Appreciating Linguistics: A typological approach

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Lecture – 27
Introduction to Phonetics - Part 2

Hi everyone, welcome to this session of my NPTEL course Appreciating Linguistics: A typological approach.

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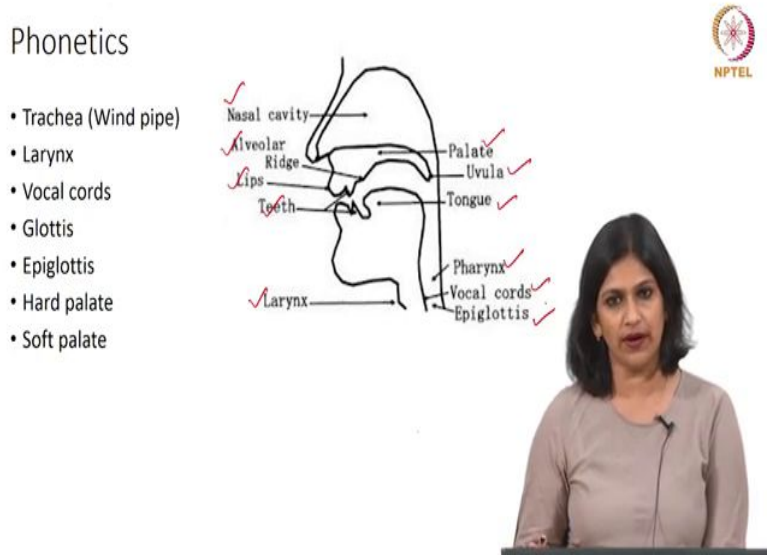

So now, let us have a very simple picture of our vocal organs or the speech apparatus if I can say. It has been labelled. You can have a look at it. These are a few important speech organs that we have. You can add more, if you are aware about them. We have trachea, which is the windpipe, then we have larynx, we have vocal chords, we have glottis epiglottis, hard palate, and soft palate. Sometimes, some people also add lungs, which I have not really added over here. Then we have tongue, we have teeth, we have alveolar ridge, all of these which are not mentioned here they are also listed in the picture, they are labelled in the picture.

Let us focus on the picture first. We have the nasal cavity here, alveolar ridge here, lips are here, teeth, larynx, palate, uvula, tongue, pharynx, vocal cord, and epiglottis. These are the chief, or primary, or major speech organs that we need, or we use, when we speak any language. And this is just not related to English. Though, I am giving you examples from the

English language, but my focus is going to be on any given language. We will see which organ is used to produce which speech sound.

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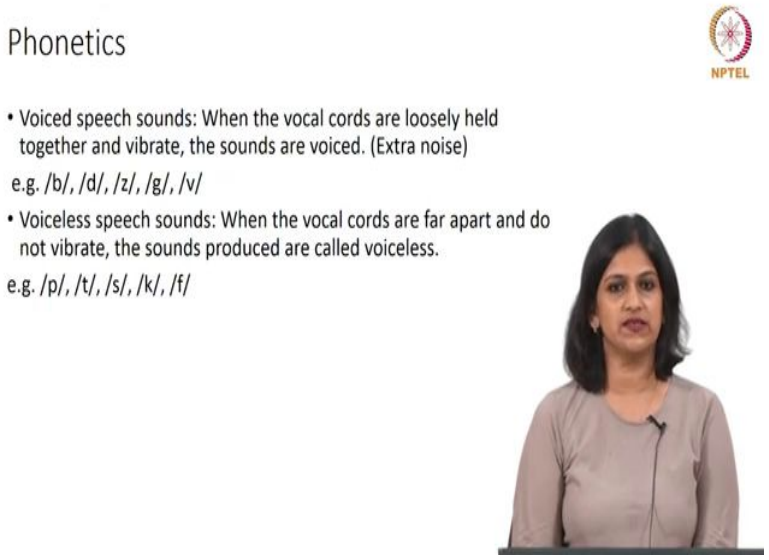

That we will come back to it later. There are two aspects of speech production: one is called place of articulation and the other one is called manner of articulation. The manner of articulation is going to tell us how a particular sound is produced and the place of articulation is going to tell us which speech organs are used when we produce the sound. These are the in detail descriptions that I am going to talk about in a while. But before that, I want you to be familiar with two very important aspects of speech sounds.

There is this word voiced and unvoiced, or you can say voiceless. We were talking about English alphabet or English speech sounds and we realized that there are 42 speed sounds available in English. So here, some of them are voiced and some of them are voiceless. So, it is actually a little tricky for a lot of us to identify which one is voiced which one is voiceless, but then with a tiny bit of carefulness, you can actually understand which one is what. When the speech sound is voiced, you can feel that the vocal cords are loosely held together and ihey vibrate also.

When the vocal cords are loosely held and there is a vibration, then the sound is voiced. When I say vibration; that means, you actually have some extra noise. And the examples of voiced sounds are /b/, /d/, /dza/, /g/, /v/. Then there are voiceless speech sounds.

When it is voiceless, the vocal cords are far apart; they are not loosely held, they are far apart and do not vibrate. That is why you do not see any extra noise during the production of these sounds. Hence they are called voiceless. And what are the sounds, we have /p/, /t/, /s/, /k/, and /f/. These are the counterparts. Wyou say /b/ and you compare it with /p/, you can easily feel that when you utter /b/ there is a bit of more vibration in the vocal cord area. There is a bit of extra noise. That is why /b/ is voiced and /p/ is voiceless.

Similarly, /d/ is voiced, but /t/ is voiceless; /ʃ/ is voiced, but sa is voiceless; /g/ is voiced, but /k/ is voiceless; /v/ is voiced, but /f/ is voiceless. These are just some preliminary information about voiced and voiceless speech sounds. Now, I will talk about some very interesting information about phonetics. I wish I could ask this question a little before. Here is a very funny and a very interesting question for you. Do you think all humans speak, if they are physically fit? Yes, they do.

Do you think just a human body can speak? Is it possible? Like, if you have a human body you can speak. Ideally that should be thinking about the generative aspect or the innateness hypothesis of language. If you have a human body, you should be able to speak. But the condition is that it should be healthy.

How about a dead body, do you think a dead body speaks? The dead body also has all the voice organs. The dead body also has mouth cavity, it does have larynx, pharynx, vocal cords. It just died and then the body is lying over there. It also has all the nasal passages, then you have vocal cords, then you have uvula, hard palate, soft palate, teeth, tongue, everything; everything is intact, still it does not speak.

So then, which one is the most important voice organ? Think about it. That is a question for you. A dead body which has all the speech organs or the voice organs attached to it, find out if these are the ones which are important or there is some other organ which plays a vital role. That is a question for you to ponder over. We will get back to it later if time permits.

Now, I will tell you a few more information related to phonetics and its broader domain. We have to figure out how sounds, and words, and meaning, they are interrelated. When they are interrelated we have to find out what is the property of sounds. Just like we did it for morphology. The property of sound should also be arranged in such a way that it can produce the right kind of words or the sounds would be comprehensible to the listener.

Just a bunch of sounds cannot make it a word, it could simply be noise. If you do not understand what the other person is speaking, that means, for you that is not speech; for you that is basically noise. Because, you do not understand anything, you are not able to infer what is being spoken. That is why that is not going to be considered as speech for you rather that is simply some noise and then that is not going to do any good to you as a listener.

We have to study the property of sounds and the way these sounds are arranged, the way these sounds are categorized. Let us compare the 2 examples given here and see how the meaning changes when the words are not arranged properly, for that matter when the sounds are not arranged properly. When you say John killed Mary versus Mary killed John, the sounds are same /j/ sound, /a/, /n/, /k/, /i/, /l/, /d/, /m/, /e/, /r/ and /i/. All these sounds are available in the other word also.

However, the meaning is absolutely different. When you say John killed Mary, Mary is dead and John has been the killer. But when you say Mary killed John, John is dead and Mary is the killer. The meaning completely changes. That is why it is important for us to remember or to realize that, the sounds have to be arranged in a certain way which will eventually result in a particular meaning. A bit of change here and there the entire meaning might change.

That is why it is important for us to understand along with the production of speech sounds, we should also focus on the arrangement of it or the type of it. Such way of speaking, such production can be included in a domain called airstream mechanism. Remember I asked you the question, dead body it has all the speech organs intact, yet it cannot speak. Why it cannot speak? I asked you to think about it and to come up with an answer.

Let me tell you why it cannot speak. Could you think about it? No, not really, not much information here. So, what is missing here? The air. When you speak, there must be an airstream mechanism which would work. If it does not work then it is going to be a problem.

That means, you cannot utter any word, you cannot utter any sound, if the airstream mechanism is not working. There must be a mechanism related to the airstream. And there are two primary types: one is the ingressive mechanism, the other one is the egressive mechanism.

When it is ingressive, you are inhaling or air is coming inside the lungs and if it is egressive, air is going outside, like you are throwing air out. When it is ingressive, you are sort of sucking air in, egressive you are throwing air out, remember this. This is the most fundamental understanding or information about airstream mechanism.

Just practice it for a while and then do tell me, when you speak which mechanism is working, whether you are taking air in or you are throwing air out. And obviously, the speech organs that is a muscular effort. The speech muscles, they contract and also they expand on the basis of the necessity. If needed they would be contracted, if needed they would be expended. So the speech muscles are important.

So, three things, and I will give you some time to think about it, whether your speech follows the ingressive mechanism or egressive mechanism; whether you are sucking air in or you are throwing air out. Then do you think speech for you also is a muscular effort? Do you think your speech muscles or the muscles associated with your voice organs, they do get contracted and expanded depending on the kind of language that you speak? Take half a minute and then think about it.

I hope you had a discussion and you could talk to your parents or friends or siblings or whoever is sitting beside you and find out do they also feel the same way. Do you think the way you produce speech sounds or the mechanism that you follow, is also followed by others? Yes, all humans speaking a particular language, the airstream mechanism remains the same of a particular language. That does not mean that all languages have similar kind of mechanisms, not really. Most of the South Asian languages or most of the world's languages follow egressive mechanism. I hope you have also checked it.

Keep the palm in front of your mouth and notice that, when you speak you can actually feel the pressure of air on the palm. If you feel the pressure of air, that means you are throwing air out. Do it like this, look at the screen and then keep the hand like this. If you feel there is a

blow of air from the mouth; that means, the mechanism is egressive. If there is no flow of air then it will be ingressive. It is very difficult for us to check the ingressive mechanism because we follow egressive mechanism.

Most of the ingressive sounds would be found in Scandinavian languages. It is not easy for me to give you a demo of an ingressive mechanism, but I would ask you to produce the sounds like chuckles or clicks. When you make these kinds of a sounds, you are actually sucking air in. These chuckles and clicks are a part of the ingressive mechanism and anything else that you are speaking in your language, if you are a South Asian language speaker, that is going to be your egressive mechanism.

Majority of our sounds, not only in the South Asian languages, but also in the world's languages follow the egressive mechanism. Air is being thrown out when you speak; you do not suck it in.

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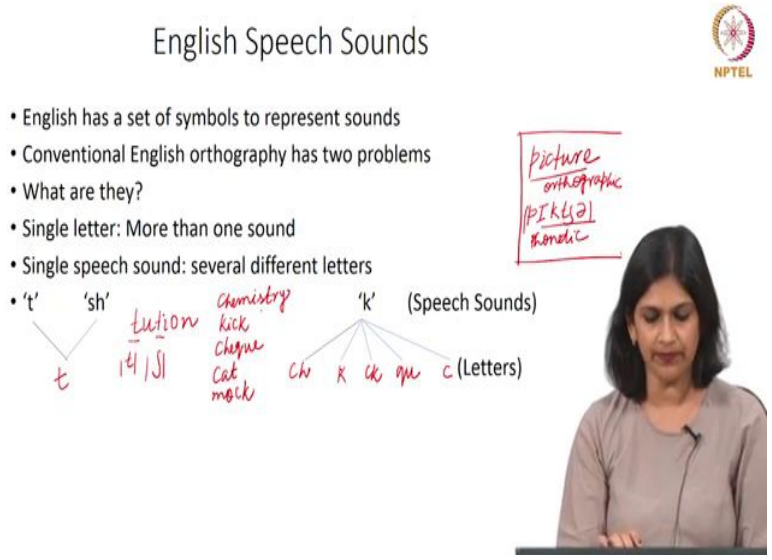

We will see other aspects of English speech sounds also. English also follows the egressive mechanism of speech. But, what is interesting about English is that the English orthography, that is the conventional English orthography has 2 major problems. And what are they? It seems there is no straightaway connection between the orthographic representation and the phonetic representation of the words.

The words will have two different kinds of representation. Let us say I am drawing a tiny box out here. I am writing picture. This is the spelling of picture. This is called orthographic representation. There is something called phonetic representation. Phonetic representation would be like this. This is called phonetic representation.

So, each word will have 2 domains: one the way it is written, the way it is spoken. The written form would be the orthographic representation, using a certain script, It is not necessary that all languages have individual scripts. There are languages which do not have scripts. And they might use Roman scripts or any other kind of script to write their own words. But since we are talking about English which uses Roman script, so one is the orthographic form, the other one is the phonetic form.

The orthographic representation deals with the spelling or the letters or the alphabet, and the phonetic representation deals with phonemes, I am going to talk about phonemes in the next session probably. Let me help you out to understand why English is a little tricky, or English phonetics is a little tricky. And sometimes this is the reason why the non-native speakers of English find it difficult to learn.

Because, the way things are written is not the way things are not spoken. There is no direct correlation. In most of the cases, there is no direct correlation between the orthographic representation and the phonetic representation; that means, the way it is written and the way it is spoken.

Now, let us see what are the two major problems. The first problem is there is a single letter, which has more than one sound. One letter can have 2 sounds or 3 sounds or more than that. The other side of the problem is there is only one speech sound, which can be written in several different letters. Let us look at the first one. This line is the /t/ sound, this is the /ʃ/ sound, this is /k/ sound. So, the sound /t/ and the sound /ʃ/ can be produced or can be written using only one letter.

So, the letter t can lead to the sound /t/ and the sound /ʃ/. Can you think about it, can you give me the examples of /t/ and /ʃ/, where the letter t is used? Can you just take a bit of time and then think about it? The other side of the story is there is a single speech sound and it can be used in multiple ways or multiple letters are going to represent the same sound. So, it is /k/,

but the letters are going to be different here. So, that is what you have to think. I am giving you some time, maybe a minute or two, you need to focus on 2 different questions. One question, the letter is one, sounds are different; the other question the sound is one, letters are different.

So, because of these two fundamental problems, English speech sounds are a little tricky for learning as far as a non-native speaker is concerned. Let me give you an idea how it works. I hope you have thought about it. Do let me know. Here maybe in a live session we can talk about it in more detail. But as of now, I am just going to give you an idea how I wanted you to work on it. Is it a word? What does it mean? Tuition. Tuition is like beyond the school if you are taking help of a private tutor to prepare for your exams.

When it is tuition, look at the first /t/ and then the second /t/. How do you pronounce the first /t/? Tution /t/. The sound is also /t/. But how about the second one, do you say tuiton? No, you do not do that, you say tuition. So, the second one is the /ʃ/ sound. The letter t in the word tuition, first it refers to /t/ sound then it refers to the /ʃ/ sound. So, that is one mismatch that English has.

Now, come let us go to the second one. The speech sound is /k/. I would like you to check these words, one is chemistry, then we have kick, then we have check, then we have cat or we can have mockery, mock, 5 words, actually kick can take care of 2 different letters. Now let us look at the first word chemistry. What is the first sound when you utter or when you say the word chemistry, what is the first sound? /k/. If the first sound is ka, what are the corresponding letters? If you look at this the corresponding letters are ch.

How about the second one kick, what is the /k/ sound here? /k/ sound is the first letter k. So, can ch correspond to ka? k can also correspond to /k/, refer to the same word kick. So, when you say /k/, /i/, /k/, then it becomes kick. So, first /k/ is k and what is the second /k/? Second /k/, is ck.

Then the next one is check. So, give me a check or I can pay you through my check, where is my checkbook. In this case, which letters correspond to the sound /k/? Obviously, this is qu. Then finally, we have cat. So, when you say cat, which letter corresponds to /k/? This is c. So, these are the different letters that can actually correspond to the speech sound /k/. So, it

could be ch and you can also consider mock. So, in mock also ck, that also we have already considered that in the word kick.

So, chemistry, kick, check, cat. The speech sound /k/ can be represented orthographically. Thus the phonetic representation of /k/ can be orthographically represented as ch in chemistry, as k in kick, as ck in mock, as qu in cheque, and as c in cat. This mismatch, the orthographic and phonetic representation mismatch, is a big problem in English. That is why we need to understand English phonetics to be a better speaker of English.

We will talk about it more in detail in the next slide or in a while, but before that, I want you to recall what I just said before. I said English alphabet has 26 letters and these 26 letters correspond to 42 speech sounds. So, when you say 42 speech sounds, some of them are vowel sounds and some of them are consonant sounds. How many vowels do we have in the alphabet of English? 5, a e i o and u. Orthographically we have these 5 letters, which are considered to be vowels in English. Then there are 21 consonants.

These 21 consonants refer to 24 consonant sounds and the 5 vowels refer to 20 vowel sounds. We will talk about the division. I will just check. No, I haven't given the division here. So, maybe I will draw the division in this slide.

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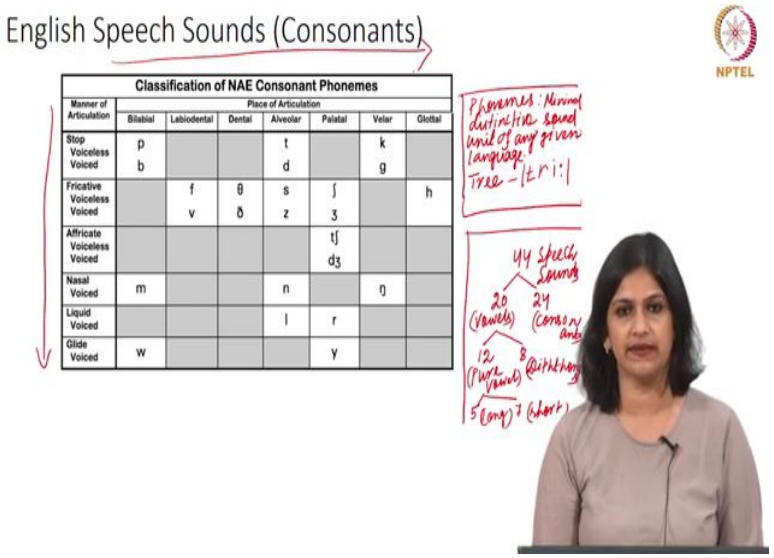

So, this is how it should look like. These are the English speech sounds, the consonants basically. Maybe I am going to draw it over here. We have 44 speech sounds in English. These 44 can be divided into 20 and 24. 24 are going to be in the category of consonants, and 20 are going to be vowels. And these 20 would have 12 and 8. The number 8 represents diphthongs and the 12 will be pure vowels. These pure vowels can also be divided into 5 and 7. 5 would be your long vowels, 5 long and 7 short vowels. I want you to remember this definition by heart. So, this is the division of the English speech sounds. Here, in this table or in this picture, I am showing you the classification of consonant phonemes.

Let me just give you an idea what is a phoneme first. I think I missed that. A phoneme is the minimal, distinctive sound unit. So, this is what you need to remember, when I say phoneme, there is a tiny box out here. We are going to talk about phonemes. This is a minimal, distinctive sound unit of any given language.

So, I am writing a word tree. There are 4 letters orthographically, this is t r e e. But if I try to analyze the phonemes here, the first phoneme is /t/, the second phoneme is /r/ and the third phoneme is /i/ tree. Orthographically it is written t r e e, but phonetically there is the /t/ sound, /r/ sound, and /i:/ long vowel sound. So then, /t/ is a phoneme here, /r/ is a phoneme here, and /i:/ is the phoneme here. That is why the definition of phoneme is going to be minimal, distinctive sound unit of any given language. That would be considered as a phoneme.

When we say tree orthographically, there are 4 units t r e e, but phonetically there are 3 units. What are they? The /t/ phoneme, the /r/ phoneme and /i:/ phoneme. With this information about phonemes I would like you to have a look at the chart given here. This is written NAE the North American English. These are the consonant phonemes of this variety of English.

Let us read the table first. This line or this area is written for place of articulation. Which speech organs are involved to utter or to produce these sounds? This side is the manner of articulation and this is the place of articulation. So, when you utter /p/ or when you try to produce the sound /p/, you have to find out which speech organs are used. So, this is the upper lip and then the lower lip. That is why the place of articulation of /p/ would be bilabial. This is just an example I am giving.

And then if I ask you how it is produced or what is the manner, then primarily I would say these are the stops, or some phoneticians would call them as plosives. When it is a stop, that means there is a complete stop of airflow, when you say /p/ or /b/. There is a complete closure of airflow at your lips; the upper lip and the lower lip are completely closed when this kind of a sound is produced.

Look at this side. So, bilabial, labiodental, dental, alveolar palatal, velar and glottal, these are the place of articulation of English consonant phonemes. On the other side, we have stops, fricatives, affricates, nasals, liquids and glides. These are the manner of articulation. My suggestion for you would be to remember this, so that it will be easier for you to recognize the phonetic symbols or you can easily read the transcriptions. You can also play around with the data from your own language.

Let me reiterate, place of articulation is related to the deployment of the speech organs that you have; manner of articulation is related to how the speech organ has been created. So, when it is bilabial it is about lips; very lightly your upper lip and your lower lip, they are going to be used. When it is labiodental, labio is related to lips and dental related to teeth. So, your lips and your teeth they are going to be deployed to utter such kind of sounds. Dental it is purely the teeth.

The teeth are the primary speech organs and they have to touch either the teeth ridge or the hard palate or soft palate, accordingly it has to be decided. Then the alveolar ridge is the primary speech organ. Then palatal, it is the soft palate. The palatal region, the alveolar region, then the palatal region. And then you have the velar, velar which is related to the uvula inside the mouth cavity. And finally, glottal, glottal also the uvular region.

So, the velar and then the glottal they are towards the inner side of the mouth cavity and palatal is a little outer, alveolar is further outer, dental is at the teeth level, then the labiodental and finally, labial. That is how you have to proceed. Bilabial the most external organs are used, and glottal the most internal organs are used.

Now, look at the manner of articulation. When I say stop; that means, there is a complete closure of the airstream mechanism, like the complete closure of the airflow. When it is

fricative, there must be some kind of friction, when you say /f/, /v/, /s/, /th/. There is a friction here. Affricate there is a friction, then there is a stop, and then it releases slowly cha, ja.

There is a friction, but the friction is longer. In case of fricative the friction in the air closure is also there. When it is nasal, it has to go through your nasal cavity /m/. When you say /m/, the air passes through the nasal cavity. You cannot block your nose and then say /m/; cannot do that.

Then you have the liquids which are the easiest sounds. It is believed that the /l/ sound is the easiest. That is why the children say it pretty easily and it is available in most of the world's languages. So, that is a liquid, it flows. And then there is the last one is the glide; glide means the tongue is going to be twisted a bit. So, when say /w/ or /y/. So, it also has a half vowel-like feature.

So, this is how we classify the consonant sounds of English. The way it has been produced that will be the manner of articulation, the place it has been produced would be the place of articulation, we will know more about it in the next class. So, this is all about the 24 consonant sounds that English has. In the next session we have to check each of the sounds and we will see why we are going to call it bilabial, why we are going to call it, labiodental or velar or nasal..

We are going to discuss each of the consonant sounds, then after that, we will move to the vowel sounds in English. So, that is all for this session thank you and we will meet again very soon.

Thanks.

Keywords: speech apparatus, voiced and voiceless sounds, airstream mechanism, ingressive and egressive mechanism, orthographic representation, phonetic representation, vowel sounds, consonant sounds, phoneme, place of articulation, manner of articulation