Language and Mind
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Module – 02
Lecture - 10
Mechanism of Sound Production

We have been talking about language and human mind and throughout we are trying to see how languages connected with human mind. We have even said and we have been trying to establish that language is one of the most sophisticated products of human mind. We are saying one of the most sophisticated products, because human mind does many other things, language happens to be just one of them.

In our effort to establish relationship between language and human mind, we have talked about language and we have talked about how we learn language. And we have talked about the generative apparatus which, may be, had to begin with hypothetical device, hypothetical system. But, it helps us understand how language might have, how human mind might be playing a role in our learning of language.

And we see compelling evidence of such things in understanding how human mind plays a role in language learning. We have talked about language acquisition device, we have talked about universal grammar, we have talked about principles and parameters, and finally, we saw how these things help us create a body of knowledge which we call knowledge of language, which is basically, on the basis of input that we receive from immediate society, how generative apparatus helps decode underlying rules of language. This is the fundamental assumption in learning of language.

We have been looking at it also from two different perspectives. Well, there are two different parts of it; first is i-language. So, whatever we have talked about so far is understanding language from the perspective of i-language. I am using this term for the first time and I draw your attention to that. I-language simply means Internal language, and the moment we say internal, we mean internal to human mind. The other term is e-language; e-language means External language.

External means external to human mind, where the idea is language is a social system language, language belongs to society, where people look at use of language, how it

works in the society and the relationship between language and society. We have taken one particular part from e-language, that is immediate society, and we have applied it to i-language, that is the apparatus it has in human mind. So, that is the point where the two converge and then we get language learning.

So, there is, even though in a very small way, there is a role of e-language, that is, there is a role of society in us learning language. Another worth mentioning point at this stage is, at this is stage you can figure out, why we speak, what we speak. Our input determines that if I have received input from Hindi, I will be speaking Hindi. If I have received input while learning language from Tamil, I will be speaking Tamil, and so on.

The assumption here is also that if a child receives input, assume hypothetically from all the possible languages of the world. The idea is, a child will end up speaking all the languages of the world. Now, it is too strong a claim. It is difficult to prove or disprove, because under no circumstances a child is going to get input from all the languages of the world; therefore, no child will end up speaking all the languages of the world.

But, at a micro level, it is not very difficult for us to see, if a child receives input in 3, 4, 5 languages spoken in and around society, the child will probably end up speaking 3, 4, languages of the world. We will look at these things again when we come back.

So, I am only trying to establish the background to talk about, how human mind helps, how human mind uncovers underlying rules from the input that it receives and the generative mechanism helps us get, give language; and that is what enables us when we start speaking.

To do that there are three things that we will be looking at throughout the course, particularly, in particular three things: sounds, words and sentences. Today, I begin with sounds and then, I want you to see how, what happens with sounds and how human mind helps us decode underlying patterns of sounds. To understand that, let us see how mechanism of sound production works. So far so good; let us look at this.

We have talked about language being the most sophisticated product of human mind. At this point, I should also mention that human body is probably the most perfect example of creation. If we can slightly use the word engineering, we can say, human body would be the most significant example or a perfect piece of engineering. I do not mean much

when I say that. I mean it in only specific case of sound products and I will show you why I say so. How do we speak? What happens? Let us see.

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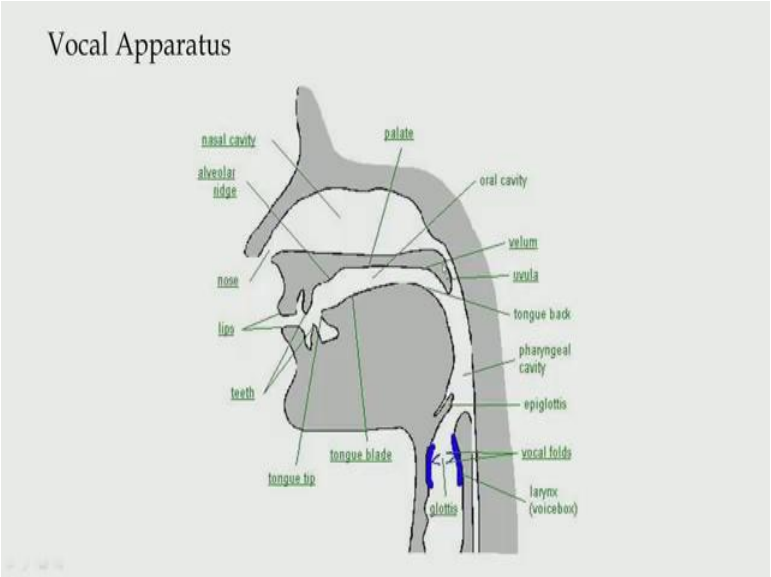

Let us look at this vocal apparatus. It is a picture of how our vocal apparatus looks like. It has various different names around it; we will be mentioning some of these names time to time. First, I want to broadly describe this to you and then, the production of sound; and then we will talk about sounds as well and see, how they work vis a vis this thing.

There are two parts of this; you can locate oral cavity in it and here is what we mean by oral cavity. You see the oral cavity here, and this is what we mean by oral cavity. Oral cavity has lips, teeth, tongue, which you see here is tip of the tongue, tongue blade, tongue back, and uvula; you see velum, uvula. You also see palette, you see alveolar ridge, these are the parts of what we know as oral cavity; and then, we have nasal cavity. Look at the nasal cavity; see here - nasal cavity; and this part is nasal cavity. So, these are the two parts which are important to keep in mind and then, there are lots of other things that you see from here.

Keep looking at this picture while I am talking about how it works. When we inhale air, it starts from our nose and goes all the way to heart. There are technical terms for those things. But, I will use non technical terms to explain that. It goes all the way to heart. Now, for the functioning of human body, inhaling may have various different things, may have various different reasons.

For example, one of the particular purpose of inhaling in human body I would think as a…I would think, because I do not know much about physical properties of human body - is the… one of the reasons probably why we inhale is because human body requires oxygen. We inhale everything that is available in the environment; it goes to a particular place ,then what is required by human body is retained, and then, that is probably oxygen which has various different functions, blood formation in particularly blood circulation, and then rest of the things are exhaled; so that is the process of inhaling and exhaling.

Now, let me bring in when I said, human body appears to be the perfect example of engineering. Now, this exhaling process results into language sounds. See the connection between the two. We have talked about language that without language, we cannot imagine humans; such is the significance of language in human life. And we start language with the exhaling process of air flow. So even exhaling process is not just redundant in human body, it results into particular function which is language and that happens to be the most significant thing which defines us.

We will look at this thing - significance of language - later. We have already established these things and I hope this makes sense so far. So what happens in exhaling? When we are exhaling the air flow, there are two things that might happen. One, the flow will be without much restrictions and direct; the other will be with restrictions, with stops, modifications, and then flow. So, and here now we begin with the discussion of sounds.

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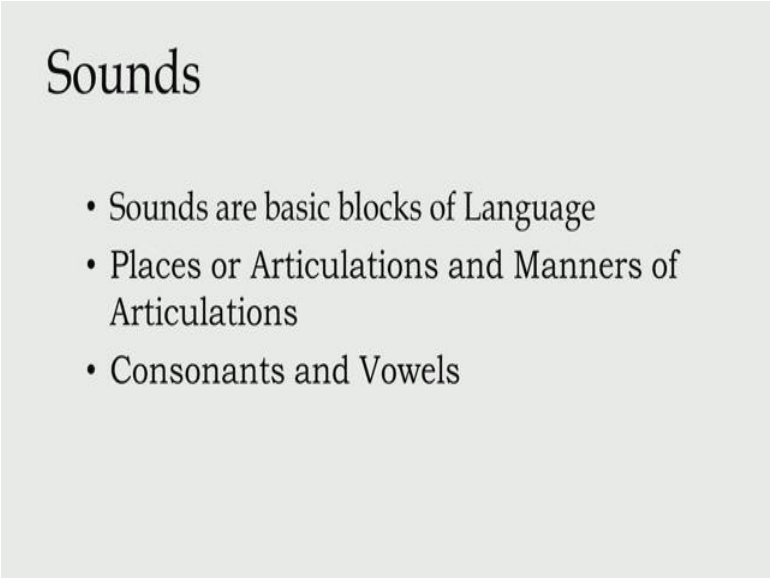

As we know sounds are basic blocks of language. We are going to look at several sounds and we have also mentioned in the last couple of modules that with the only few dozens of sounds, we can come up with thousands of words. A note on that process will follow later. But, again I want to draw your attention the sounds do not belong to a particular language. When we say few dozens of sounds, we mean… and if we are talking about a particular language, then at this point we need to see the distinction between language and languages with respect to sounds.

All languages share sounds. There is no language in the world, no spoken language in the world, known or unknown, to you, me or anybody, which do not share sounds with one another. It is a very strong claim, but that is true. It is possible that two languages would share only few sounds and also it is possible that two languages would share most of the sounds. That is, two languages would probably differ from one another in only a few sounds; these things are possible.

But, it is not possible that two languages would not share sounds; such is the significance… On the basis of such things, we are saying sounds do not belong to a particular language. So, coming back to the production of sounds and the whole mechanism… So, when the flow of air is with less modifications, with less restrictions, we get vowel sounds; and when we have more restrictions, more modifications at different places in oral cavity, then we get consonant sounds.

So, you may have heard these two types of sounds in natural language: one is consonants and then vowels. This is the precise distinction between a vowel sound and a consonant sound. Once again, a vowel sound is with minimum constraints on the flow of exhaling air with minimum modifications in the oral cavity; for the consonants, for the production of consonants, we have modifications, obstructions at various different places and therefore, we get consonants from various different places of articulations.

As you can see, what follows from here is, with less modifications, with less obstructions of the flow of air, naturally we will get less number of sounds; with more modifications and at more number of places, we will get more sounds. So, as a matter of consequence, what happens is, at any point in time the total number of consonants is going to be larger than the total number of vowels in language. See the production mechanism of sounds. Now, let me give you examples of… we take examples first from vowels.

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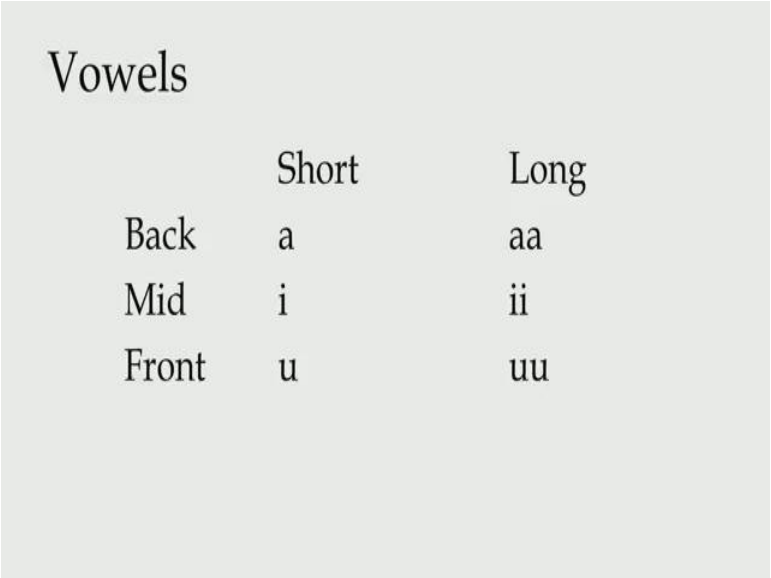

We have examples of vowels like a, aa, i, ii, u and uu. Let me use these six examples to make my point and I want you to check this for yourself. The distinction between a and aa, i and ii, u and uu is observably - one is short, the other is long; a short, aa long, i short, ii long, u short, uu long; the distinction is really in terms of length and this length is relative. So, when we speak a word, when we use these sounds in word, we really do not make a distinction the way we are saying right now.

Probably we will be making very small a distinction, the distinction will be very small in duration of production; but that happens when we use them in a word. But, what I am telling you right now is true; one set of sounds a, i, u short - these are called short vowels; aa, ii, uu are long vowels, relatively. So, that would be the distinction between the two at the level of manners of articulations of vowel sounds. When we want to look at the particular place of production of these sounds in the oral tract, we are going to have to depend on three terms; look at the terms used here - back, mid and front.

What we mean by back, mid and front is the following; and to understand that, I want you to look at this picture once again ((Refer Time: 20:39)) and look at the oral cavity. Here is the oral cavity. So, you see a tongue back? That part would be back of the oral cavity; front tip of the tongue area would be the front and tongue blade is in the middle part of the oral cavity.

So, this front, mid and back that we are talking about is the relative position of tongue and we are dividing this oral cavity in three parts on the basis of the position of the tongue. So, when we get a sound like ah, say it for yourself and then you will realize, that it comes from the back on the basis of the division of oral cavity, the way I have explained to you. So, ah would be back vowel, i would be a mid vowel and u will be front vowel, where you can see visibly that without rounding of lips that is both upper lips and lower lips, a sound like u is not possible.

So, we can say here that the flow of exhaling air has been modified at three different places; when it gets modified in the back, we get sound like a, when it gets modified in the middle we get i and when it gets modified in the front we get u; and from the same place, if the duration is little longer, then we get long vowels and it is possible… possible that we can have longer duration for the production of vowel sounds because, the flow is with minimum obstruction. This is how we get vowel sounds.

The fundamental idea in the production of vowel sounds is little modification, less obstructions and therefore, less number of vowel sounds and also it is possible to have distinction in terms of long and short. So, we see two things: we see modification of air flow in the oral tract for the purpose of vowels here. Therefore, this is how we understand vowel sounds and then we also understand the functioning of vocal apparatus. We will look at consonant sounds next time. Thank you.