

Voice production...Lec. 3

All the sounds we make are the result of muscles contracting. The muscles in the chest that we use for breathing produce the flow of air that is needed for almost all speech sounds in addition muscles in the larynx produce many different modifications in the flow of air from the chest to the mouth.

The Air Stream Mechanisms

The production of any sound involves the movement of an airstream .

There are three types of air stream mechanisms :

1 The pulmonic airstream mechanism: is based on pushing the lung air out of the body through the mouth and sometimes through the nose. It is sometimes called "Egressive" because the air is pushed out .

2 The glottalic airstream mechanism : which produces some sounds, like ejectives and implosives the air here is sucked not pushed . that is why , it is ingressive.

3 The velaric air stream mechanism: which produces clicks.

Transcription and its types

Transcription is a way of representing sounds by symbols. There are two types of transcription:

1. **phonemic T.** represents the phonemes of any language by the same number of symbols. For instance, 44 symbols for the 44 phonemes of the English sounds: put /put/, kick /kik/.

2. phonetic T. used many symbols to denote the different phonetic variants of the phonemes of any language : place /p^hleis/ , mean /mi:n/.

The ways of describing the segmentals

The segmentals, in any language, include consonants and vowels .

A consonant is a sound which is articulated with an obstruction to the flow of air. This obstruction means a kind of stoppage to the flow of air , could be complete (in the case of stops) or partial (in the production of nasals). Meanwhile, a vowel is articulated without any obstruction . in English , there are 24 consonants and 20 vowels excluding the five triphthongs .

Describing consonants

Consonants are seen different from vowels in obstruction , orality and voice. Consonants , in English , are voiced (15 in number) and voiceless (9). While , all vowels are voiced. The idea is that all vowels are oral , but only 21 consonants are oral and the others are nasals.

In addition , the absence of consonants from words makes words totally unclear. While vowels can be somehow predictable from the whole words or their contexts.

Different phoneticians propose various ways of describing consonants. Approaches to consonant , description can be grouped under two headings : General and distinctive feature theory. The distinctive feature theory of describing consonants includes, such features as **alveolar , bilabial , velar , lenis , plosive , fricative and nasal (this theory will be explained later) as for the general ways of description, the following ways are constructed from various phoneticians:**

1. **vibration is the movement of the vocal cords . if the air is powerful , it causes the vocal cords to vibrate and the resultant consonant is voiced (15 in English) , but if it is smooth , it does not cause them to vibrate and the resultant consonant is voiceless (9in English). These consonants are listed below with examples ;**

A. voiceless consonants: (/p, t, k, f, s, h, Ø, ʃ, tʃ/):

1. /p/ __ please /pli:z/
2. /t/ __ tea /ti:/
3. /k/ __ car /ka:/
4. /f/ __ film /film/
5. /s/ __ sin /sin/
6. /Ø/ __ thin /θin/
7. /ʃ/ __ /ʃi:z/
8. /tʃ/ __ chart /tʃa:t/
9. /h/ __ head /hed/

B. voiced consonants:

1. /b/ __ bed /bed
2. /d/ __ door /dɔ:/
3. /g/ __ /gou/
4. /v/ __ vast /vast/
5. /m/ __ mouse /mɔʊz/
6. /n/ __ nate /nait/
7. /ŋ/ __ heading /hedɪŋ/
8. /z/ __ zeal /zi:l/
9. /ð/ __ they /ðei/
10. /ʒ/ __ measure /meʒə/
11. /dʒ/ __ judge /dʒʌdʒ/
12. /w/ __ wait /wait/

13. /j__ yet /jet/

14. /r/ red__ /red/

15. /l__lack /la:k/

2. oral vs. nasal: another way of description is based on whether the air goes through the oral cavity or the nasal cavity. So, if the soft palate is lowered , it closes the way to the oral cavity forcing the air to go through the nasal cavity to the nose out and the produced consonant is a nasal (3 nasals in English). On the other hand , if the soft palate is raised, the air goes through the oral cavity and the consonant produced is called oral (orals in English).

3 places of articulationLec. 4

The place of articulation refers to the point at which the consonant articulation is made. The different places of articulation as the following :

A- labials : the labials are the consonants produced either by the two lips (bilabials like /b/, /p/ , /w/ , and /m/) or by

the lower lip with the upper set of teeth (labiodentals : /f/ and /v/).

B- alveolars: alveolars are the consonants produced by tongue tip with alveolar ridge. These include /t/ , /d/ , /l/ , /n/ , /s/ & /z/.

C- velars: velars are produced by tongue back with the soft palate. like , /k/ /g/ & /ŋ/.

D- glottals: the glottals are produced in the opening between the vocal cords (the glottis). These include /h/ and /ʔ/ (الهمزة) in Arabic.

E- dentals: dentals are the consonants produced by inserting the tongue tip between the upper set of teeth . they are also called **interdentals** (/θ/ and /ð/)

F- alveopalatals: the tongue front set against the hard palate just behind the alveolar ridge produces alveopalatals (/tʃ/ and /dʒ/) , /tʃ/ , /dʒ/ .

4- Manners of articulation:

by manners of articulation, it is meant the way sounds are produced. These include the following:

A- Stops (plosives): a stop consonant is articulated when the air stops at a particular point of articulation. This often accompanied by explosion. That is why, stops are called plosives.

The different phases of plosive production are :

A- the closure phase , when the articulations move from the structure for the plosion.

B- the hold phase , when the compressed air is stopped from the escape .

C- the release phase , when the articulations forming the stricture are moved to allow the air to escape .

D- the post – release phase , which happens after the release phase.

Plosives can be classified depending on the point(s) at which the stoppage happens. We have bilabial stops like /p/ and /b/ (stopping at two lips) , alveolar stops like /t/ and /d/ (stopping at the stricture between alveolar ridge and tongue tip) and velar stops like /k/ and /g/ (stopping at the stricture between the tongue back and the soft palate). There are **6 plosives** in English : /t/ , /d/ , /p/ , /b/ /k/ & /g/. Both /t/ and /d/ are characteristically stops though they are sometimes called **affricates**. **Then, all the other consonants are continuants**

B- fricatives : fricatives are produced not by stopping the airflow but by narrowing it. This narrowing causes a friction sound . fricatives are **9 in English** : /s/ , /z/, /f/ , /v/ , /θ/ , /ð/ , /ʃ/, /ʒ/ and /h/.

C- Affricates: Affricates are the sounds , which are made of a glide from a stop to a fricative . there are **2 affricates** in English : /tʃ/ and /dʒ/ .

D-lateral: the only lateral consonant in English is /l/. It is formed by partially blocking the central of the air passage

and letting the air pass on both sides of the tongue. The tongue in this case is raised towards the middle of the mouth. There are **two variants** of /l/ **dark** and **light**. The dark /l/ is produced at the end of words when it precedes a consonant while the light one is uttered at the beginning of words and when it precedes a vowel.

E- sibilants : sibilants include /s/ , /z/ , /ʃ/ , /ʒ/ , /tʃ/ and /dʒ/ are produced with a friction causing a hissing sound.

F- liquids : both /l/ and /r/ are sonorants but the mouth air is not enough to cause friction. That is why, they are called liquids. /r/ is formed in English by curling the tongue tip back behind alveolar ridge. This is also called retroflex /r/ , but there are also trill, uvular and flap /r/. **A trill /r/** is produced by the tongue tip vibrating against the roof of the mouth; **a uvular /r/** by vibrating the uvula and **the flap** one by flapping against alveolar ridge. The /r/ is pronounced at the beginning of words and when it precedes a vowel otherwise (when it precedes a consonant and when it occurs finally), it is not pronounced. For example,

~read /ri:d/, sister /sistə:/, charity /tʃariti/ , harmful /ha:mful/ .

H- glides : are the sounds which are phonetically vowels **because** they are like vowels since there is no obstruction of the air in their production and they can be preceded by the indefinite article (a), (e.g., a way or a year), and phonetically consonants **because**:

1. they occur before vowels;
2. they can be preceded by the article (the) (e.g., the way /ðə/ /wei/).

When they are uttered , they are not obstructed and they are followed by vowels in distribution. There are **two glides** in English: (/j/ and /w/).

~you /ju:/ , yellow /jelo:/ , yet /jet/

~we /wi:/ , wit /wit/ , wide /waid/

L-nasals: are articulated when the soft palate is lowered closing the way to the oral cavity forcing the air to go through the nasal cavity to the nose out. There are **three**

nasals in English (/m/ /n/ and /ŋ/). **All the other 21 English consonants are oral.**

5- strength : strength refers to one of the discriminating factors in consonant description. The difference between the voiceless fricatives and the voiced ones is a matter of length, in addition to voice . /f/ , /θ/ , /s/ , /ʃ/ & /h/ are strong and their voiced counterparts are weak.

6- length : all the voiceless consonants are also longer than the voiced ones. This shows also a point of departure .

7- aspiration : short period after the explosion of /p/ /t/ /k/ when air leaves the *mouth without voice*.

During the production of voiceless sounds, the glottis is open and the air passes freely through this opening. When the following sound is a voiced one , the vocal cords must close. Thus, the voiceless sounds may differ depending on the timing of that closer. So, when there is a brief period of voicelessness immediately after the stop closure is released , we can say that such sounds are aspirated. Others, in the

production of which the vocal cords start vibrating as soon as the lips are opened, are thus unaspirated.

6- Syllabicity : is a feature of some sounds in syllables. There are **five syllabic do not center on vowels**. Rather, they center on the aforementioned syllabic consonants to mark syllables. Vowels which stand for the peaks of sonority of syllables, are compensated for by such consonants.

Examples: cattle /ka:t|/ happen /ha:pn/ history /histri/

All the syllabic consonant occur without an alveolar consonant:

Example: bottle /botl/

To sum up our discussion of the ways of describing consonants the following table is constructed to account for all the English consonants and all the ways for describing them :

Sound	Voice	Strength	Length	Place	Manner	Oral	Syllabicity
/p/	Voiceless	Strong	Long	Bilabial	Plosive	Oral	Un-Syllabic
/b/	Voiced	Weak	Short	Bilabial	Plosive	Oral	Un
/t/	Voiceless	Strong	Long	Alveolar	Plosive	Oral	Un
/d/	Voiced	Weak	Short	Alveolar	Plosive	Oral	Un
/k/	Voiceless	Strong	Long	Velar	Plosive	Oral	Un
/g/	Voiced	Weak	Short	Velar	Plosive	Oral	Un
/tʃ/	Voiceless	Strong	Long	Alveopalatal	Affricative	Oral	Un
/dʒ/	Voiced	Weak	Short	Alveopalatal	Affricative	Oral	Un
/f/	Voiceless	Strong	Long	Labiodental	Fricative	Oral	Un
/v/	Voiced	Weak	Short	Labiodental	Fricative	Oral	Un
/θ/	Voiceless	Strong	Long	Dental	Fricative	Oral	Un
/ð/	Voiced	Weak	Short	Dental	Fricative	Oral	Un
/s/	Voiceless	Strong	Long	Alveolar	Fricative	Oral	Un
/z/	Voiced	Weak	Short	Alveolar	Fricative	Oral	Un
/ʃ/	Voiceless	Strong	Long	Alveopalatal	Fricative	Oral	Un
/ʒ/	Voiced	Weak	Short	Alveopalatal	Fricative	Oral	Un
/h/	Voiceless	Strong	Long	Glottal	Fricative	Oral	Un
/m/	Voiced	Weak	Short	Bilabial	Nasal	Nasal	Syllabic
/n/	Voiced	Weak	Short	Alveolar	Nasal	Nasal	Syllabic
/ŋ/	Voiced	Weak	Short	Velar	Nasal	Nasal	Syllabic
/j/	Voiced	Weak	Short	Palatal	Glide	Oral	Un
/w/	Voiced	Weak	Short	Bilabial	Glide	Oral	Un
/l/	Voiced	Weak	Short	Alveolar	Lateral	Oral	Syllabic
/r/	Voiced	Weak	Short	Retroflex	Liquid	Oral	Syllabic