking.

- ▶ Rise:
 - ▶ General questions:
 - ▶ E.g. Can you /help me?
 - ▶ Is it /over?
- 

- ▶ ToBI, Tone and Break Indices, was proposed by Silverman et al. (1992) as an agreed system
- ▶ for transcribing prosodic structures which could be used consistently by researchers
- ▶ in various fields.
- ▶ ToBI provides tiers in which different linguistic phenomena are analysed. As the
- ▶ most basic components of ToBI, Beckman and Elam (1997) proposed four tiers: tone,
- ▶ orthographic, break index, and miscellaneous. The tone and break index tiers, which deal
- ▶ with the phonological and lexical phenomena, are the center of the linguistic analyses.

In this utterance, 'there are two syllables that are relatively more prominent than any other, the accented syllables in the words *Marianna* and *marmalade*' (Beckman and Elam 1997: 10). This approach does not require indication of the placement of the nuclear syllable, 'since the word with nuclear stress is defined positionally; it is the last accented word, or the accented word (if there is only one in the phrase)' (Beckman and Elam 1997:

From the nuclear syllable to the end, the pitch falls from a relatively high position and it keeps falling toward the end.

The break index tier is related to the prosodic events as well, but in an indirect way: 'Break indices represent a rating [on a scale from 0 to 4] for the degree of juncture perceived between each pair of words and between the final word and the silence at the end of the utterance.'

The tone tier and the break index tier are responsible for different linguistic phenomena, lexis, phonology and / or phonetics. In the tone tier, the boundary of the prosodic unit (tone) never separates a word. In the break index tier, the grammatical unit word again determines boundaries: break indices, which are based on evaluating the sound, are assigned between every grammatical word.

- ▶ Intonation systems in the establishment of meaning
- ▶ Three systems are involved in making meaning through intonation: tone, tonality and tonicity. These are phonological systems; but they function directly as the realization of systems in the grammar. In this respect intonation systems differ from systems of articulation (consonants and vowels). Thus, while (say) the vowels /a/ /i/ /u/ are systemically distinct in the phonology, they have no direct lexicogrammatical function – there is no general meaning realized by the contrast between them. With intonation systems, on the other hand, there is; the contrast between rising tone and falling tone, for example, always realizes a contrast between terms in some grammatical system. Typically an intonational system will have more than one function in the grammar, depending on the lexicogrammatical environment; but in all cases their meanings are proportional. We shall exemplify this in the next three subsections.

▶ TONE

▶ A choice in tone can realize both **interpersonal** and **logical** meanings. We will illustrate from the logical first.



▶ **A SHORT SEMINAR /WORKSHOP**

- ▶ The limiting case of a tone unit is one that consists of only one syllable, like // 1
- ▶ stop // or // 1 why // or // 2 cream // ('Do you want cream with your coffee?'). Here,
- ▶ there is no choice as to where the tonic element begins – no choice in **tonicity**, as
- ▶ we call it. As soon as there is more than one syllable in the tone unit, as in the great
- ▶ majority of instances, there is a choice in tonicity. Tonicity means the location of the Tonic element; this is initiated by the tonic syllable, which is realised phonetically as
- ▶ that syllable carrying prominence of the kind described.

▶ A note on SALIENCE

- ▶ The syllable that carries the tonic prominence will always be a **salient** syllable: one that
- ▶ already carries a prominence of its own because of its position in the wording.
- ▶ Let us mark out the salient syllables in that previous paragraph, as they will appear
- ▶ if it is read aloud. The salient syllables are all those immediately following the slash.

- ▶ Phonetically this salience appears as greater amplitude and duration. Salient syllables
- ▶ are generally heard as both louder and longer than the non-salient, or **weak**, syllables
- ▶ surrounding them.

- ▶ How do we know which syllables will be salient? English words of two or more
- ▶ syllables have one syllable (more than one in very long words) which is **accented**; this is
- ▶ often the first syllable, but not always. In the example above, the words syllable, carries,
- ▶ tonic, prominence, always, salient and wording are accented on the first syllable, the
- ▶ words already, because and position on the second. Such accented syllables will normally
- ▶ carry salience in connected speech, simply by virtue of their prominence within the
- ▶ word.

- ▶ virtue of their prominence within the
- ▶ word. In addition, some monosyllabic words will typically be salient: namely, those

- ▶ which operate lexically, as 'content' words (in open sets). We could change the end of
- ▶ the above example to
- ▶ ...be/cause of its / place in the / text

- ▶ which operate lexically, as ‘content’ words (in open sets). We could change the end of
- ▶ the above example to
- ▶ ...be/cause of its / place in the / text
- ▶ where both place and text would be salient. Monosyllabic words which operate grammatically,
- ▶ as ‘function’ words (in closed systems), like that a the of, are normally not
- ▶ salient. Many words lie on the borderline: common adverbs like just and soon and out,
- ▶ numbers, ‘person’ words like myself
- ▶
- ▶
- ▶ where both place and text would be salient. Monosyllabic words which operate grammatically,
- ▶ as ‘function’ words (in closed systems), like that a the of, are normally not
- ▶ salient. Many words lie on the borderline: common adverbs like just and soon and out,
- ▶ numbers, ‘person’ words like myself and own, modal auxiliaries; and these regularly
- ▶ occur either salient or non-salient.
- ▶ When you listen carefully to continuously flowing English speech, you find there
- ▶ is a tendency for salient syllables to occur at fairly regular intervals, and this affects the
- ▶ syllables in between: the more of them there, the more they will be squashed together to
- ▶ maintain the tempo. Thus the syllables in /prominence of its will be shorter than those in
- ▶ /tonic or /own be-. This means that there is a level of organization of the speech sound in
- ▶ between the tone unit and the syllable, a unit that contains one salient syllable plus any
- ▶ following weak (non-salient) syllables before the next salient one. This is rather like a
- ▶ bar, in music, which always begins with the beat; both arise from the same bodily urge
- ▶ for a regular pulse or **rhythm**. It is also what lies behind the metric foot in verse; so the
- ▶ name **foot** has been taken over from metrics to refer to it.


- ▶ // please pass me the **salt** //.
- ▶ More specifically, the Tonic syllable is the last salient syllable in the focal element. So,
- ▶ for example, in
- ▶ // I've just been having a conversation with one of the best-informed newspaper
- ▶ correspondents you could ever expect to **meet** //
- ▶ the item under focus is the whole of the phrase with one of the best informed newspaper
- ▶ correspondents you could ever expect to meet.
- ▶ The system of information focus makes a clear distinction between an unmarked
- ▶ and a marked option:

- ▶ TONALITY and information distribution
- ▶ tonality is concerned with setting the boundaries of the tone unit. As with tonicity,
- ▶ we can look at it from the phonetic point of vantage: there are moments where one pitch
- ▶ contour is overtaken by another. Note that there are typically no pauses between tone
- ▶ units; the melodic contour of spoken discourse is continuous, and a pause is much more
- ▶ likely to occur in the middle of a tone unit – for example before a rare or unexpected
- ▶ word – than at the point where a tone unit ends.
- ▶ In fact there are no clear boundaries between

- ▶ Distinguish between the following sounds:
- ▶ (i) / **b**/ and / **ŋ**/
- ▶ (ii) / **tʃ**/ and [ʒ]

- ▶ In the production of speech sound, the term aspiration refers to...

- ▶ Give a three-term description of the following sounds:
- ▶ [t^w] [ɹ] [ŋ]
- ▶ [t^h] [ɹ]


- 
- ▶ Give **two** examples each of rounded and unrounded vowels in English.
 - ▶ What is Voice Onset Time (**VOT**) in the articulation of plosives?
 - ▶ Briefly describe how a glottal stop is produced.
 - ▶ Mention two roles played by the velum in the production of speech.
 - ▶ What role is played by the basal cavity in the production of speech sound.

- ▶ Distinguish between the two l-sounds in ‘hospital’ and ‘literature’ as they are normally produced in English.
- ▶ State the difference between the two instances of /p/ in ‘pull’ and ‘pin’.

- ▶ State the environments in which the following sounds [k^h] and [k^w] occur in English.
- ▶ Mention two ways in which the English phoneme /t/ can be released.
- ▶ Transcribe the following words using **broad** transcription:

▶ (i) **country**

(ii) **yacht**



▶ Clamber	disconnect	career
▶ Festoon	entering	personality
▶ Detest	injury	person
▶ Paper	event	pinker
▶ sunrise	suitcase	teacup
▶ Bad-tempered	heavy-handed	ice-cream

