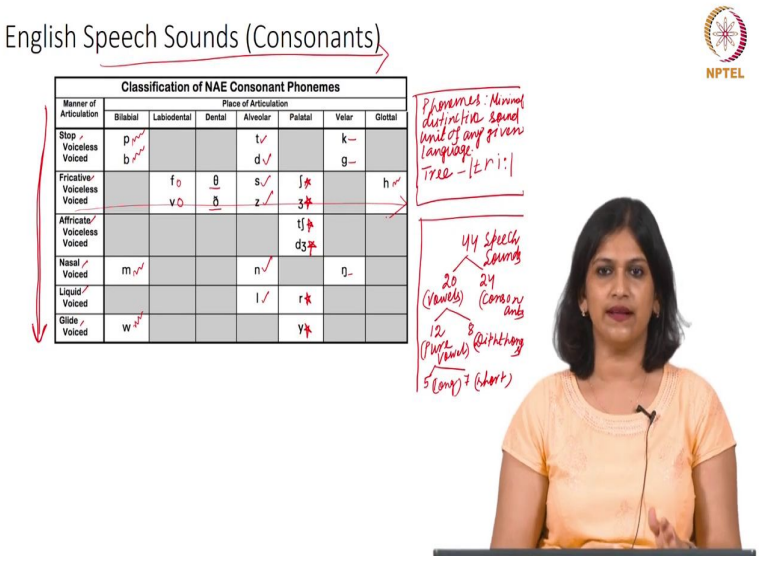
Appreciating Linguistics: A typological approach
Dr. Anindita Sahoo
Department of Humanities and Social Sciences
Indian Institute of Technology, Madras

Lecture - 28
Introduction to Phonetics and Speech sounds - Part 1

Hi, hello everyone. Welcome to this session of my NPTEL course Appreciating Linguistics: A typological approach. We are talking about Phonology and eventually, we will move to phonological typology. So, when I say phonology, I am also including phonetics by default in my discussion.

(Refer Slide Time: 00:36)



We were talking about phonetics and phonology, and eventually we will move to phonological typology. We did discuss what is the simplest definition of phoneme. Phoneme would be the minimal, distinctive sound unit. When you utter a word like tree, it will have a /t/ sound, /r/ sound and then /i:/. So, /t/ would be a consonant; /r/ is another consonant sound and /i:/ is a vowel sound.

So, these are the three phonemes found in the word tree and if you look at the orthographic representation, then there are 4 letters; t r e e. After this, we were trying to understand how this phonetic system or what are the different sound systems available in one of the most

widely studied languages of the world that is English, which is also lingua franca and our medium of communication or the mode of instruction for this course is also English.

I was talking about available or possible English sounds let us say in American variety or in American English for the moment. This is the chart or this is the detailed description about English speech sounds and here is a division that I did yesterday. What is the number of letters in English alphabet? That is 26.

These 26 letters correspond to 44 sounds and these 44 sounds are known as phonemes. So, English will have 44 phonemes in total. Out of these 44, we have 20 vowel sounds and 24 consonant sounds. These 20 vowel sounds will have 12 pure vowels and 8 would be the diphthongs or the combination of two vowels and of these 12 pure vowels, we will have 5 long ones and 7 short ones. That is how we are going to proceed for the classification of English consonant phonemes.

Here is the chart. Let us look at this. We were talking about two aspects of it. Each of the consonant sounds will have two domains. You have to understand whether this is a voiced or a voiceless sound. So, that is what we discussed first and practically if you try to figure out which one is voiced, which one is voiceless, I gave you a simple solution like keep your palm before your mouth and then, you speak; also keep the tip of a finger on your throat like on your vocal cord area and if you feel the vibration more, then the sound is going to be voiced.

If the vibration is less, then the sound is going to be voiceless. It is like extra noise. So, if the noise is more, then it is voiced; if it is less, then it is voiceless. Let us compare /b/ with /p/. When you say /b/, if you keep the tip of your finger here, when you say /b/, this buzzing sound is a little more. When you say /p/, then you do not feel much of the buzz over here.

That is why /b/ should be a voiced sound and /p/ should be a voiceless sound. Besides this voiced and voiceless distinction, we also have place of articulation and manner of articulation. So, place of articulation would be related to the voice organs that we have, the organs of speech that we have. If you remember, we were talking about these, teeth, tongue, then uvula, then hard palate, soft palate, pharynx, larynx; these are the voice organs.

These are the different parts of voice organs which help us to utter any sound and most importantly, speech is absolutely a muscular activity. So, your speech muscles, they get contracted and expanded on the basis of the kind of sound that they have to produce. Now, let us look at the classification table here. I briefly gave you an idea what is a bilabial sound.

Remember a bilabial sound is formed using both upper lip and then, the lower lip. So, when you say /p/, obviously, the upper lip and the lower lip both are coming together and then we will call it bilabial. What are the bilabial sounds in English? Let us look at the classification table given here. We have /p/ sound, /p/ is a bilabial; /b/ is a bilabial sound; /m/ is a bilabial sound and /w/ is a bilabial sound. So, /p/, /b/, /m/ and /w/. So, these four sounds are known as bilabial sounds because of the place of articulation that they have.

Now, let us move to the second category. The second category is the labiodental. So, when it is labiodental, these sounds are formed with the upper teeth and the lower lip. So, let us see what are the sounds. The first sound that we have here is /f/. When you say /f/, you can notice that your lower lip actually touches the upper teeth. That is why it will be known as labiodental /f/.

Then you have the second sound which is /v/. Here also one is voiced, the other one is voiceless. /F/ would be a voiceless sound and /v/ would be a voiced sound, but both of them are labiodentals. So, /f/ and /v/ these two are the labiodental sounds in English.

Then, we are coming to the dentals. As the name suggests, the dental sounds are formed with the tongue tip behind the upper front teeth. So, remember the tip of the tongue and the upper front teeth. Then you get the sounds which are known as dentals. We have two dental sounds in English; one is /θ/, the other one is /ð/. So, which two organs are involved? The first is your tongue and then there is the teeth ridge or you can say the upper front teeth. Then you get the dental sounds.

Since we have discussed the voiced and voiceless distinction, when you produce /θ/ and when you produce /ð/, can you tell me which one is voiced and which one is voiceless? When we utter the sound /θ/, we generally do not feel the noise more or the vibration more. So, this will

be a voiceless sound, but when you say /ð/, then it is a voiced sound because the vibration is more at the vocal cord area. So, these two are the dental sounds in English.

Then, we are going to the alveolars. Alveolar sounds are formed with the front part of the tongue and the alveolar ridge. So, two things; one is the front part of the tongue, and it must touch the alveolar ridge. There are quite a few alveolar sounds in English. Let us look at the classification chart and we will see what are the alveolar sounds. We have /t/, we have /d/, we have /s/, we have /z/, we have /n/ and /l/. So, these are the alveolar sounds.

Let me read it again /t/, /d/, /s/, /z/, /n/ and /l/. Remember, these are produced by using the front part of the tongue and it must touch the alveolar ridge; then, you are going to call it alveolar sounds. Some of them are voiced and some of them are voiceless. Figure out for yourself which one is voiceless and which one is voiced. Take a minute's time and think about /t/, /d/, /s/, /z/, /n/ and /l/; how many of them are voiced and how many of them are voiceless. This is going to be a question later. I leave it up to you to think about it.

After that, the next category of consonant sounds on the basis of the place of articulation, that would be palatals. When you say palatals, you have to actually feel your speech organs a bit. When you feel back behind the alveolar ridge. Try to touch it through your tongue. When you feel back behind the alveolar ridge, you would find the hard part of the roof of your mouth. There is this roof of your mouth, on the top of it, and then, if you feel that or if you touch it using your tongue, you will feel that some part of it is hard and towards the mouth cavity, it becomes softer.

So, palates, or these are called hard palate and then the soft palate. When you talk about palatal sounds, this hard palate or we can simply call it palate that comes into play with the tongue to produce such sounds. Palatals are produced when the tongue touches the hard palate or the palatal area. That is what we call palatals and some linguists also call it alveopalatals; oth are the same things, either you call them palatals or you call them alveopalatals.

So, what are the alveopalatal or the palatal sounds in English? We have /ʃ/. The /ʃ/ sound, I am using a different notation for this. So, this is /ʃ/, this is /ʒ/, this is /ʧ/ and this is /ʤ/. Then, we have /r/ and you have /j/. These are the palatal sounds. Let us focus on the pronunciation.

The first palatal sound or the alveopalatal sound that I am going to utter, I am going to produce is /ʃ/, then you have /ʒ/, then you have /ʧ/, then /ʤ/ and then /r/, finally /j/. These are known as palatals or alveopalatal sounds.

Why we call it alveopalatal or palatal, I have already given you the definition or the explanation. Your hard palate, right after the alveolar ridge, towards the mouth cavity and the tongue these two speech organs are deployed to produce this sound. That is why we call it palatals.

Then, we are going to the velars. As I just mentioned, when you are trying to feel the mouth cavity after the teeth ridge, you have the alveolar ridge and then you have the hard palate and finally, towards the mouth cavity or right inside, you will have the soft palate. You can find a soft area if you can feel that; that is called the soft palate or this is also known as velum.

From the name velum, the sounds that are produced with the back of the tongue against the velum, are called velars. So, it has to be the soft palate, that area is also known as velum. When the back of your tongue is touching the velum area or the velar area, the sound is known as velars. And what are the velar sounds that we have? We have /k/, we have /g/ and then we have /ɲ/. So, there are three velar sounds in English; /k/, /g/ and /ɲ/. I am writing the notation for this like this. Listen to me, when I put a mark here, this is /k/; this is /g/ and this /ɲ/. So, these three are the velar sounds.

Which speech organs help you to produce the sound? The back of the tongue and then the velum or the soft palate if you can remember soft palate/velum plus your back of the tongue. So, together the place of articulation is going to be known as velar sound. We have 3 consonants which are velars.

Then the next one you have is called the glottals. There is only one glottal sound in English. How it is produced? The sound is [h]; house, horse. So, this is [h] sound, but how is it produced and why we call it glottal? Let us have an explanation for that. There is this active use of the tongue and other parts of the mouth when you produce ha. When you produce [h], that means, the only organ that kind of plays a vital role here is the tongue.

Generally that is why we call it a glottal sound, it is related to the glottis. And what is the glottis? Glottis is the space between the vocal folds in the larynx. If you can recall what all divisions we had there, so primarily the glottis area is the space between the vocal folds in the larynx. When the glottis is open, there is a production free flow of a voiceless sound and that is [h]. So, when you say house, horse or you can say hats.

So, the initial sound of hat, the initial sound of house, there is a free flow of air through the glottis and which way is your glottis? Your glottis is the space between the vocal folds in the larynx. Because of the smooth free flow of the air through the glottis area, where the tongue is actually playing a vital role, we call it glottal. There is only one glottal sound we have in English; that is [h].

So, now, I am going to read like I am going to mark all of this sounds and then please listen to me more carefully. If you remember, in the previous session I told you please lend me your ears. Now let us go through it all over again; all the place of articulation. This is one dimension of your English consonant phonemes or the consonant sounds, I will redo that. We will start it from the bilabial.

Listen to me carefully and remember what I am saying, how to identify the consonants. So, what was bilabial? Let us recall. Bilabial is where you have the upper lip and the lower lip these two are working as the speech organs to produce this sound. So, /p/ and /b/; then, we have /m/, then we have /w/. For all the four sounds /p/, /b/, /m/ and /w/, your lips are the primary organs; the upper lip and the lower lip they are producing the sounds.

Then you have labiodentals where you have the upper teeth and then the lower lip; upper teeths and then the lower lip. So, when it is /f/ or /v/, you can see that the upper teeth and the lower lip are going to come into play.

Then you have dental. So, dental obviously, as the name suggests, it is going to be /θ/ and /ð/. When you say /θ/ that is the tip of the tongue, behind the upper front teeth. The same two organs would be used for the production of the other sound, that is /ð/.

Then, you have alveolars, where the front part of the tongue touches the alveolar ridge. So, we have /t/, /d/, /s/, /z/, /n/ and /l/. Then, you have /ʃ/, /ʒ/, /ʧ/, /ʤ/, /ra/ and /j/; these are the

palatal sounds, where the hard palate or this is also simply called as palate, that and the tongue, these two organs are going to participate in the production of these sounds.

Then, we have the velar, where the soft palate beyond your hard palate, actually the soft palate and then the back of the tongue. So, when the back of the tongue is against the velum, we call it velar. This is /k/, /g/ and /ɲ/. So, that is going to be the velar sounds and then we have glottal, where there is a free flow of air through the glottis and that will be [h]; house, horse. I am going to give you corresponding words for each of the sounds maybe in a while.

Now, after we are done with the place of articulation story, let us move to the manner of articulation. If you remember I did mention after you understand what is the place of articulation, you should also have a look at the manner of articulation; how these sound. So now, we got to know that these are the speech organs which are used to produce the sounds. That is fine, absolutely alright, but then after that the airstream mechanism that we were talking about, there would be a certain kind of flow of air when you would target this sort of sounds.

We have to find out how the stops are working or the fricatives. Let us look at the classification chart. I have already drawn the arrow over here. This is the manner of articulation section. We have stop, then we have fricative, then we have affricate, nasal, liquid and glide. Now, it is time we need to understand why certain sounds are known as stops; what exactly is stopping and where? Why certain sounds are known as fricatives? What is so fricative about it; where is the friction? Then obviously, from fricatives, you are moving to affricates. So, as the name suggests there must be some kind of friction associated with it.

Then, we have nasals. When you have nasals, the air must pass through the nasal cavity, then liquids. Liquids are like flowing freely without much problem and then, glide where it must be kind of up and down thing. So, we will check them one by one, the same thing I will do as I was talking about the consonant sounds. As far as the place of articulation is concerned, now I will talk abou the manner of articulation and we will go through it one by one.

The first set of sounds as far as the manner of articulation is concerned, these are stops. When you said stop there is literally a stop of the airstream, but it is very brief; it does not stop or it

does not get halted there forever not really. Let us produce or let us try to utter the sounds like /p/, and /b/, /t/, /d/, /k/, /g/. So, these are the sounds; there are different places where the airflow gets blocked. So, when you say /p/ and /b/, the air flow is blocked right at the lips. There is a complete closure for a while very briefly like it is not going to stop there forever as I just mentioned rather it is going to be there for a very brief time and then it gets released; so, /p/ and /b/.

If you remember /t/ and /d/ are the alveolar sounds. There is a stop or there is a closure of airflow at the alveolar ridge level. Try to visualize your mouth cavity and you see at what level the airflow gets stopped, what is the mechanism behind it? So, /p/ /b/, the airflow stops briefly at the lips level, then at /t/ /d/ it stops at the alveolar ridge level, /k/ and /g/ it stops at the velar level. Going by the place of articulation; /p/, /b/, /t/, /d/, /k/, /g/ these are produced in the same manner and that is why we call them stops.

Now, let us go to the second category. The second category also has quite a few sounds in English. These sounds involve blocking of the airstream and after that there is a push of it through a very narrow opening; remember what is happening compare stop and fricative. In stop there is a complete closure, then it gets released, without any kind of blockage anywhere.

However, in case of fricatives there is almost blocking, but you cannot you cannot say that it is absolutely blocked like stops, not really. There is almost blocking and then after that air is pushed through a narrow opening. So, blocking almost, then there is a narrow opening. That is why we can feel a mild friction. A very mild type of friction is produced and the resulting sounds would be fricatives. So, let us see what are the fricatives that we have in English. This also has quite a few fricative sounds in this language.

So, we will start it from /f/, then we have /v/, then we have /θ/, /ð/, /s/, /z/, /ʃ/, /ʒ/ and /h/ all of them are fricative sounds. Look at this line from the left to the right. This line is going to be the fricatives. I am repeating it /f/, /v/, /s/, /ð/, /z/, /ʃ/, /ʒ/ and /h/. So, these are the fricatives in English. With this, we will move to the affricates. As the name suggests, if you compare fricatives with affricates, there would be some kind of similarity. What is the similarity? The word fricate. So, when it is related to fricate, the word that comes to our mind

is friction. So, in the previous one in affricate also there was a mild friction, in this one also there is a mild friction.

But here what happens there is a brief stopping of the airstream, then there is an obstructed release; the other one was a narrow release, but this one is a little obstructed release. But there would surely be a friction and that we would call affricate. So, when you say /ʧ/. So, you see there is an obstruction in the release. When you say /θ/ that obstruction is not much wide. It produces through a narrow opening, but when you say /ʧ/, there is a friction and the the friction is longer here. So, /ʧ/ and /ʤ/; so, these two are the affricates in English; only two sounds.

Then, we go to nasals. Nasal sounds are produced through the nasal cavity like orally; the airflow is not much released through the mouth cavity rather there is a nasal passage for it. And in this case what happens, the velum inside the mouth cavity that gets raised. Because the velum gets raised, the airflow gets prevented entering into the nasal cavity. Then the velum gets lowered and then the air is allowed to flow out through the nose. So, first the velum gets raised and then it blocks the air from entering the nasal cavity. However, when the velum is lowered, air passes through the nasal cavity. There are only three sounds when the velum is lowered, the rest of the sounds the velum is raised.

So, because of the raising of the velum, most of the sounds are produced through the oral cavity. In case of /m/, /n/ and /ɲ/, instead of being raised, the velum is actually lowered and this is the reason for which airstream gets a chance to come through the nasal cavity and as a result, we get three sounds /m/, /n/ and /ɲ/. So, these are known to be nasals. Test it for yourself, all of them are voiced sounds. Unlike the voiceless sounds that we find in other categories, this kind of manner of articulation involves only voiced sounds.

The special feature of nasals just remember, in this case, the velum which is inside the mouth cavity that actually gets lowered; and because of the lowering of it, the airflow passes through the nose and then as a result, we are getting 3 different sounds /m/, /n/ and /ɲ/. Then, the next manner of articulation, the category of words would belong to liquids. There are only two liquid sounds and there is not much difficulty to produce the liquids /l/ and /r/. Here, the tip of

the tongue is raised and then curled back. Where? Near the alveolar ridge. It gets produced in this way; you have your tip of the tongue, it gets raised and then it is curled back.

These two sounds, they would be called liquids because of the ease that it involves; and /l/ is very frequently found in the child's speech. So, that would be the second last category of manner of articulation. Finally, we have glides. Glides are voiced and they also have vowel-like quality. Why it has vowel-like quality? Because vowel sounds are generally voiced. Because of the voiced feature, they are sometimes also considered as semivowels. a English has two of them. One is /w/, which is a bilabial sound and then there is /j/, which is a palatal sound. So, these would be known as glides.

What is the manner by which we produce a glide? There is a gliding force associated with it. When the tongue is in motion and then this actually gets glided in the position of a vowel. That is why we sometimes call them semivowels. There are only two sounds, one is /w/, the other one is /y/. So, that is about the independent discussions on place of articulation and manner of articulation. Now, we will see, as I mentioned, each consonant sound of English will have three different domains.

It will have place of articulation, like which two speech organs are involved. It will have manner of articulation, how it is produced and the third one would be whether it is voiced or voiceless. So, you pick and choose any consonant in this classification table given over here and we have to find out what are the three dimensions associated with it. Let us go for the first one. /p/ as in party. So, the /p/ sound is bilabial, stop, and voiceless. Try to recognize it from the table itself. So, if I look at the sound /p/, it will have bilabial, stop and voiceless. These are the three dimensions.

Similarly, /b/ would be bilabial, stop, but voiced. /m/ would be bilabial, nasal, voiced. /w/ would be bilabial, glide and voiced. Each of you pick and choose any consonant, you will find three different aspects of it. Check /f/ sound, it is labiodental, fricative and voiceless. Now, let us randomly choose something from here. /ʧ/ is a palatal, affricate and voiceless. Let us check /g/. /g/ is velar, voiced, stop. So, that is how we have to recognize each of the symbols in English.

That is why when you check a dictionary next time, when you try to find out the meaning of a word and you check a dictionary, please make sure that you are familiar enough to recognize which sound stands for which symbol and which symbol stands for which sound. For example, this sound looks like a long tail of a snake, but this is actually /ʃ/. Then you have /ʒ/, pleasure. I will give you the corresponding words for each of these symbols in a while.

Keywords: place of articulations, bilabials, labiodentals, dentals, alveolars, palatals, velas, glottals, manner of articulation, stops, fricatives, affricates, nasals, liquids, glides