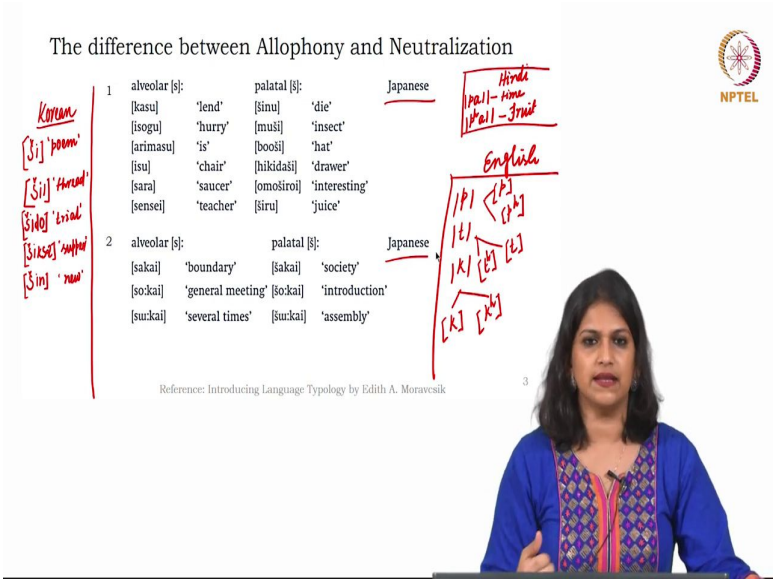
Appreciating Linguistics: A typological approach
Dr. Anindita Sahoo
Department of Humanities and Social Sciences
Indian Institute of Technology, Madras

Lecture - 32
Introduction to Allophones

Hi, hello everyone, welcome to this session of our NPTEL course Appreciating Linguistics: A typological approach. Today we are going to talk about two conceptual terms in Phonology, which are very important to understand the phonological typology, the crosslinguistic generalizations: one is allophony, the other one is neutralization.

Before we move to allophony as a process, let us try to understand what is it derived from. Allophony as a word has been derived from allophone, and if I remember it correctly, I briefly discussed allophones in various languages in the world, and how to understand what an allophone is. Primarily it is a variation of the same phoneme or two different forms related to the same phoneme.

(Refer Slide Time: 01:14)



When that happens, we call it allophones, something like aspirated /p/ and unaspirated /p/. So, /p^h/ and /p/ and /t^h/ and /t/, similarly /k^h/ and /k/. Considering I speak a language which does not have any aspirated version of any sound, it is a little difficult for me, I am not the

right person to give a demonstration. But this is how it is understood when we talk about allophony. The best example I can give, if you ask me what is an allophone in English, we have the /p/, /k/, /t/,, these are the three phones which will have allophonic variations.

Maybe I will just draw it over here. One is the /p/ sound, then the /t/ sound, and then the /k/ sound. /p/ will have one allophone /p/, the other one is /p^h/. Similarly /k/ will have one allophone /k/ and the other one would be /k^h/; /t/ would have one phone /t/ and phone /t^h/. That is how one is aspirated, the other one is unaspirated. Generally the aspirated one occurs in the beginning of the word, the first sound of the word is generally aspirated in English and if it is in the middle or at the end, generally that is unaspirated.

So, when you say teacher and cat, there is going to be a difference. When you say cat, /t/ is unaspirated, but when you say teacher, the /t/ is aspirated In English it works in this way. This process of production of the allophonic variations of the same phoneme would be known as allophony.

We will talk about this process in a while, but before that I would like to tell you if I remember it correctly, I have already discussed a bit about it in some of my sessions. So, in Hindi, this /p/ and /p^h/ which are allophones in English; in Hindi they are not. So, those who know Hindi as a language or if you are native speakers of Hindi, can you tell me the reason why /p/ and /p^h/ are not allophones in let us say in Hindi; but /p/ and /p^h/ are definitely allophones in English.

So, one is spear, the other one is let us say hop. So, when you say hop, you do not have the aspiration on this. But when you say appeal, in that case, the /p/, the first sound is shwa and then /p/ occurs in the middle of the word, it is still /p/, it is still aspirated; so appeal. But you do not really say hop, you do not say that, you say hop. In spear, and hop, that is unaspirated. In spear and hop, that is unaspirated, but in a word like appeal, it is going to be aspirated.

Similar is the case with /t/. I just gave you the example; teacher and a tap and you can say cot. One is the aspirated, the other one is unaspirated. Why do we call them allophones? Because these are the two variants of the same phoneme. If certain languages do not have any aspirated-unaspirated difference, they can use it interchangeably. If a Britisher or a native speaker of American English is going to say teacher, an Indian speaker might say it as

teacher, but the meaning remains the same; it is just the variation or just the variety of the same phoneme.

So, for an Indian like me, who has been speaking Indian English all her life, it is going to be, I would not ever say teacher I would always teacher, because in my speech I do not have the aspirated form of /t/. That is the reason why since we can use it interchangeably, we are going to consider it as allophones. But in Hindi, compare this /p/ and /p^h/ and then do tell me do you feel this is also an allophonic distribution in case of Hindi? I am sure you would find it, no..

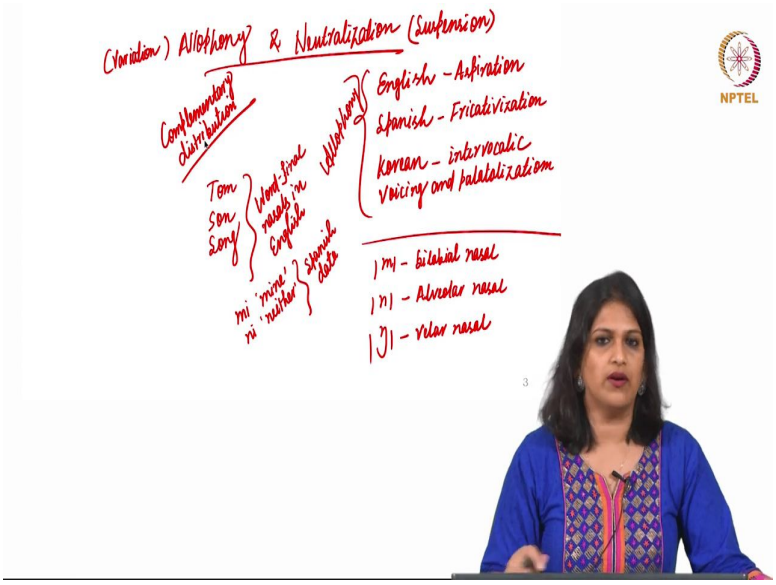
I am giving you an example here. I am writing this, the first word I will write is this, and then the second word I would write is this. This phal [FL] or something like that [FL] [FL] something like that [FL]; so the memories of time to time.

This one is related to time, and this p^hal is fruit. Since the meanings are different, when /p/ is replaced by /p^h/, that is the reason why we would say /p/. /p/ and /p^h/ are not allophones in Hindi. Is it clear? Could you understand? But the same thing can be considered as allophonic variations in English, but this is not going to be considered as allophonic variation in let us say, Hindi. Hindi and English behave differently.

So, typologically taking into account allophony as a tool to understand this process, we would understand that Hindi belongs to a different type and English belongs to a different type. This typological difference can also be identified phenomena like neutralization. Allophony and neutralization are the two two linguistic tools that we have in hand to identify language types, plus we can also figure out the crosslinguistic generalizations, that we can draw as far as these two phenomena are concerned.

So, what are we going to do now? We will just have a look at how we need to understand allophony and neutralization from a typological understanding.

(Refer Slide Time: 09:20)



We are going to understand these two terms in phonology, one is allophony; and the second term that we are going to understand is neutralization. There is some kind of overlapping in the meaning of these two.

We just realized, in English we have these aspirated and non-aspirated versions of the same phoneme. The aspirated and non-aspirated versions are known as allophones. So, in English it is aspiration, in Spanish it is fricativization, and in Korean it is intervocalic voicing and palatalization, so remember this. How does allophony work in different languages of the world? We have English, then we have Spanish and third we have Korean. In English, aspiration is the process which leads to allophones; in Spanish fricativization is the process which leads to fricativization. It is the process which leads to allophony and on the other hand, we have Korean, where there is intervocalic voicing and palatalization. These 3 things lead to allophony.

So, just like in English, you have aspirated and non-aspirated /p/, aspirated and non-aspirated or unaspirated /t/ and /k/ leads to allophony or leads to let us say allophones. Similar is the case with Spanish; fricativization takes place. Let us look at how allophony as a linguistic phenomenon works in the world's languages. There are three different processes involved for three different languages; in English aspiration leads to allophony, in Spanish fricativization leads to allophony and in Korean intervocalic voicing and palatal palatalization leads to allophony,.

We are just focusing on aspiration here, from the English perspective, because we have the English data in hand. Something similar happens at the fricative level in Spanish. Let us say, the fricatives like /f/ and /v/, probably some sounds would be more fricative, some sounds would be less fricative. I am not pretty sure about it, but then maybe we need to find out more about it a little later.

But at least we are sure about one language. The data that we have in hand is English. So, for English we have aspirated /p/, unaspirated /p/; aspirated /p/ sounds like /p^h/ and unaspirated /p/ is anyway /p/. Similar is the case with /t^h/ and /t/; /t^h/ is going to be aspirated and /t/ is going to be unaspirated, clear? This kind of allophonic variation would be an interesting process to study and to understand . Neutralization happens at the nasal level. We have the nasal sounds like /n/, /m/ and /ŋ/.

Some people might argue that /m/ and /n/ sound almost like allophones, because of the place of articulation and the manner of articulation that is concerned. Maybe the manner of articulation is going to be different but where is the place of articulation? It is always going to be nasals. So, /m/ and /n/ are always nasals and the manner of articulation is going to be different.

In case of /m/ sound, this is bilabial and in case of /n/, it is alveolar and when it is /ŋ/, it is going to be at the velar level. So, these are the three things we need to understand what neutralization is. So, we have /m/ then we have /n/ and then we have /ŋ/.

All three of them are nasal sounds. When I say nasal; that means, the place of articulation is the nasal passage. But how do they get their manner? What is the manner of articulation? When it is /m/, /m/ is a mm sound, bilabial, it is not /m/ it is actually mm. This is bilabial nasal. What is nn? So, /n/ is the alveolar nasal and /ŋ/ is the velar nasal. So, bilabial, alveolar and velar, these are the three different kinds of nasal sounds in English. To a layperson it might sound all similar, up to some point, because of the nasal feature that these sounds have.

However, there is an interesting phenomenon happening which is called nasalization. There is a very strong point. Why /m/, /n/ and /ŋ/ would never be considered as allophones in English,

plus Spanish? Some other languages might behave in a different way, but as far as Spanish and English is concerned we need to understand these nasal sounds in a more minute fashion.

What happens in English and Spanish is that, this /m/, /n/ and /ŋ/ sounds always exhibit complementary distribution. When we say complementary distribution, what does it mean? This is an important point for you to understand. Complementary distribution means, if there is /m/, in that position /n/ cannot occur; and if the position is meant for /n/, /ŋ/ cannot occur; and if it is the position meant for /ŋ/ then /m/ or /n/ cannot occur. So, the three nasals /m/, /n/ and /ŋ/ occur word finally, let us say there are three words; one is let us say tom, which is an English word, then we have son, and then we have song.

So, tom, son and song, in this case, what happens the /m/, /n/ and /ŋ/ these are the word final sounds. Look at the first word tom, /m/ is the final sound, son /n/ is the final sound and song /ŋ/ is the final sound. So, in these cases, it is only preceding and obstruent; that the nasals are willing to give up their own place of articulation in favor of the following sounds. So, when it is like the following sound is always /m/, /n/ and /ŋ/.

So what happens, the preceding obstruent that it has, the one that creates the obstruction or the preceding obstruent, in these cases which are the nasals, they are willing to give up their own place of articulation in favor of the following sound. Something similar also happens in Spanish. In Spanish also, these are the English examples. I am writing here word final nasals in English.

Then we will go to the Spanish data. So, what happens in Spanish data, we have /m/ and /n/ sound in Spanish too. /m/ and /n/ are independent phonemes, something like English. Something as you saw in the final position of tom, son and song, you have /m/, /n/ and /ŋ/ sound. In Spanish also, we have two different words one is mi, that means, let us say in mine and ni that is let us say in neither. So, these are the Spanish examples and what happens in these languages? So, in case of the Spanish examples here, where much like English, /m/ and /n/ are also in complementary distribution,.

As we saw in English, there is the word final position in one instance there is /m/, the other instance there is /n/ and the third instance we have /ŋ/; similar is the case with Spanish /m/ and /n/ in the words like mine and neither. So, in their Spanish counterparts, these nasal

sounds occur in complementary distribution. This process of complementary distribution is known as neutralization. I would not say the complementary distribution is neutralization, but rather it is labeled as neutralization or it is known as, it is understood as neutralization.

What happens in such cases, the difference between the bilabial, alveolar, and velar nasal phonemes are said to be neutralized or suspended. Why do we call it neutralized or why do we call it neutralization? Because the velar nasal like /ŋ/, the bilabial nasal like /m/ and then the alveolar nasal like /n/, are suspended in such instances, or they are neutralized in such instances because of the presence of a preceding obstruent.

One obstruent preceding the other obstruent always neutralizes the nasals. This entire process is known as neutralization in phonology, clear? The other thing to add over here is that, why don't the speakers have a choice between the alternative forms of a single phoneme, but rather they have a choice between different phonemes.

Let us say they cannot go by /m/ and /n/ variation here, rather they have to identify another phoneme somewhere. So, /m/ and /n/ or /n/ and /ŋ/ or /m/ and /ŋ/ the three nasals that we have bilabial, alveolar and velar, they cannot occur alternatively, primarily because of the neutralized or the suspended form that they belong to.

What kind of an idea do you get when I talk about allophony and neutralization here? That means, allophony is surely the variation of certain phonemes and neutralization is something where a particular phoneme has been suspended or a particular phoneme has been neutralized because of the preceding obstruent that it has. So, the presence of the preceding obstruent is going to give you some information about the allophony or the neutralization in this particular process or in this phenomenon.

Primarily what I want to highlight here is that, the meaning of neutralization, the moment when you hear about neutralization, it would primarily mean suspension, and allophony means variation. So, variation and suspension; allophony leads to variation and neutralization leads to suspension. What kind of suspension of a nasal sound in case of /m/, /n/ and /ŋ/ sound. Because of this process of suspension, we call it neutralization.

Now, I will show you a set of data so that you can understand what is neutralization, and what is the difference between neutralization and variation. So, here we go. Let me just shift this slide to here and then we have the data here.

Here we have data from Japanese and we have the alveolar sa and then the palatal /s/. So, whether something is an allophonic variation or not, or neutralization. what is the difference between allophony and neutralization can be easily understood from this set of data. Look at the data set number 1. The first set of data is Japanese both are basically from Japanese, but then the first set of data would be the alveolar and then the palatal sounds; the words having alveolar and palatal sounds.

Let us compare to understand the difference between allophony and neutralization. I want you to pay attention to the data given here; compare the Japanese data with the Korean data. The Korean data is in the handwritten form. I have not really put it in the slides.

The handwritten Korean data that we have here; and then the Japanese data set in one, you would see that there is a difference between the two languages. On the surface it looks the same, but then there would be a bit of difference if you study Japanese data in a little more careful manner. First, let us focus on 1 and compare it with Korean. What do we see? At the first instance when you compare Korean with Japanese examples, at the first instance, the two patterns seem to be the same. So, what is the similarity between the 2 patterns, the pattern in Korean and Japanese data in 1? The palatal sibilant preceding /i/ sound and then the alveolar sibilants elsewhere they seem to be in the similar kind of distribution. So, sil, sido, siksa, and then sin,here you have sinu, musi, boosi, and then omosiroi siru.

These kind of the palatal version or the palatal sibilant, that is preceding, which is the preceding /i/ and then the alveolar sibilant elsewhere. When you say elsewhere, you have let us say arimasu and then isu. So, these are also the palatal sibilant /i/ sound; they seem to be behaving in the same manner. Look at the palatal e sound, the palatal sibilant preceding the /i/ sound. So, it is the palatal /s/ sound. Here also the same thing, so, si, sil, sido, siksa, and sin; and here we have sinu, musi, boosi, and hikidasi, which is drawer and then omosiroi which means interesting, siru which means juice. So, in this set, this set of data, the palatal sa sound

when it is preceded by /i/ and then the alveolar sibilants in the other places, they behave almost similarly.

However, when you compare this data with the palatal version, you see that the /i/ sound is missing here. Look at the data given in 2. Here, the palatal fricative is not restricted to occur before /i/. When it is sakai, the palatal fricative does not have any requirement to be or to occur before the /i/ sound. That is the reason why we need to figure out or we need to understand how this kind of allophony and neutralization happens in this language. What we need to understand here is that when you are trying to compare allophony and neutralization; basically in neutralization, one particular sound becomes suspended.

So, what is that suspended sound that you get, when you compare the Japanese data and Korean plus some other data from Japanese as far as the palatal fricatives are concerned? First we saw Korean and Japanese behave almost in a similar manner. How they are behaving in a similar manner? The palatal is always preceded by the /i/ sound. The examples are sinu, musi, cat in the Japanese set; and si, sil, sido, in the Korean set. You see that this particular sound is always preceded by the /i/. However, there are certain instances of palatal /s/; in such cases, it is not mandatory that the palatal /s/ would always precede /i/. There is absolutely no rule about it.

Now, the concern here is that, in case of the difference between the alveolar and the palatal place of articulation is neutralized before /i/ in favor of palatality. Look at the first set of data. This is the alveolar set then it is the palatal set. Look at the second set of data, alveolar set and palatal set. In such cases, what is happening? How should we understand neutralization? In these cases, by showing you the data from Japanese, primarily our concern here is that the difference between alveolar and palatal place of articulation is neutralized. So, in the alveolar /s/ and in the palatal /s/ you see it has been neutralized before the /i/ sound. So, just before the /i/, we see there has been a change, there has been a suspension of a particular sound.

That is what we are going to call neutralization. Difference with an alveolar and palatal place of articulation is neutralized before /i/ in favor of palatality. The alveolar feature is going to be suppressed and then the palatal feature is going to be highlighted; and because of the

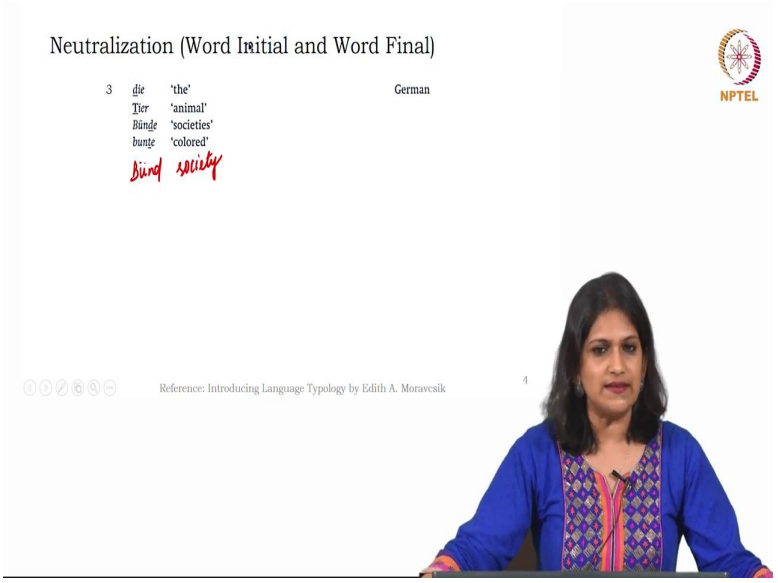
highlighting of the palatal feature, alveolar feature has been suspended or has been neutralized, clear?

However, if you go in maybe you can, you should actually check the Korean data again. There is also the palatal version of Korean. In Korean data, there are no such minimal pairs; the occurrence of /s/ versus /s/ is contextually conditioned throughout the language. They are allophones. Let me go through the Korean data again. In the Korean data, when you say sai, that means, bird; and when you say si palatal /s/ that becomes poam.

That is how we should understand. We are not going to going to talk about Korean much here. Our concern is to understand how allophony and neutralization work. So, that is the concern that we have in hand. At least the Japanese data that we have here, we saw that comparing 1 with 2, the alveolar feature has been suspended or the alveolar feature has been neutralized, rather the palatal feature has been highlighted. And this highlighting of one feature and suspension of the other feature is known as neutralization.

Ccosslinguistically if you ask me the question, whether the neutralization behaves in this way, we have the two different sets of data in hand. In Korean it behaves differently; in Japanese it behaves differently. In Korean the alveolar and the palatal /s/, these are the allophones; but in Japanese more than the allophony, the neutralization feature is going to be more highlighted. So, crosslinguistically the generalization pattern is going to be something different.

(Refer Slide Time: 34:26)



So, now let us see a little more about neutralization. There is another set of data that we have in hand here. We have the German data. So, German data, the /d/ sound, /t/ sound and when it becomes bunde and bunte. So, you see the da and ta has been neutralized in in the words like societies and colored. So, in the and die and and tier I think, I am not a German speaker, so I do not know much about it.

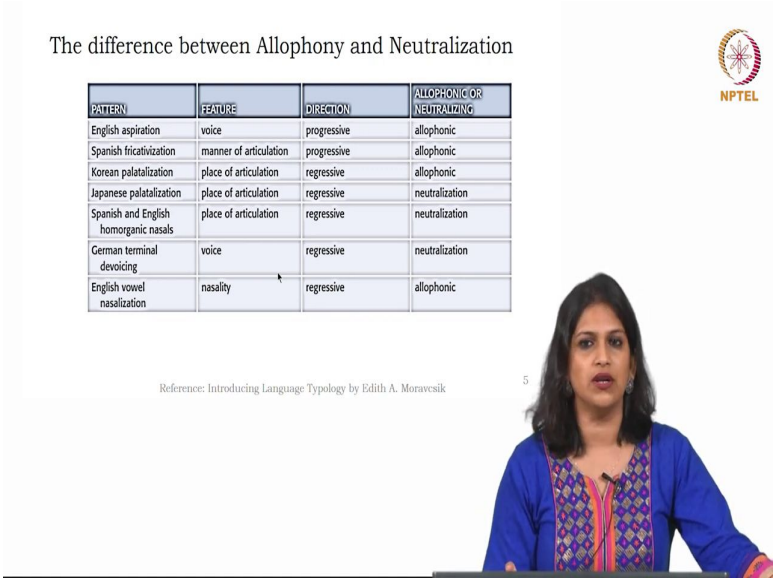
In the German data given over here, the word initial position let me talk about the common neutralization pattern and how in German the alveolar stops in which German has both voiced and voiceless. So, /d/ and /t/ in German, these are the alveolar stops; they have both voiced /d/ and voiced /t/ and voiceless. But if you look at the data given over here, these are two separate phonemes full rights, each can occur in most of the environments.

So, the /d/ and /t/ because of the independent phoneme status that they have, they can be used either in the word initial position or in the word final position. But in the word final position, the word for societies and the word for colored, the story is a bit different and how it is different the /t/ occurs, but /d/ does not.

So, the singular form of societies or I do not know maybe bund or whatever is spelt as b u n d. So, this is the plural form and b u n d is society. So, which one has been neutralized? The

/i/ sound has been neutralized. One of the sounds has been suppressed. That is the German story. Maybe with the /t/ sound it is not, but with the /d/ sound it gets suppressed.

(Refer Slide Time: 36:39)



Then what I will do, I will just give you a tabular structure of neutralization and allophony. So, what we have seen, so far? There are different ways in which sounds take on different shapes depending on the environment. Word medial, word final, and word initial; in most of the cases if it is the word initial, the sounds are aspirated. If there is a difference between aspirated and unaspirated form, something like English or German.

In most of the cases, the word initial one is aspirated. But that is not crosslinguistically true. There are at least instances of German where the word final position is also equally aspirated as we just saw the examples; so the German examples or the German data that I was talking about.

Even at the word final position, you can have the aspiration or the aspirated phoneme; but in most of the cases it is the word initial. However, let us look at the those have the summer like if I want to summarize what I have discussed so far, there are different like there are different sounds in the world's languages which take different shapes depending on their environment; whether as an allophone or as a separate phoneme in a neutralization pattern. So, either it is going to be variation centric, so it will be allophone, or suspension centric which is going to

be neutralization. If one particular sound is suspended, we get the neutralized form; if one particular sound has two different varieties, we get the allophones.

These are the two ways by which the sounds are going to be decided depending on the situation that they are in, or their position in the word or in the phrase. So, all the examples that we have considered so far, the influence of the context was assimilatory and the different shapes that sounds take it actually depends on its surrounding sounds and various types of properties.

So, whether a particular sound is aspirated or unaspirated, is primarily getting decided by its phonemic surrounding. Phonemic surrounding means, it could be either allophonic or it could be neutralizing. There are two different ways by which we can understand the property of a sound. On the basis of the variation, it is going to be aspirated or unaspirated; on the basis of the suspension, it is going to be neutralized or non-neutralized.

Now let us look at the tabular summarized form of allophony and neutralization. Look at the table given here by Edith Moravesik. We have a column for pattern, then there is feature, then there is direction and then we will decide whether it is allophonic or neutralizing depending on the pattern and the feature and the direction. English aspiration is the pattern and what is its feature?

The feature whether it is voiced or voiceless. So, /p/ and /p^h/ whether it is /b/ and /b^h/. I will not consider /b/,, /t/ and /th/. Whether this is going to be voiced or voiceless, that is the feature. So, the pattern is English aspiration, the feature is whether voiced or voiceless, the direction means whether it is progressive or regressive and on the basis of that, we would call it allophonic.

When the pattern is Spanish fricativization; fricativization, what is the feature? The feature is manner of articulation. And the direction is progressive and it is again allophonic. Korean palatalization, I told you there are three things aspiration, fricativization, palatalization; aspiration in English, fricativization in Spanish and palatalization in Korea. In Korean palatalization this is again, place of articulation, the direction is regressive and then it is allophonic. In Japanese palatalization it is place of articulation, regressive and it is neutralization. Spanish and English forget about the homorganic nasal. So, these are a couple

of examples. We have not really discussed through extensive data, but if you look at the book, you can find out more. You can ignore the next three. So, at least we have discussed English, Spanish and Korean.

But in case of homorganic nasals also, in Spanish and English we have discussed already. This is also regressive and the function is neutralization. German terminal voicing you can ignore that, but just remember, the feature is related to voice, direction is regressive and this is neutralization.

And similarly with English vowel nasalization, it is nasality regressive and it is also going to be allophonic. So, this is just a comprehensive table that allophony and neutralization as linguistic processes they have; but we need to focus on the very basic or the rudimentary thing of linguistic variation. Let us consider English data as much as possible; and if you know more about different languages, you can always refer to the book over there.

So, when we are talking about crosslinguistic generalization, you have to find out certain types. And on the basis of certain types of languages that we have in hand, using the linguistic phenomena as the tools to identify the different types of languages, we can draw a crosslinguistic pattern or crosslinguistic generalization. I think we have something like 16 or 17 generalizations; I do not remember the number exactly, gradually we will get to know about it. We have quite a few generalizations phonetic and phonological generalizations in hand, which helps us to understand phonetic typology in more detail.

There would be a lot of more discussions related to different linguistic phenomena and how using these linguistic phenomena as tools we are going to understand the crosslinguistic generalizations in the coming sessions. So, that is about allophony and neutralization today. Gradually we will get to know more about phonetics and phonology.

Thank you.

Keywords: allophony, neutralization, allophonic variation, aspiration, fricativization, palatalization, intervocalic voicing, nasalization, complementary distribution, suspension