

Fundamentals of language Acquisition

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Week 02

Lecture 07

Lec 7: Behaviorism; Nativism

Hello, welcome back. Today, we will start with module 2. In module 1, we talked about various theories; we started with the theories of language acquisition and looked into the details of behaviorism as one of the important theories. We started with Shechnov and went on to Skinner and others. So today we will continue with behaviorism. We will look at Bandura first and foremost, and then we will talk about others before moving on to nativism.

So, one important name within the behaviorist theories of language acquisition is Bandura. Most importantly, his contribution is in what is called social learning theory. His theory is called the social learning theory. This is quite similar to Skinner's behaviorist learning theory, which includes rewards and punishments.

But his theory has some additional components to it. It is not just stimulus and response with the agent or the organism being a passive part of it; rather, he also includes cognitive processes and internal brain mechanisms in his theory. So, they feature prominently even though the broader outlook is behaviorist, but he also includes these things. So, he added mediating processes and observational learning to the existing classical conditioning and operant conditioning. Classical conditioning and operant conditioning have already been seen with Pavlov and Skinner.

So, Bandura believes in social learning and says that it is a four-stage process: attention, retention, motor reproduction, and motivation. So, this is how he structures his theory. This is, in a nutshell, what he talks about. So, first and foremost, an organism, an agent, a human, a child, or whoever, the first part of the entire process is attention. You need to pay attention to what is happening around you in order to learn that, be it language or any other mental process.

So, first and foremost, it is attention. So, you need to observe others and pay attention. Now, after this the second part of the mechanism will be to retention, to retain the information. So, store the information for future reference. Because learning does not happen, you know, here and now; learning happens over a period of time.

So, the first experience you observe, you understand, and you store that information, and the second time the same experience occurs, you do not really waste time; this is simply a kind of optimization process. So, the same thing is also part of Bandura's theory: you have to store the information, and then comes the motor reproduction. So, this is where the behavior comes in, till here there is no behavior. So, first you observe, you pay attention, then you retain, and then you react to it. So, the reproduction of behavior is present, and then there is a motivation, which is something like reward and punishment, which are the classic reinforcements in terms of behaviorist theory.

So, these are the primary, key points of his theory. Now, the most famous and well-known experiment of Bandura is, of course, that he is known for many other things, but this is the most important experiment he carried out. It is called the Bobo Doll Experiment. Let me first tell you the primary crux of the matter; then we can go into the details. So, what he wanted to check is whether the kinds of environmental inputs that a child is exposed to have any impact on the way the child behaves.

How much the environmental inputs and how much the stimuli in the social structure and social stimuli have an impact on the child's behavioral output is primarily what he was looking at, and if it does, what are the variables within that? So, is it that, you know, a same-gender person will impact them more or not, or is it, you know, what are the nuances within that? That is what he was trying to find out. So, the experiment went like this: there were 72 children equally divided into boys and girls; their age range was 3 to 7 years. There was a control group of 24 children who had no experiments done on them, as control usually means, and then another 24 were exposed to aggressive behavior in the environment, and yet another 24 were exposed to non-aggression. So, the entire group of children was divided into three groups like this. So, he tested them through learning, observation, and imitation using sensory input.

So, how much do they learn, what kind of environmental input do they receive, how much do they imitate, and how do they ultimately behave in the real world? So, the experiment had two parts: in part one, an adult and a child go into a playroom; the child gets some attractive things like stickers and stamps to play with. Another corner of the room the adult has a Bobo doll, a mallet with a soft non-metal head, and a toy set. So, he has some interesting things to play with; the child also has some colorful stickers and stamps to play with. So, the instruction is that only adults are supposed to play with the toys, not the child.

Once the experimenter leaves the room, two possible scenarios emerge.

So, these are the two types of groups that we are talking about. Scene 1: aggression condition where the adult hits the doll, uses words like "hit him," "crush him," and so on in the experiment, and he goes on like this. After some time, the experimenter returns, dismisses the adult, and takes the child to another room. This is one possibility. The other possibility is that the adult plays with the other toys and ignores the doll.

The experimenter returns after 10 minutes, dismisses the adult, and takes the child to another room. So, the only difference between these two scenarios is that in one scenario, the adult is aggressive towards the doll; he hits it, and he also tries to be verbally aggressive towards the doll, and so on. In the other case, the adult does not do anything aggressive; he just simply sits there and plays with the doll, and the child is a witness to all of this, and then the child is taken to another room. Part two starts when the child is taken to another room. And this room has more toys; the child plays with them for 2 minutes, and then he or she is told that they cannot play any longer with these, as they are for another kid.

So, the moment they have started playing, 2 minutes is hardly any time for a child; they do not even begin to, you know, start playing. So, as soon as they start to play, they are told that no, you cannot play anymore; this is for somebody else. So, this is done to build frustration in the child. The child is then taken to the previous room and allowed to play for 20 minutes. Now, there is no restriction what they will play with and what they will not.

So, they are left there for a longer duration of time, which is 20 minutes in this case. Now, their behavior is recorded. The result is that the children exposed to aggressive models showed aggressive behavior towards the dolls when they were left alone. When the experimenter is gone, the child exhibits a similar kind of aggressive behavior toward the Bobo doll as he had seen the adult doing. Same-gender models, sorry, and the children from the non-aggressive group, of course, did not show any such behavior.

And more interestingly, same-gender models had a higher impact, more so on the boys. So, with this study, what Bandura found out was, and that is why it is an iconic study, they found out that children do imitate, they do pay attention to what is happening around them even if they are not directly part of it, and they do imitate; that means they have retained that information, they have paid attention, they have retained that information, and they act it out as well. And when do we see how the impact varies? Turns out that the impact is greater when the model they saw was the same gender. So if they saw a boy saw another man doing this, they would have a greater impact. The impact was found to be greater on boys than on girls.

So, this is a very interesting study. Of course, there are many other scholars in this domain, but with this, I hope I have given you a broad idea of how the stimulus-response system is part of the stimulus-response and motivation, reward, and punishment. These components are part of behaviorist theory, and what are the primary takeaways from behaviorist theory. So, after some time around 1956 or 1957, Chomsky came onto the scene, and of course, behaviorism was heavily criticized and temporarily sidelined. However, of late, neo-behaviorism has emerged again, and it is not only relevant, but it is also useful in many domains.

One of the areas where we can find traces of behaviorism is cognitive behavior theory. So, behaviorism is not entirely sidelined anymore; it is still there in different avatars, as you might know. Now we will move on to another, and perhaps the most important, theoretical standpoint within language acquisition theory, which is that of nativism by Noam Chomsky. So, Noam Chomsky burst onto the scene, so to speak, with his criticism of Skinner's Verbal Behavior. Now, Noam Chomsky's primary idea is what we call the innateness hypothesis.

So, with this, he brought in an entirely different outlook on how language acquisition happens. And remember, Chomsky's criticism came at a time when the cognitive revolution was happening. He was in the thick of things; that is when the studies into how the human mind works, how the brain works, how we look at language from that perspective, and so on. So, that was a very important time in the history of, you know, understanding of intelligent systems. So, that is the background in which Chomsky was working.

So, his idea of language was that he did not try to talk about language as a behavioral output; it was not a linguistic behavior, so to say. But rather tries to make his main focus figuring out what the underlying mechanism is. As I said at that time, we were trying to figure out how the mind works. So, from that perspective, how do we use language? What is there behind the scenes? What is there in the brain that is making us do this? That was the fundamental question, not what is the observable behavior. Observable behavior is the starting point for the behaviorists.

For innateness hypothesis, for the nativist, the underlying mental mechanism is the point of departure. So, he proposed that humans are born with a language acquisition device, which is what he called it in the beginning; later, it was called universal grammar. This latent algorithmic structure of some sort is the thing that is responsible for language learning and not a stimulus-response system. So, that was the primary shift; you know it is a huge paradigm shift. Another aspect of his theory is called modularity.

So, language function is autonomous; it is not dependent on any other kind of mental function. Syntax is of primary concern; syntax is sacrosanct as far as this theory goes. So, now let us look into more detail. So, according to Chomsky, children are born with underlying universal grammar or structural rules. What is this underlying grammar about? It is a rule as to how language and structure will play out when you speak and when you use language.

So, they only need to learn that this is something that comes—you know—you are pre-packed with it; you are bio-programmed with it. The only thing that the child has to learn is the language-specific aspects; that is it. So, you are coming out with the system in a factory setting kind of way. So, first of all, children learn language within a remarkably short span of time. If they had to depend on stimuli to guide their responses, this would not be possible because children learn language within 2 years; as we have seen before, by 2 years, children start to speak in sentences.

So, if you are depending on a stimulus-response sort of loop, this is not possible. Now, this, coupled with the almost identical acquisition steps in all languages, suggests that they must be arriving at a similar mental representation of language. So, that is what an innateness hypothesis is. So, this is another way of looking at it. So, they are to be able to do such remarkable things within such a short span of time when you have no other skills developed, so to speak.

That means there is an underlying mechanism working; it is not dependent on the kind of stimuli we are getting from the environment. "That children are able to acquire the rich and exotic grammatical knowledge in such a short time shows that knowledge is built in". So, this is what Chomsky said in his interview with Gliedman where he talked about this. So, primarily, his entire thesis is based on a couple of very important notions.

One is the poverty of stimulus. A child, when he grows into an adult over his entire lifetime, will be able to generate millions of very complex sentences that he or she has never heard. So, if the stimulus-response loop is what makes us learn language, then this does not work because there is no equivalence between the stimuli and the amount of response that you generate; that is why it is called generativism. So, at the very beginning, that theory simply does not hold; you cannot simply have that amount of stimuli. Not only that, but some of the very complex sentences are also very rare. Most of the time, the language you hear, and the people you hear speaking around you, do not use very complex sentences.

Most of the time, we do not even use the rare sentences. Rare and complex sentences are even less heard than common sentences. But children still find out; children are still able

to figure out complex sentences and use them. So, this is the problem; this is what is called the logical problem of language acquisition, or the more common name, poverty of stimulus. So, for example, there are a couple of examples that I have added here.

So, 'which article did you file without reading it?' Now, I have put this in brackets just to make a point about what it is. So, in the first sentence, 'which article did you file without reading it'? In the second sentence, it reads, "John was killed by a rock falling on him." Now, in the first case, as Chomsky says, 'it' need not be mentioned; you can drop that pronoun and do not need to mention it, but in the second case, if you drop the pronoun, the sentence does not make sense. Now, this is not something that you teach children; the children figure this out at a very young age. So, the pronoun can be dropped in the first case, but not in the second case, and children are able to find it out without any difficulty.

So, how do they do that? Nobody consciously teaches a child. Similarly, children hear correct sentences most of the time; they rarely hear wrong ones, and even when they do, nobody really explains to them why it is wrong. In fact, even if you try explaining it, imagine explaining to a 2-year-old why a particular sentence is grammatically wrong. That is not how it works; this is not possible, and it will not make any sense to the child either.

So, this does not that does not happen. So, this means that the negative input is not there as much as the positive input is. However, when children hear incorrect sentences, they are also able to judge that appropriately. which means they are able to derive that knowledge solely on the basis of positive evidence which means there has to be a rule, there has to be an underlying rule. So, as they say, they seem to figure it out without being taught. So, figuring this out is the whole idea here: how do they figure out if they do not have an internal structure already present? This does not need to be taught.

Another example that I have given here, again from I quote, 'is the child who is playing and feeling happy about his linguistic skills?'. Now, this is a complex sentence; this is called auxiliary inversion. So, children understand this language perfectly well, and even very young children are also capable of using such sentences. This is what the whole idea of poverty of stimulus is about. Not only is the entire gamut of experience less, but also certain kinds of structures that children probably do not hear very often, yet they still manage to master them.

That is one. And then there is the idea of language-specific knowledge. You may say that languages are different. Each language has a different way of expressing the same thought. So, the innateness hypothesis does not only talk about the general language learning abilities that children are born with, but also about the principles underlying all human languages and the parameters which can have two or more values.

So, this is where language specificity comes in. At the general level, you have a language acquisition device under universal grammar that takes care of the basic structure, but what about the language-specific structure? For that, we have principles and parameters. So, the principles cover phonetic, syntactic, and semantic properties of languages, and they are part of the language faculty, which in turn is part of the faculty of mind. So, for example, one of the key things in this principle and parameter aspect will be the head-left or the head-right values. Some languages you know, some languages follow this; some languages follow that. So, all languages share the same principle, but how this is realized differs among languages.

And this is some sort of akin to turning switches on and off, as Chomsky puts it. So, depending on which language has the head left and which has the head right, you will have to simply switch that parameter on and off. So, this is how variation in the possible composition of parameters takes place in any language. So, those possibilities are already there; depending on what language you are exposed to, you will be switching on that parameter and switching off the other. So, the language organ, so to speak, interacts with early experience, and this is important; the language organ is already there, and it interacts with experience and matures into the grammar of that specific language.

So, each parameter can potentially trigger other parameter settings. So, it is not as if you are learning one thing at a time. So, once you have set one parameter that will trigger another, which will trigger another, this is the kind of system that it is supposed to work on. So, that is how learning happens at an astonishing speed while taking care of language-specific properties. That is about Chomsky's theory and many others in that tradition.

Another name that I would like to talk about is Wilfrid Sellars. Sellars agrees with the concept of innateness. One of the most important publications that I have quoted here is *Empiricism and the Philosophy of Mind*, 1956. Here he talks about agreeing with innateness and thinks that awareness of abstract entities and the acquisition of linguistic knowledge are connected. so the idea that some sort of an abstract knowledge system is already embedded is common between Chomsky and Sellars.

He says that there is prior abstract knowledge before the acquisition of language. He compares language to games in which thoughts, assertions, etc. are positions and communication, interaction, intelligibility, etc. are goals. Very interesting way Sellars puts it; you might like to read the original work.

So, language is like a game. So, you know you have these positions and those goals, and how you play the game is what decides whether you are a learner or a sophisticated user of

the language. So, what is important according to Sellers is how we learn to move from one position to another. What do we mean by position? So, he suggests a distinction between pattern-governed and rule-governed behavior. So, the language users are basically playing a game that is dependent on whether it is rule-governed or pattern-governed behavior. So, the idea here is that the competent language user, without intention, exhibits a pattern-governed behavior.

And whereas a beginner will be using rule-governed behavior, he will be exhibiting rule-governed behavior, which means that the initial game player will be recognizing rules in the linguistic pattern and gradually becomes competent as he acquires a clear understanding of them. This is somewhat like that of a chess player. Let us take an example of a chess player. So, if somebody who is, say, a grandmaster lays out the chessboard, a grandmaster looking at the chessboard will not need to look at all the pieces on the board. He just needs to glance at it, and if you ask him after two hours what the layout was, he will be able to recall each and every piece.

So, why does it happen that way? Because the chessboard, at any given point in time, not only talks about where the pieces are, but also where they came from. So, what must have been the previous stages through which the board has arrived at that particular configuration is what the master chess player will be able to tell immediately, but a novice will need to remember each and every piece in order to recount them later. Something similar, so they are trying to figure out the rules. So, when a novice language user is exposed to a language, they try to figure out the rules, and eventually, as we grow and our competence in the language increases, we become more engaged in pattern-governed behavior than in rule-governed behavior.

So that is his most important contribution. Conditioning and conforming to the pattern needed to be a language player is what Sellars says. So, with Chomsky and Sellars, there are some important overlaps and some new ideas that he brings in. Moving forward, we will discuss constructivism. This is yet another very important theoretical standpoint regarding language acquisition.

Let us look at the main tenets. So, the main tenets in constructivism are that knowledge resides in the human mind. So, here they are kind of agreeing with the nativist that there is some sort of abstract knowledge in the human mind. The mind is the seat of knowledge. However, the most important distinction they make is that knowledge is constructed.

It does not come in a pre-structured way. Your brain does not come, you know, pre-loaded with the software already. So, the idea is that it is neither innate nor passively absorbed, as behaviorists claimed. The learner has an active part in it; that is why it is named so. So, the

learner constructs knowledge from the experiences that he or she has in the world. So, the learner gradually builds up knowledge upon the foundation of previous experience and then builds upon one layer on top of another.

So, the psychologists supporting constructivism believe that cognitive development takes place in tandem with the agents' interactions with the world. And what do we mean by interaction? This interaction can be both in the natural and the socio-cultural world. So, we are surrounded by the natural world; we are also surrounded by the socio-cultural world of other humans, other communities, other speakers, and so on. So, our interaction with this entire environment is what creates knowledge for us. So there are some important names, of course, like the previous theories; we would not be able to look at all of them.

We will try to cover the main figures here. The most important and first one is the Luria, Russian neuropsychologist Alexander Romanovich Luria. Luria's contribution is immense in the field of neuropsychology. He was among the first in this theoretical position to talk about how the brain processes information, how the brain is a processing unit that takes into account the input, processes it, and accordingly gives out the responses that it produces. So, his work was primarily informed by his time spent in the battlefield of World War II. He was treating brain-injured patients, head-injured soldiers, and he came across a number of soldiers who had lost the ability to speak, and then he could correlate.

In fact, he is credited with the major contribution, which was the sensory, semantic, and motor aphasia that he listed in various kinds; in fact, the list that he created based on the type of brain injury and the resultant aphasia largely holds. Some of them, of course, were later found to be kind of, you know, overlapping categories, but many of them were also confirmed later. So, his functional organization of the brain, which is the dynamic interaction between experience and brain structure, is where his primary contribution comes in. So, he talks about the language functions and dysfunctions in terms of brain mechanisms and processes.

So, this is how we will try to look at it. So, language and, in general, any psychological processes, as far as Luria goes, represent the brain's functional systems. So, what we call a process has an analogous brain function as well. So, whatever the mental process is, it also has a brain process attached to it. Brain areas work together for any functions to be carried out, including language. So, this is not only one particular area; if you have to go by Chomsky and Fodor's idea of modularity, there is only one language area in the brain that works on its own.

That, on the other hand, Luria says that various brain regions work together for any kind of psychological process, including language. So, the main components of that are

attention, arousal, motivation, planning, and processing. Planning, attention, simultaneous, and successive processing are what later came to be called the PASS model. So, this is the model that came out much later based on Luria's work. So, first you can see the input comes in, then this is how the entire process goes in the brain, and then the output.

So, between input and output is the processing unit, so to speak, and this is called the pass theory. So, once the input comes in, you have planning and attention; this is where the executive function works, and then you will have either simultaneous processing or successive processing. After all of that is over, then comes the output, which is the main contribution of Luria in this matter. So, as the name suggests, input means the information that you get from the sensory organs, whether visual, auditory, or tactile, and then it processes. So, sorting happens, followed by the after-sorting analysis, then interpretation, and finally the output.

So, like this the entire mechanism goes. I have just unpacked the whole thing. For example, lexical ambiguities will be processed simultaneously. So, if you have, for example, the word bank. Bank could be a financial institution; it could be the river bank. So, when you are processing that, the brain, according to him, is looking at both interpretations simultaneously; however, the syntactic ambiguity of deep structure and surface structure is part of successive processes. So, you go by one; 'I saw the man with binoculars', so you process one particular sense of the sentence first, and then you come up with the other, which is the idea of successive processing; one after another, and then planning and decision-making.

So, in terms of language functions, certain features may be more emphasized than others, and he studied these aspects in spontaneous speech to arrive at the automatic verbal behavior; this is what he called automatic verbal behavior. He paired up with Lev Vygotsky, and they looked at cultural differences in language as well. So, through these investigations, he arrived at the conclusion that language cannot be studied independently but must be studied in relation to understanding cognition, because we are talking about psychological processes that may or may not involve language; you know this is a language-independent process, and language is also part of that. So, it needs to be tied up with the basic human cognition.

Then comes our another stalwart here, Jean Piaget. So, he was a child psychologist, his stages of children's developmental behavior, and how the developmental stages of language development go like this. So, he stressed that language learning is an integral part of cognitive development linked to biological maturation. So, these are the biological stages of maturation: the sensory motor stage from birth to almost 2 years, then the preoperational stage, followed by the concrete operational stage, and finally the formal operational stage.

In the first stage, mental representations and schemas are formed.

When in the sensory motor stage, the child is basically trying to figure out their environment. The interaction is primarily sensorimotor. They are trying to figure out, you know, various kinds of inputs, such as simple things like the angles, the surface, whether something is plain, something is smooth, or something is not, and so on and so forth. And through these experiences, children are said to create schematic representations of them in the brain. So, you already have those schemas in place when language starts to appear. So, a language starts to appear at the end of the first stage when the child realizes that words can be used to represent those objects and feelings.

So, when they fell down, they did not realize that there is, you know, a slight gap somewhere. So, they fell, and now the brain already has that structure. So, when language comes in, it has a name for that feeling, that experience, or that object, and so on; that is what Jean Piaget's idea is. So, in this state, the child starts thinking, but it is egocentric, driven by self-gain. Thus, according to Piaget, mental development occurs before language development.

This is the most crucial aspect of Piaget's theory. He does not really address the sociocultural or environmental settings much, which were taken up by others. He was of the opinion that language did not contribute to mental development. It is the other way around. So, according to Piaget, language is driven by thought, and mental development precedes language development.

And as far as he is concerned, egocentric speech is not important. Then comes Lev Vygotsky, another very important scholar in this domain. So, he based his theory on constructivist learning theory and emphasized culture and environment. How much the environment shapes a child's development in terms of various kinds of processes is where his main contribution lies. He stressed the importance of the social environment in understanding human interactions.

A child's development, as per his theory, appears on two planes: social and psychological. And there is a strong relationship between the two. So, according to his philosophy, language plays a crucial role in shaping the overt behavior of an individual as well as influencing the covert behavior. So, covert behavior is basically thought. So, both the contribution of the environment to the overt behavior and the way the person thinks.

These are very important as far as Vygotsky's theory is concerned. So, one of the most important aspects of his theory is called the 'zone of proximal development' and scaffolding. This concept refers basically to what a child can achieve on his own and what

he can learn from the more knowledgeable others. So, in short, MKO. So, these more knowledgeable others can be, you know, parents, friends, teachers, or whoever. So, whoever the child is learning from, someone who has, you know, a slightly better idea about the thing that the child is struggling with, will help them learn, from the other person.

So, he views this area as crucial for the skill development of a child, which the child can use to develop higher mental functions on his own. So, this is basically where the 'constructivism' part comes in. So, you are out in the world figuring out things on your own, and at the same time, you are also surrounded by other humans who know better than you, and from them, you learn, maybe overtly, maybe covertly, that knowledge shapes your experiences as well as how you look at those inputs on your own. So, that is why everything remains the same; if you just change the surroundings, children may turn out to be different.

That is where probably the whole thing comes together. So, this view expresses the idea that an individual's experiences form and shape the behavior of that individual. He also talks about another important contribution of his, which is that of inner and private speech. So, he was the first psychologist to talk about private speech and regarded it as a transition between social and inner speech. Inner speech eventually becomes thoughts. So, through interaction with the social environment, a child develops the ability for private inner speech, and through inner speech, a child is able to differentiate between thought and language, thus giving the ability to express his thoughts to others through language.

So, that is this very fine-tuned, very nuanced differentiation between social language and private language, so to say. So, the child eventually learns it, and the private speech eventually becomes thought, and that thought is transferred to the overt speech, which is the language that we see. So, this private speech diminishes as children grow older and follows a curvilinear trend. Vygotsky proposes that this is because it goes underground to become inner speech and verbal thought, which is what is talked about. So, for you, just because I have talked about so many people, it might be a little easier if we have this in a chart format as to who said what and what the similarities and differences are.

So, I have added Piaget, Vygotsky as well as Sellars, and Bandura here. Because there are some similarities across theoretical perspectives as well. So, certain things that are part of constructivism might have been said by Bandura, and so on. So, in order to make that thing clear, I have added this here; you can just look it up. Another important person in this domain is Jerome Bruner.

He is responsible for what we know as the discovery learning theory. Bruno was also essentially a constructivist. He proposed a three-stage model of children's cognitive development. These are somewhat similar to Piaget's, but with some slight differences. He

talks about the enactive stage, the iconic stage, and the symbolic stage. So, the enactive stage, iconic stage, and symbolic stage of development.

These are not strictly age-bound stages, but these are development-bound cognitive developmental stages. So, the enactive stage is 0 to 1 year; this is a psychomotor stage, an action-based stage, which is something similar to Piaget's sensory motor stage. The iconic stage is where they use visual imagery; information is stored as sensory images or something like an icon. Usually, visual icons like pictures come first, then the symbolic stage follows. So, moving from the iconic to the symbolic is one of the biggest steps in cognitive development, and this happens around 7 years old. Abstract images that are based on language represent the last stage of learning, where knowledge is stored primarily as language, mathematical symbols, or in other kinds of symbolic systems.

So, this somewhat corresponds to Piaget's concrete operational stage. So, symbols are basically flexible in that they can be manipulated, ordered, classified, etc. so that the user is not constrained by actions or images that have a fixed relation to that. According to his taxonomy, these differ from icons in that the symbols are arbitrary, which is something that you already know. For example, in Saussure's signifier-signified, there is no particular reason why a particular label is given or why something symbolizes that which is symbolized. So, the word "beauty," for example, is an arbitrary designation for the idea of beauty in that the word itself is not inherently more beautiful or anything; it is just an arbitrary connection between the sign and the signified.

So, language is important for the increased ability to deal with abstract concepts because it is a label; it is a symbol for various kinds of concepts that you might have created. He argues that language can code stimuli and free an individual from the constraints of dealing only with appearances, providing a more complex yet flexible cognition. So, he is also connecting it to cognition, like the others in this domain. Use of words can aid the development of the concepts that they represent and can remove the constraints of the here and now concept. So, you have an abstract concept; language gives it a symbolic structure, and then you are freed from the constraints of an iconic sort of connection.

So, that is what the primary meaning is here. So, there are comparisons that have been made between him and Piaget. He is different from Piaget in that he does not connect stages to age per se. He talks about autonomous learners, and he would probably agree more with Vygotsky than with Piaget that language serves to mediate between environmental stimuli and the individual's response. So, both Bruner and Vygotsky adhere to the social nature of language learning through scaffolding. And on the other hand, Bruner and Piaget agree on some points, such as children being pre-adaptive to language and their cognitive development happening in stages. But the main differences between Bruner and Piaget can

be that language is a cause rather than an effect of cognitive development.

Social factors like language aid in cognitive growth, and this can be sped up with adequate scaffolding; thus, the stages of development are not strictly age-dependent. So, this is how we can summarize the two theories that we talked about: universal grammar on the one hand and constructivism on the other hand. Universal grammar considers language a task too demanding to acquire without specific innate equipment. On the other hand, constructivists do not really believe in the specificity of language, so to speak.

They focus more on the importance of linguistic input, along with the general cognitive mechanisms and social interaction. So, this is more of an interaction with other agents, the environment, and the other inputs, and then the agent creates knowledge about many other things, including language. But on the other hand, nativists believe that language is an innate thing and does not have much give and take with other aspects. So, these are the primary differences among them. So, with this, we complete this particular segment, and then we start the next segments with the theory of mind and other variables. Theories we are, we will stop here, but the other variables we will start with in the next lecture. Thank you.