

More about the unique features of Human Language and intro to Speech Sounds

☰ Week	Week 3
🔗 Files	itl class 6.txt
☑ Column	☑
# Lecture	6
☰ Unit/Module	Basics Phonetics

We were looking at the characteristic features of human language and we were figuring out how it is different from animal communication and otherwise just unique. We also looked at the overlapping with the other communication systems but there are some features which are absolutely peculiar and unique to human language and we were exploring those features.

Structure Dependence/Hierarchy

This feature is supposed to be typical to human language

When we have a sentence, it's not just a bag of words mixed or placed randomly. Because of the way our communication works, we utter words in a linear fashion but the order is not really random but a very definite pattern.

Language is not a mere concatenation of words in a linear sequence.

The Martian example. How do these creatures who don't know anything about the human language form an interrogative sentence - yes/no type?

- **The boy is late** -> **Is the boy late?** (humans are easily able to do it)

So the martian is trying to figure out the pattern and looking at the above example, they might infer that to make an interrogative sentence from a statement they should **move the third word to the front** and yaya the martian is able form an interrogative sentence.

But how about '**The boy in the red shirt is late**'? The martian realizes that just moving the third word forward won't really work because we get a meaningless

sentence - **In the boy the red shirt is late**

So, now the martian concludes that they should just **bring 'is' to the front** and now the martian is able to form the new sentence again yayayay.

Now, how about '**The boy who is wearing a red shirt is my brother**'?

Which 'is' should be moved?

If the martian applies the rules they have just figured out, this is what they get - **Is the boy who wearing a red shirt is my brother?**

We see that if we move the first is, the pattern is destroyed and it doesn't work.

So, finally what is the solution? ***The real solution is that we need to choose the 'is' in the Verb Phrase of the Sentence.***

Solution:

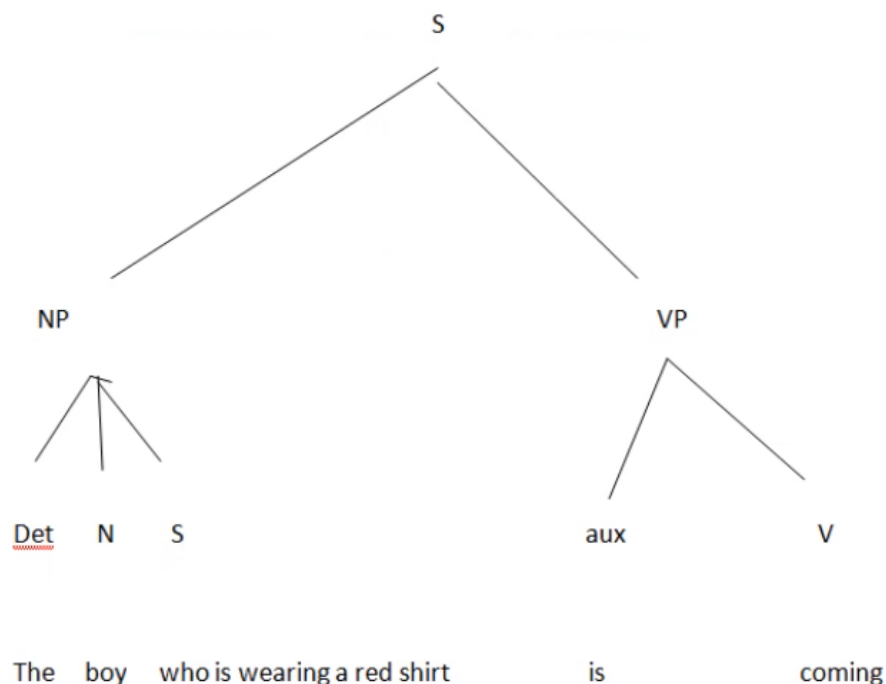
To recognize 'units' irrespective of the number of words.

We need to thus understand the structure of a sentence and realize that a sentence is made up on different layers or small blocks called units

Our sentence is usually made up of two units- the noun phrase and a verb phrase, which are further broken down into more elements or smaller units that it can be easily broken down into. We also need to observe that they are ordered hierarchially into different layers

The following sentences have been broken down into smaller units We can also observe how the verb phrase has a verb or might even have an auxiliary verb and then also can include a noun phrase.

Lalita	has dropped the course
My brother	can swim
The roses in the garden	are going to blossom
The boy who is wearing a red shirt	is my brother



We need to break our total sentence into smaller parts called a noun phrase and verb phrase and auxiliary.

What we need to observe in this case is that we don't break down a sentence depending on the number of words it has but instead on the types of phrases and its innate structure that it follows.

We don't go by mechanical counting of words or the order of words, or the number of words of what word it is, but we go by the order of the different kinds of phrases in the sentence.

This also makes us realize that **a sentence has a hierarchical structure that it always follows and there is depth to the sentences we utter**. It's not just a bunch of words that are ordered randomly.

Things like the sentence and the NP or VPs can be broken down into further smaller units and the process just keeps going on.

S-> NP VP

NP->Det N S

VP->Aux V NP

It is as if there is an invisible structure in sentences - same words at the lower level and in the main clause - so we automatically know which is to move to the front (in our experimental sentence that the martian was trying to work with)

This follows the idea given by Chomsky: this knowledge of the inherent structure of language is part of child's biological endowment, part of the structure of the language faculty'

We are born with the ability to see and understand that language has a hierarchical nature, it is a part of our language faculty. We don't need to teach a child how to understand or recognize the pattern of sentences of the depth in language in order for them to be able to understand and form sentences.

Acc to Chomsky, this knowledge is inherent

Another thing we need to realize is that there is a **Structure Dependence** in any language, even when there are no overt clues. Something that demonstrates this is the experiment conducted by psychologist Garret.

In that experiment 2 sentences with the words "George drove furiously to the station"

1. In order to catch the train, George drove furiously to the station.
2. The reporters assigned to George drove furiously to the station.

They recorded the sentences and spliced them. A listener will hear a beep on George and mark a structural break in the correct place, i.e. , before or after the beep. (the way it works is that we are able to break down the same sentence in different ways depending on it's structure and meaning it is trying to convey - the knowledge about how to break it down is inherent to us, and not something that we need to learn or be taught as such)

(look more into this experiment)

Listeners impose a structure where there is no physical evidence.

According to Chomsky: **Simple slot filling operations are inadequate as explanation of language. Language must be organized on two levels - surface and deep.**

So what the martian was doing initially was just simply filling slots, but that is not an appropriate way to work with sentences as we need to realize that a sentence has more depth than just that and it needs to be broken down into smaller units.

The difference in the surface and depth of sentences is also why ambiguous sentences exist

Ambiguous sentences -

this happens in cases where there can be more than one deep structures for a single surface structure, but we should also note that didactic terms also might lead to ambiguity in sentences

Flying planes can be dangerous

The chicken is ready to eat

The missionary is ready to eat

We can have one deep structure and several surface structures as well

eg: I ate an apple

An apple was eaten by me

The above was a typical characteristic of human language

Why are we assuming a man from mars? And not just a speaker of another language

A human being has the innate ability to figure out that language is organized in a hierarchical structure and there are different layers in a language and it's structure - this knowledge is easily available to us, but it might not be available to a martian or someone who's not a human.

Recursion

- Embedding one NP into another NP or a S into another S

NP

[color] NP

[the tail's [color]NP] NP

[the cat's [tail's [color] NP] NP] NP

[the boy's [cat's [tail's [color]NP]NP]NP]NP...

- Embedding a sentence in a sentence and we keep going

Galileo said that the earth moves

The officers claimed that Galileo said that earth moves

The church alleged that the officers claimed that Galileo said that earth moves

The press reported that the church alleged that the officers claimed that Galileo

said that earth moves

Everyone agrees that the press reported that the church alleged that the officers claimed that Galileo said that earth moves

And so on ad infinitum

"This is the House that Jack Built" is a popular British nursery rhyme and cumulative tale

In a cumulative tale, sometimes also called a chain tale, action or dialogue repeats and builds up in some way as the tale progresses. With only the sparest of plots, these tales often depend upon repetition and rhythm for their effect and can require a skilled storyteller to negotiate their tongue twisting repetition in performance

This is the house that Jack built.

This is the malt
That lay in the house that Jack built.

This is the rat,
That ate the malt
That lay in the house that Jack built.

This is the cat,
That kill'd the rat,
That ate the malt
That lay in the house that Jack built.

This is the dog,
That worried the cat,
That kill'd the rat,
That ate the malt
That lay in the house that Jack built.

This is the cow with the crumpled horn,
That toss'd the dog,
That worried the cat,
That kill'd the rat,
That ate the malt
That lay in the house that Jack built.

This is the maiden all forlorn,
That milk'd the cow with the crumpled horn,
That tossed the dog,
That worried the cat,
That kill'd the rat,
That ate the malt
That lay in the house that Jack built.

This is the man all tatter'd and torn,
That kissed the maiden all forlorn,
That milk'd the cow with the crumpled horn,
That tossed the dog,

That worried the cat,
That kill'd the rat,
That ate the malt
That lay in the house that Jack built.

This is the priest all shaven and shorn,
That married the man all tatter'd and torn,
That kissed the maiden all forlorn,
That milked the cow with the crumpled horn,
That tossed the dog,
That worried the cat,
That kill'd the rat,
That ate the malt
That lay in the house that Jack built.

This is the cock that crow'd in the morn,
That waked the priest all shaven and shorn,
That married the man all tatter'd and torn,
That kissed the maiden all forlorn,
That milk'd the cow with the crumpled horn,
That tossed the dog,
That worried the cat,
That kill'd the rat,
That ate the malt
That lay in the house that Jack built.

This is the farmer sowing his corn,
That kept the cock that crow'd in the morn,
That waked the priest all shaven and shorn,
That married the man all tatter'd and torn,
That kissed the maiden all forlorn,
That milk'd the cow with the crumpled horn,
That tossed the dog,
That worried the cat,
That killed the rat,
That ate the malt
That lay in the house that Jack built

These, among our linguist friends are also called **jalebi** type of construction as it goes round and round and on and on forever almost :)

Finally, we are at the end of the topic about how human language is different than other communication sentences.

The most important things -> duality of patterning and structure dependence + recursion as well

We can't talk about language at one go, we need to break into small analyzable digestible units and then work with those to make it easier.

Speech Sounds

Language: Primarily uses the vocal - auditory channel

Speaker —————>hearer

Articulation → acoustic signals → auditory mechanism

We need to observe that there is no sound in vacuum, sound waves need a medium to travel. Disturbance created in the air → sound waves → speech sounds (all sounds we create need not be speech sounds - things like achoo, aah etc.)

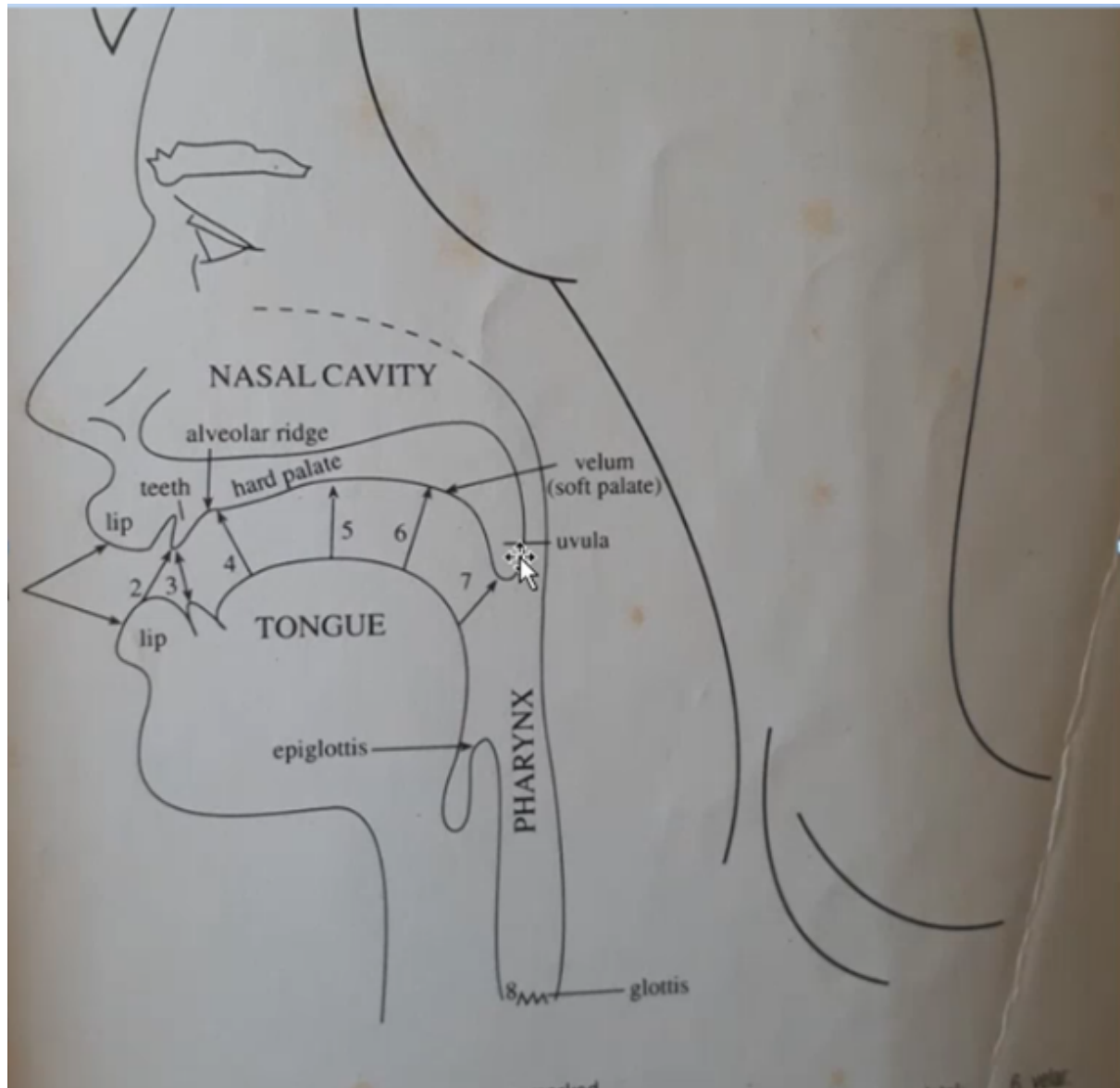
Speech sounds are the ones which have a function, which can combine with one another to form larger units or words.

The disturbance in the air: can be controlled/calibrated. Musical instruments - piano, harmonium, flute, sitar

Resonance chamber: organs of speech: lungs to mouth and nose. (we calibrate to make closures to form different kinds of sounds for communication or speech)

This is a very beautiful/efficient mechanism for speech production.

Lateral section: cross section



In order for us to calibrate or move or intervene the air flow, something have to be moved and for that we have different articulators - they can be of two types, active and passive.

Active and Passive articulators

The portions in our lower jaw are the **active articulators** as they move in order to help us produce different kinds of sounds (the part of uvula in our upper jaw can also be considered an active articulator as it helps us control if the air passes through our nose or mouth)

The passive ones stay in it's position and work with the active articulators in order to produce meaningful sounds

Phonation

It depends on both the place of articulation and manner of articulation.

So the sound we produce not only is based on like place of articulation but also the way we let the air pass and go around in order to produce a particular sound.

Air-stream mechanisms

- air coming from lungs - pulmonic air stream
- air coming from glottis - glottalic air stream
- air coming from velum - velaric air stream

What are the things we are looking at when we look at a sound?

- the place of articulation
- the manner of articulation
- the air stream mechanism

We also look at whether the vocal chords are vibrating or is it held tight and there is a passage through it [if it is vibrating - voiced and if it is not vibrating it's called voiceless] **(eg the distinction between [p] and [b])**



Thing to look at: The phonetic keyboard and things related, get the IPA chart which produces a chart of all possible sounds in human language and also gives the details of those sounds as well!