

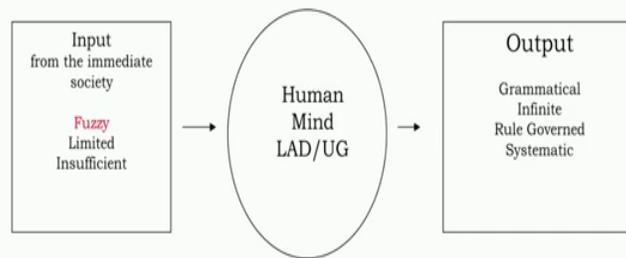
**Subject name: Language and Society**  
**Professor name: Prof.Rajesh Kumar**  
**Department: Department of Humanities and Social Sciences**  
**Institute name: IIT Madras**  
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We are looking at the relationship between language and society and in order to do so, we have first tried to understand the role of language learning particularly, the role of first language learning and second language learning. To understand the connections between the two, in the sense that, how language is not one entity rather language can be defined as languages and therefore, multilinguality. To appreciate this phenomenon we are going to be looking at some of the components of language. And today we will look at sounds and words.

A proper understanding of sounds and words as components of language is relevant for looking at language as a larger phenomena in the society.

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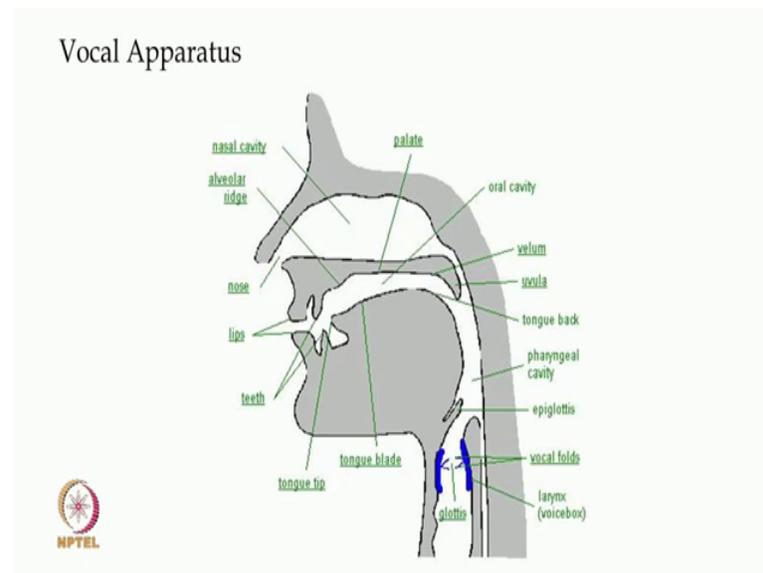
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Very briefly we will be looking at these two aspects. We understand so far what follows from the understanding of language learning in the framework of mentalist grammar, we learn language from the input from the society. And this input part from the society makes this discussion more relevant for understanding the relationship between language and society.

And then it is processed in human mind in terms of the development of language that takes place, the computation that works to combine several components of sentences to produce grammatical, infinite, rule governed and systematic output. All of that happens because the computation takes place in human mind as a subconscious process. And as a phenomenon this subconscious process also includes learning the rules of performance that is the rules of language use in society. Let us appreciate how we speak first.

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The inhaling flow of air which goes directly to lungs and after whatever is required for human physiology is retained and rest of it transforms into exhaling flow and gets out of the body. This is the exhaling flow of air which is responsible for speech sounds. Modification of exhaling air in the vocal tract in the oral cavity, that is vocal apparatus, is responsible for speech sounds.

With a lesser obstruction of the flow of exhaling air, we get vowels; with more obstructions at different places in oral cavity we get consonants. Consonants and vowels are two types of sounds which are responsible for words, sentences. And therefore, together when they form sounds, we can say sounds are fundamental units of language. We have established in various discussions that what we speak are sounds and what we write are symbols.

We do not speak symbols, we speak sounds. And a computation of various sounds in a particular way that we are going to look at today gives us words. And a computation of words will give sentences which we will look little later. So in that context we would like to say, there are two parts of sounds - consonants and vowels. And then in the entire mechanism of sound production we need to look at places of articulations and manners of articulations in the context of both. Let us first look at consonants.

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## Sounds

- Sounds are basic blocks of Language
- Places or Articulations and Manners of Articulations
- Consonants and Vowels



Consonants are produced with more obstruction in the vocal tract, more obstructions to the flow of exhaling air. And therefore we get consonant sounds. The places where obstruction take place - some such examples are velar, palate, alveolar region, teeth, and lips. The sounds that come from velar region are called velar sounds, sounds that come from palatal regions are called palatal sounds, from alveolar region sounds are called retroflex sounds, the sounds which require the role of teeth in it are called dental sounds and sounds that are produced by closing both the lips together are called labials or bilabial sounds.

We take, for example, sound /k/ - this is produced from velar; /ch/ - palate, /t/ - retroflex sounds from alveolar region, /th/ - dental, /p/ - bilabial. If you do this exercise on your own you will see that we cannot say a sound like /p/ without bringing the two lips together and therefore this sound is called bilabial sound. The tip of the tongue hits teeth when we say /t/, /th/ and therefore

the sound is called dental sound. The front part of the tongue goes up, curls back, and unfolds hitting alveolar region and sounds that come out of it are called retroflex sounds, for example /t/, /d/.

Most of the languages of South Asian subcontinents have got this sound. These sounds are originally found in Dravidian languages like Tamil, Telugu, Malayalam, Kannada and some of the Dravidian languages spoken in Hindukush mountains. There are several several Dravidian languages which are spoken in southern part of the country as minority languages. All these languages have got retroflex sounds. Retroflex sounds got into Sanskrit, European language, Indo European language and via Sanskrit it came to Indo Aryan languages as well. We will have a discussion on retroflex sounds when we talk about linguistics, India as a linguistic area.

However, English, French, several other western languages do not have got retroflex sounds. /Ch/ is a palatal sound. It comes from the palatal region and /k/ is an alveolar **sound**. Now what is interesting hereafter is to see the distinction between /k/ and /kh/. When we say the two sounds we realise that the distinction is in terms of flow of the air or **extra** release of air in /kh/. **So** /k/ with less release and /kh/ with more release; /g/ with less release and /gh/ with again more release.

The point is we get the distinction between /k/ and /kh/ in terms of more release or less release of the flow of air. But what explains the distinction between /g/ and /gh/, definitely more or less release of the flow of air is part of it. But there is definitely more than the flow of air and the release of air. Now technically this more release of air is called “aspiration” and less release of air - to make a distinction between the two - we will say one as “non-aspirated” whereas the other, “aspirated”. In this chart you can see the symbol as minus aspiration and plus aspiration. So we get the category, categorized distinction between four sounds where we have minus aspirated /k/, plus aspirated /kh/, minus aspirated /g/, and plus aspirated /gh/. However the distinction between /k/ and /g/ are not clear. To get this distinction we have to look at the vibration in the vocal cord.

So the vibration in the vocal cord is responsible for the distinction between /k/ and /g/ and such a feature is called “voicing”. So we say /k/ is “non-voiced” and /kh/ is also non-voiced whereas /g/ is a “voiced sound” and /gh/ is also a voiced sound. The two features namely aspiration and

voicing and their binary distinction, that is plus and minus - plus aspirated, minus aspirated plus voice and minus voice - a combination of these two features give us the distinctive design for each one of the sounds in the chart below.

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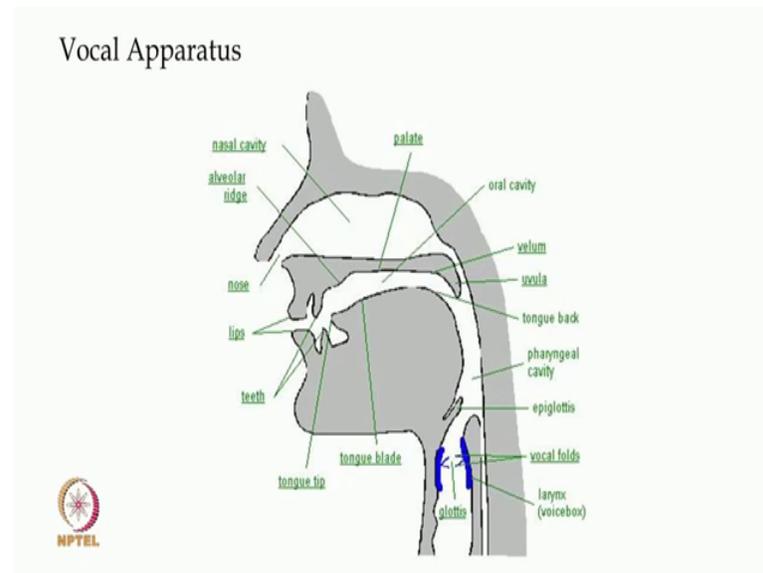
	<i>Oral Sounds</i>				<i>Nasal Sounds</i>
	-asp -voice	+asp -voice	-asp +voice	+asp +voice	
Velar	k	kh	g	gh	ng
Palatal	c	ch	j	jh	ny
Retroflex	T	Th	D	Dh	N
Dental	t	th	d	dh	n
Labial	p	ph	b	bh	m

And the organisation if you look at it carefully is very scientific in the sense that all the vowels in this chart are organised in terms of the places of articulation in the direction of flow of exhaling air. The flow of exhaling air gets first modified at velum which is in the back of the mouth, then palate, then alveolar region, then teeth, and then lips. So this design is in terms of places of articulation is, in terms of, in the direction of flow of air, of the exhaling air.

Then the features - plus and minus aspirations and plus and minus voicing - are called “manners of articulation”. So if we put these classification of understanding of sounds, in terms of places of articulations and manners of articulations, we get to see distinctive design of each sounds. And some of these sounds are fundamental to most of the languages. However this chart is not the cardinal sounds of most of the languages. The one more rejoinder here, most of these sounds are available in Indic languages, languages of the South Asian subcontinent. However this list is not exhaustive. And these are not the only places of articulation in human vocal tract. There are more places of articulations and more sounds that are part of other languages of the world. Now we

need to look at one more distinction. So what we have seen so far through this Vocal Apparatus is flow of air moves through this.

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This is the vocal cord which is responsible for voicing of sounds. And then the sound travels through these things and gets - in the description of the sounds that we have seen so far - they get first modified here in velum here and get velar sounds, then we get to palate which is responsible for palatal sounds, then we get to this area which is teeth. But if you look at this alveolar ridge, then this tip of the tongue here curls back and hits the ridge little bit beyond this ridge and the sound that comes out of this area are called retroflex sounds.

Then we move on and then this tip of the tongue, an interaction between the tip of the tongue and teeth is responsible for dental sounds. And then we have lips here for labial sounds. There are more sounds in more languages of the world and all of them have a place of articulation in the oral tract. But for the purpose of understanding of the sounds, most of the sounds in the South Asian subcontinent that we have seen, most of the consonant sounds in most of the languages of South Asian subcontinent, if we look at these places of articulations then we cover most of it.

And what is more or rather very significant for us to look at is the flow of exhaling air moves in this direction and therefore then velum first, and then palatal, then alveolar or retroflex, then dental, and then labial sounds. Thus this vocal apparatus, this diagram, helps us understand our vocal apparatus for the purpose of sounds.

Then what we also want to understand is the distinction between oral cavity and the nasal cavity. All the movement that we have seen so far in this direction is oral cavity, alright? And this part is called nasal cavity. Look at this thing and it shows us oral cavity. And then we have here broad area as nasal cavity. Now why is that significant is, let's look at this small instrument called uvula here. The flow of air here gets directed to oral cavity by erasing that uvula which helps close the passes through the nasal cavity. This erasing of uvula closes the passes in the nasal cavity and then the air flow could move only through oral cavity. And thus all the sounds made in this region are called "oral sounds". When it gets lowered, that is what uvula gets lowered as it is right now, it does not have to completely close the oral cavity. But it helps the air moves through nasal cavity as well. And then by the lowering of uvula and movement of partial flow of air through nasal cavity is responsible for what we know as nasal sounds. In this chart that you see these are the nasal sounds. So look at the distinction - we have oral sounds and then nasal sounds; then different articulations of our oral cavity; and some features categorised in terms of manners of articulations that is whether a sound is aspirated or not aspirated, whether a sound is voiced or not voiced, all these things helps us categorize sounds and provide unique distinctive features to these sounds which are part of languages of South Asian subcontinent. That is a brief description of consonants sounds.

Then we would like to look at vowel sounds very briefly. Vowel sounds are produced through lesser modification of flow of air in oral cavity. And most of vowel sounds can be produced for longer duration. So, some are front vowel sounds like oo and then ee is going to be a mid vowel sound aa is a back vowel sound. So this back, mid and front are only the positions where the flow of air is modified in a very limited way, and then we get aa as a back vowel sound as ee a mid vowel sound and oo as front vowel sound.

There are many vowels in natural language. Most of the vowels are most fundamental to the word formation. We will see that formation of word in a moment. So we are going to see that vowels are going to be less in numbers in the inventory of sounds of any language, but more

fundamental in the sense that no word is possible without a vowel. So what we are going to see is the design of vowel is, some are front vowel, some are mid vowel, some are back vowel, at the same time, some are going to be short vowel and then some are going to be long vowel.

For example, 'a' is a back vowel from the description based on the modification of sounds in the flow of air in the oral cavity but it also has got two variants - one is /a/ and the other is /aa/. So /a/ is a shorter vowel compared to /aa/ because /a/ is takes lesser duration of time and /aa/ takes more. Similarly /i/ - short and /ii/ - long, /u/- short, /uu/ - long, and all these sounds are distinctive sounds in natural language. Then we would like to spend some time in understanding words.

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## Words

- How do we make words?
- Are words random collection of sounds?
- What are the patterns underlying sounds?



As we have seen a brief description of consonants and vowels we would like to understand how words are made. Normally when you'd want to define a word you will hear 'words are collections of sounds', but please understand that words are not random collections of sounds. It has underlying pattern. And sounds in any word can only be organised in certain number of ways. So let me repeat what I said a minute ago. There are two types of sounds - consonants and vowels. Vowels are more fundamental because no word is possible without a vowel sound.

However, a word is possible only with a vowel sound but no word is possible only with consonant sounds. So every word in any languages of the world must have a combination of

vowels and consonants and thus we get a word. There is another point which we need to understand at this moment is the term “syllable”.

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## Syllables

- read = one syllable  
Onset = [ r ]  
Rhyme = [ id ] (within the rhyme:  
Nucleus = [ i ]  
Coda = [ d ]
- flop = one syllable  
Onset = [ f l ]  
Rhyme = [ a p ]  
Nucleus = [ a ]  
Coda = [ p ]



A syllable could be defined in simpler way as a unit of word which is smaller than a word but larger than a sound. Also a foot note here is important: a sound could also be a syllable and a word could also be a full syllable by itself. And we call a syllable as a smaller part of a word because a multisyllable word is possible in natural language. That is the meaning of a syllable. And then there are internal division of syllables which is required for larger understanding of this. I leave this discussion for you to find out the two parts of syllables like “onset” and “rhyme”. And then initial sound of the syllable is called onset and rest of it is called rhyme, whereas in the rhyme, nucleus is the vowel and after that whatever is left is called “coda”, or the last sound is called coda. So what we find from these terms as onset, nucleus, and coda, the nucleus being most important part.

And now we can extend what we said about a word that no word is possible without a vowel, we can also say no syllable is possible without a vowel. So whether a word is monosyllabic or bisyllabic it depends on nature of the word. But if we have got a word with two syllables or three syllables or for that matter four syllables, we are going to be confident that each one of the four syllables or three syllables or two syllables, each one of them will have a vowel in them.

Therefore, a four syllabic word will have four vowels in them. However it is possible that a monosyllabic word will have just one vowel in that. That is the significance of the syllable and understanding syllable in the context of vowel sound, that is, a vowel sound is going to be the nucleus of the word. Some of the patterns that are possible are the following:

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## Patterns

- CVCV
  - VCVC
- VVV
- CCVC
  - CVCCV
  - CVCVCC
- CCCVC
- CCCC\*V



And we are going to see these things as the phonetic roles and words usually would not violate these patterns. Most common and productive pattern information of word is going to be the sequence of a consonant and a vowel and a consonant and a vowel. So, and a permutation and combination of this is possible because we can also have a vowel, consonant, a vowel, consonant.

We can have more number of these sequences like, here we have two consonants and two vowels. It is possible that we can have three consonants and three vowels, four consonants and four vowels. Such a flexibility allows more number of words in natural languages. Please understand that a language will roughly have somewhere around fifty sounds. But a combination of these fifty sounds which includes both consonants and vowel are responsible for infinite words, uncountable number of words possible in that language. And such a possibility of being uncountable and infinite with the constraints of the types of the patterns that we are discussing right now, is only possible because there is no restriction on the size of a word. It could be just a

sound or it could be many sequences of consonant, vowel, consonant, vowel. Hope the first point is clear. A word is also possible with only vowels as we have mentioned. We could have a V, we could have a VV and we could have a 'VV and V'. What becomes more interesting to see and why we call it pattern, and we want to call these patterns in terms of constraints, is also because it is possible to have two consonants as cluster in some position in a word. This cluster is possible in the initial position of a word, it is also possible in the middle position of a word, and a cluster is possible at the final position of a word as you can see in the examples of the patterns given in the slide. And two significant points here so far: a cluster is possible, and a cluster is possible at any position in the word. However when we have a cluster the total number of possible words in any given language compared to the possible words with an alternation of consonants and vowels becomes drastically low.

So if uncountable number of words is possible with consonant-vowel alternation only a limited number of words are possible with clusters. And when we move further we are going to see that there are some words which are possible with a cluster of three consonants in the beginning of a word and then comes a vowel and then comes a consonant again. With this cluster of three consonants we are going to see more restrictions and even few numbers of words possible in a language. Therefore they are only going to be a handful of them.

Now when what we see with this increasing weight of these constraints in the pattern is the increasing weight of constraints is reducing the possible number of words in any given language. Still the total number of possible words are going to be uncountable as one of the final constraints on the formation of word is that the cluster of four consonants in the initial position of the word is just not possible as you see in the last thing.

Some people argue that its possible at the final position of the word in language like English but a cluster of four consonants in the beginning of the word is definitely not possible. We will just take example of one. Let's talk about little bit of examples of number one. A possible word with CVCV pattern could 'papa', 'mama'. Let us look at the possible example of a word. So when we say 'paa paa' it has got two. The pattern that we are talking about is CVCV so /p/ as a consonant, /aa/ as a vowel, /p/ as a consonant, and /aa/ again as a vowel.

So this is an example of the first pattern, CVCV. It's also possible to what we were hinting at, in terms of number of words, there is no restrictions on the length of a word. However this pattern is going to be followed. What is not possible is a word with four consonants as the cluster in the beginning of the word. What is possible with two consonants as the cluster in the beginning of the word, or at any point in the word, and these words are like, like a hindi word, like "kyaa" where these two consonants are forming a cluster in the beginning of a word. In English we could have a word like "spice", /s/ and /p/ - two consonants - are forming a cluster in the beginning of a word. However when we want to see examples of the cluster of three consonants in the beginning of the word and as I mentioned it is only possible

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## CCVC

- Spring (C C C = S P R)
- String (C C C = S T R)
- Screw (C C C = S K R)
- Splash (C C C = S P L)



that we get a few words with heavier constraints on them. So look at the examples: these are the examples of words with three consonants as clusters. We see examples like "spring", "string", "screw", and "splash". What we see in each one of them is we have, we do have three consonants as clusters. But in each one of these examples we see that the first member of the cluster is the sound /s/, second member of the cluster can only be /p/, /t/, /k/. The unique thing about these three sounds is: they are all "stop sounds", and the final member, third member of the cluster could either be /r/ or /l/.

Now these sounds - /r/ and /l/ - are called “liquids”. So when you have three consonants as cluster, when you have a sequence of three consonants forming a cluster in the beginning of a word, you see a very constraint environment where the first member must be a “fricative”, /s/, second member must be one of the “stops”, /p/, /t/, and /k/, and third member can only be a “liquid”, either /r/ or /l/. With this constraint we are going to have a word with three consonants as cluster in the beginning of the word in natural languages. These are called “constraints”.

And these are called underlying patterns in word formation. No word will violate one of these patterns. In other words all the words must follow one of the patterns given here. And if you look at any possible word in any language, you will find that they respect these constraints in the formation of these words.

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## Cluster of three consonants

- The first consonant must be ‘s’ (dental fricative)
- The second one must be one of the following:
- P T K are stop sounds. Stop means a total closure before the release of air flow.
- The third one must be either R or L. These are liquid sounds.



This is what I have just explained, that the first consonant will be a dental fricative; the second consonant must be one of the following - it could be /p/, /t/, /k/. /p/ and /t/ and /k/ are stop sounds. What we mean by stop sounds is closure before the release of flow of air. When we say /p/ there is a total closure before the release of the air at the lips. And in the case of /t/ there is a total closure at the teeth and there is a total closure at the velum in case of /k/. /r/ and /l/ are liquid sounds.

So what we have seen today is a brief discussion on sounds. That is the mechanism of sound production, consonants and vowels, and mechanism of sound production in the types of sounds. We have seen consonants and vowels as types of sounds, and we have seen the entire mechanism of sound production in terms of places of articulations, manners of articulations, and the flow of air, and the features of sounds in terms of aspirations and voicing.

Then we moved to words. And we have seen that words in natural language follow a very severe constraint and with that constraint with the limited number of sounds we can still have unlimited number of words in any given language. And words are not random collection of sounds. Words are presented, words present a very systematic alternation between consonants and vowels in terms of constraints on them to form a word.

That becomes one of the units of sentence and we will look at an interrelationship between words and sentences which eventually form a unit in discourse which becomes language in the real society. So the idea to look at these internal components of language is to be familiar with the components of the discourse that we use as language in the society. Thank you.