

# **Fundamentals of language Acquisition**

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**Week 01**

**Lecture 01**

Lec 1: Introduction to the course, specific properties of human language

Hello, I welcome all of you to the course titled Fundamentals of Language Acquisition. I am Bidisha Shom from Department of HSS IIT Guwahati and I am your instructor for this course. Now, as the name suggests fundamentals of language acquisition will be dealing with language acquisition as very clear. Now, language acquisition as a domain is rather rich, there is a lot of scholarship available in this domain, there are lot of theories, this is also rich in empirical data, a lot of empirical data from multiple perspectives have also been you know in there in this discipline in this domain. So, it is probably not possible to include all of it in this course. But we will try and look at the most important ones, the dominant theories and the most important findings.

Those findings, those theories that have had a lasting impact on the way language acquisition is understood today and that is how we will be trying to cover the majority of it if not everything. And for every domain, every area we will have adequate references for you to follow up. Now, let us start with a very brief introduction to the course. So, this course will discuss fundamental aspects of language acquisition.

Now, when we say language acquisition as many of you might be already aware that we will be talking about both first and second language acquisition. Language acquisition happens not only in childhood, but it can happen throughout your life. Of course, there are different names for it. we will be covering both childhood and adult language acquisition. And then in that case we will have a division between childhood language acquisition and adult language acquisition.

Each of the domains have their own theoretical positions, own ways of looking at the entire story and there will be a lot of different kinds of data. So, we will be discussing each of them in segments, different segments. The way we have organized this course is

as per module. Each module will be covered in one week's time. Now, each week we will have five lectures, each lecture will be looking at a smaller aspect of the entire picture.

So, one module will roughly be equivalent to one week. So, one week one module and each week we will have five lectures. So, each module will try to look at five different aspects or four different aspects of the same question. We will start with the first module that we will start today will be language evolution. Language evolution and language acquisition are intricately connected with each other and from various perspectives as we will shortly see and that is why we will start with language evolution and then proceed to looking at language acquisition per se.

Now, before we go there, before we start with language evolution, let me give you a very brief overview of each module wise or week wise break up of the entire course, right. So, there are 12 modules, each module will have one topic. So, module 1 which is equivalent to week 1 will have evolution of human language. Evolution of human language again it is a vast topic, there the scholarship goes back for a pretty long time and every other day we have new data coming in, new kinds of theoretical upgrading happening, every other day new data and so on and so forth. But we will look at the most important theoretical positions in this domain.

So theoretical positions will be primarily biological and cultural perspectives and within each of these perspectives we will talk about the main scholars, main theories and their implications and how they look at it and where we in terms of where we stand today. So, important scholars we will have Noam Chomsky, Mark Houser, Michael Corballis, Howes and Philip Lieberman as well as we will have Simon Kirby, Christiansen and Daniel Everett and many others. So, these will be the two main domains, the biological as well as the cultural basis of evolution and the last segment in this module will sort of wrap up, will give you the latest findings, latest debate and latest research with some data and so on. that will wrap up the first module. Module 2 will start with the theories.

Now as I started by saying that this is a domain that is very rich in theoretical perspectives as well as in terms of data. So, there are a number of different kinds of theories. So, we need to have a brief understanding of the theories first before we get into the specific details of morphology, phonology, syntax and semantics and so on. So, we hence we will talk about these theories first. So, lecture 1 will be looking at child language development, prenatal, neonatal and childhood stages, a brief overview and then lecture 2 onward we will talk about the theory.

So, behaviorism, nativism, cognitivism and so on and all the important variables also will be discussed and up to the times of today. So, in the modern days we talk about joint

attention, we talk about body schematics and so on and so forth. A brief overview of all of these will be discussed in the second module. Third module will start with language as it is specific in terms of phonology. So, week 3 will be phonology.

So, how language, how children, infants acquire sounds of the languages, first language, primarily first language. This will also be, we will also be taking into account the prenatal stages of phonological awareness and acquisition and then move on with childhood. Various theories like attunement theory, perceptual assimilation model, various kinds of models will be discussed and then of course both in terms of comprehension as well as speech production. So, many theories and findings and data up to date will be discussed here. Next week we will look at morphology, all kinds of perspectives within morphology.

So, we will have both inflectional and derivational morphology to start with. And then we will look at how specific types of morphological awareness, specific kinds of morphological particles will be understood or understood or learnt by children in what stage. So, data will be discussed. the same understanding will be looked at from both nativist as well as constructivist theories of morphology acquisition. And then various other kinds of theories like models, single route, dual route and connectionist models and so on will be discussed.

And the last part will of course talk about production. So, most of these cases when it is phonology or morphology or word, We will start with comprehension and then move on to production. So, both comprehension and production will be discussed. Not only how they are internalizing, how they are understanding, able to understand, but also how they are able to produce sounds and morphemes and then followed by words and so on. Similarly, week 5 will talk about word and their meaning from phonological word form to word meaning, mapping and word comprehension and the various kinds of theoretical positions as always we will be discussing; theory of innate linguistic bias and so on.

Various kinds of models that are there. Most of the important models of course, there are more than this, but we will cover the most dominant theories. Module 6, which is again week 6, this is where we will discuss syntax. Again, the various theories as you might be already aware, the most important theory in this domain is the generative theory. So, we will talk about that, talk about nativist theories and constructivist theories as well.

Syntactic development, the kinds of constraints are there and morphosyntactic dependency, movement dependency and so on. Again, just a pointer here, because this is again a domain which is fraught with lot of different kinds of theoretical positions as well as different kinds of data that have been used to support this or that theory. We will talk

about it in brief, but we will not get into any either of the, this course is not meant for supporting or not supporting any of the theories, this is just to give you the fundamental notions. So, when we talk about learning syntax what is the theoretical position offered by the nativist and the constructivist and how the data supports or does not support and how does it work that is what we will discuss right. And then week 7 we will be talking about second language acquisition that is what I was talking about in the beginning.

So, first language acquisition now we are talking about second language acquisition. Now second language acquisition is relevant not only for adult learners, but also children young people, children So, all the theoretical positions again we will be discussing with respect to children learning two languages there are different kinds of stages. So, there is simultaneous learning and then successive learning and so on and then of course, you have your adult learners All of that will be discussed All the functional approaches psychological, neural aspects of SLA, complexity theory, everything will be discussed. SLA is specifically important also because of the latest debates on bilingualism, psychological and neural underpinnings of the same. So, we will be touching upon those theories as well, whatever is possible within a week's time we will do that.

Week 8 which is module 8 again, second language acquisition has to continue, various other theories also. Some of the important variables in terms of language acquisition and language production research will also be discussed that is what we have mentioned here. So, stages, age, input and the interaction models and so on all of these will be discussed. So, we are not devoting one, but two weeks for SLA, second language acquisition. Module 9 will be the role of nurture.

How important is it, how important is the environment, how important is nurture, nature-nurture debate all of you are probably aware of. So, that bit we will be discussing role of nurture, how much is the ecology, the environment in which you live, what are the important variables and so on. Ecological brain is an important concept within this domain. So, we will be having a couple of lectures devoted to that. Module 10 which is lecture week 10 where we will be talking about communication.

So, after the sound system, the morphological system and the words and syntax are in place, now it is time for the child to speak, to communicate in the environment with others other children, adults and so on. So, how does it, how do they really go about it? What are the main stages of getting to learn how to communicate? What are the theories? Of course, the most important theorem will be a Grecian maxim. So, we will be talking about that Then various kinds of speech acts and various other perspectives within this all of that will be taken care of primarily mostly focusing on the important variables, important stages so to say. So, scalar implicature, when they try to figure out when they

understand, when children understand how to abide by the scalar implicature, how to learn, how to turn take in a conversation and so on.

So, this will be the tenth week. Eleventh module will be devoted to brain development. So, language and brain develops at the same time, as the brain in case of humans the brain keeps developing after birth for quite some time. Now, this is also the time when the child is exposed to language. Its beginning to figure out how language works, starting with the small particles of sound and morphemes and then words and so on; simultaneously the human brain is also developing. As a result of which there is a lot of give and take between brain development and language development.

So, we will be discussing that as well. Again, sticking to the most important ones, so looking at language areas and the data most of the time has come from patient data. So, aphasia and epilepsy data we will be discussing with respect to brain development and then the neural correlates of language development, bilingualism and so on and so forth. And, then the last week will be devoted to understanding about the language development in atypical population. Atypical population is the those children whose development is not typical, as in they are not so to say normal.

So, there is some kind of a language disorder, language delay. Or because of some other kinds of you know cognitive disorders language is also affected and so on. So, those children are called atypical children. So, we will be discussing about atypical children language development among atypical children. We will be covering autism ASD autism spectrum disorder.

We will be also talking about in brief about Down syndrome, Williams syndrome you know all of that. Also, not only the theoretical discussion we will have there, but we will also talk about the interventions. In today's time, the technological advances are so fine tuned that we do have some really interesting breakthroughs with respect to talking about how to help those children with language disorder to overcome them. So, some of those intervention techniques that are used today we will be discussing at some length. And, then of course that is the last lecture will be concluding remarks and we will discuss some of the latest trends of research in the entire not only in this atypical population, but the latest trends in the entire of language acquisition research that is happening today that we will discuss.

So, this is the brief overview about how the course will go. Now let us move on with the first segment, which is our language evolution. Now language evolution, this is how we will go. I think I have shown this already. So, first and foremost, why do we even study language evolution? What is the connection between language evolution and language

acquisition? How are they connected? Some of it we will see.

Of course, again here there are lots and lots of theories and findings. We will try and incorporate as many as possible and try to give you a sort of a concise view of what is the field, what does the field look like as of today. So, different kinds of perspectives. Now, first thing first. why all this noise about language acquisition, what is it about language that is the first thing that comes to our mind, why of all things.

So, the primary reason given by researchers of this domain as well as students of the discipline like myself, we tend to believe that we are special, humans are special because we have we are somehow not like other animals of course, we are part of the animal world, but we are different. We are different why not only because we have language, but also because of various other things that some of them has been very wittily listed by Christiansen. For example, unlike other species who are "exquisitely adapted to their ecological niche, humans can live virtually in any environment". In childhood we all have learnt that you know the habitat decides how the animal looks or behaves and how the camouflage works and so on and so forth. The entire thing boils down to the fact that the animal has to adapt to the situation in which it lives, which is what the Christiansen says that exquisitely adapted to, but that does not work with humans, humans can live anywhere.

We live in you know we have scientist living in Arctic and the Antarctic region and all and everything in between. So, from desert to the sea and you know island and everything hills. So, that means we do not adapt to the nature, but we make things like our own. So, we can we can mold situation as per our own necessity. So, that is something that is singularly important for understanding why humans are special.

right. And then of course, we also have we have considerable amount of scientific knowledge about the world and about ourselves. And then he goes on to say that "we mold the world around us in unprecedented ways, create structures that can be seen from the space and then go to space to see them". quite funny, but this is what we are actually doing. So, for many very often you will see the people who go to space latest is Sunita Williams. So, when she was finally brought back to earth, she was asked probably I do not know the question, but she replied saying the how she looked at the India, how Himalayas appeared to her, how you know various other structures that you can see.

So, this is something that we often talk about. So, this is human endeavor, this is human achievement and this is the human specialty that we are talking about here. So, a key to understand what it is to be human is to know how language came to be, how it functions and how it is learnt. So, that is why this is a key question in the human civilization no

matter how far we go to Mars or you know wherever, it is always a very important question, pertinent question to answer how did it all start. Because without language there will be no science, without language there will be no philosophy. So, how did it all come about? Now, if you have any of you have visited one of those prehistoric caves where the first early drawings of humans were there; that is an interesting thing to make you really ponder about what were the first things that they thought about drawing of course, you can you know we can we are free to speculate what the purpose were, were they teachers teaching the children about how to hunt or what they just keeping a record or we do not know or is it early poetry, but anyway this is how it all started.

Now, because a large part of knowledge creation, propagation and application is done using language. So, starting from the pictorial depiction of the early humans or early homo sapiens sapiens and then to today's internet language they all qualify to be called language. There is some purpose to it not only about communication, but also about reflecting the thought that you have. So, language and connection with thought language and cognition on the one hand and the other hand language merely as a tool for communication both come together in the humans. And, this is where the most important part of language comes into being.

So, this is the tool which makes us special, this is the hallmark of human intelligence. And, at the same time while language is being a tool for communication, it is also being a you know a part of the network of language cognition and other things, language in itself is interesting as well. There are certain properties of language that makes it you know stand apart from various other kinds of communication system, communication tool. Other many other animals also have, we are only beginning to understand them. So, starting with you know prairie dogs to whales and various other various birds and so on, they communicate.

So, there has to be some difference about human language. So, there are these five points that we have here, we have collected here to talk about the basic general property of humans and then we will move on to the specifics. So, the first property of human language is that it is primarily symbolic. What does it mean? It means that there is no one to one mapping between the sign and the meaning. So, the signifier and signified, this is largely arbitrary.

Now, when it started we do not know how it started, why this is you know certain things are called, what they are called, but and over a period of time it becomes sort of a conventionalized of a system, but even then children need to learn it. So, that is something that is primarily symbolic, that is what I mean by symbolic, it stands for something. So, the word elephant stands for an animal, nothing elephantish about the

word elephant, that is what is why it is symbolic. Similarly, language human languages have an extraordinarily large vocabulary or lexicon. Many other animals as I was just mentioning also use, language in some sense.

But the argument here is that they do not have such a large repertoire like humans do. We have enormous amount of number of words. So, to give you an estimate: humans by the age of 18 have acquired approximately 60,000 words as per one researchers. Then, comes the human vocal apparatus and the auditory system. This allows us to produce and distinguish many different sounds which we can combine in a controlled fashion in order to create even more distinctive sounds.

So, that amount of not only the vocabulary size is very large, but also the capacity to create and distinguish different kinds of sound system that is that seems to be unique to human vocal system vocal apparatus. and then we do combine them to create even more large number of words and sentences and so on and so forth. And then if you go cross-linguistically, one language may have you know 26 consonants, another language may have less, some languages may have even completely different set of sounds. For example, certain languages in Africa have click sounds which is not there, which is not present in Indian languages and so on and so forth.

So, the variety is really really vast and very rich. So, that is possible that is so far, till today, we think that amount of variety that kind of diversity is available only for human language. Then this is an open system, open system means that meaning we are constantly coining new words. This is more evident more than ever it is evident in the social media, you will see every now- and- then new words come into existence and they perfectly sit in there without you know much problem, new words get just get into the lexicon. So, and for an unknown object that you have never seen before, we can create new words, similarly new words completely out of the blue can be created for talking about new concepts and so on. So, this is an open ended, ever growing sort of a system, it is not a closed system like for example, say the bee dance.

Then the last part is the language has a complex grammar which allows us to combine words in a different order and inflect words to give utterance different meanings. depending on the language, but most languages do have a very complex system. We can do a lot of things with the simple things that we have at our disposal. So, we have syntactic rules and we have words vocabulary and then we can mix and match you know combine them with tones and intonation and do n number of things. So, from some something like as simple as an assertive sentence you can go all the way to metaphors and idioms and so on.

So, we can do all of that is also because of the complexity that is part and parcel of human language. So, that is the general property. These five properties are the most common general properties of human language. Some specifics have been pointed out by Charles Hockett. So, this is uniquely human and then of course, he talked about the design features of human language which is I have just added the most important four.

So, arbitrariness, generativity, displacement and reflexiveness. Arbitrariness we have already talked about. Generative you already probably know that language system can be used to generate new words and new sentences. There is absolutely no limit to it. You can continuously go on creating sentences and new words are constantly coined anyway.

This is generative and this allows us what is called displacement. So, the displacement basically talks about the feature that human language can talk about things removed both in time and in space. So, we can use language to talk about and the other part of things that are part of other part of the world. Similarly, let us say thousands of years before us. So, that is what is displacement.

Finally, it can be reflexive, reflexive means talking about oneself. So, language can be used not only to talk about ourselves as in humans, but also about language itself That is what we are doing in this course anyway. So, I am using language to understand and try to make sense about how languages came into being, in this module. Now, let us move on to language evolution and language acquisition, the connection between them. It might not be immediately apparent why what is the connection.

So, let us just look at few of the reasons. First and foremost language acquisition theories are primarily based on two main premises. one of them is nurture and the other is nature. So, the whether it is biologically programmed or if there it is culturally programmed or is it a combination of both of these. So, are we simply because we are biologically programmed, we have the brain structure, we have the vocal apparatus and so on, hence we speak or do we also need the cultural apparatus to be able to utilize that kind of a mechanism.

These are the two primary domains of the theoretical positions. Similarly, theories of language evolution also has the same kind of a dichotomy. So, is it because language came into being, language evolved in humans because it was biologically driven? or was it because it was a culturally, so there was a co-emergence of both language and culture at the same time. So, is it culturally driven or is it language biologically driven or if it was both, in what degrees and so on. So, there is a parallel between the theoretical positions in these two domains. Now, how languages evolved in the human race and how language evolves in a particular human are obviously then interconnected.

So, if when you see a child learning language, when you look at the stages of the language acquisition in an infant, it kind of gives you a glimpse of how things might have been. Now, either the brain evolved in such a way that humans evolved to speak whereas our closest cousins did not. So, chimpanzees however much you try it there is a limitation that we have always seen. Similarly, it is thus it automatically follows that humans are biologically endowed and hence they learn to speak irrespective of where they are born.

So, culture can be completely ignored. Or the other possibility is that language is adapted to the human brain owing to the cultural evolution, right? So, cultural evolution was the precursor and then the rest of the things happened, which way it is we do not yet know. So, that is the controversy we will be talking about, the debate that we will be talking about. Now, either way understanding language evolution would help understand language acquisition and vice versa that is why we discuss. Within these theories there are of course n number of theories, but one of the main ones is the talks about C induction and N induction. Development in humans basically involves two interrelated challenges and finding their solutions.

So, what are the challenges? There is one N induction, the other is C induction, N refers to nature, C refers to culture. Now, acquiring the ability to understand and manipulate the natural world is part of your N induction. So, when a child is born it has to first and foremost figure out the world around themselves, right. So, they have to get an understanding of mass, of weight, of velocity, speed, color, texture and n number of other things. So, that is part of the world and then comes the ability to coordinate with each other, other fellow human beings.

So, that is the C induction. So, that is again you see the biological versus cultural part of the same kind of a developmental trajectory. So, in case of N induction the restrictions are natural and external to the organism It's there out there the stone is heavy no matter who looks at it or whether we agree to it or not right. So, that is what we mean by the restrictions are natural and external to the organism that is the human child. So, we need to match up the challenges if we that the tree is there we need to learn how to climb it in order to save ourselves from you know anything charging at us something of that sort. On the other hand C induction imposes challenges that are social, leading to behave in the same way.

Now, when you are dealing with the nature, dealing with something that is external to you that is part of the larger you know real world, which is real irrespective of our view point, there the challenge there you can have a different you know individualistic solution to the problem, you can find your own way of going about it. But, in case of C induction,

solutions are typically social. You learn from others you want to you try to be like the others; because in a society largely there is a lot of cohesion that is what society and social norms are all about. So, there you have a easy it is always easier to learn cultural norms than about finding your way out in the natural world. So, together these two need us to understand the world and then same time coordinate our behavior with the fellow humans and language as a result of which straddles both of these domains.

Now, N induction refers to the child's perceptual and motor interactions with the world. We have to find out how things work and then there is a constant negotiation between the sensory motor apparatus of the human child and the real world and then she needs to understand the concept or various kinds of concepts. This is important for him to be to do things like simple things like holding a toy. Now this is what is called a lonely journey, many researchers have called the child is a lone scientist because they have to understand, they have to discover and invent ways of handling this. So, this is the tougher part. On the contrary, C induction primarily means doing what others do, this makes the enterprise relatively easy.

So, Child here is and I quote, "a musician whose objective is to not to attain any absolute pitch, but to be in tune with the rest of the orchestra". That is what social beings are all about, social cognition is all about and being human is all about. So, there is no true language that is independent of humans and as a result of which there is a lot of support for the C induction perspective of language acquisition and language evolution as well. Now, this debate of course can go on and we will be taking up this again later in the module. But till here we can sum up by saying that favoring if you favor C induction over N induction as the primary driving force language evolution can have significant implication for child language acquisition theories.

Because even when there are biological basis of learning language, success will depend on whether these basis are shared across individuals. I might have the apparatus to learn language, but what if I say something that nobody understands. So, that part has to be developed in conjunction with the other members of the same society that is where the C induction thing comes in. And this is a continuously developing debate that is going on. But today most scholars kind of agree that language evolved due to an interaction of three complex adaptive systems, biological evolution first, then comes human learning and through the acquisition the sustenance of the human culture.

Of course, it is a chicken and egg problem, so did culture in some sense evolved before language and did it necessitate the creation of human language or did it happen the other way round. This is how it is going, but these three are one of the primary pillars of behind language acquisition as per most of the researchers. Now, there is another perspective to

this and with which we will complete this today's segment. This perspective talks about language evolution as different from evolution of language. So, there are two things: language evolution as in when how language evolves over a period of time Language constantly evolves.

Language is human and humans change all the time. So, over space and over time language changes. So, that is language evolution as opposed to what we were discussing till now as which is evolution of language. Language evolution is very interesting and has been studied from multiple perspectives. So, there is an idea that idea of language evolution that it happens through generation and is a continuous process and this is the domain where again language learning and acquisition and evolution come together. Why? Because the way languages are evolving, even if it does not appear very apparent, it does not look very salient for now, but over a period of time you will notice, if you notice that diachronically language changes, language have always changed. Now, within that parameter how do children still manage to learn, because things have changed, the structures have changed.

That might also give us an insight as to how language started in the first place. That is why we are talking about this. Though we will not be bringing this up again because this is slightly different. So, there are lots of studies on this. Mathematical and computational modeling have also come into the picture and they have proposed how to predict how the language will evolve.

So, it has been proposed to predict this evolution and brings out an interplay between the two. that language evolution actually predicts language acquisition and the other way round. So, differences in learning algorithm may predict different outcomes of language evolution. How children learn and then pass it on to the next generation will again have an impact on how languages evolve over time, right? So, historical linguistics has anyway shown us that language changes may not always be linear and that is exactly what this model also throws up that there can be dramatic changes across generations, it is possible and it is all it kind of boils down to the learning algorithm.

So, this is what the models predict. So, this is where we will stop. In the next lecture, we will take up the theories of evolution and from various perspectives. Thank you.