Language and Mind
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Module - 08
Lecture - 40
Language and Mind: A summary

Hello, this brings us to the conclusion of the course on Language and Mind. Today, I intend to give you a summary of what we have done, and why we have done what we have done. We started looking at the relationship between language and human mind and we moved into the details about language. In our outline we have said that language is one of the most fascinating activities of human mind; language is primary means of everything that we do. We cannot think of human existence without language; it is such a crucial element of human life.

Then we started looking at how does it happen that we internalize such a complex system so effortlessly, and particularly most of it happens before the age of 5 years. This is one of the most interesting wonders of modern time. At the same time, this is one of the most interesting challenges of modern time to find out what happens in human mind that we internalize such a complex system called language. We started looking at the relationship between the two; that is, language and human mind, with the help of structure of language. And then we looked at first, the learning of language or acquisition of language; in particular, first language. Rather, only first language because that gives us a window into human mind. You have also heard human mind is like a computer; it is like a computer system; it is also called biological computer.

So, what is the connection between the two? See, for long, most of the approaches in description of language learning came from psychology, and for long time, they did not focus on the role of human mind in learning a language. The dominant theoretical description, the dominant theory that was prevalent right before mentalism is known as behaviorism, which underlines the significance of language as a human behavior. And the primary thing in that theory is - the response is equivalent to a stimulus. Now such a thing is going to assume that we learn only the things that we hear, that we interact; however, the strength of mentalism lies in empirical evidence that it is not the case. We know and we can perform in terms of language with much more than what we could

have learnt or what we think we know. So that brings the notion of function of human mind in understanding language learning. This is where we started with the role of human mind in learning language.

We looked at the proposal from Chomsky that every human child is born with a hypothetical device called language acquisition device. We argued following Chomsky that such a device has universal grammar inbuilt in it. Universal grammar is the set of rules of language. We have looked at the distinction between language and languages, and language is a system; and by language we mean common rules, common structure of the system. So, we say universal grammar is a set of rules that are common to all languages. This is also called principles; and then universal grammar also contains parameters along which languages differ from one another. With these things inbuilt, children interact with real world, real society, which is not a very friendly place for children to learn, but the real picture of learning language starts from here.

What actually happens is when children interact with the world, human mind is always active, and it starts generalizing rules, and it starts abstraction of rules at whatever comes as input. And within a very short period of time, that is between 0 to 5 years, we find a fully grammatical sentence coming out of children. Lot of studies have gone at that stage as well, and one of the primary studies which we have discussed as how children learn language comes from Ray Jackendoff, and you can see how Jackendoff describes every stage involved in learning. And beginning from babbling to one word stage, and two words stage, and then finally the full sentence stage, there is a lot that is happening, but the time period is too short for all these things to happen with the purpose of, with the role of instruction in it.

And a detailed understanding of these stages helps us more to understand that the role of practice, role of imitation is very limited, when it comes to learning of language. Rather, what happens is human child with its interactions with the real world, keeps figuring out patterns underlying language at various levels. We start looking with, looking at examples from sounds, and then we have looked at the sound system of language and how we get our vocal tract functioning, and then in terms of their places of articulations and manners of articulations, we looked at some of the features of sounds very briefly for us to understand, what happens at the stage of babbling, what starts with babbling.

Then, when children come to one word stage, the primary thing at that stage is for us to see that the child has figured out what a word means in terms of its structure, in terms of its construction. So, whatever it takes to make a word, we have looked at the patterns underlying construction of words in terms of constraints in great details for us to understand what we mean by a word and how children have figured these things out so early in the stage of learning. A jump between the ages of two and a half to four has been indicated in the same chapter by Jackendoff and this happens from the 50 words of vocabulary to several thousands. This is actually explosive and this helps us understand that children have completely figured out all the possible structures with all the possible constraints at that stage.

Then they figure out several structures, several patterns, that combine two words together at the stage of two words, and then slowly they move to sentences. You can also see with the help of those stages and the things that we have discussed throughout the course that, at every stage we see something else coming up. So soon after two words stage, when children move from examples like 'mummy water' to 'please give me a glass of water' or 'this is a pen' or 'this is a pen' or 'I like pizza' or 'I want a doll'; what you see is, with a limited grammar of 'mommy ball' or 'my pen', at that stage, if children were not coming up with full sentences, because there were certain things which has not taken place and what those things are, now looking back, is not difficult for you to see that they have not figured out, how inflection system works, how agreement works, and how we put elements of sentences together at a particular level of representation in human mind.

Thus we see several instances by the study of a structure of language which will help us understand functioning of human mind. We have looked at…having looked at sentences, we have looked at several processes that takes place at deep structure, and the particular level of representation in human mind in terms of case assignment, in terms of displacement and dependencies. With all these things, we saw that language is indeed specific-purpose learning and a special type of learning which is different from others. We tried to look at an intersection between cognitive science and the understanding of language learning, and the structure of language. The approach of cognitive scientists have been to come up with a theory which can unify all kinds of learning and understanding which we have seen, an honest acknowledgement, that this does not

happen. Computer algorithms in the domains of artificial intelligence have tried best, but modeling learning of language and role of human mind in it has been increasingly difficult for these things.

Then we looked at computational linguistics, and we saw that that computer can be used as a tool in understanding structure of language, and doing more with the structure of language; with doing more in analyzing a structure of language and processing how natural language really works. And in particular we saw, rather we just mentioned that, data mining and development of software is largely dependent on the structure of language and findings from the structure of language. At the same time, we saw some difficulties that also became apparent and that also comes up as challenges as to why certain things are difficult for machines to do.

With a specific goal of machine design in mind that we can come up with a machine which will function like human mind, we saw the roadblocks in such developments. And one of them was interpreting ambiguities or resolving ambiguities. We saw several examples where why it was difficult to resolve ambiguities for machines and it is so easy for human mind to resolve those ambiguities.

Now, what is missing as the link between the two is the missing context. Human mind has inbuilt context all ready, all the time, available so that it can resolve ambiguities in no time; however, the programming or the computer algorithm that helps computers, machines, to design algorithms for understanding of structure of sentence does not have inbuilt context in it for interpretation of… interpretations and resolving ambiguities. Therefore it is difficult for machines to resolve ambiguities. We have done…we have looked at these things.

With that, we close this course on Language and Mind. We hope it was helpful for you to understand the details of language, structure of language and what we mean by underlying patterns in language. Such a study helps us understand the role of human mind at length in learning of language and in understanding language structure.

Thank you. All the best!