Phonetics & Phonology

[الصوتيات والنظام الصوتي]

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Lecture 1.

Phonetics and Phonology

Phonetics and Phonology

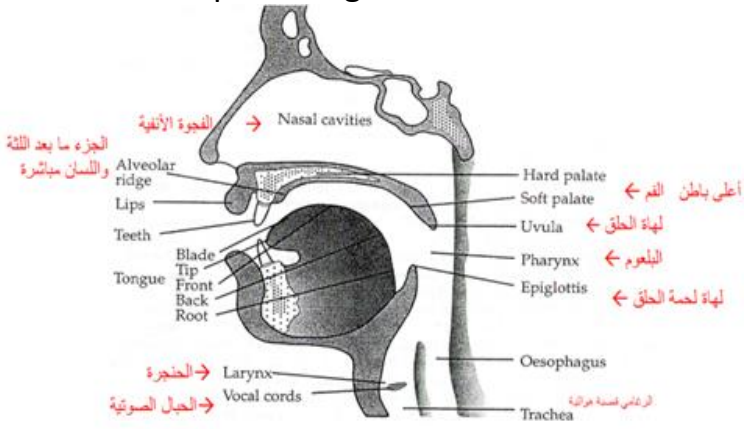
1. All the sounds we make when we speak are the result of muscles contracting. The muscles in the chest that we use for breathing produce the flow of air that is needed for almost all speech sounds; muscles in the **larynx** produce many different modifications in the flow of air from the chest to the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

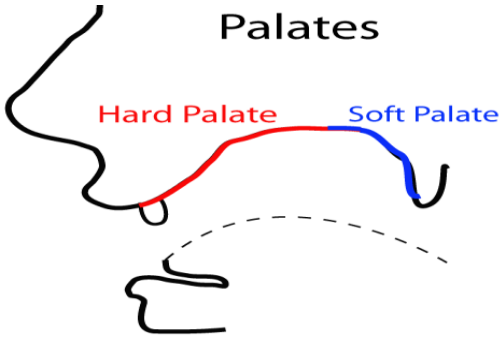
2. **After passing through the larynx,** the air goes through what we call the **vocal tract**, which ends at the **mouth and nostrils**. Here the air from the **lungs** escapes into the atmosphere.

3. We have a large and complex set of muscles that can produce changes in the shape of the vocal tract, and in order to learn how the sounds of speech are produced it is necessary to become familiar with the different parts of the vocal tract. These different parts are called **articulators**, and the study of them is called **articulatory phonetics**. **These parts are**:

4. i) **The pharynx** is a tube which begins just above the larynx. It is about **7cm long in women** and about **8 cm in men**, and at its top end it is divided into two**, one part** being the back of the mouth and the **other** being the beginning of the way through the **nasal cavity**.

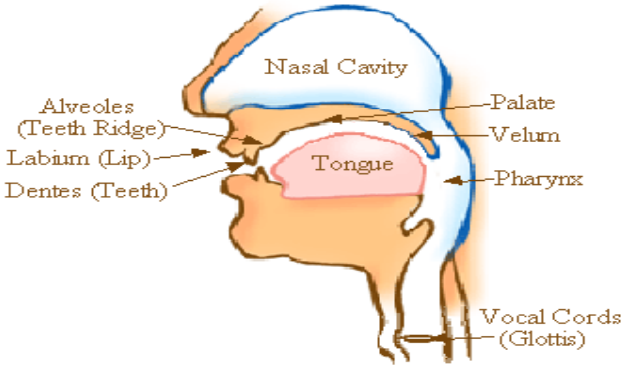
ii) **The velum or soft palate** is seen in any diagram in a position that allows air to pass through the nose and through the mouth. In speech it is raised so that air **cannot** escape through the nose.





iii) **The hard palate** is often called 'the roof of the mouth'. You can feel its smooth curved surface with your tongue.

iv) **The alveolar ridge** is between the top front teeth and the hard palate. You can feel its shape with your tongue. Sounds made with the tongue touching here (such as **t and d**) are called alveolar.



Lungs

V) **The tongue** is, of course, a very important articulator and it can be moved into many different places and different shapes. It is usual to divide the tongue into different parts: **tip**, **blade**, **front**, **back** and **root**.

vi) **The teeth (upper and lower).** Sounds made with the tongue touching the front teeth are called dental.

vii) **The lips** are important in speech. They can be pressed together (when we produce the sounds **p, b**), brought into contact with the teeth (as in **f, v**), or rounded to produce the lip-shape for vowels like **u**: . Sounds in which the lips are contact with each other are called **bilabial**, while those with lip-to –teeth contact are called **labiodentals**.

We have also to remember that **the nose and the nasal cavity** are a very important part of our equipment for making sounds. But we **cannot describe the nose and the nasal cavity as articulators in the same sense as** (i) to (vii) above.

Lecture 2

1. The first point at which the flow of air can be modified, as it passes from the lungs, is **the larynx** (you can feel the front of this, the Adam's apple, protruding slightly at the front of your throat)„ in which are located the vocal folds or focal cords).

a. The vocal folds may lie open, in which case the airstream passes through them unimpeded. Sounds which are made when the focal folds are open are called **voiceless sounds**. Thus, /s/ is a voiceless sound.

b. The focal folds may be brought together so that they are closed, and no air may flow through them from the lungs. When the air comes from the lungs the build up of air pressure underneath this closure is sufficient to force that closure open. But the air pressure then drops and the muscular pressure causes the folds to close again. The sequence is then repeated very rapidly and the results in what is called vocal folds vibration this vibration is felt when you put your fingers to your larynx and produce a sound like /z/. Sounds which are produced with this **vocal folds vibration** are said to be **voiced sounds** whereas sounds produced **without such vibration** are said to be **voiceless**.

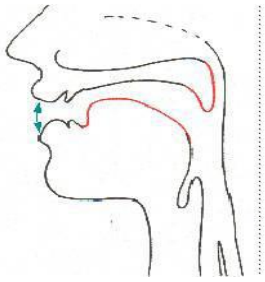
★ This distinction will constitute the first of the three descriptive parameters by means of which we will describe a given consonantal sound: we will say, for any given consonant, whether it is voiced or voiceless.

2. To transcribe speech sounds, phoneticians use International Phonetic Alphabet (IPA).

3. **Place of Articulation**

We will refer to the points at which the flow of air can be modified as places of articulation. We have just identified the vocal folds as a place of articulation; since the space between the vocal cords is referred to as the glottis, we will refer to sounds produced at this place of articulation as **glottal sounds**. There are many other places of articulation; we will identify a further seven.

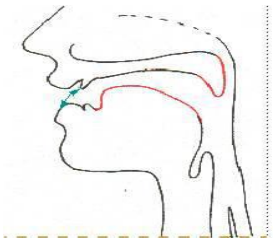
- **Bilabial sounds**. Sounds in which the airflow is modified by forming a constriction between the **lower lip and the upper lip** are referred to as bilabial sounds. An example is the first sound in pit and bite .



Bilabial

b, p, m

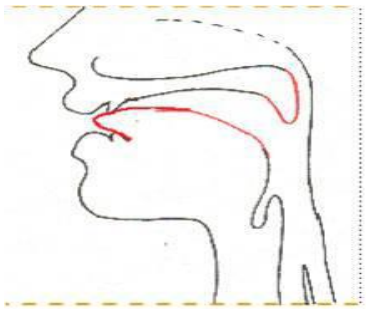
- **Labio-dental sounds**. Sounds in which there is a constriction between the **lower lip and upper teeth** are referred to as labio-dental sounds. An example is the first sound in fit and very.



Labio-dental

f, v

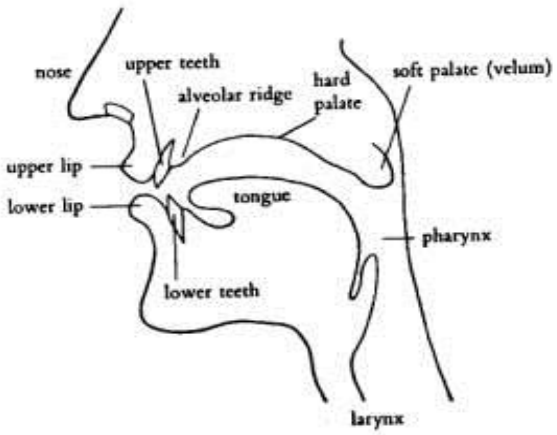
- **Dental sounds**. Sounds in which there is a constriction between **the tip of the tongue and the upper teeth** are referred to as dental sounds. An example is the first sound in thin.



dental

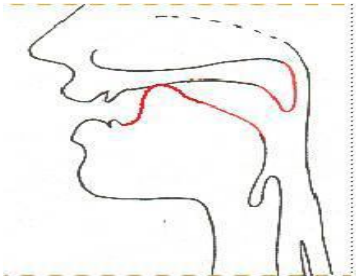
θ, ð

For the remaining places of articulation, let us distinguish between the tip, the blade of the tongue, the front of the tongue and the back of the tongue. Let us distinguish various points along the upper part of the mouth. We will identify four different areas. **The alveolar ridge** (the hard, bony ridge behind the teeth, **the hard palate** (the hard, bony part of the roof of the mouth, **the palate-alveolar (or post-alveolar)** region (the area in between the alveolar ridge and the hard palate), and the velum (the soft part at the back of the roof of the mouth, also known as the soft palate.



- Sounds in which there is a constriction between the **blade of the tongue and the palate-alveolar (or post-alveolar)** region are called **palate-alveolar sounds**. An example is the first sound in ship.

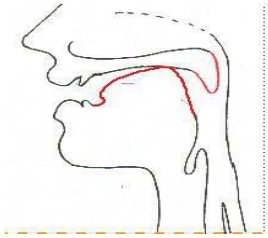
- Sounds in which there is a constriction between the **front of the tongue and the hard palate** are called **palatal sounds**. An example is the first sound in yes.



palatal

š, ž

- Sounds in which there is a constriction between the **back of the tongue and the velum** are called **velar sounds**. An example is the first sound in cool, go.



velar

g, k, ŋ

We have now identified eight places of articulation :

1- Glottal: /?/ ⟹ / h /
2- Bilabial: /b/, /p/
3- Labio-dental: /f/, /v/
4- Dental: / θ*l*, /ð/
5- Alveolar: /s/, /z/, /t/, /d/
6- Palate-alveolar: , /ʃ/, / /ʒ/, / ʤ/, /tʃ/
7- Palatal: /j/ the first sound in yes.
8- Velar: /g/, /k/

Manner of Articulation

1- For any given sound we will say whether it is voiced or voiceless, and what its place of articulation is. But to distinguish between the full ranges of speech sounds, we will require **a third descriptive parameter**: **manner of articulation**. To identify the manner in which a sound is articulated, we will identify three different **degrees** of constriction (complete closure, close approximation, and open approximation), and thus three different **categories** of consonant: stops, fricative and approximations .

***Stop sounds*:** such as: /t/, /d/ /k//g/, /b/, /p /

In pronouncing these sounds the articulators involved in pronouncing them make a complete closure. For example, when we pronounce the /p/ sound, the lower and upper lips completely block the flow of air from the lungs; that closure may then be released, as it is in pit and then produce a sudden outflow of air. Sounds which are produced with complete closure are referred to as **stops (or plosives).**

Given these three parameters, we may describe the first sound in **pit** as a **voiceless bilabial stop.**

Notice that we may write the **voiceless** sounds like [**-v**]
and the **voiced** sounds like [**+v**].

So the /p/ sound phonetic description will be like:

/p/
-v
Bilabial
Stop

Fricatives:
such as: /s/, /z/, /f/, /v/, / θ/ /ð/, /ʃ/ , /ʒ/

Let us now distinguish between complete closure and another, less extreme, degree of constriction:
Close approximation. Sounds which are produced with this kind of constriction entail a bringing together of the two articulators to the point where the airflow is not quite fully blocked: enough of a gap remains for air to escape, but the articulators are so close together that friction is created as the air escapes. Sounds of this sort are referred to as **fricatives**.

The first sound in **fin** is created by bringing the lower lip close to the upper teeth in a constriction of close approximation. This sound is a **voiceless labi-dental fricative (transcribed as [f]).**

Another example is / s /. it is created by bringing the tip or blade of the tongue into a constriction of close approximation with the alveolar ridge. It is a **voiceless alveolar fricative**. **Normally the phonetic description is written in this way**:

/s/
-v
Alveolar
Fricative

While the

/z/
+v
Alveolar
Fricative

Approximants: the **least degree** of constriction occurs when articulators come fairly close together, but not sufficiently close together to create friction. This kind of stricture is called **open approximation**. Consonants produced in this way are called **approximants or approximations.** The first sound in **yes** is an **approximant**. It is described like /j/ and it is a **voiced palatal approximant**. /w/, /r/, and /l/ are also considered **approximants**.

❖ Charting consonant sounds:

Place	Bilabial		Labiodental		Dental		Alveolar		Palatal		Velar		Glottal	
Voicing	-V	+V	-V	+V	-V	+V	-V	+V	-V	+V	-V	+V	-V	+V
Manner														
Stops	p	b					t	d			k	g		
Fricatives			f	v	θ	ð	s	z	ʃ	ʒ			h	
Affricates									tʃ	dʒ				
Nasals		m						n				ŋ		
Liquids								l r						
Glides		w								j				

Phonetics and Phonology

Phonetics and Phonology

1- So, the least radical degree of constriction occurs when the articulators come fairly close together, but not sufficiently close together to create friction. This kind of stricture is called open approximation.

2- We have **four approximants**. These are: the **first** sound in **yes**. It is written in the **IPA** system as /**j**/. The **second** approximant is the first sound in **rip**. The **r** is **alveolar approximant**. The **third** sound is the first sound in **wet**. /w/ **labio-velar approximant**. The **forth** approximant is the first sound in **lift**. /**l**/ is **alveolar lateral approximant**.

Important notes

1-**All approximants** are **voiced sounds**

2- The /w/ and /j/ are also called **glides**. The r and the /l/ are also called **liquids**.

Affricates :

We have distinguished three classes of consonant according to degree of Constriction: **stops**, **fricatives** and **approximants**. Consider the first sound in **chip**: it is like a stop in that there is complete closure between the blade of the tongue and the palate-alveolar region. However, it is like a fricative in that it clearly involves friction.

That friction occurs during the release phase of the closure. Sounds produced with a constriction of complete closure followed by a release phase in which friction occurs are called **affricates**. These are: / ʤ/ /tʃ/

The **affricate** in chip, transcribed as /tʃ/ is **a voiceless palate-alveolar affricate**.

The first sound in joy, transcribed as / ʤ/ is **voiced palate-alveolar affricate.**

Phonetics and Phonology

Aspiration:

-The first stop in pit, we said, is a **voiceless bilabial stop**. So too is the first stop in spit. But the **bilabial stop** in pit differs phonetically from the **bilabial stop** in spit: if you hold the palm of your hand up close to your mouth when uttering pit, you will feel a stronger puff of air on releasing the bilabial stop than you will when you utter spit. That stronger puff of air phenomenon is called **aspiration**: we say that the bilabial **stop** in pit is an **aspirated voiceless stop**, whereas the **stop** in spit is **unaspirated**.

Nasal stops:

We have been making an assumption in our discussion thus far, concerning the position of the velum in the production of the speech sounds we have described. We have assumed that, in all of these sounds, the air from the lungs is escaping only through the mouth (**the oral cavity**). This is true if the velum is in the raised position, such that it prevents the flow of air out through the nasal cavity.

In all of the sounds discussed thus far, the velum is indeed raised: we describe all such sounds as oral sounds. But the velum may be lowered, to allow velum lowered, and with air escaping through the nasal cavity alone, are referred to as nasal stops.
We have three nasal stops in English. These are:

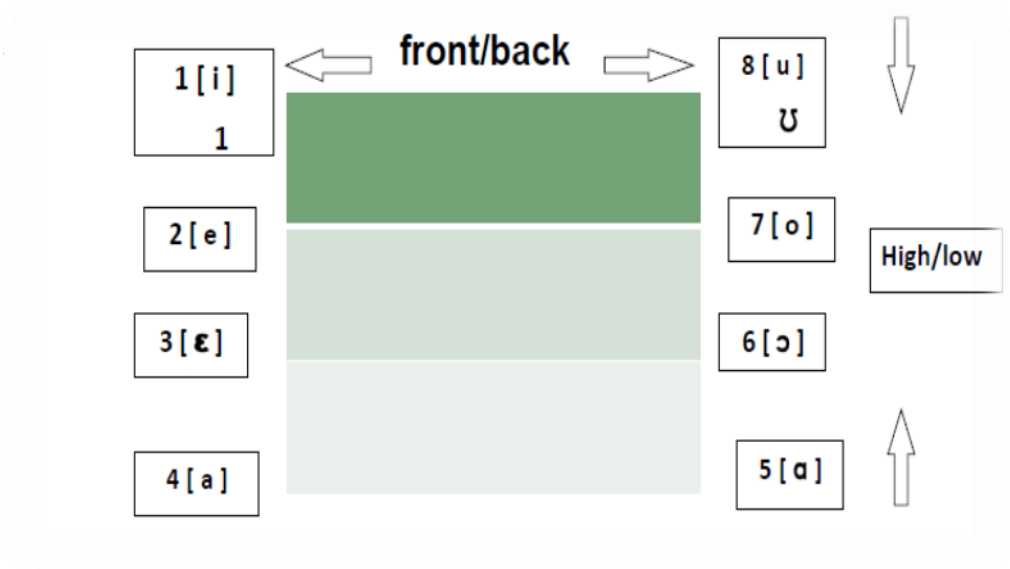
1- /m/. It is bilabial nasal stop
2- /ŋ/. It is velar nasal stop. It is the last sound in *sing*.
3- /n/. It is alveolar nasal stop. An example is the first sound in *not*.

★ All the nasal stops are voiced.

Assimilation:
When two sound segments occur in sequence and some aspect of one segment is taken or copies by the other, the process is known as **assimilation**.
An example is the word **dean**. The ea became nasalized as it is followed by a nasal sound, which is in this case the /**n**/.

Lecture 6

English vowels



Let us begin by assuming that all vowels are voiced and articulated with a constriction of open approximation. We will also assume, for the moment, that all vowels are oral sounds (i.e. that the velum is raised during their production). The range of positions which the tongue can occupy within the oral cavity while remaining in a constriction of open approximation is quite large. Let us call the entire available space for such articulations the vowel space. We will require a means of plotting the point at which a given vowel is articulate in the vowel space.

The vowel space is represented along two dimensions.

1- High/low. According to this dimension, the vowel could be high vowel, or low, or high-mid, or low-mid.

2- Front/back. According to this dimension, the vowel could be: front, back, or central

We can add a **third parameter**, which is the lip position: we will say, for a given vowel, whether, during its articulation, the lips are rounded or not**. So a vowel could be rounded or unrounded.**

* /i/ = is front, high and unrounded vowel.
Example see, lead, seed

* /u/= is back, high and rounded vowel.
Example food, soon, loose

* /e/= is high-mid, unrounded vowel.
Example, pet

* /o/ = high-mid back rounded vowel.

* /a/ = low front unrounded vowel.

* /æ/ = low front unrounded.
Example ant, pat, ban.

* /ɛ/ = front low-mid unrounded.

* /ʊ/ = high back rounded vowel.
Example: put.

* /ɑ / = low back unrounded vowel.
Example, aunt [ɑ:nt], car.

* /ɔ/ = low-mid back rounded.
Example Core.

* /^/ = central unrounded low-mid.
Example, putt, hub.

* /ə/ = mid-central vowel. It is also called schwa.
Example About, upper.

Lecture 7

English vowels

/u: / vs / ʊ/ , /ɑ:/ vs /æl/ , //ɔ:/ vs /ɒ/

Example: pool/pull or (/u:/ vs / ʊ/,)
caught/cot or (/ɔ:/ vs /ɒ/)

Wells uses three key words for the [ɔ:]. These are: **thought**, **force** and **north**. He also uses three key words for /ɑ:/. Start, and Balm

Short vowels in English:

ɪ as in pit [pɪt], fill, mid,
e as in pet [pet], led, sell [sel],
æ as in pat [pæt],
^ as in putt [p^t] or love,
ʊ as in put [pʊt], full,
ɒ as in pot [pɒt], doll,song,
ə (which is called **schwa**) as in about [əbaʊt]

Long vowels:

i: as in key [ki:]
ɑ: as in car [kɑ:], march [mɑ:tʃ],, park
ɔ: as in core [kɔ:], saw [sɔ:],
u: as in coo [ku:], food
3: as in cur [k3:]

Lecture 8

Diphthongs

In all of the **RP** and **GA** vowel sounds we have considered thus far, the articulators remain more or less in the same position throughout the articulation of the vowel. This means that the vowel quality remains more or less constant. That kind of vowel is **a monophthong**. However, there are vowel sounds in which this is not the case

This kind of vowel sound, called a **diphthong**, entails some kind of change of position of the articulators during its production, and thus a change in the vowel quality produced. A diphthong is a vowel whose quality changes within a syllable

A diphthong is not simply a sequence of two vowels. For instance, in both the RP and the GA pronunciations of the word seeing [si:ŋ], the vowel [i:] is followed by the vowel [ɪ], but the resulting sequence is **not a diphthong, because** the [i:] and the [ɪ] are **not in the same syllable**: seeing **has two syllables**, **the first of which ends in** [i:] and the **second of which begins with** [ɪ].

The following are called diphthongs.

الامثله التاليه تعتبر diphthongs:

1-/aɪ/. Examples: sigh, rye, bide, kite, site, bite, price .
2-/eɪ/. Examples: say, ray, bayed, face .
3-/ɔɪ/. Examples: boy, soy, roy, buoyed, choice .
4-/aʊ/. Examples how, now, loud, cow, mouth .
5-əʊ. Examples Go, load, home, most, coat .

Lecture 9

.RP and GA short Vowels

1- There is considerable variation in the vowel sounds uttered by speakers of different accents of English. We will begin with two particular accents; the first is Received Pronunciation (**RP**) and General American (**GA**).

RP is the accent often referred to as the **prestige accent in British society** and associated with the speech of the **graduates of the English public schools**. It is thus defined largely in terms of the **social class of its speakers**.

The term GA is an idealized over a **group of accents whose speakers inhibit a vast proportion of the United States**. It excludes eastern accents such as the New York City accent, and southern accents (such as spoken in Texas). For speakers of RP and GA, the vowels in peep and pip differ in several respects, one of which is vowel length. In peep it is a long vowel and in pip it is a short vowel.

The vowel in pip is transcribed as [ɪ]. so the word is transcribed as [pɪp]. [ɪ] is high front unrounded vowel, it is less high and less front than the vowel in peep.

The words pit, pet, pat, pot, putt and put can be used to illustrate the **short vowels**, since these words differ in pronunciation only with respect to the vowel. EXAMPLES: ɪ as in pit [pɪt], fill, mid, e as in pet [pet], led, sell [sel], **æ as in pat [pæt],** ^ as in putt [p^t] or love, ʊ as in put [pʊt], full, ɒ as in pot [pɒt], doll, song,

- ★ ɪ as in pit [pɪt], fill, mid,
- ★ e as in pet [pet], led, sell [sel],
- ★ æ as in pat [pæt],
- ★ ^ as in putt [p^t] or love,
- ★ ʊ as in put [pʊt], full,
- ★ ɒ as in pot [pɒt], doll, song,

An example of vowels to the Examination

- The vowel in the word (pat) is pronounced as:

a) e. b) æ. C) ʊ. D) e.

ə (**which is called schwa**) as in about [əbaʊt], or again. this vowel (the schwa), is typically shorter than the short vowels we have just described, and it differs from those in that it may never occur in a **stressed syllable** (in about, it occurs in the unstressed first syllable; in elephant, it occurs in the **unstressed second syllable**; in Belinda, it occurs in the **unstressed initial and final syllables.**

In discussing vowels, we will also adopt the lexical sets adopted by **wells**. These are the key words selected by wells **to bring out the similarities and differences between RP and GA**. We will therefore, at times, refer to the vowel in words such as pit as KIT vowel

The vowel in words such as pet we will call the **DRESS vowel**; words such as pat have the **TRAP vowel**; words such as pot have the **LOT vowel**; words such as put have the FOOT vowel, and words such as putt have the **STRUT vowel**.

Lecture 10

1- We have been dealing, thus, with **phonetics**, **that is with the study of human speech sounds .**

2- **Phonology is to do with something more than properties of human speech sounds per se**. **phonology is the study of certain sorts of mental organization**. So, **phonology** is **essentially the description of the systems and patterns of speech sounds in a language**.

3- The range of places within a word which a given sound may occur in is called its **distribution**. In the English data we have looked at, the **distribution of unaspirated and aspirated stops is mutually exclusive**: where you get one kind of **stops**, you never get the other. This is called **complementary distribution**.

4- English native speakers know that the sequence of segments [bl^g], is an English sequence, whereas the sequence of segments [tl^g] is not, despite the fact that she or he may will never have heard either sequence in her or his life. Let us postulate that, in making such judgments, the native speaker of English gains access to a **kind of unconscious knowledge which constitutes 'the phonology of English .'**

5- The discipline of phonology, under this view, differs from that of phonetics, since it is the study, not of speech sounds per se, **but of mental abilities and largely unconscious mental states .**

6- The /p/ in pool, and the /t/ in top, and the /k/ in killing, **are aspirated.** While the /p/,/ t/, and k/ in spurt, stop and scold, **are unaspirated** .

Furthermore, the **aspirated and the unaspirtaed** /t/ are phonetically similar: both are **stops**, both are **voiceless**, both are **alveolar**. What we want to say is that, while they are phonetically distinct, they are phonologically equivalent. That is, the two types of stops correspond to, are interpreted as belonging to, say a single mental category. We will refer to such a category as a **phoneme** .

So whether the p is **aspirated** or **unaspirated**, it is **one phoneme** .

Thus, each one of these meaning-distinguishing sounds in a language is described as a phoneme. If we change a phoneme and we replace it in the same place, this leads to change the meaning. For example, car. If we replace the /r/ by /t/ we will have a new word, cat, which has a different meaning .

Lecture 11

1- **The relation between phonemes and their associated phonetic segments is one of realization**, so that the phoneme /p/, for instance, is **realized** as [p] **after a voiceless alveolar fricative** (example: spurt), and as aspirated [p] elsewhere (example: pool)

2- Realizations of a phoneme which are entirely predictable from the context are **called its allophones**. So we say that the aspirated /p/ and the unaspirtaed /p are **allophones of the /p/ phoneme**.

3- **In other languages, such as Korean, the distribution of aspirated and unaspirated voiceless stops is overlapping**: there is at least one place in which either type of sound may occur. This kind of distribution is referred to as **parallel distribution**.

4- **Pairs of words which differ with respect to only one sound are called minimal pairs**. So, sit and sat are **minimal par**. Minimal set **if there are more than two words**. So, sit, sat, set are minimal set.

5- **The distinction between aspirated and unaspirated voiceless stops is phonemic in Korean** and **allophonic in English**.

The phonemic principle:

1- **Two or more sounds are realizations of the same phoneme if**:

(a) **they are in complementary distribution**

and

(b) **they are phonetically similar**

2- two or more sounds are realizations of different phonemes if:

(a) they are in parallel (**overlapping**) distribution

and

(b) they serve to signal a **semantic contrast**.

Lecture 12

1-last time we talked about a phonological process **called assimilation**. When two sound segments occur in sequence some aspect of one segment is taken or copied by the other, the process is known as Assimilation. For example, as a result of this process the vowel /ee/ in the word seen, becomes **nasalized** as a result of its being followed by the nasal sound /n/ We have another process called elision.

the process of not pronouncing a sound segment that might be presented in the deliberately careful pronunciation of a word in isolation is described elision. For example, there is typically no [d] sound included in the everyday pronunciation of a word like *friendship* [frɛnʃɪp].

2-Morphemes are a kind of **mental representation** which have **three properties**: a **syntactic category**, a **meaning** and a **phonological form**. For example, a native speaker knows that a word like **cats** has two morphemes: a root morpheme and a plural morpheme (**which, in this case, is a suffix**).the **morpheme** takes the form of a triple: **a syntax**, a **semantics** and a **phonology**. **Syntax (it is a noun-cat)**, **semantics (it means cat)**, and **phonology, which takes the form /kæt/;** we will refer to this as the phonological form of the morpheme.

Just as phonemes are mental objects, so the phonological form of this morpheme is a mental object: /kæt/; is a mental representation in the mind of a speaker, whereas the sequence [kæt] is a **phonetic sequence.**

3-The **phonological form** of a morpheme may, clearly **consist of more than one phoneme.**

4-The phonological form of a morpheme is present in the speaker's mentally constituted grammar, and that this phonological form consists in either a single phonological segment or a sequence of such segments.

5-The phonological units or categories we have called phonemes are part of phonological knowledge.

Lecture 13

English Syllable structure

The two main constituents within a syllable are the **onset** and the **rhyme**.

In the word bile, for instance, **the first segment**, /b/, constitutes **the onset** of the syllable and the **last two segments**, /ai/ and /l/, taken together, constitute **the rhyme**. **The onset** is defined **as any and all consonants occurring before the vowel**. **The rhyme** may be further subdivided into the constituents nucleus and coda . Thus, the word bile, the diphthong /ai/ constitutes the nucleus, and the consonant /l/ constitutes the coda.

A syllable such as this, which contains **one or more consonants in coda position, is called a closed syllable**, whereas syllable which does not contain any consonants in coda position is refered to as an **open syllable;** as in the word buy.

While a syllable must have a nucleus, it is possible to have a well-formed syllable which does not contain any element other than a nucleus.

The segment occupying the nucleus of the syllable **is normally a vowel**.

-an example of a word in English consisting of **only one syllable**, which in turn contains only a **nucleus**, is eye: /aI/.

-**but the nucleus** in English may be preceded or followed by other segments, as we have seen, and those segments are typically **consonants** .

morphemes like bile, which contain **only one syllable**, are said to be **monosyllabic**. But in English, morphemes may contain **more than one syllable**: they may be **polysyllabic**. Examples are rider, beetle, amount, desire .

In English onsets may contain **two segments** (as in bring, trap, clip, etc.); we will refer to these as **branching onsets** .

-just as onset may be **branching**, so **codas** may **branch**, as in the word hunt .

-Thus, English syllable can be like: cvc (ham), v (I), cv (do), ccvc (green) vcc (eggs), vcc (and), vc (am)

These are examples of English consonant phonemes

1- /tʃ/ Chew, chit, rich

2- / ʤ/ Gin, ridge

3- /θ/ Thigh, thin,

4- /ð/, Then, that,

5- /ʃ/ Shy, ship, leash

6- /ʒ/ Measure

7- /j/ Year

8- /ŋ/. Sing, ring

The end

تم بحمد الله ..

Done by: trook8

تنسيق : ملك بلاملكة