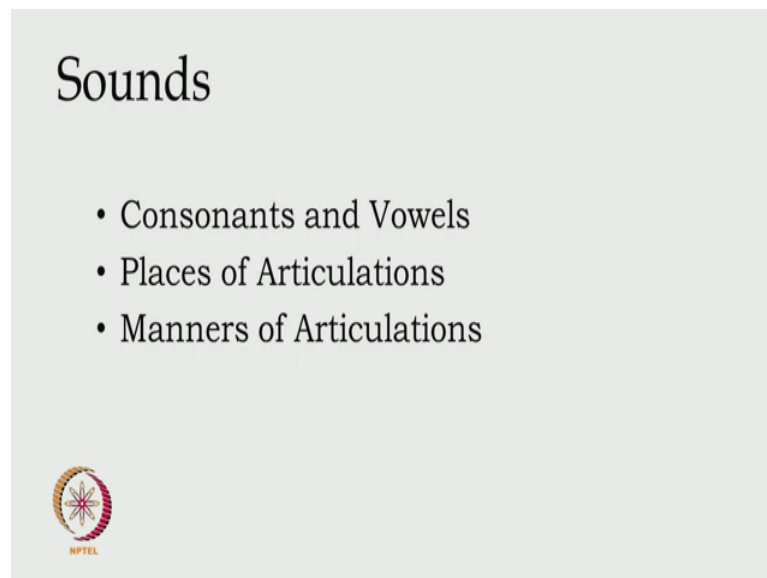


Principles and Parameters in Natural Language
Prof. Rajesh Kumar
Department of Humanities and Social Sciences
Indian Institute of Technology, Madras

Lecture - 11
Places and Manners of Articulation


We will continue talking about sounds.

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Sounds

- Consonants and Vowels
- Places of Articulations
- Manners of Articulations




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.

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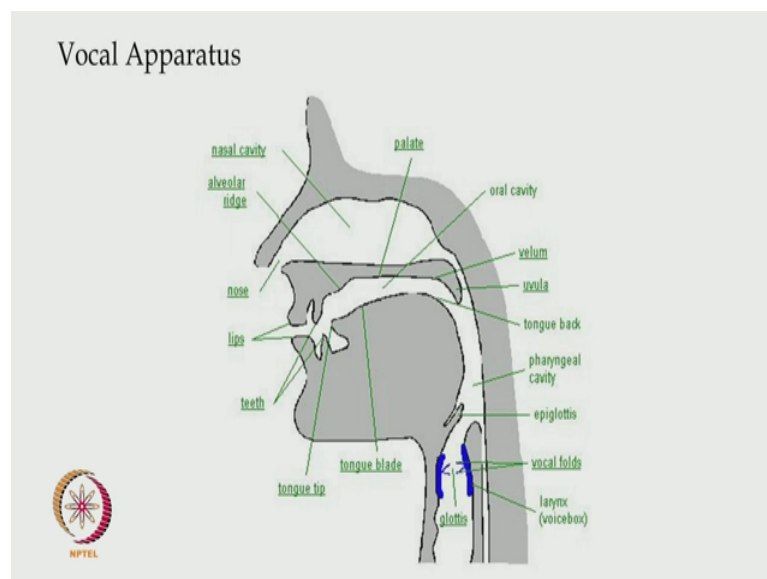
Vowels

	Short	Long
Back	a	aa
Mid	i	ii
Front	u	uu




While looking at manners 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 they could either be a short vowel and a long counterpart of that, where short and long a relative duration of their production. And according to places of articulations, vowels are either back vowel mid vowel or front vowel. And again this back mid and front is a sort of organization is on the basis of the direction of flow of air which is exhaling air. That this is 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 right.

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	<i>Oral Sounds</i>				<i>Nasal Sounds</i>
	-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 articulations that I just mentioned to you and then we saw that merely identifying place of articulation is not enough for understanding of sounds because, from each place of articulation we have see various different sounds. And then we have to have more things to describe these sounds and then once we look at this 2 more features such as, aspiration which is extra little bit extra flow of air and voicing which means vibration in vocal cord by putting these 2 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 of such sounds; however, very 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 look at sounds like [FL] right, has a specific place of articulation [FL] is significantly different from [FL] can you hear the difference between the 2 when I say [FL] and [FL] that is a significant difference between the 2 the place of articulation for [FL] 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 the sounds. However, the place of articulation for [FL] is different from teeth which is what?

Student: Alveolar ridge.

Alveolar ridge right, so again looking at this picture teeth these are our teeth see this and I want to draw your attention here beginning from here, this 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. So, if you have to explain alveolar ridge to somebody what will you do?

Student: The 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 nice term roof of the mouth, but more specifically how will you describe that? Should be should not be difficult.

Student: Roof of the mouth adjoining teeth.

Roof adjoining teeth good; so the muscular area where upper teeth are in fixed and 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. There is a reason why I am talking about that and the I bring you to that point in a moment. So, it is clear alveolar ridge is the 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 [FL] say it for yourself [FL] because all of us being speakers of our languages that is languages spoken in South Asia, we can say these sounds several other like speakers of Arabic or English may not be able to say this this sound.

Why we will look at that, but can you tell me about the position of lip, 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 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 it with the tongue?

Student: Is bending backwards.

Bending backwards can you can many of you say this [FL]

Student: [FL].

[FL].

Student: [FL].

See this thing, can you give me some words where you see this sound [FL].

Student: Tennis.

No.

Student: Tongue. .

I come back to tennis in a minute.

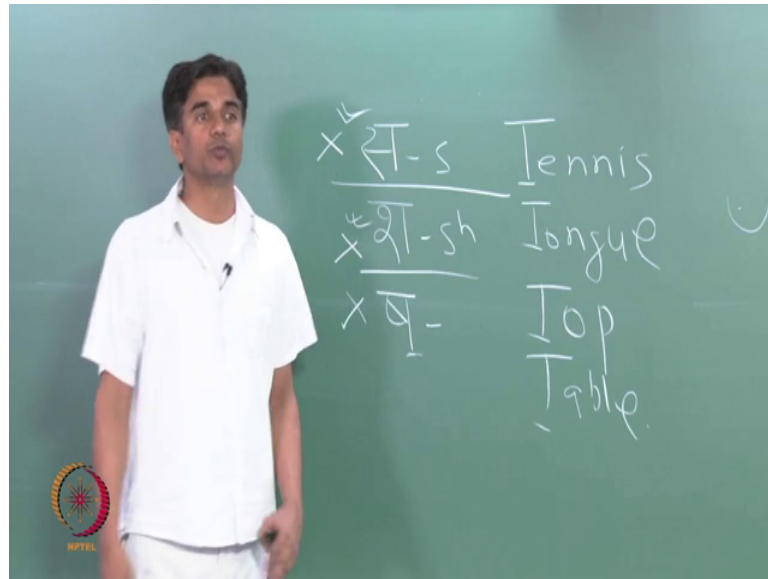
Student: Tongue.

No.

Student: (Refer Time: 08:20).

No, so?

(Refer Slide Time: 08:22)



Is this the spelling of tennis?

Student: Yes sir.

Or.

Student: (Refer Time: 08:41).

My point is I am glad you gave these examples I was going to give you these examples right away, when he was talking about these sounds they are not sounds from alveolar; however, when we say I mean speakers of South Asian languages, we do make it sound like them what do I mean by this difference by when I say we make it sound like them I am going to tell you in a moment, but that 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 alveolar ridge and I am going to tell you about that place of articulation also in a moment. We are talking about sounds [FL] right, so give us some more words where you find that I can give you a clue.

Student: (Refer Time: 09:43).

Give me a word from our languages.

Student: Tomato.

[FL] means.

Student: Tomato

(Refer Time: 09:52).

More have you heard a word called tum tum?

Student: Yes.

Yes know.

Student: (Refer Time: 10:04).

Some of you [FL] is a horse carriage have you seen a horse carriage where did you see that.

Student: Movies.

Movies not in real life not yet see how far we have moved. So, [FL] is a horse carriage right that is a word for horse carriage more words with [FL], have you heard a word called [FL] cheat [FL] right have you heard a word called [FL].

Student: Do not know.

No [FL] no that is [FL].

Student: [FL] means a stick.

Stick these are the sounds [FL] in [FL] in [FL] and [FL] in [FL] have you seen a have you heard a word called [FL].

Student: Tap sir.

Tap and [FL] is also metaphorically used for stupid, but have you have you heard this word right, 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 with these sounds right. Can someone think about that and tell me some of the

words from Telugu or Tamil or Malayalam with retroflex sounds [FL] no or are you is 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 know that for sure that all the Dravidian languages to be more generic all languages of South Asian part of the world have these sounds in abundance. When we say these sounds in abundance we mean 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, what is the last sound of the word called word Tamil.

Student: [FL].

When I am saying am I saying it correct when I say Tamil.

Student: No.

Tamil.

Student: No.

See this thing. So, when I am saying it I am not saying, it correct what is that sound.

Student: (Refer Time: 13:36).

That sound is a 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 a different place of articulation where the tongue is rolling back or not, that is the retroflex sound. See the see that there could be many more what 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 these 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, are going to have difficulty

with these sounds. Just like we have difficulty with some of the sounds of English, namely this 1 the sound [FL] in tennis is not as [FL] we say let me say that same word twice and then see if I am making the difference or not tennis, I saying the first sound differently in 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 that.

Student: (Refer Time: 15:36).

This?

Student: Flexing in the case of first.

Flexing much meaning?

Student: It is not bending much.

Student: (Refer Time: 15:43).

In fact, 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 right; 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, the tip of the tongue goes in between these 2 places look at this now; see alveolar ridge here and upper teeth it stays somewhere in the middle here, the tip of the tongue just stays somewhere there [FL] sometimes these descriptions are given like the following. English [FL] is softer right you may have heard there are a stereotypical descriptions of Dravidian languages.

The Dravidian languages are very hard have you heard this thing? Some of you must have heard these thing I hear this every time many other is stereotypical descriptions of not, just Dravidian languages many other languages as well. what they were really mean Dravidian languages have lot of retroflex sounds, which is lot of words with retroflex sounds 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 [FL] and it some

more only few of them. However, just now I gave you an example of the last sound of the word Tamil, that is another l in Tamil and there are more.

Another Dravidian language Malayalam has few more Dravidian sound, few more of 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 does not have any retroflex sound this is what people mean when they say [FL] English ta is softer, the tongue is not supposed to roll back and is this place of articulation in your mind for English [FL] right. So, what do you think we are going to call that place?

Student: (Refer Time: 19:31).

Take you back there again, if the other place was alveolar ridge right and the previous l 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, there are more sounds in English specific to English which could be located in these 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 right. So, it is not possible that we have some sounds and that is not in English, I am telling you about retroflex sounds that these sounds are not there in English.

So, this is part of the list which are 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 in this place of articulation think clear do you everybody, do you understand now when I said these things are not retroflex sounds clear I think.

Student: Can you (Refer Time: 21:16).

Sorry.

Student: Can you pronounce that 4 words.

Say 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, see that in the second ones what I am doing is it is getting rolled back now avoid of caution here as a footnote, if I end up saying or if you end up saying tip not 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 it is not deficiency.

Student: Conditioning (Refer Time: 22:28).

Conditioning is the key word, when we were growing up with these sounds with these languages we are not growing up with sounds these languages, our generative apparatus that is in our human 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, what conditioned with these the sounds that we have. Later on we add 1 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 right, when we say table we do not say table, what I mean it is not it does not become dental, what 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 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.

It is like saying I do not look like someone what is the problem in that and these 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 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 therefore, I should not be at all bothered even about if someone points it out to you, that is difficulties of English particularly in terms of pronunciation.

Keep speaking the way you do it is not a problem for 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 would not repeat this thing again I am saying this thing after showing you technical aspects of these things and this is the answer to these questions. You may have heard about some training programs I see things written on roads come and learn English in 2 months right and then I have also heard about some training programs, where they were some schools give training where you start sounding like American's, there are some schools of that type I do not know what they do there.

I do not know whether they have some vaccines or what happens I really do not understand, trust me I am not trying to be 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 is called hyper correction 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; so I could be saying this thing for you twice or if maybe 4 times.

That this is not ta this is [FL], but trust me when I am speaking fluently either Hindi or English, I may be saying the same thing [FL] as in table [FL] as in top, see this thing can we move at now. So, that that is about one that is the story of retroflex sounds and it is little bit overlap with some of the sounds in English and the difference between retroflex sounds which come from alveolar ridge and alveolar sounds which come from alveolar itself, curling the tongue back backward and not curling the tongue backward the differences are these get it. Rest of the sounds we have we have already discussed have we and you have seen how aspiration and voicing did we did 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, what is the most unique feature of artificial language java c plus.

Student: Semi column.

More unique no, if I say binary does this make any.

Student: (Refer Time: 29:09).

Difference to the use of binary symbols in artificial language, either those binary symbols could be either 0 1 or in terms of plus minus did this make sense no do you do you see the use of 0 1 in artificial languages.

Student: As if we do not know actually use that compare this converter to that.


No that is the problem most of the time what when you are doing these things, now you are working with a compiler when those things are written they are artificial languages, are primarily based on binaries coding am I right 0 or one same thing could be with plus or minus, 1 of that comes from the binary features of natural language. How does a sound in natural language gets uniqueness it gets uniqueness only when you look at it is 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 this top things, this thing. 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 was taught to you because to teach artificial languages you do not even need to talk about, 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 1 of the things, that come to binary come to artificial language is from here all right. With this we can move ahead.

(Refer Slide Time: 31:39)

Places of Articulations

- Velar
- Palatal
- Retroflex
- Dental
- Labials




We have looked at these places of articulations in details and these manners of articulations in details there is one more part which I want to talk to you one more types of sounds and they are fricative sounds.

(Refer Slide Time: 32:01)

Manners of Articulations

-asp	+asp	-asp	+asp
-voice	-voice	+voice	+voice

Fricatives



Fricatives

- s subah 'morning'
- sh shaam 'evening'
- ksh krshnaa
 purush 'male'

- f fool
- ph phuul 'flower'
- phal 'fruit'



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 [FL] or a sound [FL] in a word like [FL] do you see the difference between these 2 [FL] to and [FL].

Student: Tongue is making (Refer Time: 32:42).

Tongue is making this difference let is be more precise.

Student: (Refer Time: 32:45).

Of what?

Student: (Refer Time: 32:48).

First of all when we say the first 1 what is the place of articulation before we look at tongue, 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.

Student: (Refer Time: 33:20).

So, is it located in the front or back?

Student: Front.

Front fine where exactly in front.

Student: Tip of the tongue.

That is not a place tip of the tongue is involved in that, but where does the tip of the tongue go.

Student: (Refer Time: 33:37).

Teeth does it sorry.

Student: (Refer Time: 33:40).

It stays it stays floating, but the words which side.

Student: Lower teeth.

Teeth of towards teeth these sounds, first one is dental just for that and then tip of the tongue what does it do to that teeth does it go in between or does it.

Student: Brush.

Touch it brush it right [FL] and then what is going on with the flow of air.

Student: Air comes.

It comes.

Student: Fast.

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 the dental sound, you have seen the dental row do you see them here do you see that here no, 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, see 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 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 it is 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.

The chart is not important for us see the next one [FL], what is the place of articulation for that is if lip sorry if tongue is involved you have seen so far the most of the sounds that we have discussed tongue is involved in some way or the other everywhere right, what is tongue doing to which place.

Student: Palate.

Palate right and what is it doing sure. So, this is a palatal sound then what is and again you see this is not in that list of palatal sounds right. So, if this is a bilateral sound what else is happening with tongue [FL] try little harder soon to be very difficult?

Student: (Refer Time: 37:00).

Say it again.

Student: (Refer Time: 37:01).

U type of shape.

Student: (Refer Time: 37:04).

So, what correct me if I am describing what you are saying as u type, the 2 side blades of tongue are touching to palate and then that does it is making it is shape like this and the flow of air is through that. So, this sound is called palatal fricative.

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 [FL] and s. So, when these sounds are classified they are classified on a different basis, the last 1 something like I i do not know how to say that when we say a word like [FL] right, somebody who is speaks Hindi Punjabi or Marathi .

Student: (Refer Time: 38.25).

How do we say that?

Student: [FL].

Which 1 is that when you are saying that there is 1 thing which I did not put here, how many of you are familiar with Nagari rewriting system? Some of you. So, bear with me I will just take 1 example from there to indicate something. So, we I am talking about this kind of thing which is this am I right then we have this.

Student: (Refer Time: 38:50).

Which is this.

Student: (Refer Time: 38:53).

Which is the second one here and then I am talking about something like this right which is the third one.

Student: (Refer Time: 39:13).

Third one is this right. So, this is a writing system this is a symbol for that sound get it, now when we say the word [FL] 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 [FL] sounds.

Student: (Refer Time: 39:40) and already (Refer Time: 39:42).

It is.

Student: Expanded by the [FL].

No do not tell me that what I am saying is you are right it is high there, but are you able to say that or when I say [FL] do I sound like this.

Student: (Refer Time: 40:10).

Actually every time we say this sound by way I mean here speakers of non-Dravidian languages that is speakers of indo Aryan languages particularly say when they wanted to say 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 say this we actually end up saying this.

So, in a spoken language this is almost lost. However, this has not gone from writing system, which is another way of saying written language change very slow or sometimes it does not need to, there are 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 in some languages namely Bengal, this also does not exist if they wanted to say this 1 they would end up saying this, 1 now these are the things which help people make stereotypes, but trust me these are not I mean in 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 tract, on other hand some languages does not have this one they only have this one. For example, languages is spoken in eastern UP or nor sorry not east eastern UP and western Bihar or for that matter entire Bihar to all the way to Assam, they do not have this one.

So, if I say a speaker of Hindi from Bihar would say [FL] instead of [FL] and that is not their fault either it is just that it is an output of conditioning. If someone wants to say this thing [FL] probably a Bangladesh speaker would end up saying [FL], just listen to them carefully you will get these things and this is lost. However, this is not lost Dravidian languages, this is intact in Dravidian languages because this is a retroflex [FL] retroflex [FL].

Sometimes ago probably this was available in Hindi also through Sanskrit. Now it is lost Dravidian languages have not lost it because the video languages have more retroflex sounds. So, it is not too expensive quote and quote for them to retain this 1; however, for indo Aryan languages it is too expensive to retain, again expensive under quotes expensive 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.

Student: (Refer Time: 44:37).

If there are only few words.

Student: (Refer Time: 44:38).

Where you are going to find this sound retroflex [FL] it is going to remove it and merge in favour of the existing one 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 some we described this that something has lost right. when we say Hindi or other indo Aryan languages have lost 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 under operation principle of economy in human mind, see this thing because of abundance of retroflex sounds such loss is not visible in the Dravidian languages get it.

So, these are the important things to keep in mind while we understand sounds and it is structure all right. one more sound and then we stop we have we often find a sound call ph right, please read that 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, but I just want to introduce this to you, when we say a word like fool right and a word like [FL] do you hear the difference between the 2 fool and pool what is that difference.

Student: (Refer Time: 47:01).

You can you can see that difference.

Student: Lip touching.

Lips touching both the lips touching in which one?

Student: P h.

[FL] right; that is because this is a bilabial sound both the lips must touch. Now the next 1 is the first 1 is [FL] where lips are not touching each other, [FL] now this sound ph the first 1 it is not in abundance in our languages and the second one [FL] where lips are touching is not available in English. So, when we learn a how English word like fool it is highly likely that many of us would end up saying [FL]; however, these 2 words are

completely different things, because of the first sound of these 2 words. Are you with me see the see the difference between the 2 sound, now what is the place of articulation we already know the place of articulation for [FL] in the word [FL] or [FL].

In the word [FL] had these 2 words [FL] and [FL] we know the place of articulation of these 2 sounds, what is the place of articulation of [FL]. Clearly both the lips are not touching. So, where is the place of articulation for that?

Student: upper teeth or a lower lip (Refer Time: 48:46).

[FL] 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 right; so upper teeth sorry lower teeth and Lower lips and Upper teeth. So, what is what will be the sound?

Student: (Refer Time: 49:14).

Simple lips and teeth labiodental that is called labiodentals, I am sorry I should not have expected that term from you, leave you dental right and again what about the flow of air is it too much or like.

Student: Too much.

Too much therefore, it is classified as fricative [FL] is labia dental fricative, see this thing now [FL] 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 sounds. And then we go to the world formation processes, where we see application of these things in words and possible constraints on word formation.

Thank you.