Fundamentals of language Acquisition

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Week 10

Lecture 048

Lec 48: Implicatures: scalar and relevance

Hello and welcome back. We are in Lecture 3 today. Until now in this module, which is module 10, we have been looking at the communication aspect of how children learn different aspects of communication in real-life scenarios. Within this, we have already looked at the maxims of Grice with respect to how the conversation needs to be informative, relevant, have the adequate amount of information, true, and so on and so forth. But in real life, the communication does not go that way all the time. So, sometimes people will say something and mean something else; sometimes they will give less information and sometimes more information. So, in a real-life conversation, the children need to figure out what is implied rather than what is said very often. So, that is the inference we are talking about. So, we have seen this before in the previous lectures as well. So, we will take this discussion forward to discuss another kind of inference called implicature.

Within implicature, there are two kinds: scalar implicature and relevance implicature. So, what are these two kinds of implicature? These arise when there is a violation of one of the conversational maxims, as far as Grice is concerned. The listener is expected to notice this violation and, as a result, draw their own inferences. So, as I just said, that conversation does not always go in a linear fashion. I do not always say exactly what I mean. That is the beauty of human communication; that is the beauty of language use. So language use in real scenarios needs the conversation partners to infer a lot of things that are probably not said. So, the idea of implicature is based on the fact that when there is a violation of one of Grice's maxims, and the conversation partner has noticed it, they are able to infer what is actually meant. So, based on these there are two kinds of violations

and as a result we have two kinds of implicatures. So, one of them is called the scalar implicator, and the other is called the relevance implicature.

So, scalar implicature is the violation of the maxim of quantity, and relevance implicature is the violation of the maxim of relation. So, we will take them one by one. We will start with scalar implicature. Now, scalar implicature—the idea comes from the word "scale." Now, in terms of quantifiers, for example, we understand many different things in life, different kinds of experiences, and different kinds of, you know, concrete things as well; in terms of quantification, we quantify our experiences.

So, sometimes we say, "I am really very sad," or sometimes you say, "I am very happy." So, even an abstract thing like emotions can be quantified. Similarly, many other concrete things. So, in this domain, we are talking about the maxim of quantity. So, here sometimes people may use it, so in any kind of quantification, there is a scale. At one end of the scale, there is the ;most;, and at the other end of the scale, you have the 'least'. So, 'none' and 'all'. If you are using terms like this, then one end of the spectrum will be all, and the other end will be none. And in between, you have many different possibilities: some, few, and so on. So, on a scale of, let us say, 5, you have 0, which will be none; all will be 5, and then in between, you can have 3 more, or you can have more; the scale can be on a broader level as well.
So this is what we understand when we talk about quantification. Now let us take the example of some, few, and all, etc. On a scale, "all" is considered a strong term. That is the technical term used. All will be a strong term, and few or some will be weak ones.

So if you are talking about quantifying objects, quantifying anything, any real-life object in a concrete object or an abstract thing, you can have a scale from all to none. So, all as a result is considered a strong term, while few and some are weak terms within that scale. Now, if one uses the term "some" to quantify something, whatever that may be, it normally means 'not all'. So, there is a reason why we have different terms for different kinds of quantifications. So, if we want to mean that one portion of the entire entity is what I mean, then I will use "some," "few," or "something.

" So, I have a few books. I do have a few books from my friend who shifted out of the town. So, that means I do not have all her books; I have taken some of her books, probably those that I really liked. So, in this kind of scenario, we do not mean all; we actually mean some. So if that is the case when we use "some" or "few," the listener in this kind of sentence will infer that the strong alternative does not hold, meaning that the

strong alternative is not the appropriate one, meaning that I actually mean "some" or "few," not the entire lot of the books. However, in real life, that might not always be the case. So, if sometimes the stronger alternative may be true, I have still used the weaker alternative. In such a case, the use of a weaker scale will be pragmatically inappropriate. So, if I want to mean all but I have said some, that is the problem; that is where there is a violation of the maxim of quantity because I am not being truthful about the exact quantity of the thing I am talking about. So, this is what is called pragmatically inappropriate.

Now this has to be understood by the listeners. So the idea here has to do with what a term implies, whether the implication is right or wrong, and where it lies on the scale. So what does the term mean? Where is it on the scale? Is it appropriate or not? All of these are computed when we listen to any sentence that uses a quantifier. When we use the term "some," we exclude the sense of "all" from it. Like a sentence, this is an example: I ate some of the cheese. Now, we infer this meaning because we follow the Gricean maxim of quantity, which is to remember that this is what we discussed. So, most conversations will typically follow these rules. So, we tend to infer the exact meaning because that is what, according to Grice, the conversation is based on. So, the speaker is striving to be as informative as needed, right? That is what the maxim says, and hence we would have meant some and not all. But in real life, that is not how it always goes; it is not always linear.

So, there are some studies that we will look at now. So, one of them studied this phenomenon in adults and children. The study went like this: English and French adults and children participated in this study, and they had to judge how true a particular sentence was. So they created sentences in English and French, using quantifiers like some, all, and few, and the participants, both the adults and the children, had to say whether it was true or not. A very simple task: they will see a sentence and say yes or no, true or false. Now, one of those sentences was like this: "some giraffes have long necks", so this is the quantifier that they used. Now, what did they find? They found that adults rejected such sentences 59 percent of the time, which is quite a large amount. So, we can safely say that the majority of the time the adults rejected such sentences. Why? Because in this sentence, "some" implies not all, because that is what our implicature says: that if you are using "some," it means some. That is how the sentence should be understood if we follow the maxim of quantity.

But in reality, that is not how it is because it is not some giraffes but all giraffes that have

long necks. As a result, you are violating that principle. So, adults have noticed that there is a violation of the principle of quantity, and as a result, they have understood. So, they infer this sentence to be incorrect. That is what the whole thing is about.

So, this is a scalar implicature. So, where on the scale from 0 to, none to all, from 0 to all, do we place the uttered quantifier, and whether it is truthful or not is also dependent upon your real-life knowledge. Now, the adults can easily discard this sentence as not true because they know that all giraffes have long necks. Hence, saying that some giraffes have long necks is wrong, wrong because the implication is wrong. Of course, some of the giraffes have long necks because a subset of all giraffes also has long necks, but the overall implication is that the term "some" negates the existence of "all.

" So, that is how the understanding of adults is. So, this means the adults notice the violation of the maxim, and as a result, they inferred it correctly, making the use of "some" inappropriate in this case. Now this is fine; this is how adults typically tend to behave in this kind of scenario. Now we will see how children behaved. The children were 8 to 10 years of age; they accepted the sentences 85 percent of the time in a much larger proportion than the adults, who rejected this, majority of children actually, they accepted this sentence as true and they were not very small; they were 8 to 10 years of age, and only 15 percent rejected it.

Now, what is happening? The author said that the children did not compute the scalar implicature as adults do. You need to compute correctly, so there is a scale you immediately know to activate in your mental scale: where does 'some' belong, does it truthfully represent the real-life scenario or not, what is the person implying, and so on and so forth. So, a lot of mental calculation is part of properly understanding this sentence and thereby judging it. So, as far as the output by the children goes, the author says that they did not get it right. So, subsequent studies with 5 to 9-year-olds have also shown that children do not reject under-informative statements as adults do because this is under-informative; it should be "all giraffes have long necks.

" So, you are not giving all the information. Many studies found the same kind of acceptance rate by children and rejection rate by adults. However, as children grow, they tend to have a higher rejection rate as opposed to a higher acceptance rate. Now, why do children find scalar implicature difficult? Because this seems to be the finding across a number of studies that say most of the time children accept it as true. What is happening here? Are they not capable of understanding the implied meaning, or are they not able to follow the violation of the maxim, or what is happening? There are many hypotheses; one of them is called the pragmatic delay hypothesis.

So, the pragmatic delay hypothesis basically says that this pragmatic development, which we have seen before in the previous lectures, indicates that pragmatic competence or communicative competence develops slowly. It takes a lot of time; as opposed to the grammatical understanding or structural understanding of language, pragmatic understanding takes longer, and that is why children develop these abilities much later; you know, they take longer to develop this ability, sometimes until adolescence. So, that is how the idea is that the pragmatic delay is the reason why children of this age range do not have the ability to reason about the speaker's intention and thereby find fault with it or whatever. However, this theory has been rejected primarily for two reasons.

One reason is that many studies have found that in other domains, children are actually quite capable of reasoning. Not exactly in this scalar implicature domain, but in other domains, the research findings point towards the idea that children are actually smarter than we thought they were. Which is something we have seen throughout this course in many domains: children are actually much more capable of processing information than we think they are. So, for example, in one of those studies that have been put forward as a counterexample, children familiar with the word one will assume that an unfamiliar number word like five refers to a group of objects rather than a single object. So, if the child has learned the number word one and they know what it means, learning means they know what it means in real life. So, when they are encountering another number word, they know that this does not mean the same thing.

So, the number word one refers to one entity in the real world. So, now if you are teaching them the number word five, they know for sure that it is not the same. It must mean more than one because the slot we already have is taken. So, that way, that kind of basic reasoning ability children already have at a very early age. So, it is not a lack of reasoning capacity that is resulting in their inability to process scalar implicature; that is one of the arguments against the pragmatic delay hypothesis.

Secondly, children can actually compute scalar implicature if we tweak the scenario a little bit. For example, if we give them some sort of helping hand in processing that information, then they are actually able to process it. There are many studies on this; one of the more famous ones is by Papafragou and colleagues. So the study was like this: children were shown a picture, and then they were asked to help Minnie Mouse choose the best description for the picture. So there is a character; the entire thing is like a game.

So there is Minnie Mouse, and Minnie Mouse has to describe a scene; there are various kinds of scenes, there are pictures, and Minnie Mouse is a character whom the child is

helping. So Minnie Mouse will describe the scene, and if the description is wrong, the child has to help. For example, in a picture of a dog and a sentence that describes it as a little animal with four legs. Now, if the child did not say that the description was less than perfect, then the experimenter would prompt. So, Minnie Mouse says that this is a little animal with four legs. The child is expected to correct Minnie Mouse and say that this is a cat. If the child does not do that, the experimenter will help. This is how the experiment was built. Minnie did not say that right. This is a dog. That is how the experimenter will correct it. And this was one aspect of the experiment. Additionally, there was also a background story that was created which made it crucial for Minnie to get all the answers right and all the sentences right. Otherwise, she will be punished or something like that. So, children, out of their own natural empathetic mentality, will help Minnie get the sentences correct all the time.

So, there were two conditions. One was Minnie supposed to be correct. So, Minnie's being correct is dependent on the child helping Minnie Mouse, and that is one. Secondly, if the child does not give the correct response, then the experimenter will help. With these two kinds of hypotheses, they were trying to see if, with a little bit of help, the child actually gets the scalar implicature correct. The hypothesis, therefore, was that these two methods would make it easy for children to correctly understand the scalar implicature in this scenario, whatever is implied. The results also showed that children did pretty well when this kind of helping hand was provided in this context because they created a situation for Minnie to get it correct. So, children were paying more attention to exactly how the sentence matched the scenario. And on the other hand, they were also being corrected by the experimenter whenever they did not get it correct. So, because of all this scaffolding, they actually got it correct. These results are compatible with what researchers call pragmatic limitation hypothesis.

So this is another hypothesis regarding how to explain the apparent failure of children to understand scalar implicature. So this is the second hypothesis. Now this hypothesis does not say that it is the delay in pragmatic development that is responsible for their failure. It says that it is about the cognitive effect, the load, and the cognitive load that the child is taking. Because children's language skills are less efficient and less practiced than those of adults, it requires more cognitive effort for them to process.

Because children, by virtue of being children, have less experience, which results in less understanding of the entire scenario. So, it needs more effort from them as opposed to adults. So, adding practice sessions or providing context can help them overcome this situation, which is what they found out. So, if you are helping to lessen the cognitive load by giving them a context and providing a little bit of support, no, this is not right; you

have to say it like this. So, with a little bit of nudging, they actually get it correct.

So, this is why they have proposed that it concerns cognitive load rather than delay in pragmatics. Similarly, in this hypothesis, the role of the question has also been discussed a lot because when you ask if some giraffes have long necks, whether it is a right observation or a truthful observation, the reason they do not reject this outright is that the sentence is actually not factually incorrect. Giraffes do have long necks; some of them do if you are thinking of it in terms of a subset of all the giraffes that have long necks. So, it is not as wrong as saying giraffes have short necks.

So, that is probably how they process. So, when you tell them to ask if the sentence "some giraffes have long necks" is correct. They are actually comparing it with giraffes, saying that some giraffes have short necks, and thereby claiming that this is correct because, for children, it is a matter of right and wrong, not scalar right and scalar wrong. This is the idea that has been proposed by other groups. For example, this was tested by another another group of researchers to find out whether that is the case.

So, this study was like this. They devised a method in which the child had to reward the speaker of a sentence. So, they created a character named Mr. Caveman. Now, Mr. Caveman was describing some scenes, similar to the previous experiments.

So, the caveman was giving a sentence that described a scene that was happening there. Now, the role of the child here was to reward a character called Mr. Caveman. If Mr. Caveman got the answers correct, he would give the caveman some strawberries.

So, there were different sizes of strawberries. So, that is how they quantified the scalar implicature; you know whether the child got it right or whether the caveman got it right. So, by giving this kind of stimulus, they created a graded response with a graded reward system. So, the reward was strawberries of different sizes, depending on how true the sentence was. So, the logic behind this design, as I was just explaining, was that this would teach the children to be sensitive to the scalar implicature because they could see there was a concrete thing in front of them: strawberries of different sizes. So, the correct answer: big strawberry, the wrong answer: no strawberry, and half correct: small strawberry, like this.

So, they could quantify it in concrete terms, and the hypothesis was that they would this time get it correct because you were giving them some sort of helping hand. So, the scalar implicature will be so if you are not giving them an option between right and wrong; they do not have to say anything as wrong. Everything is right, but within right, if you make

them, you know, if you give them a little bit of a nudge to find out the gradation within right, then how do they behave? And also, you keep "wrong" as one of the options, not as you know either, or not as 0 and 1 kind of an option. Because they will learn to differentiate between sentences without requiring them to reject the underinformative ones. So, if it is partially correct, they have the option of giving them the medium-sized strawberry, for example.

That is how the experiment was created. So, children would give Mr. Caveman bigger strawberries when the sentence was completely accurate, which is optimal when he got it absolutely correct. So, whatever the picture depicts, the caveman is describing it as it is; that is the optimal condition, and then the caveman gets the bigger strawberries. He will get smaller ones when he is, under-informative; it is some versus all. So, even if that is all implied, he says 'some' , the caveman still gets some strawberries. Thus, in the case of the sentence "the turtle played with some of the balls," it is an under-informative sentence because the turtle was playing with all the balls.

So, in this case, the child was expected to give smaller strawberries to Mr. Caveman. The results proved their hypothesis to be right. It was a very interesting experiment to see if, in the absence of a scenario where they had to reject one option, they actually did better. So the child learned the difference; what they found out was very interesting for another reason.

Of course, they would offer big strawberries to the caveman when his sentences were under-informative. So they gave them big because it was still correct. Remember, that is why they did not reject the sentences in the first experiment. So they understood it to be correct.

So big strawberries were given to him, not the small ones. Big strawberries were given. Huge strawberries, the biggest possible strawberries, were given when the sentences were optimal. Interestingly, small strawberries were given when the sentence was completely untrue. This is something interesting about a child's mind. So, they not only learned the scalar implicature, but also developed tolerance towards them, stating that it is fine, this is also correct, and that also. So, this proved that children under less task demand can compute scalar implicature. So, that is the take-home lesson from this very interesting experiment: that if the task demand is not too high. So, you do not have to choose between right and wrong; it is not, you know, an either-or kind of option. You have many options; when you give more options to a child, then the child actually does better in this scale. However, in spite of these promising results, it still remains true that most of the time children do not get it 100 percent correct.

So, they still do not match up to the adult level of understanding. That is about scalar implicature. The other kind of implicature is called relevance implicature. Now this is another violation, as we said, because it implies, the basic premise is that there is a violation of the maxims, and that is why there is an implicature, and the child is supposed to infer that violation. They are supposed to understand and infer what is meant. So, in the case of relevance implicature, the idea that is violated is that of relation.

So, the relationship between two sentences. So, I am asking you something, and you are saying something completely different. So, I need to say it is not exactly related. So, there is not a one-to-one mapping of the question and answer, let us say. So, for example, if somebody asks, "Do you want to go for a walk?" the other person says, "It is raining.

" The question was a yes-no question. The answer would have been either yes or no. Yes, I want to go. No, I do not want to go. That would be exact. Then the relationship will be matched one-to-one. However, the answer here is that it is raining. So, does it mean that the other person did not understand the question? He did. He actually responded; he is still cooperating because, remember, as per Grice, conversations are basically collaborative efforts. There is cooperation between two people when they are talking. So, here the second person is still collaborating.

He is still cooperating, and he is actually explaining. So, even though he or she is not saying that I will not go for a walk, it is by way of an explanation that they are implying that. This is what the child is supposed to understand and infer, and this is our question: whether they get it or not. So, studies show that children are not able to generate relevance implicature before the age of 6. So, they do not understand this until they are 6. So, in one study, 2 to 7-year-old children were asked to choose a possible ending for a conversation exchange. So, these are all tested in a conversation setup. So, the conversation is like this: In an exchange, two siblings stand in front of a toy shop. The brother says, "Would you get me that game?" Sister says "we do not have any money", and they were supposed to continue the task for the children, which was to continue and give a possible ending to the conversational exchange. So, what should happen after this? How would you take this forward? Where should it end? Like this. Only 6 to 7-year-old children provided endings that reflected their understanding of the implied meaning.

For example, the sentence "The girl cannot get her brother that game" is the implicature. And this inferred meaning was given only by those children who were between 6 and 7 years old. So, from 2 to 6, those children did not get it correct. They could not do it properly, which means they do not understand what is implied here. Similarly, another study by de Villiers and his group presented children with short interactions, such as

small conversations.

So, Dad: "what happened to the ham?" Boy: "the dog looks happy". So, what is happening here is that the father is saying where the ham has disappeared, and the boy says that the dog looks happy. So, the implied meaning here is that the dog has eaten the ham. Now, they were asked to explain; here, they were not asked to complete the sentence; rather, they were asked questions: What did the speaker mean? What did the boy mean? Why did he say that? All these kinds of questions were asked. Again, here also the same kind of findings: only children above 6 years could get the relevance implicature in their answer, which is that the dog ate the ham. So, this is a slightly more complicated sort of implicature, and children before the age of 6 do not get it correct.

So, what is the explanation? Here, explanations have been on various factors based on various variables; one of them is the methodological factor, which is the task condition. Remember, in the previous example, we saw that in scalar implicature we also observed the same thing: if you change the task demand, then children tend to do better. So, here also the same kind of questions have been put forward: is it a matter of methodology? For example, asking children to reflect on a conversation requires metalinguistic awareness. This is not just about the sentence, but it requires them to have a metalinguistic understanding of the entire thing.

Now, this understanding is not possible and is not accessible for very small children. This is learned, this is understood, and this is acquired a little later. So, this skill is developed. In fact, many researchers claim that this develops through school years. So, it is expected that young children will not do very well and they will fare badly on this task because entire school years are needed for understanding metalinguistic concepts.

That is one hypothesis that has been put forward. Secondly, it is not clear whether children had the required world knowledge that has also been proposed, because to compute, metalinguistic awareness is not only about the language level, but also about the way the ideas are encoded in language, and simultaneously, you need to have adequate world knowledge. You need to know, that many researchers have pointed out, that in order for the child to infer that not having money, for example, see the sentence, "We do not have any money." So, the connection between having money and getting the game is that the child needs to know that you need to have money to buy certain things; if you are standing in front of a shop, you need to have money because that is how the exchange works. So, you give money, you get the thing. Does the child in that experiment have that understanding? Did they develop that world knowledge and real-life knowledge? that has also been questioned.

What if it is not about computing at all; it is rather about a lack of worldly understanding? So, the inference depended on the background knowledge, as they put it: background knowledge that products cost money, and without money, people cannot buy them. So, this could be a simple matter of world knowledge. Later studies, however, which are slightly older, found a different result again. For example, in one such study, they created a very interesting experimental setup.

They created a scenario where the child, if you look around, small children often play-act. One of the areas of play acting could also be that they are selling things. There are buyers, there are sellers, and somebody is selling something, and so on. So, that is the exact thing they created: they created a scenario where the child is selling something to the experimenter. So, the experimenter is the buyer, and the child is the seller.

And then the child would show something to the experimenter; there are pictures. So, the child will show the picture to the experimenter, who will give a comment on that picture, either a positive or a negative adjective, and the child's task was to place it in one of two boxes: accepted or rejected. So, if the child thought that the experimenter would buy her product, then the object would go into one box; if not, it would go into another box. Now, the interesting thing here was connecting the adjective with the experimenter's intention to either buy or not buy. So, the experimenter would use something like a positive or a negative adjective, such as the trousers being either pretty or ugly. So, if the child is showing them a picture of trousers, a pair of trousers, and the experimenter says, "Oh, they are ugly," that means I will not buy this.

So, the child has to infer that meaning and accordingly put the item in the rejected box, or if it is "oh, they are pretty," the trousers are pretty, then she has to put it in the accepted box. This required the child to infer the buyer's mentality from the adjective used. So, this was the basic task. In this case, even the three-year-olds could correctly calculate the implicature. Until now, we have been saying that till the age of six years they were not able to do it; they were not able to infer it correctly.

However, in this experiment, what they found was that three-year-olds could also correctly calculate the implicature, and five-year-olds did so at par with adults. So they got it right all the time. 3-year-olds also could get it correct. So, this was the finding of this particular study.

Many such studies followed by the Tomasello group also conducted many other studies. But that means the children are able to get it. But the question that researchers have asked after this, after they got positive results and negative results, is whether the positive results tell us whether children are actually computing the relevance implicature or if they are doing some other kind of inference or mental processes to arrive at this result. So, just getting it correct does not mean they are able to compute it. That is the new problem we have.

So, the positive results do not tell us whether children truly computed a relevance implicature. That is, we are not sure whether they understood that the speaker meant to convey an indirect request through a statement, because all of these are statements. So, when the experimenter said those trousers were pretty, that was a statement. In some other cases, it may be a request. So, understanding the indirect request or other similar things requires computing the speaker's mentality. Are they actually doing this? Did they simply draw justified inferences about what should happen or what the speaker wanted, given the stated preference, rather than understanding it in terms of implicature, are they just looking at it from a real-life perspective and considering what should happen? This is the other theory that has been put forward.

Thus, the results on children's ability to compute relevance implicature are also mixed, and there are various kinds of hypotheses that have been put forward. Due to the paucity of time, we cannot go into the details, but all the papers will be added to the references, so you can look them up. It is often believed that children depend on contextual cues to infer their understanding rather than relying on the speaker's intentions. So, we have looked at implicatures of two kinds, which are one of the important aspects of conversational techniques and strategies. And we have seen that for both we have mixed results; for scalar implicature, the results are still somewhat clear that if you give them a helping hand, they do get it, but for relevance, there are many theories.

So, this is sort of a mixed result. So, this is where we will end our Lecture 3. In Lecture 4, we will take up yet another important variable of conversation, communication, which is turn-taking, and we will follow it up with understanding non-literal language; that is how we will go ahead. So, thank you. We look forward to you joining the next lecture.