

Fundamentals of language Acquisition

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Week 09

Lecture 041

Lec 41: Is experience necessary?

Hello and welcome back. We are in week 9 now. So, this is the ninth module. In this module, we will discuss the role of nurture. Nurture refers to the environmental inputs that are around the child when the child is growing up. What is the role of those inputs—be it linguistic input or socio-cultural input—in everything that the child grows up with? How do they influence, and whether they influence, how do they influence, and so on.

So, we will look at various theories in this domain. So, this is a roadmap. In Lecture 1, we will look at the various scenarios that have been reported in the literature with respect to whether the environment is essential or not. Remember we talked about behaviorism and constructivism, where we looked at how language learning is outside of the agent.

So, inside out or outside in, there are these two kinds of theoretical positions. Inside out, the language faculty is innate. So, all the things that a child eventually learns are already there as an innate tendency, as an innate property. On the other hand, the outside-in theory talks about how the environment adds information to the child's language-learning ability. So, we will look at some instances, some stories, some background information, and in order to give you a broad idea of what kind of evidence we have so far.

In lectures 2 and 3, we will cover the nature of input in terms of linguistic input; primarily, we will talk about the baby talk register, which is also called motherese. So, what kind of baby talk typically surrounds the children, not always, and then we will also look at certain cases where it does not work, where there are exceptions, or where there are just different cultural differences, and so on. And then the last part of the last two lectures will look at the brain in terms of the ecologies. The brain is also developing as the child develops his

or her linguistic abilities. So, these two things go hand in hand simultaneously, as a result of which the development of the brain and its functions are also somewhat connected to the environment.

So, how does that impact language learning? This is what we will look at in the last two lectures. So, 4 and 5 will focus on the ecological brain. So, this is today's lecture. In lecture 1, we are looking at the question of whether experience is necessary. We have some opinions, some stories, and some findings to discuss in this segment.

So, first and foremost, the role of the environment on language development seems almost self-evident. This is how it is; otherwise, how will they learn? You know that kind of commonsensical question often comes to your mind. So, children probably learn language due to their innate capacity. So, the capacity to learn is innate, but what they will learn is dependent on where they are situated. So, where they are, the community they belong to, the language they are surrounded by, and so on.

So, for example, dependent upon the environment, if the child is born in an English-speaking environment, he might grow up speaking English. Similarly, the same probability also exists for a language called Yimkhiung, which is a Naga language spoken in the northeastern part of India. So, the innate ability does not determine which language the child will speak. So that depends on where the child is born. So, the capacity is innate, but the output, which language you ultimately grow up speaking, depends on the environment.

So, there have been studies that have also looked at the specifiable features of maternal and other caretakers' speech on language learning. So, certain kinds of properties of the maternal language, mother's language, or any other caregiver's language, there are certain features of the mother's language that may have some impact on the children's language learning ability. So that is another aspect of the environment impacting the child's language. So, this kind of finding, this kind of situation, or let us say reality typically stresses the importance of an expert language user in the environment. So, there has to be somebody who knows the language and some people who speak the language in order for the child to be a master speaker of that language.

Also, on the other hand, we have the theory of universal grammar. While the theory of universal grammar advocates for a biological programming of language abilities, it does not really say that specific grammars are programmed that way. What is programmed is an

innate capacity, an innate underlying universal grammar that is there, but it is not language-specific, so to speak. So, as a result, even the innateness hypothesis is not exactly against some sort of environmental input to help the child learn language. So, the input of specific language data is needed to interact with the underlying grammar.

Similarly, other theories have also underscored the importance of epigenetics and the role of the environment. Genetics and epigenetics; that is how we understand them. So, things that are not genetic, but are out there in the environment, in the social environment that the child interacts with while growing up, those are called epigenetics. So, the role of epigenetics and the environment has been stressed by other theories as well. So, similarly, we also have findings from children who are deaf.

So, in typically developing children, or let us say hearing children, they usually have a babbling phase in the first year of life. that we have already seen when tracing the stages of development. So, that is a very brief period in the first year of life. However, for deaf children, the oral babbling continues for a very long time, sometimes up to 6 years. So, this is also taken as evidence that this happens because they lack a model of language.

So, basically, there is no input; the epigenetic information is not there, the environmental input is not there; that is probably why this thing happens and this babbling continues for a long time. So, these are some very simple observations and findings that point to the idea that experience might be necessary. Now, experience, or technically, we can also call it a model of language, the ambient language model, is essential. So, let us now look at cases where this does not really seem to hold. For example, cases where their language acquisition has happened but in the face of serious deprivation of various kinds, deprivation as in when the environment did not provide an adequate amount of input that would help the acquisition of language.

So, let us go back a little bit in history. The question of whether experience is needed to learn a language is actually pretty old. The oldest information in this regard that we have is from Herodotus, the Greek historian, who in 460 BCE mentioned two kings, one Egyptian king and one Phrygian king, who were having a debate of sorts as to whose language, whether it is the Egyptian language or the Phrygian language, is the first language, the very first language that came into existence. So, that debate was going on. So, they ordered an experiment.

In this experiment, there were two infants who were raised in isolation in cabins. They were fed, taken care of, but there was no linguistic input. So, they were living in isolation with no other human beings around, though they were taken care of; not that they were starved or anything, but unlike Genie. So, you must know about the story of the Genie. We have also referred to her in some cases regarding the critical period hypothesis.

This is not that kind of isolation, but isolated they were. They had no other human contact; no adults were there who were speaking in any language around them, and as a result, there was no language input. So, the experiment, as I said, was designed to find out. So, they wanted to let the children be, as they were confined from the very beginning of their lives, and they wanted to see when the child would start to speak. They were kind of innatists, you know, in some sense, because they believed that even if they were left on their own, they would speak.

So, on the basis of that, they designed this experiment so that whenever the child starts to speak, whatever comes out of his or her mouth will be the first language. So that was the idea. So, apparently, the baby started to speak in Phrygian, which for some time, for some millennia, had settled the debate. Apparently, their first words were "Bekos," which means bread in Phrygian. So, that is the oldest reference we have from history about ambient language and its role in language understanding or acquiring language.

So, these children who grew up in isolation had no linguistic input, yet they spoke something that was a particular language in question. Now, we look at some examples that Lenneberg has provided us with that show language learning can also happen in the face of serious pathological conditions. So, he showed that children's early language development can survive radical pathology. For example, there is a particular problem called anarthria, which is a serious inability to articulate speech even though auditory and written comprehension are intact. So, even if they understand, they are not able to speak; that is anarthria.

Similarly, organic damage to the speech centers of the brain, even in the case of tracheotomy, has been found to allow children to speak and learn language. In the case of tracheotomy, this kind of thing is not very regular. So, this stands out as a very interesting finding. So, the infant in question here underwent a tracheotomy at 6 months of age. Now, this is a medical procedure that is sometimes done for various reasons, but typically to help the patient breathe well.

So, there is an opening made in the throat, and a tube is placed in the trachea through a hole. As a result, they cannot speak. So, this child underwent this treatment for 8 months. However, after this, the child's linguistic development was recorded immediately after the treatment was over, and from then on, his development was tracked; however, it did not show any major issues with his language abilities. So, which meant that in spite of him being unable to speak and unable to utilize his vocal apparatus for 8 long months starting at 6 months, he still grew up to speak a language.

So, this made Lenneberg suggest that overt practice of vocalization may not be needed for creating a model of language. There is a theory that when you hear yourself speak alongside hearing others, this helps you create a model of the language in your mind. So, that is what he is countering with this evidence: that these children did not, because the articulation was not there. So, similarly for the other kinds of patients, even in the absence of articulation, they could create a model of language. The same kind of idea has been investigated by other researchers as well, which is whether language acquisition can happen without a model.

So, there was a study carried out on home sign. So, this is about a study that was carried out on congenitally deaf children. This group of researchers studied 10 deaf children. So, they wanted to check whether home sign would emerge spontaneously.

So, a kind of creative signing. So, this is not the sign language that is formal and that you already know is an existing formalized sign language. That is not a home sign. Home sign is what children automatically create on their own when they have no access to any kind of sign language and are also deaf. So, they have no way to get speech input from the other hearing and speaking people around them. So, these children were looking at those children who are not exposed to conventional modes of either spoken or sign language.

Ten congenitally deaf children aged between 1.4 and 4.1 years when the recording started and they were around 2.6 to 5.9 years of age when the final interview happened.

They were video recorded in their homes. Now, what they found during this time when the recording was going on and when the study was carried out was that children started to communicate, and the first kind of communication they used was pointing to people and objects. Now, up to this point, it is normal; it is similar to what other hearing and speaking

children will also do. So, they made eye contact and did not point when anyone was looking. This is also fine because by now you must already be familiar with the joint attention mechanism. So, they made eye contact and then pointed it out so that they could initiate joint attention.

Now, in hearing children, pointing reduces after a point because when speech emerges, they do not need to use pointing anymore; they can then speak. So, when they have learned the word for toy, they do not need to point to the toy to get it; they can simply say "toy." By just saying the word "toy," it means "I want the toy." So, that is what happens with speaking and hearing children, but in this case what they found was that these children, during those very specific timelines, started to use pointing in combination. So, it is not just one kind of pointing, but they used it in a very creative way.

They used a combination of pointing that was understood to convey the semantic relationship between the references. Something like, let us say, pointing to the toy and another, you know, ball or something, so that they probably mean that the toy, let us say, the doll and a ball. So, maybe they want to say that the ball belongs to the doll or something like that. So, this is what the combination of pointing is trying to make by trying to establish a semantic connection between the references. And then eventually they also invented it; why are we calling it invention? Because they were not familiar; they were not exposed to any kind of formal sign language.

So, they had no idea how sign language worked. So, whatever is happening with the children is happening organically; automatically, they are doing it spontaneously on their own. So, they also invented motor iconic gestures that seem to specify predicates. So, from pointing, they go on to proper gestures. Soon, there emerged a combination of points and gestures. The combination of gestures into strings then functioned as meaningful sentences.

So, they started with a single gesture, gradually moving to two-gesture phrases and then complex sentences, just as a speaking child will do, starting with simple sounds followed by words, then the two-word stage, and then some simple sentences, and then complex sentences. Exactly in the same way and on the same trajectory, these children were found to invent gestures, combine them, and combine them with pointing and so on; thereby, they created their own complex language entirely on the basis of home sign. Thus, home sign shows systematic properties of language development much like the conventional pattern of language acquisition. Another study on deaf children that comes from Nicaragua is yet another famous study. Now, in this study, the children in this case are from Nicaragua.

So, they were found to use and create their own home signs. Now, Nicaragua did not have a sign language of its own at that time. This study is pretty old, from the 90s. At that time, they did not have a sign language, so these deaf children created their own home sign. And when the deaf children came together, I quote, "they immediately started to sign with each other.

" So, they immediately communicated with each other using home signs, and they understood each other perfectly well. In fact, this is how Nicaraguan Sign Language was born. So, this was one of the first documented birth of a natural language. This happened right in front of people's eyes.

This was documented, and this could be studied. So, this is a case where there was no exposure to sign language and, because they were deaf, they could not make use of the speech around them. Similarly, another example that has been discussed with respect to the lack of exposure to the model of language, where language still forms is the case of Creoles. So, as you all might be aware, Creoles are created when pidgins start to get native speakers.

So, pidgins are.. what are pidgins? Pidgins are those languages which are typically born out of trade situations, where people speak different languages. Due to trade, they have to interact with each other and discuss that particular activity of trade with respect to one another. As a result, a very limited sort of language emerges, which is called pidgin. But over a period of time, Pidgin also undergoes changes from a simplistic nature to having complex grammatical systems and so on. And eventually, when Creoles are spoken by children as their first native language, they tend to get more and more complex, take on a life of their own, and become like any other normal language.

So, this is also given as an example of how creoles happen; creoles grow when the native language is typically not present. So, the Creole is a mixture. So, even if the lexifier source language is present or not, the model that the creole will follow is not there. So, as a result, this also qualifies to be considered for a language that develops without an explicit model. Similarly, another domain that has been studied at length with respect to this lack of model and use of language and communication is whether language development and the development of communication go hand in hand.

Because when we learn to speak, we speak in order to communicate. So, they are understood to be going together. If you have learned to speak, you will also be able to communicate, but does it always happen? Apparently, it does not. So, there are some studies that I have quoted here, studies that have revealed that there is probably sometimes a near total divorce between these two factors of language acquisition and language learning on the one hand, and communication on the other hand. So, one particular case where John, the name given to him, is John, aged 3.

3 years, had normal language development for his age, but at the same time, his interpersonal communication skills were almost non-existent. So, he hardly communicated with anybody, even though his language development was normal. So, this was a case of the difference between, or let us say, non-cooperation between these two skills. So he refused to talk to other children and teachers.

His verbalization was irrelevant to what the parent had just said. So, sometimes he did communicate with his parents, but with friends and teachers he did not. So there are some examples. So, for example, on one occasion his mother said, "Are we going to go and say hi to Daddy?" He replied, "Ok, here we are in the garage." So, that kind of communication skill he had is not very useful.

So, his communication skills were very poor. This is a study carried out in 1979. Another case was that of Christopher; he was in his 30s when the study was carried out. So, he had a severe case of deficit in non-verbal IQ. He could not find his way around, could not take care of himself, did not remember numbers, and also showed significant visuospatial deficits, which indicated serious problems with his non-verbal capacities in various domains.

However, his linguistic abilities were exceptional. So, this was evident both in the speed with which he learned new languages and also in his fluency in the languages he knew. So, this is what we meant by his language abilities being exceptional. So, he could learn languages at exceptional speed, and he was also rather fluent in all the languages that he knew. He knew quite a few languages. So, he could read and write in about 15 to 20 languages and showed a remarkable ability to translate these languages as well.

So, he not only spoke, just to be able to speak one language, let us say your third or fourth language, and also to translate those languages to your L1 or L2, or between them, or whatever takes a lot of, you know, high proficiency caliber. He had that as well; this is what we mean by high proficiency. So, he showed an attention bordering on obsession with the orthographic form of words and their morphological makeup. So, basically, he was

rather obsessed with language as a tool. So, he not only mastered the languages, but he was also very focused on their structure.

So, the orthographic form, the morphological makeup, and everything. So, he was very much into languages. At the same time, he showed an impoverished conversational ability, mostly answering in monosyllables and being reluctant to initiate conversation. So, in spite of such difficulties, his language ability was remarkable. So, that is another case of divorce between the language and communicative abilities. And then yet another case, that of Clive, demonstrated this kind of dissociation again.

So, he is eager to communicate but has grammatical deficits. For example, he says "they mean cold and bath ice in it they do all the". So, there are no sentences; there is just no grammar, nothing to it. So, he was eager to communicate. So, in this case, it is the other way round as opposed to Christopher and John, who were not able to communicate. This person wants to communicate and tries to communicate, but the language does not quite cooperate.

So, his grammatical abilities were deficient. So, these kinds of examples show that language acquisition and communication abilities may have separate sources. So, because communication depends on it, your communication is part of your negotiation with your surroundings. So, this is another kind of domain that proves that the environment and the language abilities may not be entirely together; they may not be entirely dependent on each other. So, the case of John, Christopher, and Clive shows that there are probably different and independent sources for language and communicative abilities to develop.

Now, the another domain is that of perceptual input. So, if you have no perceptual input, perceptual inputs come from the environment. If you remember, all of you must have read about or seen the various films and other things about Helen Keller, how she was touching things, and how her teacher put her hands and fingers under the flowing water to tell her what water is. So, this is how water feels. So, perceptual input comes through your five senses: visual, auditory, tactile, and others. So, the idea was to check in these studies whether language can develop without perceptual input.

So, the studies here looked into blind children. So, one particular experiment here, one particular study that we report. So, the blind child's learning of fine nuances in word meaning was explored in the study by Landau and Gleitman (1985). They reported that the child's understanding of "look" and "see" developed similarly to that of a sighted child. What is happening here is the perception of verbs, various kinds of perception, as in how you perceive and how your senses perceive a particular thing, which is dependent on your

sensory input. Now, based on that, you also have languages that have different kinds of vocabulary in that domain.

So, many languages, let us say not most languages, make a distinction between "look" and "see," and you can have even more various kinds of fine-grained differences within that. So, just using your visual apparatus to gain information from the environment can also have graded, you know, categories. So, it could be simply a thing like looking, but seeing is different from looking, and then there are all kinds of other possibilities. So, they wanted to check if this child, because the perceptual input is visual input is not there, is able to find out the difference between these two kinds of differences: minute differences and very subtle differences. So, when asked to "make it so that mummy cannot see it", she puts the toy in her pocket.

So, this is one example that the study provides. Again when asked to "look behind you", she explored the area behind her with her hands because that is how they will try to see. Also, her acquisition of the reversible pronouns "I" and "you" was not later than that of sighted children. So, these kinds of findings from a blind child were reported, and the acquisition of color terms was also reported, which was comparable with that of sighted children. So, young children, often deaf and blind children can also learn language through what is called vibrotactile information provided to the face and neck. This is a particular method of language learning that is often used with deaf and blind children.

This is called the Tadoma method, which is what Helen Keller is also said to have used. So, these cases show that language acquisition can take place without direct perception of the environment. So, there is yet another domain. Even when, let us say, you are sighted and you are not deaf and mute, you are typically developing, but then the environment is not equal for all children. The environment can be rich, rich as in linguistically rich; it can be culturally rich or it can be culturally impoverished; it can also be linguistically not very rich, and so on. So, around the world, in various kinds of language communities, the environment in which the children grow up cannot be, need not be, or will not be the same.

So, the environment is variable; environments are variable. So, there is a considerable amount of variation in the rates of language development in children. This variability is seen both in highly enriched environments as well as in deprived ones. For example, some studies have looked at orphanage children with limited language input, which often show developmental delays in many domains, including language-related domains. However, even though they might have a serious deprivation in terms of, you know, linguistic and other kinds of input.

However, there is a catch-up mechanism of some sort that helps them in the later years.

So, they counter these kinds of effects by a certain kind of mechanism that makes them actually good users of language. So even if there is a lot of variability in the environment, it need not stop a child from being able to speak properly or learning the nuances of the language into which he or she is born. Or even if they are deaf and mute, they can create their own sign language and go about it in their own way. So, to sum up, all normal children seem to contain within themselves the ability to create a language, regardless of the wide variations in the various kinds of experiences. So, we looked at blind children, deaf children, normally developing children, as well as various kinds of other studies.

All of them seem to point out that, irrespective of the environment, the children seem to do fine. In terms of until and unless they have some cognitive disorders, they do fine in learning language. So, that again brings us back to square one: is the environment useful or not? It seems it is not really very helpful. So, we wrap up this segment here, and this is the end of this lecture. In the next lecture, we will look at some other kinds of input in the experimental domain that have been studied. Thank you.