

# **Fundamentals of language Acquisition**

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**Lecture 060**

Lec 60: Summary

Hello and welcome back. This is lecture 5; we are in the last module, and this is the last lecture of the last module. So, basically, we have reached the end of the course, and it is a good time to recap and summarize what we have learned so far. So, that is what we will do in this lecture, and then we will complete the course. So, in module 1, we had a detailed discussion on the evolution of human language; we discussed both the evolution as well as the evolution of language through generations. So, both were discussed in the first module. While discussing that we have looked at various kinds of markers, we started with the biological marker, examining how various biological factors are probably responsible for humans having language and being able to speak. So, while looking at the biological markers, we discussed different kinds of theoretical positions and different kinds of techniques that are used to arrive at the conclusion that we did. So, we talked about the homologous and analogous comparisons across various species, whether they are higher primates like our close cousins or other kinds of animals that seem to have some kind of communication system. So, all of that we discussed, and then we talked about certain biological factors which seem to be human-specific, but of late we have more data in the domain, and we now know that many of those biological features are actually present in other animals too.

So, for example, we started our discussion with the FOXP2 gene. So, that takes us to the realm of genetics and how there was probably a mutation or a single gene that is responsible for humans being able to speak. So, the discovery of FOXP2 was regarded as a very important milestone in the entire debate about language evolution. Now, while it

was initially believed that FOXP2 is a human-specific gene and that any problem with it would result in a language disorder, we discussed specific language impairment in that context and also noted that later findings show that Neanderthals probably had a version of FOXP2 as well. And then there are many other speculations as well, many other pointers that probably many other higher primates also had.

So, Fox P2 probably is not the only thing that resulted in us speaking. And then we talked about the brain structure, specifically the properties in the human brain that are probably responsible for the evolution of language in humans. So, there are the Broca's area, Wernicke's area, and so on and so forth. And then we also discussed how other primates have some similar brain regions, but the same regions have different functions for other animals. So, in some higher primates, it is used for complex gestures, whereas for us, it is used for language production. So, these are the various things, and we also talked about the larynx; in the case of humans, our vocal tract is specifically designed to enable us to speak. And then we, of course, discussed various theories within the larger biological domain. We also discussed the contribution of a large number of scholars in this, and we saw that some of the biological factors that were initially thought to be human-specific were also present among our ancient predecessors, and various kinds of ancient animals also had some of those. So, the idea that was proposed by some of the scholars is that those organs, which are the brain parts and neural parts, have been repurposed in humans, although the same thing was used for something completely different in other animals and so on. And then we moved on to the cultural evolution theory regarding how factors like learnability and ease of transmission, and so on, are also important factors with respect to learning a language.

In order for language to qualify for transmission across generations, we need it to be learnable as well as transferable. So, there we discussed certain experiments using artificial agents. Primarily, we discussed Professor Simon Kirby's work, and then we also discussed gestural theory, gestural hypothesis, and vocal theory. So, with that, we concluded module 1. So, in a nutshell, module 1 was all about the evolution of language, various theories, and some studies and their findings. In Module 2, we discussed the theories of language acquisition. Now, language acquisition is a domain where there are multiple theoretical positions that have contributed over time, starting with behaviorism. We discussed the main proponents of behaviorism, the main theorists, and their ideas that were put forward, which were later utilized in the domain. So, we discussed them. And then we also discussed nativism, the generativist theory of Chomsky, the innateness hypothesis, and the primary tenets of the innateness hypothesis; and then, of course, we discussed constructivism. Similarly, the scholars and their contributions and the main tenets. So, this is how we completed the second module. From the third module onward,

we discussed the actual properties of language. So, we started discussing the structural properties of language and their acquisition from module 3 onward. So, module 3 was dedicated to the acquisition of phonology, how children learn the sounds of their language, what specific properties they learn, and what those properties are that they probably learn before they are born, meaning in the fetal stage.

So, in the prenatal stage, children are also exposed to language, primarily the mother's language and other ambient languages, and what is the impact of that prenatal experience on their neonatal performance, or let us say immediately after their birth, how do they perform on language-related tasks, primarily in the domain of sound? So, recognizing sounds or not recognizing them. So, starting with that, we discussed various theories here, as well as a number of findings. So, theories, how they developed, what the findings are, how much data supports the theories, and how much it does not. And for each module from now onward, we have looked at the major findings, the major scholars and their work, as well as the main findings from all the perspectives, the theoretical perspective that we discussed in module 2. We have brought it in again and again in each module so that we try to see the same pattern of, you know, language acquisition; in this case, phonological acquisition, and we try to see how nativist as well as constructivist theories try to make sense of or what their take is on the process that we see among children.

And we have compared and contrasted them regarding which properties nativists seem to have a better explanation for or whether it is the constructivists who have explained it better. So, we have discussed both sides of the story while keeping the structural properties in the middle. So, these are the properties. So, whether the children learn or not, children are already born with the capability of understanding all the sounds in all the languages; what are the changes that they might go through, and so on and so forth? So, that is how the third module was discussed. Primarily, we can say that all the major theories and findings have been discussed in this module. In Module 4, we started discussing morphology. So, after phonology is in place, phonology is the very basis of a language. So, what are the relevant sounds for a particular language? That is where phonology comes in. So, if my language does not have a sound, is the child who is born into our language family, language group, or in our community capable of understanding those differences in the sound system, or are they also capable of learning the other distinctions, you know, binary oppositions in another language that is not their mother tongue? So, once that part is in place, once the child understands that these are the sounds, this is how sounds are segmented, syllable structures are segmented, and so on, then they can move on to what we think we can now talk about morphology. Morphology is all about how words are created.

So, how do you form the plural form for that matter, or how do you form the progressive tense in the English language? So, these are certain things that we talked about, and of course, again, the same behaviorism, nativism, and constructivism were brought in. We looked at the data, examined the findings from the different groups of researchers, and tried to understand them both through the nativist theories and the constructivist theories, aiming to provide a broad overview of how things are today. Of course, not all data are satisfactorily addressed by any particular theory. We need to look at it through a more critical lens, but this was also discussed at length in module 4. And also because many of the theories in the initial stages had data from mostly Western European languages, we now have a wealth of data, so we have tried to see some of those properties of morphological development by using the findings from other languages as well; that was module 4. Module 5: now that our sounds and word formation processes are in place, it is time to learn language. So now the gradual the next step was to learn words. So, this section, as a result, discusses word acquisition by citing the main theories and findings. What are the main theories of word acquisition that we have followed? So, this has been the pattern starting from module 3; we have talked about the same, and the trajectory has been similar. So, we talk about the problems that are present, what the data says, and which theory explains it better. So, we have discussed both theories, you know, the positive and the negative cases; the negative, as in where the theory does not seem to explain the findings. So, both similarly for this module as well as word formation and word learning, how do children overcome certain problems of overgeneralization? How do they understand what is, how do they understand, how do they learn verbs, how do they learn nouns, and so on? And then the next segment, which is module 6, was dedicated entirely to the acquisition of syntax. So here again, we discussed the main ideas and main theories. Again, this is a very, the acquisition of syntax is a rather rich domain. A lot of literature is available, a lot of studies are available, a number of stalwarts have worked on these, the number of scholars has their own findings, and their own way of approaching the question.

Of course, we could not cover everything in one module, but we have tried to give you a brief overview of what the overall understanding of the scholars is with respect to how children acquire their sentence structure; how syntax is acquired is what we have tried to cover in this module, module 6. Modules 7 and 8 have taken you to the domain of bilingual language acquisition. So, until module 6, we looked at phonology, morphology, word formation, and syntax. So, basically, we have taken care of the fundamental aspects of language, and that was in the domain of first language acquisition, which is something that happens normally and naturally and is not taught. And after we had put in place what

the trajectories of development for first language acquisition are, we moved on to learning the second language. We have dedicated two modules for that because this is also another domain that has been studied a lot; a lot of important data is available, and there is a contribution from really great scholars in that. We have tried again to give you the basic idea about what those things are and what the main findings are. So, we looked at childhood bilingualism, adult bilingualism, and within childhood, we also examined childhood simultaneous bilingualism as well as discussed successive bilingualism in children. So, only successive bilingualism will actually qualify to be called second language acquisition because when children learn two languages at the same time, which is technically called simultaneous bilingualism, there is no first and second language; both languages are considered first languages in that case. However, because that is also a possibility that happens, this is a reality for many children; we did discuss that because they are learning two languages, not one language.

So, we discussed a little bit about that and what the primary findings are, what the controversies are, and what the theories are that try to make sense of simultaneous bilingualism in children that we covered. After that, we discussed SLA in children, SLA as in second language acquisition for children. So, what happens when a child learns his second language after the first language, typically after 3 years of age? There are those debates on that which we have discussed in the module. So, childhood bilingualism: what are the properties, and what are the main factors that are responsible for them to attain what is called ultimate attainment, which is the best possible proficiency that they can achieve, that we have discussed. After that, we looked at adult bilingualism, specifically when you learn your second language in adulthood, not when you are young.

And the factors remain similar, though not the same, and the same factors affect children and adults differently. So, we have looked at all those main factors like input, age, and interaction; all of those methods and factors we have discussed with respect to referring to the scholars we have worked with. When it comes to adult SLA, we have also discussed certain other psychological factors, such as motivation and attitude. These are also important factors and are responsible for whether your proficiency level will be or whatever your ultimate attainment level will be. So, these two modules talked entirely about bilingualism, which is learning a second language in childhood simultaneously, successively, and in adulthood with respect to various parameters that can have an impact on the way it is learned. Not only that, we have also discussed some other kinds of language learning that are similar, though not exactly the same, but comparable domains of learning another language; we talked about third language learning and heritage language learning. Heritage language acquisition, we can call it, is kind of a recent, much more recent than second language acquisition research. So, heritage language research is

a relatively new domain, and what are the parameters that are studied there? How is it comparable to the second language acquisition? we have discussed as well. Not only that, we have also talked about various language teaching methods, such as the immersion method or the CLIL method of teaching a second language, and how the scenario in this domain is. So, how have there been many changes in when you talk about second language learning? Automatically, we have to talk about language teaching as well.

This is not relevant for the first language, but this is relevant for the second language. So, we did discuss the socially learned versus the tutored second language acquisition. So, when it is a tutored second language acquisition, you learn your second language in a classroom setting; that is where the entire domain of second language teaching comes in. So, what are those methods? What were the older methods of teaching a second language? Because this is not exactly a part of the course, but we cannot avoid it. So, I have discussed this briefly while discussing the second language at ultimate attainment.

So, what are those parameters? What are the factors that are responsible for learning a second language well? Then, we discussed how these parameters have been addressed by various teaching methodologies, including the CLIL immersion, and so on. This is another way to explore an entire domain of research, but we touched upon it a little. We have also discussed the effect of bilingualism on the human mind very briefly again. After all this, we move to module 9. Module 9 discussed that in the language acquisition research domain, the main debate is about nature versus nurture.

So, how much of the knowledge that is genetically coded is part of our nature is part of the debate. Nurture, on the other hand, talks about whether there is anything in the environment or in your surroundings, or if there is something that you can learn rather than expressing what is already innately provided. That is where we brought in this module. This module looked at the role of nurture, specifically the role of epigenetics. So, the various things we have discussed in terms of various theoretical positions again show how much the ambient environment impacts the way you learn a new language.

So, in this regard, we also discussed cross-cultural data because this is very important, as different languages have different kinds of conceptualization processes and different kinds of social realizations of those conceptual processes. So, naturally, there will be some amount of, you know, interaction, and hence we discussed that this is a domain, again very rich, but we have given you a brief overview. Module 10 talks about how communication is the final goal, because until now we have been looking at language learning. So, sound system, morphology, words, syntax, and then we took it all the way to second language acquisition. So, after all of this is done, what will you do with that knowledge? So, you will use it. That is what we need to discuss next. That is what we did

in module 10. So, we looked at how the basic rules of communication, how the child learns the rules of communication, how they converse, how they learn to converse in a meaningful way, and how they can contribute to an ongoing conversation in a proper way. So, there we have discussed this module that discusses conversation rules, primarily referring to Grice and his maxims. So, how do children learn to contribute in terms of quantity, in terms of quality, in terms of relevance, and so on? And then what happens when the rules are violated, for example, when you use a metaphor or irony? Do children understand them? How do they understand it? What is the trajectory of the development of that understanding? All of these we have tried to cover in module 10, which is entirely focused on communication and learning to communicate. So, the main finding in this domain is that even though the structural properties are learned, the structural properties of language are learned pretty quickly by children, but learning to communicate takes a little longer.

They do not actually master it in their childhood. Even though they master syntax pretty early in life, learning to speak and communicate, which is where we also bring in pragmatics, is more challenging. So, communication has two different parts. Not only do you have to use the grammatically correct form of the language, but you also need to keep in mind that the person who speaks needs to consider the cultural norms. So, what are the rules of conversation from a linguistic perspective, and what are the rules of conversation from a cultural perspective? What is appropriate in a given scenario is important as well. So, children need to master both of these things and both of these properties. So, this is where our communicative competence and pragmatics come in. And that is what we discussed in module 10. And the take-home lesson from this module is that children do take some time, even though it seems that they are able to understand the nitty-gritty and the nuances of communication at an early age; it takes a little more time for them to master it. So, it is not only about knowing but also about being able to utilize it properly; that is what is important for us, and we have found that it takes some time.

After that, in module 11, we have looked at both the structure of the language and the rules of communication, and so on; then module 11 talks about the role of the human brain. So, as we have looked at various things within this module, we have examined the structural pattern of the brain, particularly in relation to the development of its structure during childhood, while language development is also occurring. So, the simultaneous development of the brain and language has been discussed here, and we have also talked about which part of the brain is responsible for processing what kind of linguistic input or output, for that matter. So, language is processed in the brain. So, is there a difference between first language and second language processing in terms of functional

lateralization, as in the localization of the process in a brain? that has also been discussed.

Within this domain, we have also talked about the concept of the ecological brain. Ecological brain refers to the simple fact that when a child is born, the brain is not entirely formed or structured properly. So, the human child's brain continues to grow after birth. So, while the brain continues to grow, which has a meaning in structural terms, as in, you know, the number of pathways that are created or the extra connections that are reduced, there is a pruning that happens. While all of these things are going on, the child is also experiencing the real world—the world that surrounds the child.

And the child is also learning language. So, what are the interactions between language development and brain development that have been discussed to some extent in this module, as well as the localization, the functional localization of processing for both L1 and L2 in terms of age, input, and other factors. So, the specific role of different brain regions in language functions has been discussed. And then finally, in the last module, which is module 12, this is where we talked about language acquisition among the atypical population. So, so far, starting from module 1 to module 12, all that we have discussed pertains to normally developing children, typically developing children. This is what will happen if the child is developing as they should, but we also know that there are children who have different kinds of language delays and language disorders, and so on.

So, what happens is that the trajectory of language development is different for them; what are the properties that we see? Also, a connected question that automatically arises in this module is whether language development and brain development, that is, cognitive development, always go hand in hand. Is it possible for somebody to have a language impairment and not have cognitive impairment, and vice versa? So, we have tried to discuss one or two examples from each type. So, for example, we discussed SLI, specific language impairment, where the impairment affects only language, but not cognitive abilities. And similarly, we also discussed Williams syndrome, where cognitive abilities are disturbed, but language ability seems to be pretty good. And then we also discussed autism spectrum disorder, where both language and cognitive development have been disturbed or delayed.

So, these are the areas that we have discussed. So, we discussed both cases where a language disorder co-occurs with a mental disorder as well as when they do not. So, we complete this module with a discussion of the latest intervention as well. For example, some of the latest findings with respect to oxygen therapy, using educational robots, social robots, and so on, as well as social games, serious games, and various kinds of

techniques that have been used and are now being used as intervention methods alongside the traditional therapies that we have also touched upon. So, this is where we end this module.

So, it brings us to the end. I hope that I have been able to give you a brief overview. This is a vast field, as I stated in the very beginning of the course. Language acquisition, specifically child language acquisition, is an enormous domain of study, and the aim of this course was to give you a good outline of the fundamental aspects of the discipline. And so that is how the course was designed, and for every topic where there are many more possible readings, I have given adequate reference. So, anybody who is interested in reading the original papers, original books, and original references is welcome to do so, because I have given a long list of references for each module. I hope you will be able to benefit from that, as well. So, that is what brings us to the end. Thank you so much for your attention. I sign off.