Fundamentals of language Acquisition

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Lecture 043

Lec 43: BTR continued

Hello and welcome back. Today, we will start with Lecture 3. In lecture 2, we looked at the perspective of how BTR probably helps or does not help in language acquisition. So, on the one hand, there are certain features of baby talk register or child-directed speech that are different from the average adult-to-adult speech, and we have also looked at how the acoustics, for example, the vowel space, and all those things change. Because of this, children probably find it easy to acquire those particular features of a language. Then we also saw that even though the vowel space is increased, it is sort of stretched; however, there were questions raised that even if the vowel space is stretched, English, Russian, and other languages will have different kinds of distinctions to be made within that very space.

So, how does it help? Some kinds of questions have been raised. So we will carry on with that discussion and let us see some more examples in this domain. So there is another kind of example that has been quoted in literature. They are called direct negative evidences.

So, when there is something that is clearly not correct, So, what happens in that situation? So, this is from a very famous study. So, children often desist or resist direct negative evidence, even if it is clear to them that what they are saying is incorrect; even then, it does not seem to help. So, this means that when the adult directly hints at correction at various levels, like phonology, syntax, etc., the child does not learn from it. So, this is an example: the child says: "there is fis in there"; father: " you mean there is fish in there?". "Yes, there is fis," so the child continuously says "fis" even after the father corrects him by saying that this is "fish." He does not say it is "fish," but he just pronounces it correctly, thereby giving a clue as to how to pronounce this. Even after the

father keeps continuously pronouncing it wrong, she also disagrees; the child disagrees. So this is what she knows; we have put it in capital letters to show that she understood. She is trying to stress the word to convey that no, this is not correct; what you are saying is not correct, but she is saying the same thing which she thinks is correct.

So this is an example of direct negative evidence; we have already seen this before. One probable reason for this is that the child understands the difference. However, the utterance and the understanding do not have a one-to-one mapping at this particular stage. So it is quite clear, as we have seen in some other examples before, that the children are aware of the acoustic signatures, but when production comes, there seems to be some sort of a lapse. Similarly, in the case of syntax, we also have a similar kind of data from older studies: the child says, "The mummy goed to the store," while the father says, "Mummy goes to the store." "No, daddy, I say it that way, not you." So, if I can make a mistake, this is my way of speaking, but you cannot; you are not supposed to make that kind of mistake. So, father keep playing with her, so "mummy wented to the store?". So, he creates certain kinds of wrong pronunciations and wrong forms of the word but child does not agree, and then when he says "mummy went to the store," that is right, and even if she understands it is right, she goes back to her "goed." So, these are some of the examples that tell us where the problem probably lies.

Similarly, another example of this is a duck. Mother says, "Say duck," but the child will say "doggy." In spite of many repetitions, the child keeps on calling the duck a doggy. Now, because of this kind of experience and these kinds of examples from literature, many scholars have opined that, in terms of linguistic input, children are not exactly data-driven; that is what Barbara Lust talks about. She said it is not as if they are actually picking up from the data. So what is happening is not directly understandable by looking at the data that is available around it. Children do not pick up data as we might think they do. So, they are not really looking at the data and trying to gain knowledge from it; rather, it is possible that they are considering the input while imposing structure on it. Remember that structure is the underlying universal grammar that we have talked about before. So, they do make mistakes, and they are not being taught.

'Being taught' is the behaviorist way of looking at it. So, they refuse to learn because they are taking input from the environment, but they are trying to impose the structure that they have already inherited. So the structure is already there; she is just trying to, so when she says "goed," it goes because of the underlying grammatical structure that the past tense will need /-ed/. In some cases in English, for example, there are exceptions, but they have yet to get there. So the mistake is primarily because they are trying to impose structure on the input they are receiving. So what do all these results mean? As per some

scholars, there are differences of opinion; this kind of finding primarily means two things: one, the strong form of motherese cannot be confirmed, meaning that 'children learn using motherese' cannot be tenable because they simply refuse to learn that, as we have already seen. Secondly, the result does not negate the possibility that children attend to specific properties of the input they do attend to, as she was correcting the father when he said "fis"; she said, "No, not fis." So she is paying attention; however, that attention is not resulting in her copying the father. So the idea is that the strong hypothesis of motherese will not be tenable. Hence these findings may suggest as per these scholars, they suggest a semi-autonomous unfolding of the language capabilities.

It's not entirely autonomous but semi-autonomous because the underlying grammar is already there. Effects of maternal input are those that match the learners' biases; remember we talked about bias before. So, those inputs that seem to match their bias are only attending to those things. So, that means the infant selects some properties of the input that are considered language-specific factors needing induction. So, we have discussed this before, but let me just refresh your memory that, as per the nativist theory, we are born with universal grammar; we have the underlying algorithmic factor already present in each human being, and we are bioprogrammed to learn language.

However, for us to have those inductions of the language-specific properties, we need some amount of input. So, that is the input we are talking about, and as far as these researchers are concerned, that is the amount of attention they are ready to allow the child to have on the environmental inputs and various kinds of inputs. However, the input is not determinant of universal aspects of language development simply because not all languages are the same. However, there are also some inputs, some data, and some research findings that point towards the idea that there is probably some amount of give and take, some amount of input that the child actually takes in, and it helps them in their language acquisition. Starting with the older studies, we have some proposals that the BTR benefits learning in these four different domains.

So, in vocabulary generation, in creating better vocabulary, learning grammar, learning conversational rules, and learning abstract concepts, in no particular order. The idea is that these are the four domains from which the child might be getting some amount of help from the input. So, first and foremost, the vocabulary development. Now the idea that is at the root of this theory is called the principle of immediacy. Now, what does it mean? It means we have talked about before that when the caregivers, the mother, or whatever you call it, that language primarily focuses on the here and now.

So, as a result, when they are learning nouns, the referent of that noun is present in the environment. So, the referent will also be something that is directly relevant to the child.

So, they will not talk about, you know, the weather, the mountain that is there in Mount Fuji, or something. They will talk about the toys, the food the child likes to eat, or you know, something that is there in the immediate environment. So, because the words used by caregivers are generally directly relevant for the child, introducing the words this way enables children to relate the words to their reference, and that is how they will probably be able to learn more, acquire more words, and acquire vocabulary in a better way.

That is how it is supposed to help them learn new things, and there is also a tendency among caregivers to introduce new toys and objects to the child. So there might be some impact from that effort on the child's vocabulary learning; that is the idea. Similarly, understanding abstract concepts, learning concrete objects is one thing; learning abstract things is a completely different matter because you cannot have a direct referent to them; you cannot show happiness; you cannot show sadness. Of course, there are some facial expressions you can make, or you know the children are taught: if you are happy, if you are sad, if you are happy, you do certain things, so those things are there; so that is what the idea is all about. So, in order to teach children the abstract concepts, there are some kinds of roundabout ways that the caregivers typically use.

So, one example that they have given is the case of 'hungry'. Now, the concept of hunger is not something you can directly point to as hunger. So, what they typically do is use related words with respect to hunger and try to teach the concept to the child. So, they might be placing more stress on words like "stomach" or "eat," and so on. Similarly, if you are happy, that is this nursery rhyme. If you are happy, you do something. So, that is how you teach that you are happy. So, if you are happy, you will be dancing; if you are happy, you will be stomping your feet, and so on and so forth. So, that is what the idea behind this motherese is: helping and learning abstract concepts. There is some amount of help that the environmental input is providing them.

Similarly, learning grammar naturally. Now, there are two ways in which you can learn the grammar of the language. One way that all typically developing children learn is through how they start acquiring language in their environment. And when you are learning a language later in life as a second or third language, it often happens that you learn it in a formal way. So, that is what we mean by learning grammar naturally.

So, there is another way of learning grammar, which is the formal manner. In childhood, when the child is learning his or her first words, they are also simultaneously picking up the grammatical rules of the language. So, generally, when the speech to children is short, simplified, and always grammatical, it does not happen that caregivers use a wrong, ungrammatical sentence while talking to the child because they are always using

grammatical sentences and also making it in bite-sized portions, smaller sentences, shorter sentences, simpler sentences, and so on. So, as a result, it is supposed to help them acquire grammar. So, grammatical consistency is useful to children who are seeking to discover the structures that underlie the utterances. So, in order for them to understand the underlying structure of this particular type, motherese helps them. And then, of course, we also have the conversation rules. Now, children do not really take part in conversations per se, but adults pretend to be engaged in a conversation. It is very common to see mothers talking to their children while the child is simply making some noise.

So that is taken as input. So, there is this back and forth: the mother says something, the child reacts but does not respond, so to speak, but reacts with some sound, a little bit of laughter or whatever, and that is taken as input, and then she replies to it. So, this kind of pretend conversation is supposed to help the children learn the conversation rules, that there is something called turn-taking: one person speaks, and then the other person responds, and so on and so forth. So this is said to teach children to take their turns as speakers and listeners in a conversation. Thus, children learn the basic rules of conversation turn, even though the adults will carry most of the conversation, because obviously children are not exactly there. They are not there yet to continue a conversation.

It is the adult who is doing the whole dialogue, but still, there is some semblance of a conversation that is supposed to help them learn. These are slightly older proposals, but in recent times we have more experimental data in this domain, and based on that data, we now have some evidence that suggests that motherese probably has some impact on the way children learn language. So, for example, acoustic stretching in motherese, which we discussed in the previous lecture, observed across languages, makes phonetic units more distinct from one another. So, you have a large number of findings that actually provide you with proof of it. Now mothers who use the exaggerated phonetic pattern to a greater extent when talking to their typically developing 2-month-old infants show that those infants demonstrate significantly better performance in phonetic discrimination tasks when tested in the laboratory. This is a very important study that connected motherese with the children's capacity to perform speech-related segmentation. From the Lou et al. study, they found exaggerated phonetic patterns in two-month-old infants, showing a direct correlation between the mother's exaggeration of the phonetic pattern and the child's ability to segment and find phonetic discrimination, which was a positive correlation. Similarly, new data also show that the potential benefits of early motherese extend to the age of 5 years, not only starting as early as 2 months, but the potential impact can be seen all the way until the age of 5 years; the same group has looked at this particular question as well. And now we also have EEG, fMRI, and various kinds of non-

behavioral methods that have been used for studying child language behavior, child language acquisition, and processing.

So, one of those studies is an ERP study that indicates that infants' brain responses to the exaggerated patterns of motherse elicit an enhanced N250 as well as increased neural synchronization at the frontal-central parietal sites. So, there is a neural signature that seems to be elicited by ERP studies dependent on the exaggerated patterns of motherese. So, the motherese, on the one hand, typically tends to exaggerate certain things, and as a result, you also see some neural signatures of it; that is what it basically means. I am not going into the details of the study. Thus, experimental findings underline the positive correlation of BTR with children's language acquisition.

There is evidence that shows there is some amount of positive correlation in certain domains, though it may not be applicable to all domains; we are still not there yet, as studies are ongoing. But we know that in certain domains there is a positive correlation between the exaggerated pattern of motherese and the child's ability to function as a language processing unit of some sort. Now let us move on from motherese to the sociocultural practices, the larger setting within which the child finds himself or herself, and how those things might also have an impact on the child's language acquisition. So, one of the most commonly studied domains is vocabulary size because, at that age, you cannot really check the grammatical capacity or other things. Vocabulary size and phonetic ability to segment phonemes will be the most commonly studied domains.

So, one particular study that is very influential by Bornstein and Cote was conducted in 2005. They looked at the compared children, the 20-month-old children across 3 countries, and examined their vocabulary size; the children's expressive vocabulary was tested, not their receptive vocabulary. This was a cross-linguistic study covering three countries: Argentina, Italy, and the United States. Three languages, as a result, were Spanish, Italian, and American English, and the settings were rural and urban. So, they compared countries, social settings, and the languages, of course, are different, and they also found a gender-wise difference, which is a very important study.

So, what they found out was that there were many important findings from this study. First, Spanish-speaking urban children in Argentina and American English-speaking urban children in the United States have larger expressive vocabularies than their peers in rural areas. So, in both Argentina and the U.S., the children from the urban setup were found to have a larger expressive vocabulary. So, the result largely favors, not entirely,

but largely favors urban over rural settings rather than a particular language being learned. So, because the same kind of findings were gathered from both Argentina and the US. So, the idea is that it is not language-specific but setting-specific. So, if you are in the urban setting, these two countries have returned data that says that urban children were better; they had a higher vocabulary size and better vocabulary size. On the other hand, rural Italy produced equal portions of nouns and verbs. So, this is something that they have also discussed in the paper. The results also suggest that the differences in rural versus urban parents' use of verbs in child-directed speech specifically involve a more didactic use of verbs by rural parents. So, that is another point they have made: why do we find the difference that we do? This probably is the reason. Also, which is not surprising, they found that the girls acquire more productive vocabulary than boys in all word categories at the same age. This is a consistent finding across countries and across languages.

The next factor that we will discuss within the socio-cultural domain is the socio-economic status, which is commonly referred to as SES. Now SES is a factor that has been explored in various domains of language research, including child language acquisition. Typically, the finding has been that children from more affluent backgrounds do better in various domains of language processing and language acquisition. For example, they have better language skills than those from poorer backgrounds, larger vocabularies, and build their vocabularies at a faster rate. Now this is almost a near-universal finding that children from urban backgrounds, or sometimes those who coincide with higher SES, exhibit these kinds of differences, even within urban areas when comparing high and low SES. Now it is not actually SES per se; it is what SES does to the child, as a result of which SES is an indirect marker of certain things. So this has an indirect influence and works more through various factors like children's physical and psychological environments. Because in a higher SES household, the entire scenario will be different. So how will they differ? So, the home learning environment differs. In a higher SES home, the learning environment, for example, a simple thing like having more books at home, is better.

They might be discussing books at home. They might be talking about ideas and things rather than anything else. So, these kinds of differences are what actually happen and what actually has an impact on the child's language acquisition rather than SES itself. That is why SES is called an indirect method of studying certain social practices. So, joint book reading has been studied by various groups to determine how it might have an impact. Joint book reading is a variable pointed out by many, and then there is the learning environment, of course, the home learning environment.

So, this has a positive correlation with language development in a range of settings, both well-resourced and more poorly resourced. So, even when the resource-poor background is present, if there is a culture of joint book reading, this might override the SES factor. So, this is taken as a very important variable in this kind of study. Also, storytelling has been studied. Many cultures have storytelling traditions, whether through bedtime stories or grandparents telling tales to their grandchildren; storytelling used to be a common part of household activities. So, if this has also been studied, cultures of storytelling versus cultures where storytelling as a practice has kind of dwindled. So, in that kind of situation also you see a differential impact. Another factor within the SES is maternal education. So, it is also a well-known factor that if the mother is educated, the chances of the children turning out better are always higher.

So, that is basically the thing. So, it is often used as a proxy for SES because it is not always possible to obtain the exact income or other factors. So, mother's education is taken as a proxy factor to judge the SES. So, the maternal level of education influences not only the language input the children receive but also various other kinds of input, which is very important. Children of mothers with higher levels of education show better language skills than their peers whose mothers have lower levels of education, which has also been studied quite widely over a period of time. So, in terms of productive vocabulary, several studies have shown that a higher level of maternal education correlates with a higher level of expressive vocabulary at different ages.

So, this is another important variable. However, even the mother's education, maternal education, and the mother's interaction with the child are also indirect methods. This is an indirect impact. Maternal levels of education affect the quality and quantity of language input that the child receives. So, the mother having a good education does not directly impact in the sense that she does not transfer her education to the child, but because when you are highly educated, or at least have higher education, the amount and the kind of words that we use will have an impact. So, the quality and quantity of language will be different that she uses with the child. So, that is what impacts the child's language output; that is the other factor. Now, taking mother's education as a variable, sometimes in certain cultures, it runs into problems in the sense that some societies have a very different way of looking at this entire dynamic. So, most of the findings with respect to SES and mother's education having a direct impact on a child's education come from the WEIRD countries, WEIRD societies. WEIRD, as in not in the, is an abbreviation that stands for Western Educated Industrialized Rich Democratic Societies. So, basically, most Western societies will fall within the WEIRD group.

But the countries that do not satisfy all of these, so many countries in the Asian or African continent, will not satisfy the WEIRD composition. And these societies have also remained slightly different from Western societies. So children living in larger families with a lot of people communicating or, you know, interacting with the child around the clock is a common thing in non-WEIRD societies. Also, for example, if you take many African countries, children living in overcrowded conditions are also very common. So in this kind of situation, they will be exposed to disorganization in their environment, accompanied by high noise levels and other distractions.

So in that case, a mother's interaction, even if the mother is educated, will not have the same kind of impact or the same degree of impact as you will find in a nuclear family. In a nuclear family, there is a one-to-one discussion, not discussion; let us say some kind of conversation between the mother and the child. This will not happen in a family where there are many people. So, there is an impact from a lot of people; the number of people will be higher. There you cannot really put that kind of factor to use it as a very important variable in this kind of scenario.

There, we have to use different kinds of markers. So, placing them in this situation, the children are placed at a high risk of developing a poor understanding and representation of temporal order; this has already been studied. So, the conditions might also affect the quantity and quality of the language directed at the children. This is another important factor in child language acquisition that not many societies actually engage in too much child-directed speech. We have already seen the studies from Papua New Guinea and other places where the adults do not really like to converse with children simply because they do not know anything. So, children are just growing up in an environment where adults are talking to each other, and they still pick up on it and do perfectly fine.

But it is also possible that in some scenarios they do not really pick up the things as they should, and then it might show in their poor language abilities, as Flores has shown. So cross-cultural differences as a result of SES in terms of SES are also a problem area. So in some contexts, maternal level of education and SES can be a measure of the quality and quantity of language input, but in some other contexts, they may not map exactly in the same way. Some cultures have different standards of measure for education, and cultural norms also dictate when and how a child is spoken to and expected to speak.

It is not like the usual pattern that we see in Western societies. So, there are some interesting studies coming out of South Africa where this kind of variable has been

questioned. So, broad measures may not be really useful in understanding factors that impact language development across cultures. So, for the Western versus the non-Western countries, cultures might have different factors. We should look at them rather than using different variables. However, this SES and mother's education have remained very important factors in understanding this domain in the western context.

Another important variable that is part of this entire socio-cultural environment the child faces is the concept of epistemic trust. Now epistemic trust is a well-known concept in psychology; when we use this in linguistics, it is typically in this kind of study that we look at it from the perspective of the trust that the child has in the interlocutor, the caregiver, or whoever the adult in the environment is. So, epistemic trust is the process by which a learner uses direct observations to infer which sources of information are trustworthy. So, the trustworthiness between people or among people and those whom you trust allows you to learn more from them rather than from the people you trust less; that is the idea of epistemic trust within the domain of language acquisition. So, evidence from non-linguistic domains indicates that infants perceive both non-linguistic behavior and group membership as relevant to judgments of informant quality.

So, basically what it means is that not only the language output that the other person is giving but also his non-linguistic behavior are the things that the child is measuring. If not overtly, at least they understand they are following those things; they are paying attention to those things, and as a result, they have this in-group/out-group understanding in their mind. So, infants are more likely to imitate instrumental actions when they are presented with information that demonstrates these things. Competence in the conventional usage of objects. And then reliability with respect to eye gaze and, of course, emotional cues. So, these are the three domains that are studied within the concept of epistemic trust with respect to children. So, when they see people they know passing the test in these three domains, that is when they try to imitate them or learn from them. So, in this domain, there are some very interesting studies. This is one of the recent studies that I have quoted here.

So, this study looked at infant behavior in word learning tasks. The idea of epistemic trust was explored with seven-month-old infants. Their response to talkers was studied. Two different races were represented, so two racial groups were present, and their eye gaze either more or less reliably predicted the appearance of a stimulus in the indicated location. So basically, how accurate the person's eye movement or eye gaze was with respect to the appearance of a particular stimulus in a particular location were the two different variables. So, the race and the accuracy of the eye gaze toward finding an object in the location were the two things they were looking at.

So, when the talker's gaze was perfectly reliable—that is, 100% of the time—infants were significantly above chance in following the talker's gaze, regardless of the talker's racial group. So, when they trust the person's abilities, as evidenced by their eye gaze to the object when they are 100% of the time correct, then they focus on those people even if they are of a different race. So, they can then override the racial identity and focus on that person, and then they follow their gaze. However, when the gaze cue was unreliable, that is, only cueing 50% of the time, then they followed the gaze of the person of their own race.

So, this is how this is what we meant by in-group, out-group. So, what is important is the parameters, that the children are measuring, are based on how accurate they are. If they are accurate, whoever it is, they will follow them. If they are not accurate, then they will follow their own race person; this is how the study goes. So, given the uncertainty in the case of uncertainties, infants appear to recruit prior beliefs about the relationship between non-linguistic social cues and informant trustworthiness. This is how epistemic trust is checked with respect to infants learning language. So it is also visible in the children's preferences for familiar versus novel speakers for word learning. A number of studies have also looked at it. So it is already well known that children learn more from familiar people compared to novel people. So they will not learn from people they do not know . So, infants show preferential attention to familiar speakers because they perceive these speakers as comparatively reliable.

So, these are some things to consider in the domain of epistemic trust. So, to sum up, socially motivated cognitive grouping is a part of human behavior and likely emerges quite early. It has also been studied that children acquire these understandings pretty early, including cognitive grouping and the knowledge of what the groups are in their vicinity. This probably leads to a differential attitude of children toward in-group and out-group members. Infant language learners may fruitfully bring their social knowledge to bear on linguistic tasks. So, this social knowledge is already in place. It can only be overridden if, in the case of their accuracy, the previous study looked at whether they are correct 100 percent of the time, even if they are not part of their own group. Otherwise, they will stick to their own group. So, given that infants use both epistemic trust and linguistic behavior to reason about social groups, it is possible that social knowledge may have a reciprocal effect on the measures of their linguistic perception. So, that is how important these social cues or sociocultural factors are in terms of language acquisition in children.

So, this is where we will complete this lecture. In the next lecture, we will look up some other factors with respect to the domain of nurture. Thank you.