Basics of Language Science
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Lecture 12
Places and Manners of Articulations of Sounds

Professor: We will continue talking about sounds.

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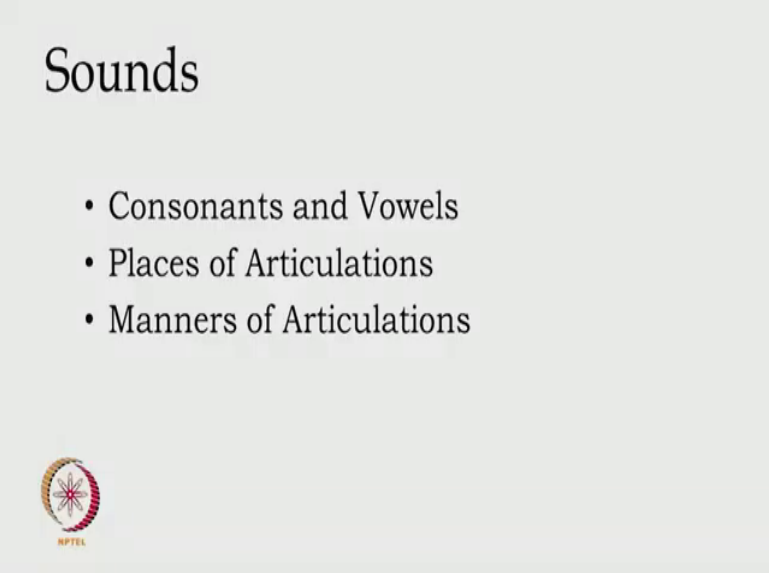

So far, we have looked at consonants and vowels. And then we were looking at places of articulation of different vowels and different consonants and manners of articulation of different consonants and different vowels.

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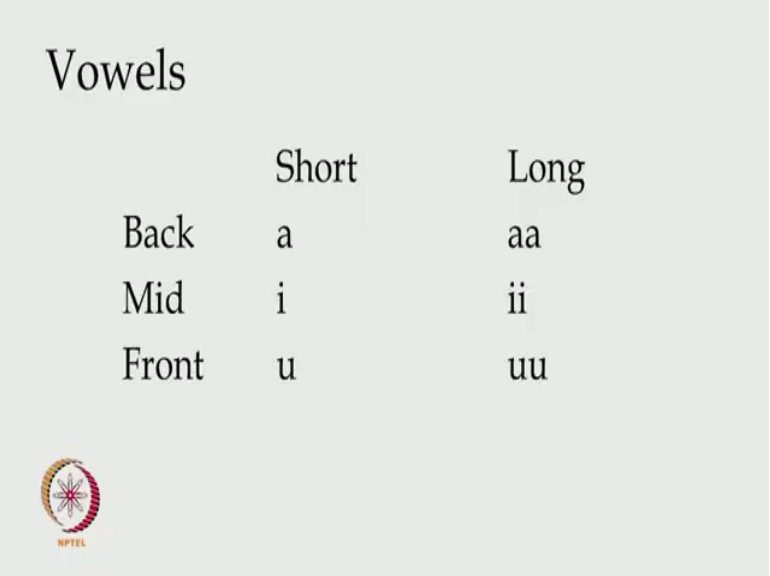

While looking at manners of articulations of vowels, we have seen that there are only two ways that we look at it, particularly the ones that I have shown you so far. They could either be a short vowel and a long counterpart of that, where short and long are the relative duration of their production. And according to places of articulation, vowels are either back vowel, mid vowel or front volume. And again, this back, mid and front is sort of organization on the basis of the direction of the flow of air, which is exhaling air, why we have back, mid and front.

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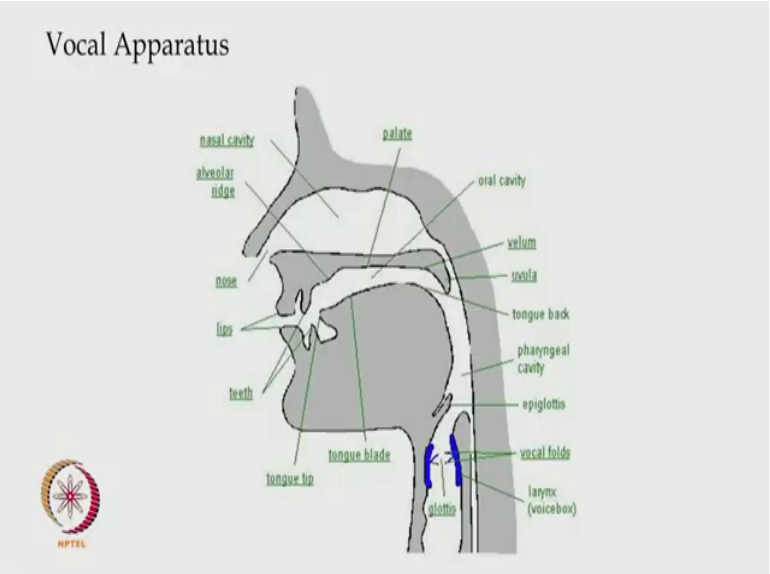

Then we carefully started looking at some of these places, where we have seen 5 different places of articulation so far, namely velum from where we get velar sounds, palate from where we get palatal sounds, teeth we get dental sound and lips we get bilabial sounds.

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	Oral Sounds				*Nasal Sounds*
	-asp -voice	+asp -voice	-asp +voice	+asp +voice	
Velar	k	kh	g	gh	ng
Palatal	c	ch	j	jh	ny
Retroflex	T	Th	D	Dh	N
Dental	t	th	d	dh	n
Labial	p	ph	b	bh	m

So, looking at this chart, once again, on the vertical axis we have places of articulation that I just mentioned to you. And then we saw that merely place of articulation, merely identifying the place of articulation is not enough for the understanding of sounds, because, from each place of articulation, we see various different sounds. And then we have to have more things to describe these sounds.

And then once we look at two more features, such as aspiration, which is a little bit extra flow of air, and voicing, which means vibration in the vocal cord. By putting these two things together, we are able to get unique features for each sound that you have seen so far. And many of these sounds are common to many languages. Some of them are specific to languages spoken in South Asia. I am going to show you some such sounds.

However, there is one more point which is important to mention here that these are not only a few places of articulation in this picture, there could be more. For example, when we look at sounds like t, t has a specific place of articulation. t is significantly different from ta, can you hear the difference between the two when I say t and ta, there is a significant difference between the two. The place of articulation for t is teeth, where the tip of the tongue goes very close or in between two teeth that are upper teeth and lower teeth and then we get these sounds.

However, the place of articulation for ta is different from teeth, which is what?

Student: Alveolar ridge.

Professor: Alveolar ridge.

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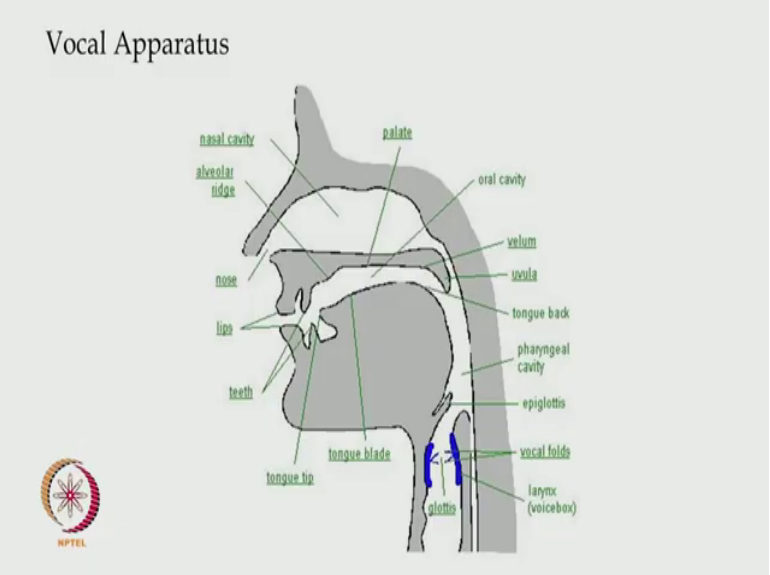

So, again, looking at this picture, teeth, these are our teeth. See this. And I want to draw your attention here. Beginning from here, the sharp part of teeth all the way to this, this is alveolar ridge. So, what would that be? In generic term, in general language, what would that be? How can we describe alveolar ridge in a simpler way? Because if I tell you alveolar ridge right away, it does not make much sense. It makes sense only when you know the term and when you know the place.

So, if you have to explain alveolar ridge to somebody, what will you do?

Student: The roof of the mouth.

Professor: Roof of the mouth has many things in it, like palate is also the roof of the mouth. So more specific. That is a nice term roof of the mouth. But more specifically, how will you describe it? It should not be difficult, right? Roof adjoining teeth. Good. So, the muscular area where upper teeth are in-fixed. Can we say that, that is the alveolar ridge. And in that area as well, the upper part area is what we know as alveolar ridge.

There is a reason why I am talking about that and I bring you to that point in a moment. So, it is clear that the alveolar ridge is the place of articulation. Then what else happens if we want

to look at the movement of the tongue? What else is going on with that? When do we get sound like ta? Say it for yourself. Because all of us are speakers of our languages, that is languages spoken in South Asia, we can say these songs, several others, like speakers of Arabic or English may not be able to say this sound.

Why, we will look at that. But can you tell me about the position of the lip, position of the tongue in that alveolar ridge sound, and those sounds which come from the alveolar ridge are called retroflex sounds.

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	Oral Sounds				*Nasal Sounds*
	-asp -voice	+asp -voice	-asp +voice	+asp +voice	
Velar	k	kh	g	gh	ng
Palatal	c	ch	j	jh	ny
Retroflex	T	Th	D	Dh	N
Dental	t	th	d	dh	n
Labial	p	ph	b	bh	m

I have talked about velar, palatal, dental, and labial, so far did not tell you about retroflex. This is why I was holding them for this moment. So, what is happening with the tongue?

Student: It is bending backwards.

Professor: It is bending backwards. Can many of you say this ta, ta? See this thing? Can you give me some words where you see this sound, ta?

Student: Tennis.

Professor: No. I will come back to tennis in a minute.

Student: Tongue.

Professor: No.

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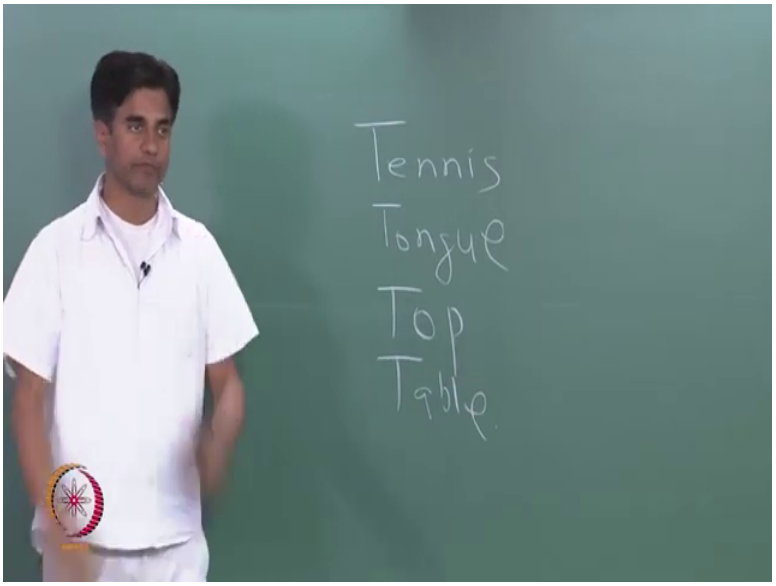

So, is this the spelling of tennis? My point is, I am glad you gave these examples. I was going to give you these examples right away. When you were talking about these sounds, they are not sounds from the alveolar ridge. However, when we say, by we I mean speakers of South Asian languages, we do make it sound like them. What do I mean by this difference? When I say we make it sound like them, I am going to tell you in a moment. But these are not the sounds from that part.

Or the better way to put it is when speakers of English say these things, then in that case, these sounds are not from the alveolar ridge, and I am going to tell you about that place of articulation also in a moment. We are talking about sounds t and th. So, give us some more words where you find that, I can give you a clue. Give me a word from our languages.

Student: Tamatar.

Professor: Tamatar. Tamatar means? Okay, more? Have you heard a word called tamtam? Yes, no, some of you? Tamtam is a horse carriage. Have you seen a horse carriage? Where did you see that? Movies, not in real life? Not yet. See how far we have moved. Okay, so tamtam is a horse carriage. That is a word for tamtam. Tamtam is a word for horse carriage. More words with t or th?

Have you heard a word called thug, cheat? Thug. Okay. Have you heard a word called danda, danda? No, danda.

Student: ((???)) (10:42).

Professor: No, that is dund, danda.

Student: Danda means stick.

Professor: These are the sounds t in tamatar, th in thug and d in danda. Have you heard a word called dhakkan? Tap. And dhakkan is also metaphorically used for stupid, but have you ever heard this word? There are lots of words in abundance with these sounds in the Dravidian languages as well. I do not speak a Dravidian language, either Telugu or Tamil. So, I do not have a word for that.

But if you think about the sound that I am talking about, and try to find a word from that in Tamil, Telugu, Kannada and Malayalam, there are lots of words, lots of words with these sounds. Can someone think about it and tell me? Some of the words from Telugu or Tamil or Malayalam with retroflex sounds t, th, d? No. No? Or are you still thinking about it? While you are thinking about it, let me continue saying this is another live example of what we know as the knowledge of language.

I am telling you, and I know that for sure that all Dravidian languages, to be more generic, all languages of the South Asian part of the world have these sounds in abundance. When we say these sounds in abundance, we mean a lot of words with these sounds. I gave you some of the words that I know. Now, I am asking you for some of the words from these languages, the languages that you speak. The fact that you are not able to tell me those words with those sounds does not mean you do not know them.

It is just that you know all those words, but you do not know that you know them. Okay, what is the last sound of the word Tamil? When I am saying, am I saying it correct when I say Tamil? Tamil. See this thing. So, when I am saying it, I am not saying it correctly? What is that sound? That sound is also a retroflex sound, which is not in this list.

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	Oral Sounds				*Nasal Sounds*
	-asp -voice	+asp -voice	-asp +voice	+asp +voice	
Velar	k	kh	g	gh	ng
Palatal	c	ch	j	jh	ny
Retroflex	T	Th	D	Dh	N
Dental	t	th	d	dh	n
Labial	p	ph	b	bh	m

But that is also a retroflex sound, say it for yourself, and then see if this is happening or not. Whether there may be a different place of articulation where the tongue is rolling back or not. That is a retroflex sound. See that, there could be many more, our languages are full of them. That is the point I am trying to make. Tongue curls back hit the flap that is the alveolar ridge, and then comes back. These are specific that these are meaning these sounds are specific features of our languages.

In other words, these sounds are not in languages which are spoken in other parts. So, anybody trying to learn our languages whose vocal tract is conditioned with the sounds of English or for that matter, some other language is going to have difficulty with these sounds. Just like we have difficulty with some of the sounds of English, namely this one.

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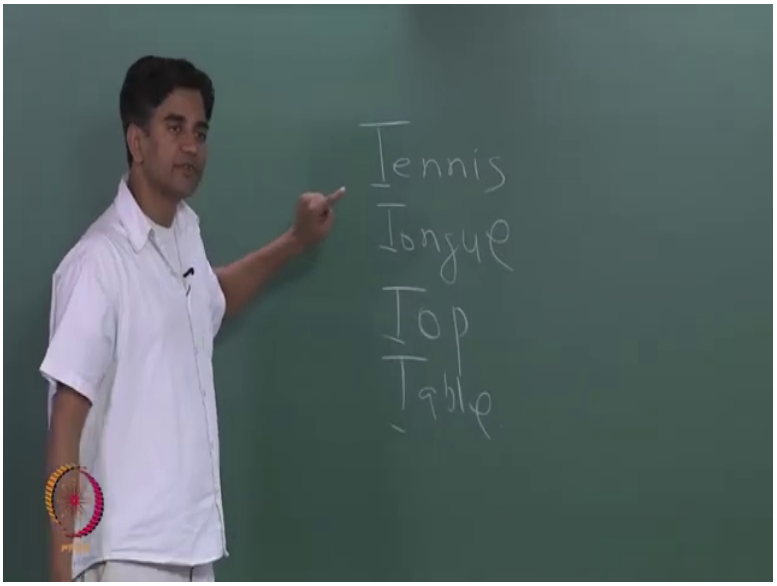

The sound t in tennis is not as t. We say, let me say it, let me say the same word twice, and then see if I am making the difference or not. Tennis, tennis, tennis, tennis. Am I saying the first sound differently when I am doing it twice? What is the difference, anyway? Any idea? Not necessarily you have to answer this question. I know the answer to this…

Student: I think it is flexing much in the case of the first one.

Professor: Flexing much meaning.

Student: It is not bending much.

Professor: It is not bending much. That is correct. In fact, when we say these sounds of English, including the sound in table, the tongue is not supposed to roll back. But our languages are full of such sounds. And in our language, we do not have this sound. So, what we say is what we are conditioned with. Therefore, we end up saying table tennis, tongue, top. However, the way I am going to describe it first, and then I will let you decide the place of articulation for these sounds.

The way they are supposed to be said or the way English speakers say these things is the following.

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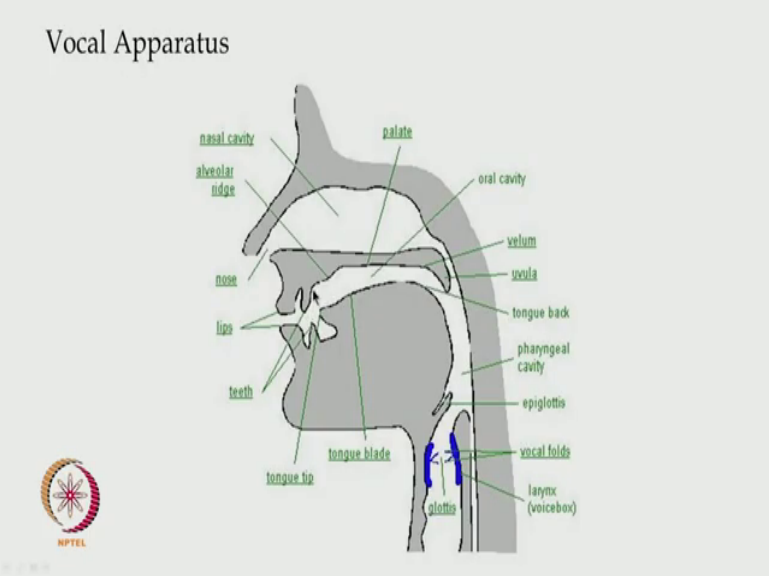

The tip of the tongue goes in between these two places, look at this now, see the alveolar ridge here and the upper teeth, it stays somewhere in the middle here. The tip of the tongue just stays somewhere there, t, t, t, t. Sometimes, these descriptions are given like the following English is softer. You may have heard there are stereotypical descriptions of Dravidian languages, that Dravidian languages are very hard. Have you heard this thing? Some of you must have heard this thing. I hear this every time, many other stereotypical descriptions of not just Dravidian languages, many other languages as well.

What they really mean is Dravidian languages have lots of retroflex sounds, which is a lot of words with retroflex sounds.

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	Oral Sounds				*Nasal Sounds*
	-asp -voice	+asp -voice	-asp +voice	+asp +voice	
Velar	k	kh	g	gh	ng
Palatal	c	ch	j	jh	ny
Retroflex	T	Th	D	Dh	N
Dental	t	th	d	dh	n
Labial	p	ph	b	bh	m

For example, if we are talking about non-Dravidian languages that are Indo Aryan languages, namely Hindi, Oriya, Punjabi, Bengali, you have only these 5, t, th, d, dh, n, and some more, only a few of them. However, just now I gave you one example of the last sound of the word Tamil. That is another one in Tamil and there are more. Another Dravidian language Malayalam has a few more Dravidian sound, a few more retroflex sounds compared to Tamil, see the point.

Therefore, sometimes people say such things, which sounds stereotypical and at times derogatory. However, the point is, these languages have more retroflex sounds. Coming back to English, English does not have any retroflex. Now, this is what people mean when they say English t is softer. The tongue is not supposed to roll back and is this, the place of articulation in your mind for English t? So, what do you think we are going to call that place? Take you back there again.

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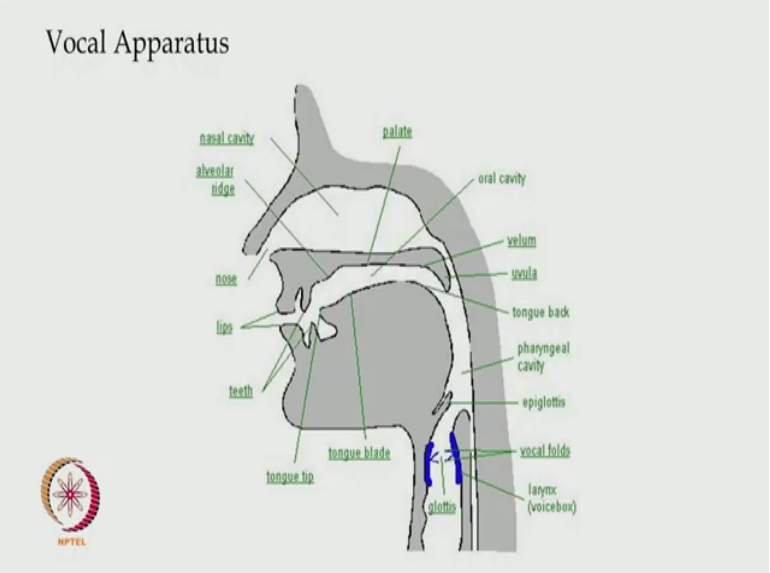

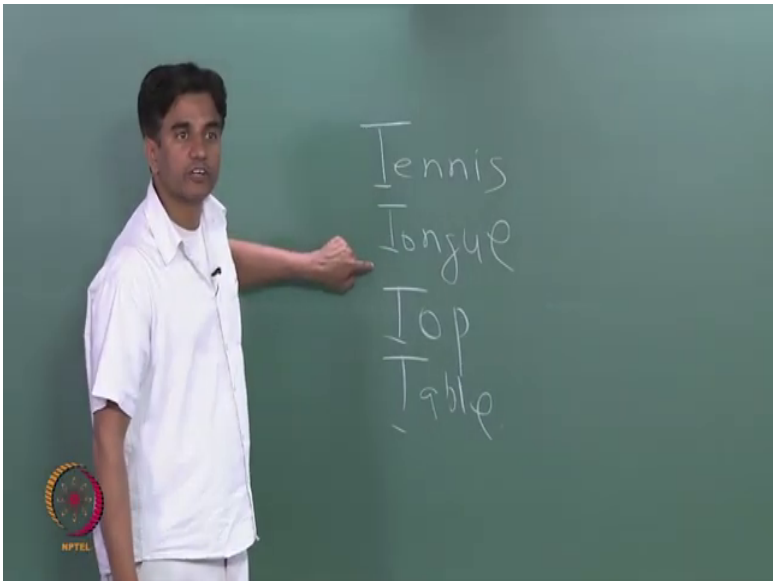

If the other place was alveolar ridge, right, and the previous one was teeth. So somewhere in between alveolar ridge and teeth. We have to find a place for that. And that place either sometimes is called alveolar, simply alveolar. So, the sounds of English are called alveolar sounds. There are more sounds in English, specific to English, which could be located in this whole vocal apparatus. There are some sounds, which are in our languages also and in English and Arabic as well, which could be located in this vocal apparatus.

Remember, languages are going to share sounds. So, it is not possible that we have some sounds, and that is not in English. I am telling you about retroflex sounds that are not there in English. So, this is part of the list which is not available in English. But then there are lots of

sounds, which are there in English, at the same time, there are some sounds of English, which are available in our languages too. I am going to show you some of them as well.

Is this place of articulation clear to everybody? Do you understand now when I said these things are not retroflex sounds? Clear. I think. Sorry.

Student: ((???)) (21:15).

Professor: Yeah, so, keep the tip of the tongue. This is not a training place where I can help you with that, but I can describe that and I can show you at least once. Keep the tip of the tongue near the upper teeth, that is the upper part of the upper teeth that is the place of articulation for. When I say keep it there, what I actually mean is speakers of English get their tip of the tongue there, table, tongue, teeth, top, as opposed to top, table tongue.

In the second one, what I am doing is getting rolled back. Now a word of caution here as a footnote. If I end up saying or if you end up saying tip, not table, table. I want to know from you, given this description so far, is that our fault? Is that a deficiency? If it is not, why is it not deficiency?

Student: Conditioning.

Professor: Conditioning is the keyword. When we were growing up, we were growing up with these sounds, with these languages. We are not going up with the sound of these languages, our generative apparatus that is in our mind, that apparatus got clicked with these sounds. And simultaneously our vocal apparatus when we started speaking one word, many words, few words, and full sentence and language, during this process of 5 years, or 6 years or 7 years of age, got conditioned with the sounds that we have.

Later on, we add one more language to that, where we found there are some sounds, some of those sounds are different. What we end up doing is we end up instead of, no not instead, we try hard and still the vocal tract does not get conditioned. Instead, what happens is we find sounds that are very close to that. Therefore, instead of saying, table, we end up saying, table. Remember, we do not say table. When we say table, we do not say table.

What I mean is it does not become dental, what it becomes is a retroflex that is the only difference and it is not a deficiency because of conditioning and it is not a problem. If I do not sound like English speakers, that is not a problem. That is because I am not supposed to

be doing that. It is like saying I do not look like someone, what is the problem in that. And this conditioning trust me is like DNA, once conditioned, not going to change.

Before conditioning gets matured or while it is in the process, you can do anything with that. By anything I mean, you have to do something, you have to relocate the child to some other place, then it gets conditioned, perfectly fine. But once it is done there is absolutely no way you can change it. Absolutely no way. Therefore, one should not be at all bothered if someone points out to you that is the difficulty of English, particularly in terms of pronunciation.

Keep speaking the way you do, it is not a problem for you, you are not making any error. It is not a problem, get the point. And I am saying this thing not because I want to be politically correct, I will not repeat this thing again, I am saying this thing after showing you the technical aspects of these things, okay. And this is the answer to these questions.

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	Oral Sounds				*Nasal Sounds*
	-asp -voice	+asp -voice	-asp +voice	+asp +voice	
Velar	k	kh	g	gh	ng
Palatal	c	ch	j	jh	ny
Retroflex	T	Th	D	Dh	N
Dental	t	th	d	dh	n
Labial	p	ph	b	bh	m

All right. The rest of the sounds we have already discussed, have we? And you have seen how aspiration and voicing are, did we talk about this or not? We talked about how the aspiration and voicing are going to give a unique feature to these sounds. Many of you know artificial languages right, many of you have done courses in artificial languages. What is the most unique feature of artificial language? Java, C+.

Student: Semicolon.

Professor: More, more unique. No. If I say binary does this make any difference to you? The use of binary symbols in artificial language, either those binary symbols could be either 0 1 or in terms of plus minus, does this make sense. No? Do you see the use of 0 1 in artificial languages?

Student: As we do not actually use them compare this convert into that ((???)) (27:19).

Professor: Well, that is the problem most of the time when you are doing these things, now you are working with the compiler. When those things are written, they are artificial languages that are primarily based on binary coding, am I right? 0 or 1 same thing could be with plus or minus.

That comes from the binary features of natural language. How does a sound in natural language get unique? It gets unique only when you look at its binary classification. If we are talking about only aspiration or only voicing, we are not giving each sound distinctive features. The distinctive feature each of these sounds get only when we look at plus aspiration, minus voicing. You see these top things, so 0 1 application of 0 1 in binary coding of artificial language is coming from here.

An important thing is you need binary coding to give uniqueness. I do not know how the artificial language was taught to you. Because to teach the artificial languages you do not even need to talk about this thing. But I am taking you somewhere else, where are those things coming from? The moment we say artificial language it has to do something with natural language. One of the things that come to binary, come to artificial language is from here, alright, okay.

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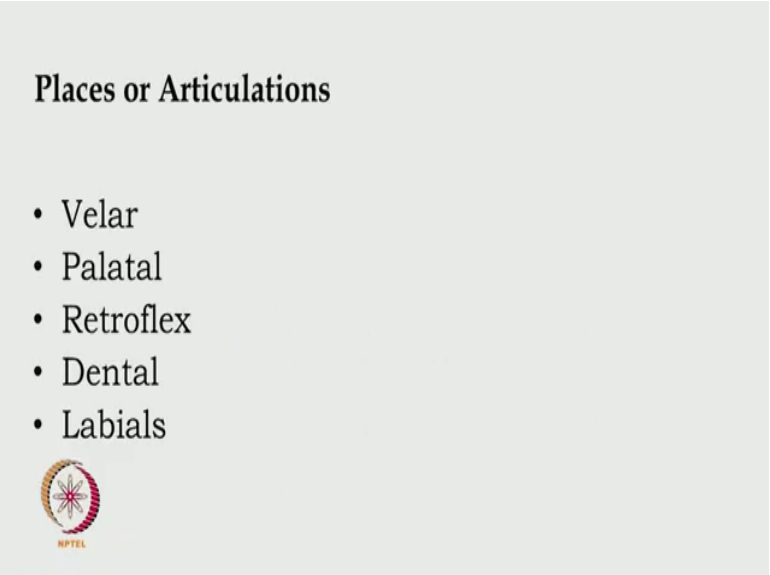

With this we can move ahead, we have looked at these places of articulation in detail and these manners of articulation in detail.

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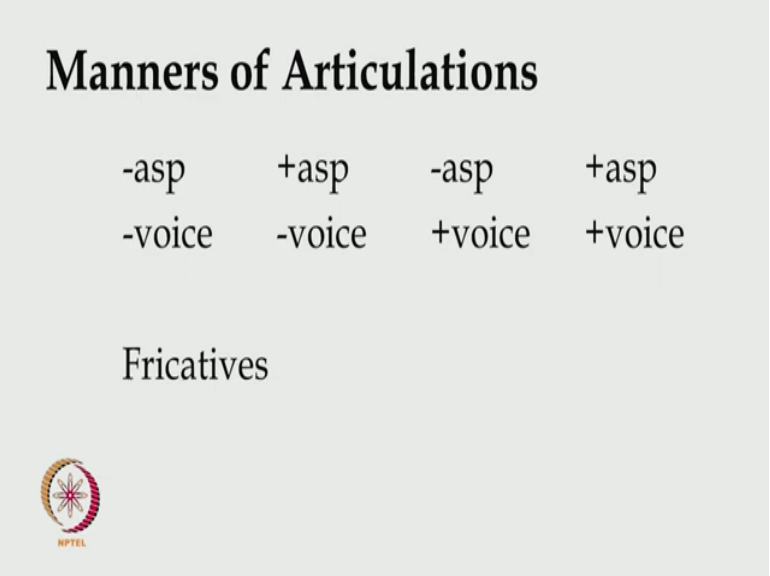

There is one more part which I want to talk to you about: one more type of sound and they are fricative sounds.

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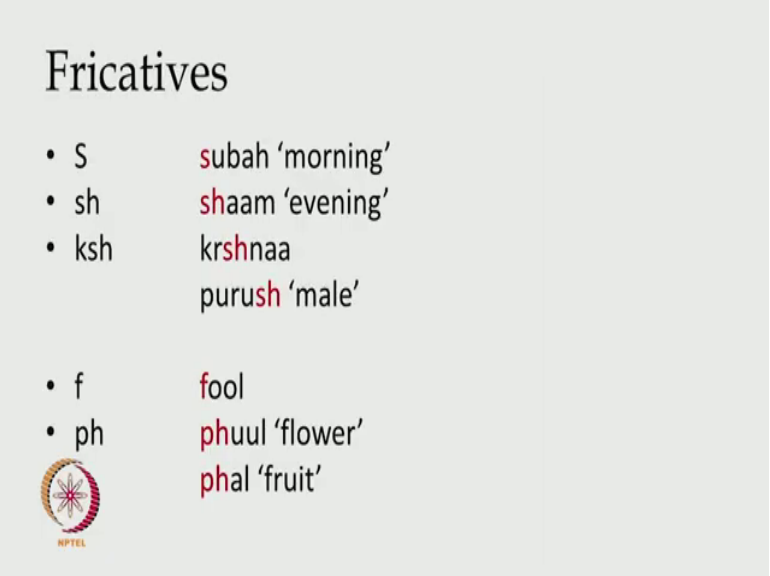

Now, let me show you some of the words. And with those words we can talk about some of such sounds. The sound s in a word like Subah or a sound sh in a word like shaam. Do you see the difference between these two s and sh? Tongue is making this difference? Let us be more precise.

Student: ((???)) (30:21)

Professor: Of what?

Student: ((???)) (30:23)

Professor: Okay, hold on first of all, when we say s, s, the first one, what is the place of articulation before we look at the tongue? S, place of articulation? Because these two things are important, to decide any sound or to talk about any sound, the first thing you need to look at is the place of articulation in the vocal apparatus. So, is it located in the front or back?

Student: Front.

Professor: Front. Fine. Where exactly in front?

Student: Tip of the tongue.

Professor: No, that is not the place. Tip of the tongue is involved in that, but where does the tip of the tongue go? Teeth. Sorry.

Student: ((???)) (31:15).

Professor: It stays floating, but towards which side, towards teeth? These sounds, the first one is dental, just for that. And then tip of the tongue, what does it do to those teeth? Does it go in between or does it touch it, brush it right s, s. And then what is going on with the flow of air?

Student: ((???)) (31:51)

Professor: It comes and it is fast. Because of that fast flow, more flow and tip of the tongue and teeth. This sound is called dental fricative. It is important, particularly to know this, because if we say this is a dental sound, you have seen the dental roll. Do you see them here?

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	Oral Sounds				*Nasal Sounds*
	-asp -voice	+asp -voice	-asp +voice	+asp +voice	
Velar	k	kh	g	gh	ng
Palatal	c	ch	j	jh	ny
Retroflex	T	Th	D	Dh	N
Dental	t	th	d	dh	n
Labial	p	ph	b	bh	m

Do you see that here? No. Now, if it is a dental sound, why is it not here? Remember, I told you about this thing. This was designed by Panini approximately 2500 years ago from now, that is around 500 BC. So, it is a great thing that this guy came up with. It is not a mistake if this dental sound is not there. In fact, it is in my understanding of this thing it is more than perfect. In the sense that he is not talking about the manner of articulation, which is close to what we say fricative here, he is putting them somewhere else.

It is a dental sound, but it is somewhere else on the basis of its manner of articulation, get this thing. Now, wherever it is put the chart is not important for us we are not learning the alphabet writing system or anything the chart is not important for us.

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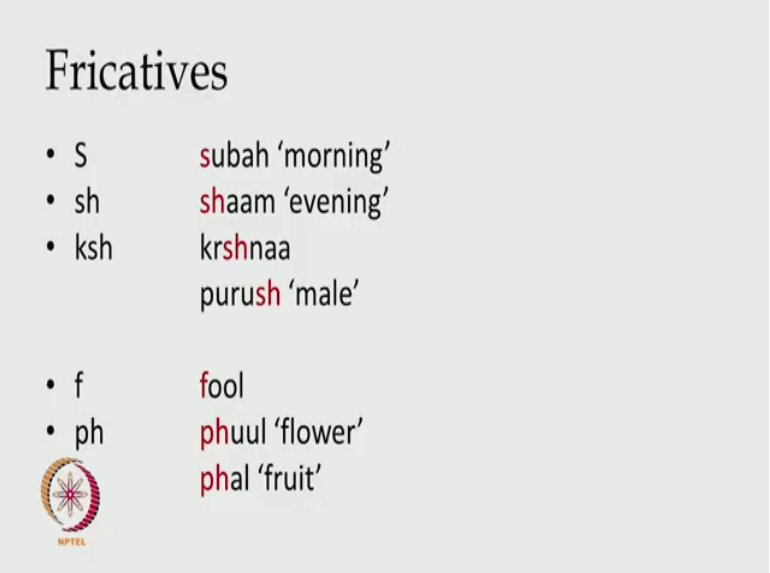

See the next one shaam, what is the place of articulation for that? That is, if lip, sorry, if the tongue is involved, you have seen so far, most of the sounds that we have discussed tongue is involved in some way or the other everywhere. What is tongue doing to which place?

Student: Palate.

Professor: Palate and what is it doing, sure, so this is a palatal sound and again you see this is not in that list of palatal sounds. So, if this is a palatal sound what else is happening with the tongue? Sh, sh. Try a little harder, it should not be very difficult. Say it again.

Student: Tongue is taking a u type shape.

Professor: U type of shape. So, correct me if I am describing what you are saying as u type. The two side blades of the tongue are touching the palate and then that does it, it is making a shape like this and the flow of air is through that. So, this sound is called palatal fricative. Okay, palatal fricative.

There are a couple of other names given to this type of sound, which are not important for us right now. That is sh and s. So, when these sounds are classified, they are classified on a different basis. The last one, something like I do not know how to say that. When we say a word like purush, some who speak Hindi, Punjabi, Marathi, how do we say that? Which one is that when you are saying that? There is one thing which I did not put here. How many of you are familiar with nagri writing system? Some of you. So, bear with me, I will just take one example from there to indicate something.

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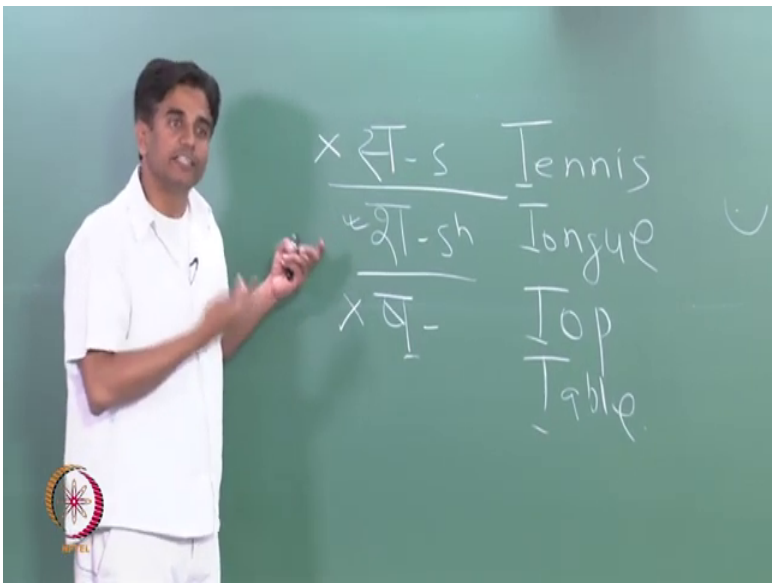

So, I am talking about this kind of thing, which is this, am I right? Then we have this, which is this, which is the second one here. And then I am talking about something like this, which is the third one.

Student: Third one is purush.

Professor: Third one is this. So, this is a writing system. This is a symbol for that sound, get it, symbol for that sound. Now, when we say the word purush, do not bring the picture of the written word in your mind. Tell me how this word sounds? To be more precise, how the last sound sh sounds.

Student: ((???)) (37:18).

Professor: It is.

Student: Extended version of sh, it is harder sh.

Professor: Do not tell me that. What I am saying is, you are right, it is harder. But are you able to say that or when I say purush, do I sound like this? Actually, every time we say this sound, by we I mean here speakers of non-Dravidian languages, that is the speakers of Indo-Aryan languages particularly, say, when they want to say this, they end up saying this one because this sound is almost lost in Indo-Aryan languages. If we take examples of Hindi or Marathi, whenever we want to say this, we actually end up saying this. So, in a spoken language, this is almost lost.

However, this has not gone from the writing system, which is another way of saying written language changes very slow or sometimes it does not need to. It is just an example of a particular symbol, which we write, but we do not say. And right now, I am talking about spoken language and in a spoken language, what has happened is this is lost, this is what we have. There is another interesting part, as a footnote I can tell you.

In some languages, namely Bangla, this also does not exist. If they want to say this one, they would end up saying this one. Now, these are the things which help people make stereotypes. But trust me, these are not, I mean, in the lighter way, people can use these things for fun. However, these are not funny things in nature, these are exclusively dependent on conditioning of the vocal tract. On the other hand, some languages do not have this one, they only have this one.

For example, languages spoken in Eastern UP or sorry, not east, yeah, Eastern UP and Western Bihar, or for that matter entire Bihar, all the way to Assam, they do not have this one, they have just this one. So, if a speaker of Hindi from Bihar would say sam instead of sham. And that is not their fault either, it is just that it is an output of conditioning. If someone wants to say this thing, subah, probably a Bangla speaker would end up saying shuba just listen to them carefully, you will get these things and this is lost.

However, this is not lost in Dravidian languages. This is intact in Dravidian languages. Because this is a retroflex s, retroflex sha. Sometimes ago probably this was available in Hindi also, through Sanskrit, now it is lost. The Dravidian languages have not lost it, because Dravidian languages have more retroflex sounds. So, it is not too expensive, quote unquote, for them to retain this one. However, for Indo-Aryan languages, it is too expensive to retain.

Again, expensive under quotes, expensive simply means the human mind works with the economy. There is a principle, always under operation in the human mind, which is called the principle of economy. It does not like redundancies. It does not like complexity. When we say human mind does not like complexity, we actually mean it does not like redundancies. If there are only a few words where you are going to find this sound retroflex sh, it is going to remove it and merge in favor of the existing one which is very close. That is called the economy of principle, which is under operation by the human mind.

So, and this is an answer to the loss, we described this that something has lost. When we say Hindi or other Indo-Aryan languages have lost it. It is not that it slipped out of their pocket. It

is not that they were traveling and they forgot it somewhere, it has disappeared. What could be the compelling motivation for that disappearance? We are talking about language. There has to be something compelling and compelling motivation for that loss is an ongoing principle, under the operation principle of economy in the human mind.

Because of the abundance of retroflex sounds, such loss is not visible in Dravidian languages. So, these are the important things to keep in mind, while we understand sounds and its structure. One more sound and then we stop. We have, we often find a sound called fa, right? Please see the words mentioned here. I am going to have to spend a few more minutes on this thing, which I do on Monday. But I just want to introduce this to you. When we say word like fool and a word like phool, do you hear the difference between the two fool and phool?

What is the difference? You can, you can see that difference. Lips touching, both the lips touching in which one pha. That is because this is a bilabial sound. Both the lips must touch.

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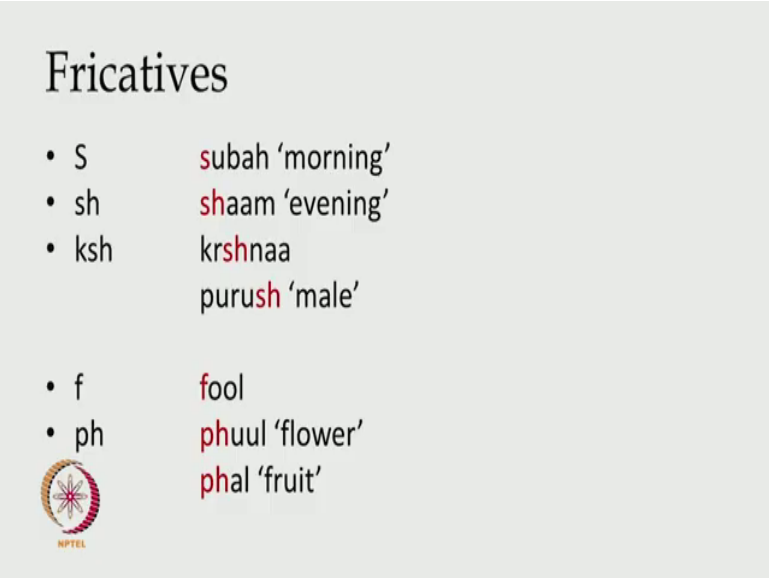

Now, the next one is, the first one is f where lips are not touching each other, f. Now this sound f, the first one is not in abundance in our languages. And the second one ph, ph where lips are touching is not available in English. So, when we learn English words like, fool, it is highly likely that many of us would end up saying, phool. However, these two words are completely different things, because of the first sound of these two words. Are you with me?

Do you see the difference between the two sounds? What is the place of articulation? We already know the place of articulation for ph in the word phool, or ph in the word phal, heard

these two words, phal and phool, we know the place of articulation of these two sounds. What is the place of articulation of f? Clearly both the lips are not touching. So where is the place of articulation for that?

Student: Upper teeth and lower lip.

Professor: F, right, upper teeth and lower lip. So, what do we call it? And that is going to be another place of articulation, another type of sound in this vocal apparatus.

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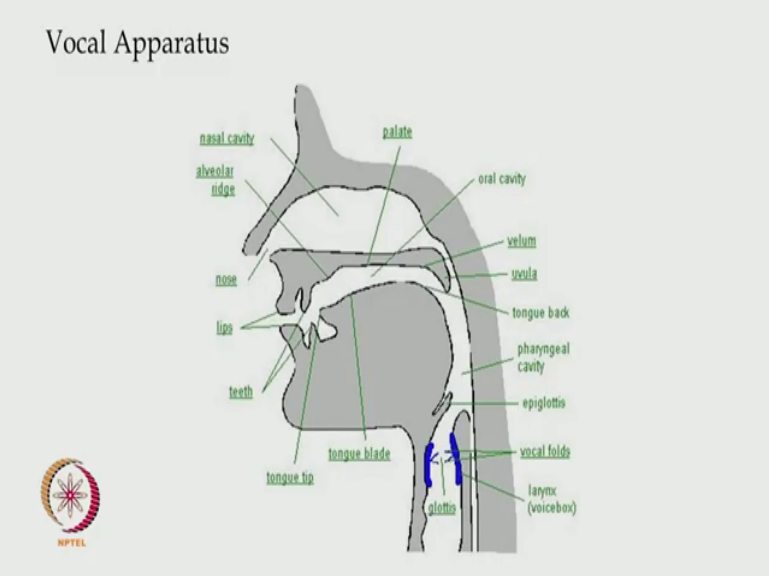

So upper teeth, sorry, lower teeth, and lower lips and upper lips. So, what will be the sound?

Student: ((???)) (46:54).

Professor: Simple lips and teeth, labio-dental, that is called labio-dental. I am sorry, I should not have expected that term from you, labio-dental. And again, what about the flow of air? Is it too much or like k?

Student: Too much.

Professor: Too much. Therefore, it is classified as fricative.

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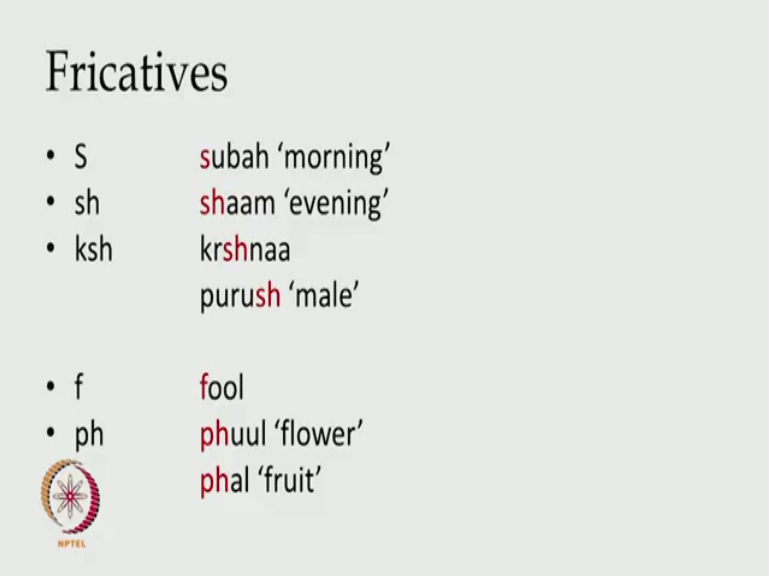

F is labio-dental fricative, serious thing. Now f is not in abundance in our language. There are a few more, which I discuss with you on Monday. And then we will close this part of the discus and on sounds. And then we go to word-formation processes where we see the application of these things in words. Okay, and possible constraints on word formation. Thank you.