

**Course Name: 'Introduction to Pāṇinian Grammar'**  
**Professor Name: Prof. Malhar Arvind Kulkarni**  
**Department Name: Humanities and Social Sciences (HSS)**  
**Institute Name: IIT Bombay**  
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Welcome; I welcome you all, to this lecture in the course Introduction to Pāṇinian grammar. In this course so far we have been studying the process of speech production as described in the Pāṇinian grammatical tradition. We have gone into some details of this process and we have seen how the Pāṇinian grammatical tradition has described. Right from the internal cognitive process up to the external audible speech production in some detail.

Then we were studying the features of these sounds noted down by the Pāṇinian grammatical traditions. We noted that there were quite a few features noted down by the Pāṇinian grammatical tradition. And then we started studying the functions assigned to them by the Pāṇinian grammatical traditions.

One of the functions namely the term *savarṇa* a sign to sounds which have similar features we studied in the previous lecture. In this lecture we shall study the next feature namely the criterion for selection offers substitution as well as substituent. So, we studied the process of speech production by using this source namely Pāṇinīyaśikṣā and the verses that are listed down they are "ātmā buddhyā sametyārthān mano yunkte vivakṣayā manaḥ kāyāgnim āhanti sa prerayati mārutaṁ mārutastūrasī caran mandraṁ janayati svaram sodīrṇo mūrdhnyabhihato vaktramāpadya mārutaḥ varṇān janayate".

Once again the purpose of reciting these verses again and again and again is very clear and very obvious, that you should get more and more familiar with with these verses. And because you have heard them so, many times they should be part of your own understanding so far.

And then there are these stages of speech production that are described in these verses. And we have noted down the stages here we have already studied them in detail they are *ātmā buddhyā sametyārthān* the first *mano yunkte vivakṣayā* the second. And we say that these two they form the cognitive aspect of this particular process which is also termed as the cause and the remaining ones they are the physical or the biological aspects of this particular process. They are also termed as the effects. So, the third stage is *manaḥ kāyāgnim āhanti*, the fourth one is *sa prerayati mārutaṁ*, the fifth one is *mārutastūrasī caran mandraṁ janayati svaram*, the sixth one is *sodīrṇo mūrdhnyabhihato*, the seventh one is *vaktramāpadya mārutaḥ* and finally, *varṇān janayate* when the audible speech is produced. We noted down the first function of the feature namely the term *savarṇa* which is a kind of super feature a sign to the commonality of the features of the sound which allows the grammarian in our case Pāṇini to achieve brevity. By assigning the

terms *savarṇa* the sounds can be further grouped and then one of them can be mentioned in the initial annunciation.

And by a rule let us say 1.1.69 Pāṇini declares that this one sound mentioned in the 14 *pratyāhārasūtra* represents all its homogeneous sounds. In this way Pāṇini achieves the brevity as far as his system is concerned; that was the first function of the features of sounds that we studied in the previous lecture. Now, the second function of these features of sounds this is what we are going to study in this lecture. So, criteria for selection of a substitute in place of a substituent when multiple substitutes get stated by the *pratyāhāra* or other metalinguistic devices this is the function.

This is the second function of these features of sounds. And I repeat criteria for selection of a substitute in place of a substituent; especially when multiple substitutes gets stated by the *pratyāhāra* or other metalinguistic devices. So, criteria for selection of a substituent, in whose place a particular substitute is to be stated this is a similar kind of function which is assigned to these features of sounds.

It is to be noted that the first function is the criteria for selection of a substitute in place of a substituent. And the second function is criteria for selection of a substituent in whose place a particular substitute is to be stated. These are the important functions that we shall study in this lecture.

Obviously these features are based on the explanation of the process the process of speech production; in which the journey of the tongue the position of the tongue can also be explained. Now let us look at the first function stated in the previous slide namely the criterion for selection of a substitute; also known as *āntaratamya-parīkṣā* namely investigation into which sound as a substitute is most similar to the substituent.

So, you take the set of sounds which are stated as the substitute and study each one of them based on the place of articulation and the effort of articulation and so on. And then match and see which sound comes closer to the sound that is to be substituted and then substitute that sound in place of the substituent this is the process that is followed. This is what is meant by *āntaratamya-parīkṣā*. So, for example, sometimes many get stated as substitute in place of a substituent amongst those many that get stated as substitutes by the *pratyāhāra* or for example, by the other metalinguistic devices like *ku cu ṭu tu* and *pu*.

There is one substitute that has to replace the substituent and in order to investigate which one is the closest substitute we need to do this āntaratamya-parīkṣā. And for this the bāhyaprayatna is used as a device by the Pāṇinian grammatical tradition. For the concept of savarṇa the ābhyantaraprayatna as well as the place of articulation sthāna was used.

And now as far as the āntaratamya-parīkṣā is concerned choosing the closest substitute in place of a substituent is concerned the bāhyaprayatna is used by the Pāṇinian grammatical tradition; however, we note that even in such a case the Pāṇinian grammatical tradition keeps using the word savarṇa. So, this is supported by the source.

Let us study the source the source is the celebrated text called Vaiyākaraṇa Siddhānta Kaumudī written by Bhaṭṭojī Dikṣita. And this passage is taken from this text it reads like this, "bāhyaprayatnāśca yadyapi savarṇasaṃjñāyām nopayuktāḥ tathāpi āntaratamyaparīkṣāyām upayujyante". And I repeat, "bāhyaprayatnāśca yadyapi savarṇasaṃjñāyām nopayuktāḥ tathāpi āntaratamyaparīkṣāyām upayujyante". what it means is even if the external effort of articulation is not used for deciding the savarṇa which sounds are homogeneous with which other sounds.

It is still used in the investigation of the most similar of the substitutes; which is the closest substitute in order to decide about this in order to investigate into this the bāhyaprayatna are used extensively by the Pāṇinian grammatical tradition. So, let us take the example 8.4.62 which is jhayo ho anyatarasyām this sūtra consists of three words jhayaḥ which is the 5 slash 1 of jhay, haḥ which is the 6 slash 1 of 'h' the consonant and then anyatarasyām which means optionally.

The word continued from the previous sūtra is pūrvasavarṇa homogeneous with the earlier pūrvasya savarṇaḥ homogeneous with the earlier sound. All these words put together we can say that following is the meaning of this particular sūtra. In place of 'h', the consonant 'h' which comes immediately after a jhay substitute optionally a sound which is homogeneous. Obviously homogeneous to both homogeneous with jhay primarily, but also with 'h'.

Now 8.4.62 says and what it says we have already seen. Now let us put it in the form of an equation and try to explain it. So, if you have jhay plus 'h' if this is the given then substitute 'h' by a sound which is homogeneous with the earlier stated sound that is a jhay. So, this can be represented in the form of an equation in the following manner. So, if you have jhay plus 'h' given applying 8.4.62 now the output would be jhay plus purvasavarṇa of jhay in place of 'h'.

Now, what is jhay? jhay is a pratyāhāra that stands for sounds stated in between the pratyāhārasūtra 8 to 12. If we try to understand what is jhay using the traditional sound inventory

we have to say that jhay stands for all the consonants that come in columns 4, 3, 2 and 1 this is what is jhay? Jhabhañ ghaḍhadhaṣ jabagadadaś khaphachaṭhatacaṭatav and kapay 8 to 12. Consonant 4, 3, 2 and 1 in the traditional sound inventory. So, if 'h' comes immediately after any of these sounds 'h' is to be substituted by the savarṇa of jhay.

Now, the features of savarṇa are the place of articulation. Namely kaṅṭha velum tālu palate mūrdha roof of the oral cavity danta tooth or teeth and oṣṭhau namely the lips. The ābhyantaraprayatna of jhay is sprṣṭa contact touch of the tongue with the place of articulation this is what we have already studied. Now if we look at the features of 'h' we note that the place of articulation of 'h' is kaṅṭha or velum and the ābhyantaraprayatna of 'h' is vivṛta or open the important point is ābhyantaraprayatna of jhay is sprṣṭa and the ābhyantaraprayatna of 'h' is vivṛta.

Now, by 1.1.9 and 10 only those sounds are called savarṇa or homogeneous which have similar sthāna and ābhyantaraprayatna in our case now jhay and 'h' do not share ābhyantaraprayatna at all. Even if there is some similarity of sthāna between 'h' and ku which is part of jhay k kh g and gh they are part of jhay and they share the sthāna with 'h'.

So, even if partially we can say jhay does share the place of articulation with h ok, but definitely all of the jhay they do not share their ābhyantaraprayatna with h the ābhyantaraprayatna of jhay as we saw earlier is sprṣṭa whereas, the ābhyantaraprayatna of h is vivṛta. So, now the question is what is the word savarṇa referring to here?

And the answer is that the word savarṇa refers to the homogeneous sound of jhay. So, if we have say for example, ḍ followed by h, h should be replaced according to 8.4.62 by any savarṇa of ḍ which is jhay. Now there are four choices that we have t th dh and n; obviously, d is also a choice. So, there are four choices t th d and t th dh and n omitting d. Now the question is which one is to be selected amongst these four. This now we shall decide on the basis of the bāhyaprayatna.

This selection should be now based on the basis of bāhyaprayatna. Let us now look at the bāhyaprayatna of h and the bāhyaprayatna of the sounds and then compare and then see which of these four comes closest to h. So, the bāhyaprayatna of h is nāda ghoṣa saṁvāra and mahāprāṇa resonance voice closure and more breath and h is called aspirate. Now all these four features they match with only one of the four choices namely the features of only dh, dh also possesses these four features as bāhyaprayatna namely nāda ghoṣa saṁvāra and mahāprāṇa.

Some features are similar to that of th as well as n. Namely the mahāprāṇa is similar with th and nāda ghoṣa and saṁvāra are the features of n as well, but n is not mahāprāṇa and th even though is mahāprāṇa its features are not nāda ghoṣa and saṁvāra they are śvāsa ghoṣa and vivāra. So, not all features of th and n match with that of h. So, they get eliminated as the choices and so now, there is only one choice that remains and that is dh.

So, for example if you have ḍ which is a jhay followed by h the resultant output after application of 8.4.62 would be d followed by dh. So, h gets substituted by dh. Similarly, if g which is a jhay followed by h then application of 8.4.62 returns the output as g followed by gh is the pūrvasavarṇa of g which is also closest to h.

Similarly if you have j followed by h where j is a jhay then in place of h we get the substitute jh which is the closest to h and also the savarṇa of j. Similarly, if we have ḍ followed by h then in place of h we have ḍh which is the pūrvasavarṇa sound of this ḍ. And lastly if we have b followed by h is to be replaced by bh which is the pūrvasavarṇa of b and also the closest to h; because the bāhyaprayatna of all these five sounds dh gh jh ḍh and bh they are the closest amongst the substitutes available to h namely nāda saṁvāra and ghoṣa and also mahāprāṇa.

All these five sounds have these features have these bāhyaprayatna. So, if we look at the concrete example here are the examples. So, if we have a compound like pad followed by hati in which here we have the similar situation described in the left hand side we have d followed by h. So, now, we apply 8.4.62 and substitute h by dh and we get the word paddhati.

Similarly if we have vāg followed by hāra also a compound we have the condition namely g followed by h. So, we apply 8.4.62 and so, we get h substituted by the pūrvasavarṇa of g namely gh. So, we get the form vagghāra. Next we have aj followed by a hal where we have j as a jhay followed by h. So, we apply 8.4.62 and substitute h by the pūrvasavarṇa of j. And so, that pūrvasavarṇa is jh which is the closest to h as well and finally, if you have gub plus hāsa where we have b which is the jhay followed by h we substitute h by bh which is savarṇa of the purva sound b and which is also closest with reference to h in terms of the bāhyaprayatna which are nāda ghoṣa and saṁvāra and also mahāprāṇa, in this way 8.4.62 applies. The basis for the application of 8.4.62 is the bāhyaprayatna in this case nāda ghoṣa and saṁvāra and also mahāprāṇa resonance voice openness and having more breath or being aspirate.

So, the explanation once again is the following the bāhyaprayatna is used as a criterion to select one substitute in place of many. Thereby giving the process of substitution a criterion based structure the process of substitution which is the main process in the grammar of Pāṇini is not based on any haphazard vims of the grammarians. It is based on a particular criterion which is

based on the features of the sounds that get produced in the process of speech production. So, this is a structure based on a criterion. This criterion is in the form of features of sounds, this criterion can be tested and also explained using the modern terminology and technology. The movement of the tongue and the compromise it has to make in the fast speech in reaching the place of articulation of the next sound to be uttered is what is at the base of this entire process.

And so, there is this compromise made by the tongue which cannot reach in time the next place of articulation. So, it stops at the nearby place of articulation which is termed as the compromise and this compromise gets reflected in this particular sūtra and similar sūtra.

Now, the next function is the criteria for selection of a substituent. So, when a grammatical operation is stated in which substitutes are stated with reference to a pratyāhāra which contain certain sounds whose features are not at all related to the substituent then the feature set comes to help and the grammar says that a substituent matching with the features of a substitute does not exist. So, select only those substituents which match with the features of the substitute and the one which does not do not make it a substituent at all this is how a substituent gets selected for the process of substitution using these features.

Let us take a concrete example 8.4.58 in the Aṣṭādhyāyī which is anusvārasya yayi parasavarṇaḥ, let us study this sūtra in detail. This sūtra has three words anusvārasya 6 slash 1 of anusvāra, yayi is 7th slash 1 of yay and parasavarṇaḥ is 1 slash 1 of parasavarṇa means the sound which is homogeneous with the latter sound. So, all this put together the meaning of 8.4.58 can be stated in the following manner immediately before yay sound substitute a sound which is homogeneous to the latter that is a yay in place of an anusvāra. To put this in the form of an equation we can say that anusvāra plus yay and we apply 8.4.58. And then the next step of derivation would be parasavarṇa plus yay. In place of anusvāra comes the parasavarṇa to explain it further we can say that this means savarṇa of yay plus yay parasavarṇa stands for savarṇa of yay. This is how it gets into the form of an output the first step of derivation can be explained as anusvāra plus yay.

The next step of explanation is parasavarṇa plus yay closely following 8.4.58 in letters and then we have savarṇa of yay plus yay as the final output. Let us take a concrete example here is the word grantha for you in which the anusvāra appears immediately after a over here followed by th which is a yay. So, we have this anusvāra followed by yay immediately.

So, here is the scope of application of 8.4.58 and we apply it and then we substitute n in place of this anusvāra n in place of anusvāra. So, immediately before th appears an anusvāra over here. So, it gets substituted by a savarṇa of th. Amongst the four savarṇas of th; namely t d dh and n only n is nasal t th d and dh they are not nasals. So, only n is nasal which matches with the

anusvāra as far as the place of articulation is concerned and so, this n becomes substitute which matches with the substituent. And. So, we get the form grantha with n coming here. In case of kuṇḍaṁ rathena which is an example taken from the VyākaraṇaMahābhāṣya of Patañjali an anusvāra appears immediately before r.

Now according to 8.4.58 this anusvāra needs to be replaced by a savarṇa of r, r is part of r is a part of yay. yay includes the semivowels y v r l as well as all the class consonants. The fifth column the fourth column the third the second as well as the first yay includes all the consonants except ś ṣ s and h that is what is present here. So, kuṇḍaṁ rathena consists of r immediately coming after this anusvāra or we can say the anusvāra comes immediately before r which is yay. Now according to 8.4.58 this anusvāra needs to be replaced by a savarṇa of r then we know from the features of r that amongst the antasthas the semi vowels only r does not have a nasalized version. All three y v and l they all have a nasalized version only r does not have a nasalized version. So, now the grammar says that since there is no substitute that matches with the features of the substituent let there not be any substituent at all and let there not be any process of a substitute. So, let kuṇḍaṁ rathena remain as it is kuṇḍaṁ rathena no substituent chosen.

To summarize this entire discussion on the process of speech production we just now saw the second function assigned to the features of the sound produced. Before that we had seen the features being used to formulate another super feature savarṇa which is used for the purpose of brevity.

Now, we summarize the entire process of the speech production as described in the Pāṇinian grammar in the following manner. The discussion on the process of speech production as described in the tradition of Pāṇinian grammar can be summarized by saying that the grammatical tradition of Sanskrit did notice features of the sounds thus produced. It classified sounds in accordance with some of these features. It also used these features as a device for effective and brief grammatical description. It also recognized the importance of the cognitive part in the overall process of speech production. It developed the theory that the audible speech is just one part of this entire process and in fact, it is the most external part of the process the internal part is the most important and can be expressed using various kinds of means. So, the external part is just an expression. This knowledge of the Indian grammatical tradition was considered advanced at some point in time when the Europeans came into contact with the tradition of the Pāṇinian grammar. It is in fact, this advanced knowledge of features of sounds that is said to have influenced and to have given rise to a new branch of phonetics in the modern world.

In the discussion so, far in this course we studied the description found in the tradition of Pāṇinian grammar. This material can be compared with the modern knowledge about the process of speech production. Technological help is also available where software in the field of

articulatory phonetics can show distinct pictures of this process with respect to each and every sound. This and other related topics we reserve for an advanced level course. This is the point where our discussion on the process of speech production comes to an end.

Now, before finishing today's lecture let us follow the practice we have been following of reciting the maṅgalācaraṇa from yet another celebrated text this time from a commentary called Tattvabodhinī on the Vaiyākaraṇa Siddhānta Kaumudī of Bhaṭṭojī Dikṣita. So, this commentary Tattvabodhinī as this maṅgalācaraṇa and I recite, "natvā viśveśvaraṁ sām̐baṁ kṛtvā ca guruvandanam siddhāntakaumudīvyākhyā kriyate tattvabodhini"; I repeat, recite "natvā viśveśvaraṁ sām̐baṁ kṛtvā ca guruvandanam siddhāntakaumudīvyākhyā kriyate tattvabodhinī".

And the five sūtras of today are taken from the first pāda of the fifth adhyāya the first subchapter of the fifth chapter and they are prākkrītācchaḥ, ugavādibhyo yat, kambalācca sam̐jñāyām, vibhaṣā havirapūpādibhyaḥ and tasmai hitam. I repeat, prākkrītācchaḥ, ugavādibhyo yat, kambalācca sam̐jñāyām, vibhaṣā havirapūpādibhyaḥ and tasmai hitam.

Thank you for your attention.