Phonology

- Phonology is the branch of linguistics which studies the ways in which sounds are used in different languages to form syllables and later words by following some system.
- So, Phonology is essentially the description of the systems and 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.
- Because of this 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.

There are some conventional notation in the field of Phonology and we must learn them first.

If we refer to any physical sound of a language, we put them under two slashes i.e. /p/, /t/ and /k/.

- However, if we talk about the representation of a sound in the mind as an abstract unit called phone, we put them in square brackets such as [p], [t] and [k].
- What should be the distinction of physical VS mental sounds?
- In other words, what is the difference between a phone and a phoneme?
- Let us make this clear first before we proceed any further in learning about phonology.

The source of Sound:

The physiology of the speech sound would tell us that the source of any sound in human body is the lungs.

The lungs must produce adequate airflow and air pressure to vibrate vocal folds.

The vocal folds (vocal cords) are a vibrating valve that chops up the airflow from the lungs into audible pulses that form the laryngeal sound source.

The articulators articulate and filter the sound that comes out from the larynx and can interact with the laryngeal airflow to modify the sound to meet the requirement of the context.

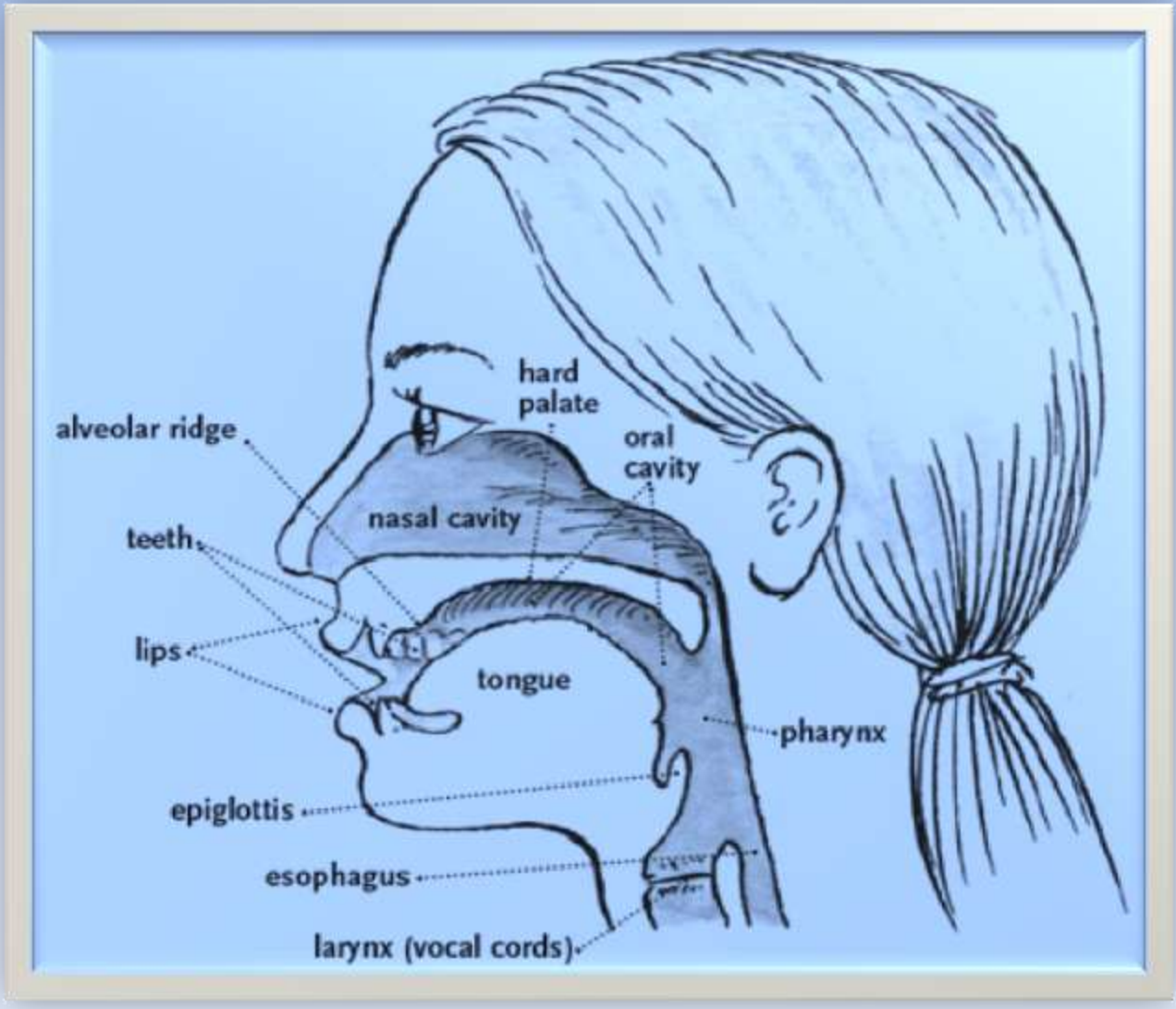
The vocal folds, also known commonly as vocal cords, are composed of twin infoldings of mucous membrane stretched horizontally across the larynx.

They vibrate, modulating the flow of air being expelled from the lungs during phonation.

Vocal folds are located within the larynx at the top of the trachea.

Some pictorial description of these human voice organs will help us to know the process of phonation better.

Anatomy of speech production



Source of Sounds for language:

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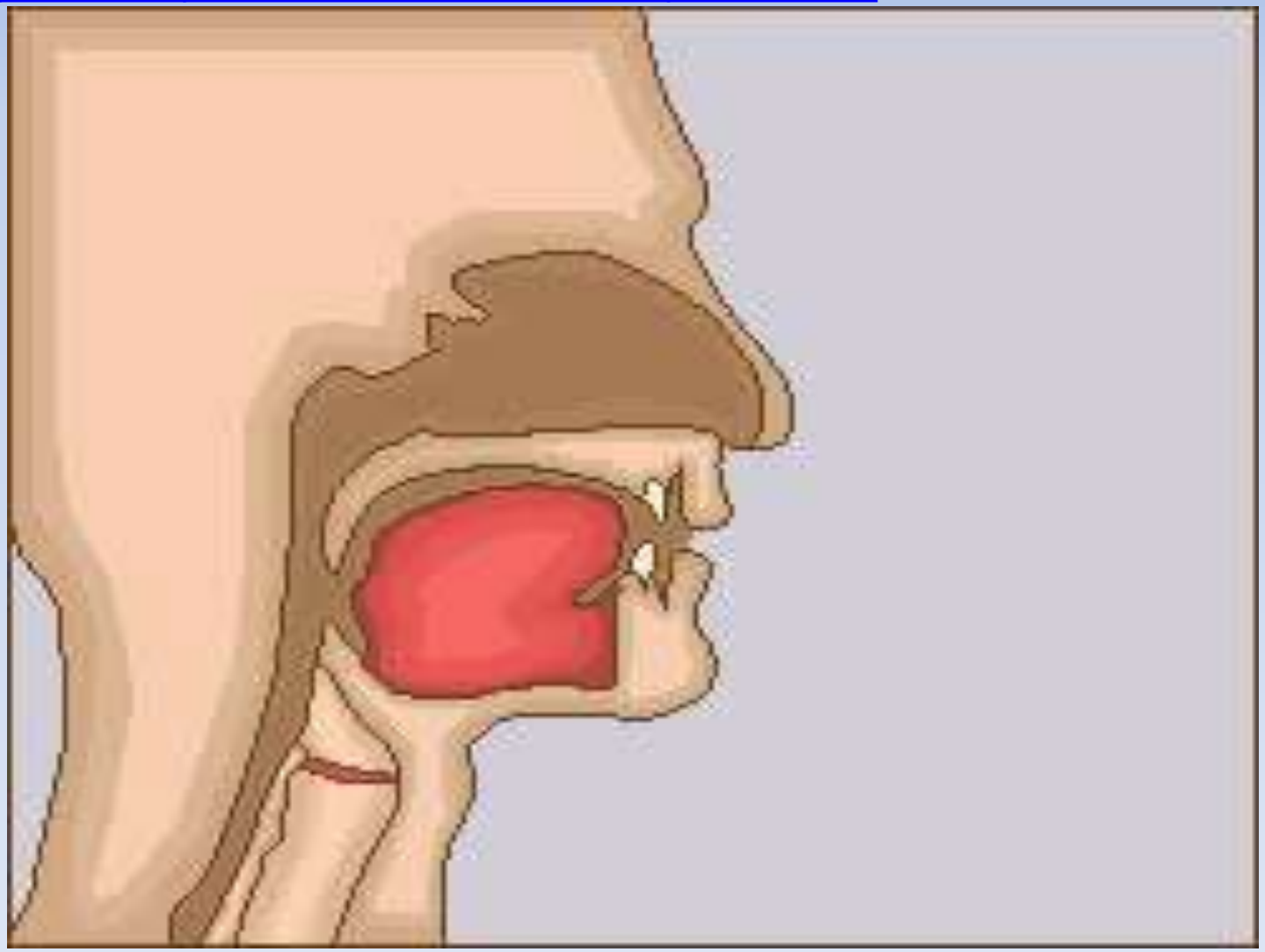


Difference between phonetics and phonology?

- Phonology deals with the sound systems languages
- Phonetics deals with the physical realisation of the elements of the sound system,
- e.g. how the sound is physically produced (articulatory phonetics),
- or how the sounds are percieved/heard (auditory phonetics)
- or the acoustic characteristics of the speech sound (acoustic phonetics)

The *phone*

- Each time a speech sound is produced it is different from the other sounds
- Each time you produce a /t/ it will be always slightly different from earlier produced /t/
- So, as a conceptual term, a *phone* is the physical realisation of a speech sound in a language.
- Don’t worry if you didn’t understand it at this point. The comparision of other terms will help us to get it better.

The *phoneme*

- The phoneme is the smallest speech sound that has linguistic value.
- When a series of phones are similar with regard to their articulations and can be distinguished from another series of phones in terms of meaning and collocation.
- The series or the group is given a name e.g. /t/.
- This is called a phoneme in linguistics.
- The phoneme is an abstract form of a sound that is located in human mind and specific to a particular language.

The allophones

If a phone is produced in two different forms in different environment and these two different forms don't change the meaning of the word, they can not be called two different physical sounds in the language.

These two forms must be connected to the same 'phoneme' which is abstractly stored in the mind of the speaker.

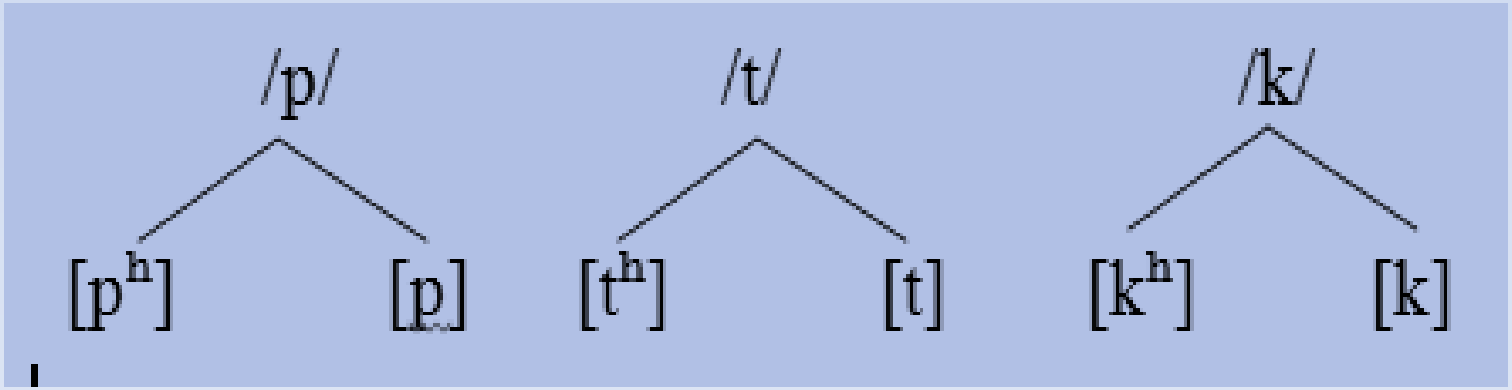
These two forms are **phonologically conditioned variants** of the same phoneme.

And they are called the ***allophones.***

Phone, Phoneme and Allophone

pan	tan	can
span	stan	scan

[p^hɛn]	[t^hɛn]	[k^hɛn]
[spɛn]	[stɛn]	[skɛn]



....more examples

Let us see the following examples from Hindi:

पल [pəl] = moment----------/p/

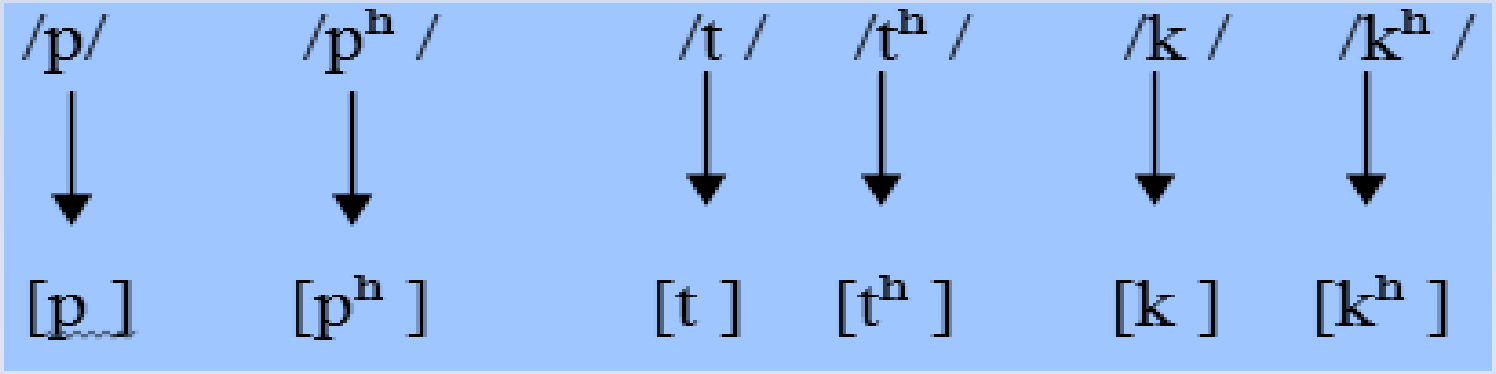
फल [p^həl] = fruit ----------/p^h/

तल [təl] = base or fry ----------/t /

थल [t^həl] = earth/ ground----------/t^h /

कल [kəl] = tomorrow, yesterday------ /k /

खल [k^həl] = grinder ----------/k^h /



Sounds in context:

- Phonology: we defined it as '…. the study of the mental organization of a systematic representation of sounds in a language. Therefore, in Phonology, we must bother about
- Units of organization:
  - Biggest: ***syllables***, metrical feet, words
  - Middle: ***segments*** (phonemes and allophones)
  - Smallest: ***features***

So, as a Phonologist, our job would be to find out the system by which languages allow to combine sounds together to form these units.

One thing that we must keep in mind that there are hundreds of possible speech sounds in the languages of the world.

The IPA chart can easily demonstrate that to us. However, we know that each language only uses a few of those sounds.

And when a Phonologist works on the system of sound of a language, what interests him/her the most is the ***kinds of contrast*** that language has at the level of sounds .

We also learned that sounds contrast when their presence in the context bring difference in the meanings of the word.

Minimal pairs

A pair of words which differ minimally with regard to the change of the sound.

These minimal difference can be spotted at three places of a word:

Initial	medial	final
pin-bin	**put-pit**	**pɛt̪-pɛd**

Learn more about the minimal pair on your own ☺

When we find a pair of words that differ in only one sound, and they mean different things, such contrast of sounds is called ‘minimal pairs’.

The above mentioned pairs of sound where sounds differ minimally is also said to be in ‘contrastive distribution’.

This procedure is adopted to find out the basic sound patterns or the basic phonemic inventories in languages.

In lay man’s terminology, the procedure allows us to find out the total number of ‘phonemes’ in a language.

However, one has to be very careful in terms of making quick judgment. For example:

- [pæd] [bæd] ***minimal pair***
- Mean different things: /p/ and /b/ contrast
- [Kæt] [k^hæt] ***not minimal pair***
- Mean the same thing: [k] and [k^h] do not contrast

Crucial concept 1: Phoneme

- When two sounds contrast they are part of different ***phonemes***.
  - /p/ and /b/ are different phonemes
- Phonemes are abstract mental units that represent sounds.
- Be careful! Phonemes are *not* sounds themselves, they are mental units representing sounds!!!

Crucial Concept 2: Allophones

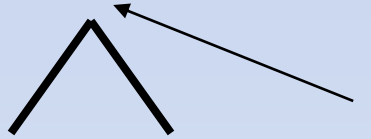
- Phonetic forms that don't contrast (make a difference in meaning) are called ***allophones***
  - [k] and [k^h] are allophones of the phoneme /k/

- Allophones are the various pronunciations of a phoneme.

Phonemes & Allophones

- Phonemes are written between / / brackets
- Allophones are written between [ ] brackets

/t/ phonemic (abstract/mental) category



in your mind

[t] [t^h] allophonic (phonetic) realizations

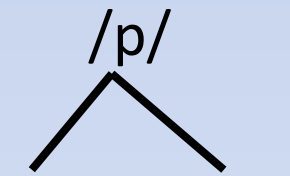
what you actually say

'tip' of tongue

't^hip' of tongue

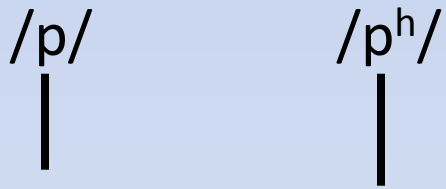
Language Specificity

- The status as a phoneme is a language specific matter
  - English



‘pin’ ‘pʰin’

Hindi



‘pəl’ = a moment

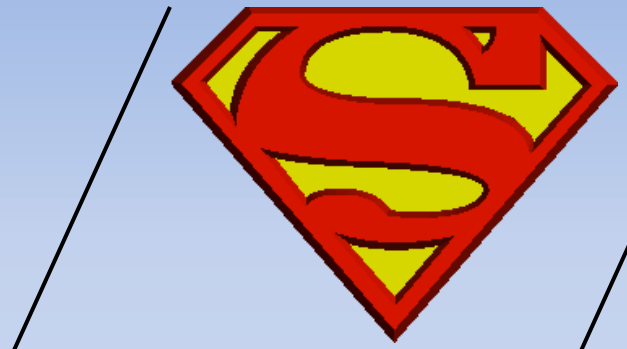
‘pʰəl’ = a fruit or result

Sounds in context

- The pronunciation of a phoneme is often determined by the other sounds around it.
- The nearby sounds around a phoneme are called the ***environment*** of that phoneme.
- E.g. in the word [pet], [p__t] is the environment for the [e].

Crucial concept 3: Complementary Distribution

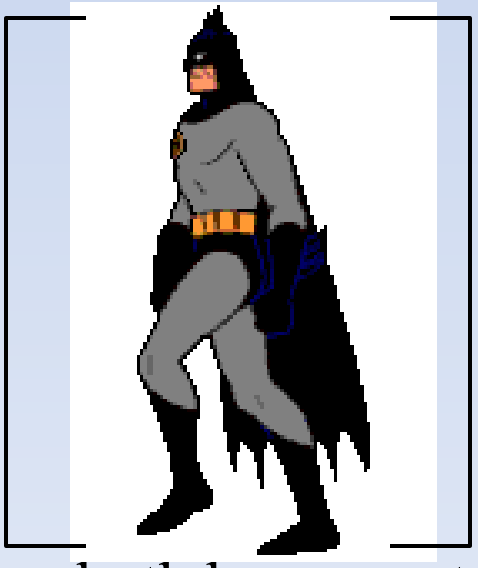
- When two phones are mutually exclusive, i.e., they appear in *different environments*
  - [skæn] [kʰæn] *[spʰæt]
  - [spul] [pʰul] *[spʰul]
- [pʰ] and [p] are in ***complementary distribution*** (which means they are allophones of the same phoneme).
- When sounds are in complementary distribution, we can predict as to where we get each of these sounds, meaning we know the environment.



The mental concept of "supermanhood"

(phoneme)

In complementary distribution: never seen in the same place at the same time. Allophones!



NOT in complementary distribution: can both be present at the same time: phones of ***different*** phonemes

Free variation

- If variation is not associated with positioning, and is rather unpredictable, such variation is called *free variation* or *random variation*.
- One type of random variation that we encounter is when we compare different realizations of one and the same phoneme by various speakers of a language.
- It differs from complementary distribution because it is context-free and it differs from phonemic variation because it is not contrastive.

Free variation

- To give an example, if a person pronounces the word *rock* as either [**rɔk**] or [**rɔk^{h}**], then we talk about free variation.
- We can have a different type of free variation when we deal with realizations of different phonemes in the same context without a change of meaning.
- E.g.: **/i:/** and **/e/** in the respective pronunciations of *economics*: **/i:kənɔmɪks/** vs. **/ekɔnɔmɪks/**;
- or **/e/** and **/eɪ/** in the respective pronunciations of *again* **/əgen/** vs. **/əgeɪn/**.