Applied Linguistics
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Lecture 6
Places and Manners of Articulation

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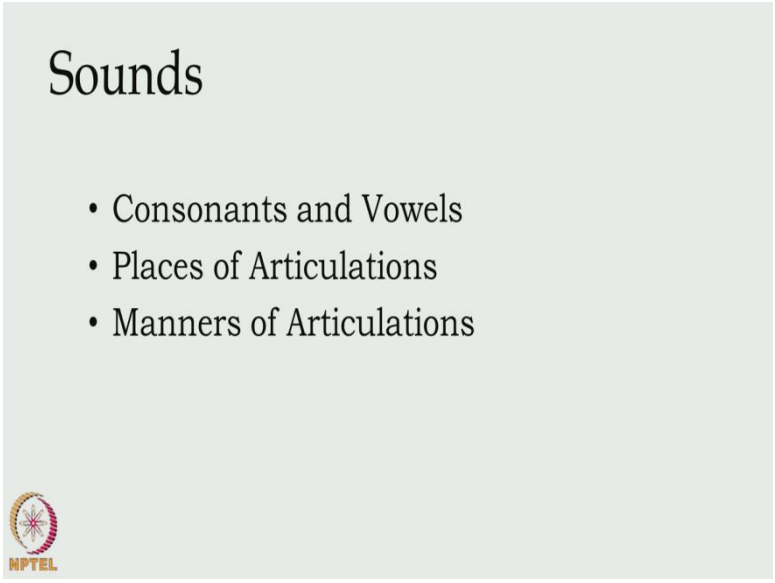

We will continue talking about sounds, so far we have looked at consonants and vowels and then we were looking at places of articulations of different vowels and different consonants and manners of articulations of different consonants and different vowels. While looking at the matters of articulations of vowels, we have seen that there are only 2 ways that we look at it, particularly the ones that I have shown you so far.

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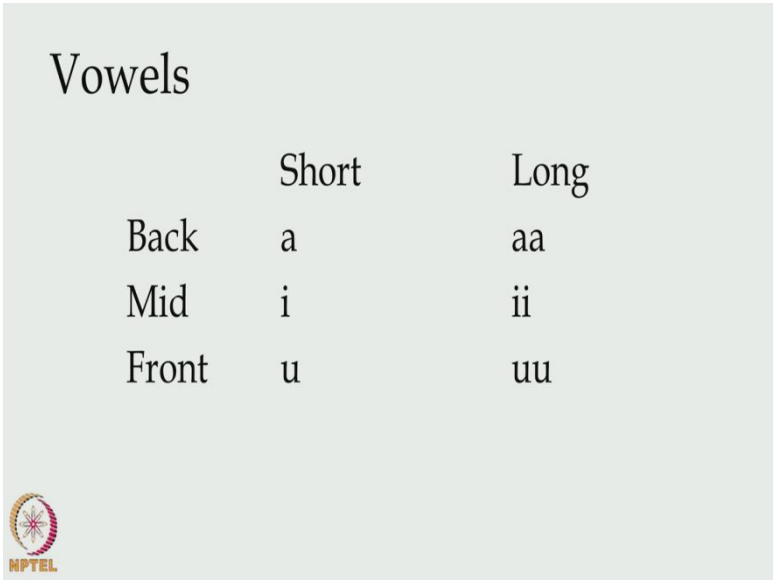

They could either be a short vowel and a long counterpart of that, where short and long are relative duration of their production. And according to places of articulation, vowels are either back vowel, mid vowel or front vowel. And again, this back, mid and front this sort of organisation is on basis of the direction of flow of air, which is either, which is exhaling air this is why we have back mid and front, okay.

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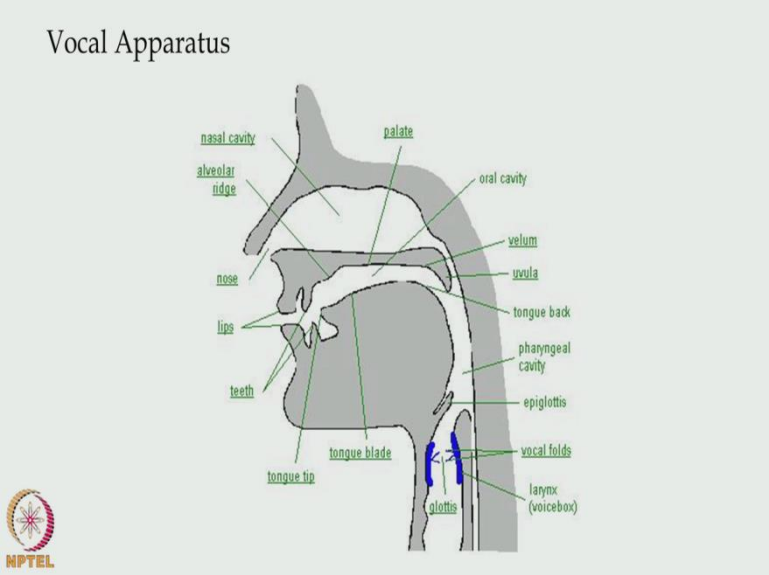

Then we carefully started looking at some of these places, where we have seen 5 different places of articulations so far namely, velum from where we get velar sounds, palate from when we get palatal sounds, teeth we get dental sound and lips we get bilabial sound, right. So looking at this chart once again, on the vertical axis we have places of articulations that I just mentioned to you.

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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

And then we saw that nearly place of articulation, nearly identifying place of articulation is not enough for understanding of sound because from each place of articulations, we have seen various different sounds. And then we have we have to have more things to describe these sounds. And then once we look this once we look at 2 more features such as aspiration, which is extra little bit extra flow of air.

And voicing, which means vibration in vocal cord. Putting these 2 things together we are able to get unique features for each sound that you have seen so far. And these 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 of some such sounds.

However, there is one more point which is important to mention here that these are not only few places of articulations in this picture, there could be more. For example, when we when we when we look at sounds like “ta” right “ta” has a specific place of articulation, “ta” is significantly different from “dta”. Can you hear the difference between the 2 when I say “dta” and “ta” there is a significant difference between the 2.

The place of articulation for “dta” is teeth, where tip of the tongue goes very close or in between 2 teeth that that are upper teeth and lower teeth and then we get these sounds. However, the place of articulation for “ta” is different from teeth.

“Professor- Student conversation starts”

Which is what?

Alveolar ridge.

Alveolar ridge, right.

“Professor-Student conversation ends”

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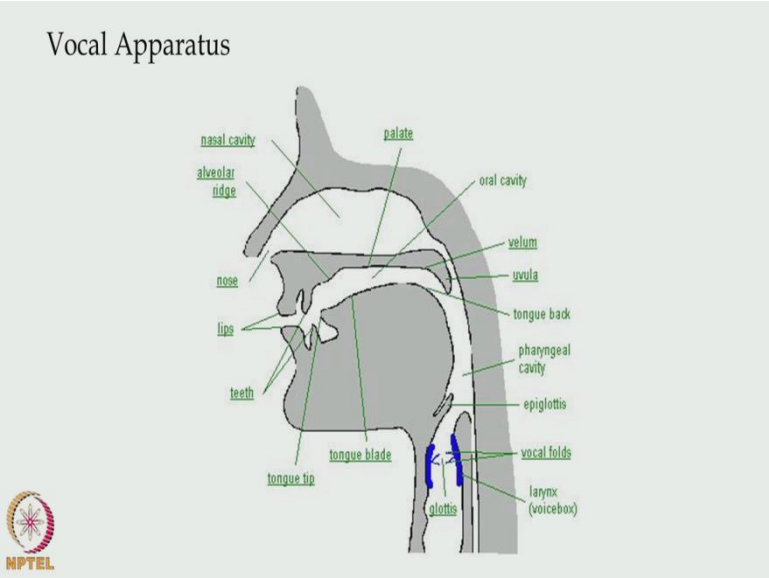

So again looking at this picture, teeth these are these are our teeth. And I want to draw your attention here. Beginning from here, the sharp part of teeth all the way to this, this is Alveolar ridge. So what would that be in generic term in general language, what would that be? How would how can we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

It makes sense only when you know the term and when you know the place.

“Professor- Student conversation starts”

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

Roof of the mouth.

Roof of the mouth has many things in it like palate is also roof of the mouth, so more specific… That is that is nice term roof of the mouth. But more specifically, how will you describe that? It should not be difficult, right?

Roof adjoining teeth.

“Professor-Student conversation ends”

Roof adjoining teeth, good so the muscular area where upper teeth are infixed, can we say that, that is the Alveolar ridge. And in that area as well, it is the upper part upper area is what we know as Alveolar ridge, okay. There is a reason why I am talking about that and I bring you to that point in a moment. So it is clear Alveolar ridge is a place of articulation, then what else happens?

If we want to look at movement of tongue, what else is going on with that when we get sound like "ta"? Say it for yourself "ta", which is all of us being speakers of our languages that is languages spoken in South Asia, we can say these sounds. Several others like speakers of Arabic or English may not be able to say this sounds, why? We will look at that.

But can you tell me about the position of lips, position of tongue in that Alveolar ridge sound and that those sounds which come from Alveolar ridge are called retroflex sounds. I have talked about velar, palatal, dental; labial so far, did not tell you about retroflex. This is why I was holding them for this moment.

"Professor- Student conversation starts"

So what is happening with the tongue?

Bending backwards.

Bending backwards, can you can you can many of you say this "ta ta"? Say this thing. Can you give me some words where you see this sound "ta"?

"Tennis"

No.

"Tongue".

No.

(())(08:18)

No. Is this the spelling of tennis?

Yes.

Yes.

“Professor-Student conversation ends”

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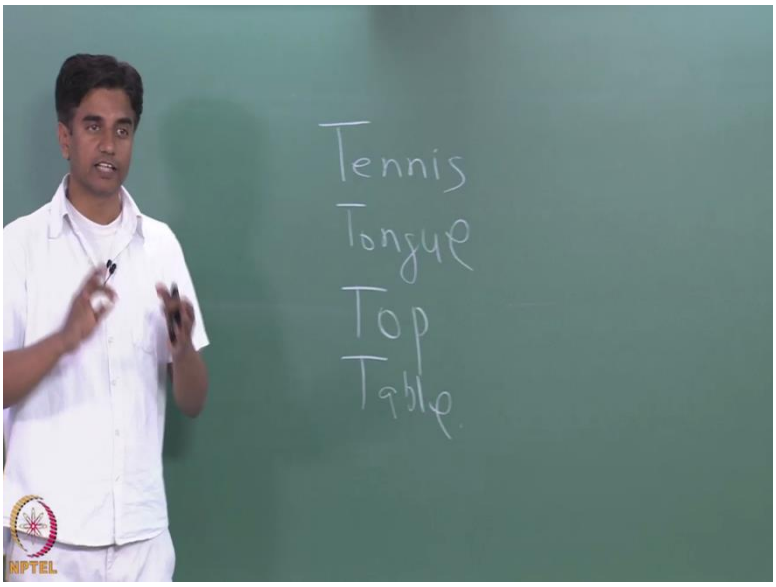

My point is, I am I am glad you gave this example I was going to give you these examples right away. When you are talking about these sounds, they are not sounds from Alveolar ridge. However, when we say by “we” I mean speakers of South Asian languages, we do make it sound like them, okay. What do I 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 or the better way to put it is when speakers of English say these things, then in that case these sounds are not from Alveolar ridge and I am going to tell you about that place of articulation also in a moment. We are talking about sounds “ta tha” right. So give us some more words where you find that.

“Professor- Student conversation starts”

I can give you a clue; give me a word from our languages.

“Tamatar”.

Tamatar, tamatar means?

Tomato.

Okay, more? Have you heard a word called Tumtum?

Yes.

Yes.

Yes no, some of you, Tumtum is a horse carriage, have you seen horse carriage?

Yes.

Where did you see that?

In movies.

Movies, not in real life?

No.

Not yet? Wow, see how far we have moved. So Tumtum is a horse carriage that is the word for Tumtum. Tumtum is the word for horse carriage. More words with “ta tha”. Have you heard a word called “thug” cheat “thug” right? Have you heard a word called “Danda danda”?

No.

No “Danda”?

Danda means Stick.

Stick.

These are the sounds “ta” in Tamatar, “tha” in Thug and “da” in Danda. Have you seen a word, have you heard a word called “Dhakkan”?

Yes.

“Tap”. And “Dhakkan” is also metaphorically used for stupid. Have you heard this word? Right?

“Professor- Student conversation ends”

There are lots of words in bundles with these sounds in Dravidian languages as well. I do not speak Dravidian languages either Telugu or Tamil, so I do not have 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. There are lots of words with the sounds.

Can someone think about that and tell me? Some of the words from Telugu or Tamil or Malayalam with retroflex sound ta, tha, da… 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 knowledge of language.

I am telling you and I I I know that for sure that all Dravidian languages, to be more generic or languages of South Asian part of the world have these sounds and abundance. When we say these sounds and abundance, we mean lots 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 for these from these languages, the languages that you speak.

The fact that you are 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 that, okay.

"Professor- Student conversation starts"

What is the last sound of the word called word Tamil?

La.

When I am saying, and I saying it correct when I Tamil?

No.

Tamil.

No.

Say this thing, so when I am saying is, I am not saying it correct. What is that sound?

Double t.

"Professor – student conversation ends"

That sound is also a retroflex sound which is not in this list, but that is also a retroflex sound. Say it for yourself and then see if this is happening or not. Whether, there may be different place of articulation, where the tongue is rolling back or not, that is a retroflex sound. Say that, there could be many more many more, our languages are full of them.

That that is the point I am trying to make, tongue curls back, hit the flap that is Alveolar ridge and then comes back. These 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 track is conditioned with the sounds of English or for that matter some other language are going to have difficulty with these sounds just like we have difficulty with some of the sounds of English namely this one, the sound "ta" in Tennis is not as "ta". We say, let me let me say it let me say that same word twice and then see if I am making the difference or not.

"Professor- Student conversation starts"

Tennis tennis tennis tennis, and I am saying the first sound differently in when I am doing it twice? What is the difference? Any idea? Not necessarily you have to answer this question, I know the answer to this this.

Tongue is flexing much in the case of first one.

Flexing much meaning?

It is not bending much.

It is not binding much, in fact that that is correct.

"Professor – student conversation ends"

In fact, when we say these sounds of English including the sound in table, 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, right? However, the way… I am going to describe it first and then I 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, the tip of the tongue goes in between these 2 places, look at this now. See, Alveolar ridge is here and upper teeth, it stays somewhere in the middle here. The tip of the tongue just stays somewhere there, "ta ta ta ta". Sometimes, these descriptions are given like the following.

English “ta” is softer, right? You may have heard that there are stereotypical descriptions of Dravidian languages; the 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, and many other languages as well. What they what they really mean is, Dravidian languages have lot of retroflex sound.

Which is lots of words with retroflex sounds. For example, if we are talking about non-Dravidian like these that are Indo-Aryan languages namely Hindi, Udia, Punjabi, Bengali, you have only these 5; ta, tha, da, dha, na and some more, only few of them. However, just now I gave you one example of last sound of the word “Tamil”. That is another one in Tamil and there are more.

Another Dravidian language, Malayalam has few more of Dravidian sounds few more of retroflex sounds compared to Tamil. See the point therefore; sometimes people say such things, which sound stereotypical and at times derogatory, okay. However, the point is these languages have more retroflex sounds. Coming back to English, English does not have any retroflex sound. This is what people mean when they say ta English ta is softer.

The tongue is not supposed to roll back and is this place of articulation in your mind for English ta? Why? So what do you think we are going to call that place? Take you back there again, 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 is called either sometimes it is called alveolar, simply alveolar.

So these sounds of English are called Alveolar sounds, okay. There are more sounds English specific to English, which could be located in this whole vocal apparatus. There are some found 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 right, so it is not possible that we have some sounds and that is not in English.

I I am telling you about retroflex sounds that these sounds 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 language is too. I am going to show you some of them as well. Is this place of articulation thing clear to everybody?

“Professor- Student conversation starts”

Do you understand when I say these things are not retroflex sounds? Clear?

(())(21:13)

Sorry

(())(213:15)

“Professor- Student conversation ends”

Yes keep the 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 upper teeth that is, upper part of the upper teeth, that is the place of articulation for that. 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, say that. In the second one, what I am doing is it is getting rolled back. Now a word of caution here as a foot note if I end up saying or if you end up saying table and not table, table.

“Professor- Student conversation starts”

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?

Conditioning.

Conditioning is the keyword.

“Professor – student conversation ends”

When we were growing up, we were growing up with these sounds, with these languages, we are not growing up sounds, these languages. Our genetic 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 conditions with these 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 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, right. When we say table, table, we do not say table. What I mean is, it is not it does not become dental. What if it becomes is retroflex. That is the only difference and it is not a deficiency because of conditioning and it is not a problem.

If if I do not sound like English speakers that is not a problem that is because I am not supposed to be doing that. Okay, it is it is like saying I do not look like someone, what is the problem in that? And these conditioning, trust me is live 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 you have to relocate the child in 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 even about if someone points it out to you that are difficulties 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 saying this thing, not because I want to be politically correct, I would not repeat this thing again. I am saying this thing after showing you technical aspects of these things, okay. And this is the answer to these questions.

You may have heard about some training programs, I see things written on the road, come and learn English in 2 months, right. And then I have also heard about some training programs, where they where some schools give training where you start sounding like Americans. There are some schools of that type; I do not know what they do there. I do not know whether they some vaccines or what happens, I really do not understand.

I am trust me, I am not trying sarcastic about them, but knowing what we know about language acquisition, how conditioning works, mechanism of sound production of any language and how we speak, what we speak, such things are not possible. For 5 minutes, I can also say that or if at all you get some training for 5 minutes or if you have done good training, maybe you can do it for 10 minutes, but that is all about it.

It is called hyper collection, okay. That is all about it. The moment you leave that thing, you are going to come back to your normal self. When I am talking about language, that is study of language, I am talking about spoken language in normal self, okay. So I would be saying this thing for you twice or maybe 4 times that this is not “ta”, this is “ta”.

But trust me, when I speaking fluently either Hindi or English, I may be saying the same thing, “ta” as in table, “ta” as in top. Sat say this thing. Can we move ahead now? Okay. So That that is about one, that that is the story of retroflex sounds and it is little bit overlapped with some of the sounds in English and the difference between retroflex sounds, which come from Alveolar ridge and alveolar sound, which comes from alveolar itself.

Curling the tongue back backward and not curling the tongue backward, the differences are these. Get it? Alright, rest of the sounds we have we have already discussed. Have we? And you have seen how aspiration and voicing, do we talk about this or not? We talked about that. Aspiration and voicing are going to give unique feature to these sounds. Many of you know artificial languages, right. Many of you have done courses in artificial languages.

“Professor- Student conversation starts”

What is the most unique feature of artificial language? Java, C+

Semicolon.

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 + -, does this make sense? No? Do you do you see the use of 0 1 in artificial languages?

As in, we do not actually them, but we convert into another language.

“Professor – student conversation ends”

That is the problem, most of the time when you are these things; you are working with the compiler. When those things are written, artificial languages are primarily based on binary coding. Am I right? 0 or 1, same thing could be with + or -. One of that comes from the binary features of natural language. How does sound in natural language gets uniqueness?

It gets uniqueness 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 feature. The

distinctive feature of each of these sounds get only when we look at plus aspiration minus voicing. You see this top things, so 0 1 application of 0 1 in binary coding of artificial language is coming from here.

And important thing is, to you need binary coding to give uniqueness. I do not know how artificial language is thought to you, because to speak artificial language you do not even need to talk about this thing. But I am taking you somewhere else that where are those things coming from? The moment we say artificial language, it has to do something with natural language.

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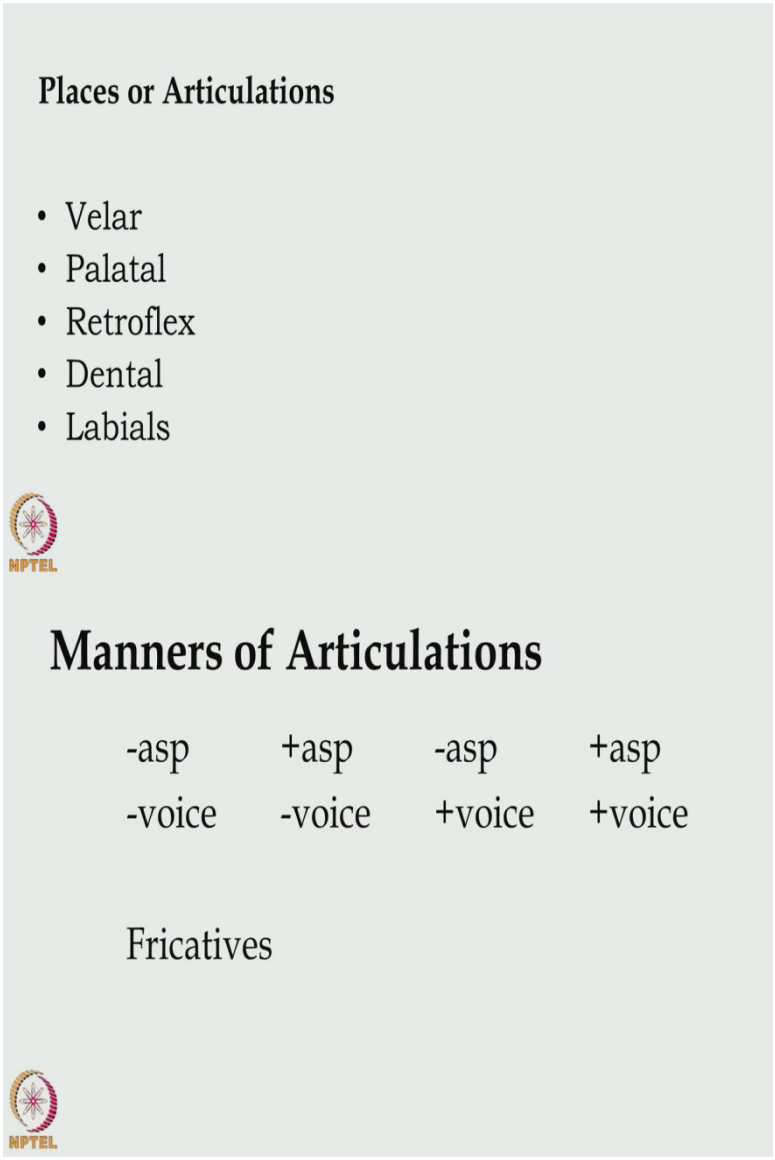

One of the things that come to artificial language is from here, alright okay. With this we can move ahead, we have looked at these places of articulations in details and these manners

of articulation in details. There is one more part which I want to talk to you, one more types of sounds and they are fricative sounds, okay. Now let me show you some of the words and with those words we can talk about some of such sounds.

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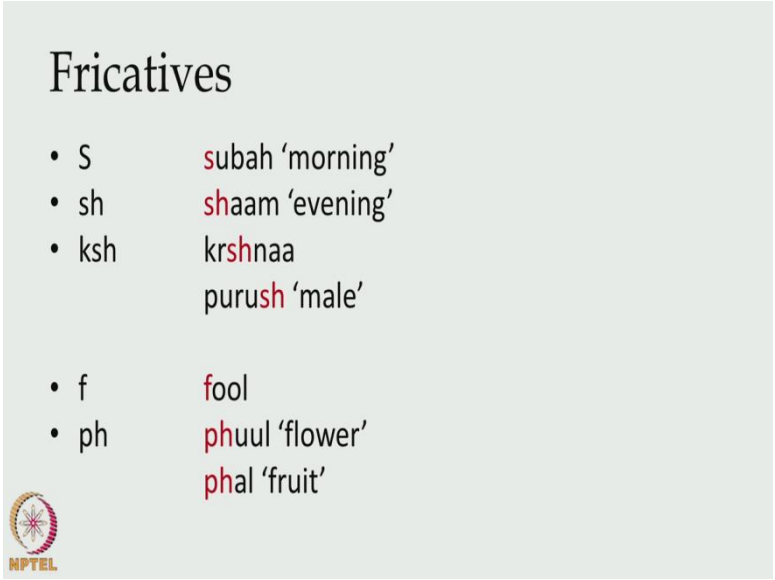

The sound "sa" in a word like "subah" or a sound "sha" in a word like "shaam".

"Professor- Student conversation starts"

Do you see the difference between these 2 "sha" "sa" and "sha".

Tongue is making this difference.

Tongue is making this difference. Let us be more precise.

(())(32:42)

Of what?

(())(32:43)

Okay, hold down.

First of all, when we "sa, sa" the first one, what is the place of articulation before we look at tongue? "sa" place of articulation? Because these 2 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?

Front.

Front fine. Where exactly in front?

Tip of the tongue.

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

Teeth.

Float.

Sorry.

Float.

It stays it stays floating, but towards which side?

Towards teeth.

Towards these sounds first one is dental. Just for that, and then tip of the tongue, what does it do to the teeth? Does it go in between or does it touch it brush it, right "sa sa". And then what is going on with the flow of air?

It is coming.

"Professor – student conversation ends"

It comes and it fasts. Because of that fast flow, more flow and tip of the tongue and teeth, this sound is called dental fricative dental fricative. It is important particularly to know this because if we say this is a dental sound, you have seen the dental row, do you see that here? No. So if it is a dental sound, then 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 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 it is not talking about the manner of articulation, which is closed to what we say fricative here. 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 alphabet writing system or anything, chart is not important for us. See the next one “shaam”, what is the place of articulation for that? That is if tongue is involved, you have seen so far most of the sounds that we have discussed, tongue is involved in somewhere or the other everywhere, right.

“Professor- Student conversation starts”

What is done going to which place?

Palate.

Palate, right? Palate, and what it is doing, sure, so this is a palatal sound. Then what is and again you see, this is not in that list of palatal sound, right. This is not in the list of palatal sounds. So if this is a palatal sound, what else is happening with tongue? “sha sha” try little harder, it should not be very difficult.

Tongue makes a U curve.

See it again.

Tongue makes U.

U type of shape.

Yes.

“Professor – student conversation ends”

Correctly if I am describing what you are saying as U type. The site blades of 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 there are couple of other names given to this type of sound, which are not important for us right now, get this thing? That is, “sha” and “sa”.

So when these sounds are classified, they are classified on different basis. The last one something like, I do not know how to say that. When we say words like “Purush” right .

“Professor- Student conversation starts”

Somebody who speaks Hindi, Punjabi or Marathi? How do we say that?

“Purush”

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 Nagari writing system? Some of you? Bear with me, I will just take one example from there to indicate something. So I am talking about this kind of thing, which is this. Am I right? Then we this which is this , which is the second one here. And then I am talking about something like this right, which is the third one.

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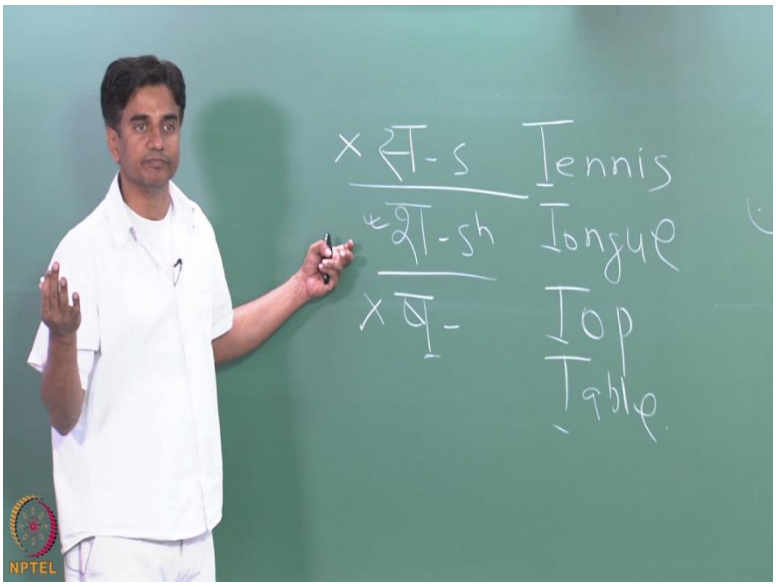

Third one is “Purush”.

Third one is this, right. So this is the writing system, this is the symbol for that sound, get it. Symbol for that sound. Now when we say the word “Purush” right, do not bring the picture of the word written word in your mind. Tell me, how this word sounds? To be more precise, how the last sound “sha” sounds.

It is extended and “sha”.

It is?

Extended extended version of “sha”. It is more harder “sha”.

Now, 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?

This is softer.

“Professor- Student conversation end”

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 see this, they end up saying this one because this sound is almost lost in Indo-Aryan languages. If we take example of Hindi or Marathi, we are whenever we want to see this, we actually end up saying this.

So in spoken language, this is almost lost. However, this is not gone from writing system, which is another way of saying, written language change very slow, written languages change very slow. Sometimes it does not needs 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 foot note I can tell you. In some languages in some languages namely Bangla, this also do 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 in the lighter way in people can use these things for fun.

However, these are not funny things in nature. These are exclusively dependent on conditioning of vocal tracked, okay. On other hand, some languages does 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 to 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 “saam” instead of “shaam” and it is not their fault either. It is just that it is an output of conditioning, okay. If someone wants to say this thing “Subah”, probably a Bangla speaker would end up saying “Shubah”. Just listen to them carefully and you would get this thing and this is lost. However, this is not lost in Dravidian languages.

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

Expenses simply means, human mind works with economy, there is a some there is a principle always under operation in human mind, which is called 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 few words when you are going to find this sound retroflex "sha", it is going to remove it and merge in favor of the existing on which is very close, that is called economy of principle, which is under operation by human mind. So and this is an answer to the loss, we describe this that something has lost, right.

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 travelling and they forgot it somewhere, it has disappeared. What could be compelling motivation for that disappearance? We are talking about language, there has to be something compelling and compelling motivation for that loss is ongoing principle under operation principle of economy in human mind.

See this thing, because of abundance of retroflex sounds, such loss is not visible in Dravidian languages, get it. So these are the important things to keep in mind while we understand sounds and its structure, alright. One more sound and then we stop. We have, we often find a sound called "fa" right.

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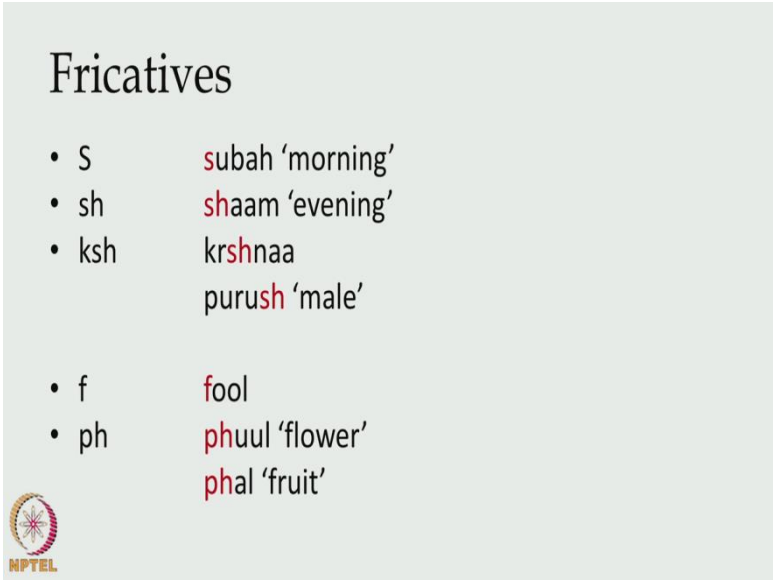

Please read the words mentioned here. I am going to have to spend few more minutes on this thing, which we do which I do on Monday, okay. But I just want to introduce this to you.

When we say a word like “fool” right and a word like “Phool” do you hear the difference between the two “fool” and “Phool”.

“Professor- Student conversation starts”

What is the difference? You can see the difference

Both the lips are touching.

Lips touching, both the lips touching in which one?

Phool.

“Professor – student conversation ends”

“Pha” right, that is because this is a bilabial sound. Both the lips must touch. Now the next one is, the first one is “fa”, where lips are not touching each other “fa” now this sound “fa” the first one is not in abundance in our languages and the 2nd one “pha pha” 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 2 words are completely different things because of the first sound of these 2 words. Are you with me? See the difference between the 2 sounds? Now, what is the place of articulation? We already know the place of articulation for “pha” in the word “Phool” or “pha” in the word “phal” has these 2 words “Phal” and “Phool”, we know the place of articulation of these 2 sounds.

“Professor- Student conversation starts”

What is the place of what relation of “fa”? Clearly both the lips are not touching, so where is the place of articulation for that?

Upper teeth.

Upper teeth or lower lip.

“fa” right Upper teeth and lower lip. So what do we call it? And that is that is going to be another place of articulation, another type of sound in this vocal apparatus, right. So lower lips and upper teeth. So what will be the sound?

(())(43:17)

“Professor- Student conversation end”

Simple, lips and teeth, labiodental that is called labiodentals, I am sorry I should not have expected that term from you, labiodental, right. And again what about the flow of air? Is it too much on like “ka”?

Too much.

Too much.

Therefore, it is classified as fricative, “fa” is labiodental fricative, see this thing. Now “fa” is not in not in abundance in our language there are there are few more which I discuss with you on Monday and then we will close this part on this part of discussion on sound and then we go to the go to word formation processes, where we see application of these things in words. Okay, and possible constraints on word formation. Thank you.