

Principles and Parameters in Natural Language
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Lecture – 35
Binding Theory and NP Interpretations

We are going to be talking about another module of principles and parameters framework of linguistic theory which is independently called binding theory. Now just a small note on this terminology the whole approach of principles and parameters in natural language is also known as the approach called government and binding theory, these are the different names for similar types of explanatory tools of natural language.

If someone asks you the differences between principles and parameters approach of looking at natural language and that of government and binding the answer is none they are the same thing. However, these terms independently mean different things principles means something else, parameters means something else, government means something else and binding means something else that I am going to show you today.


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So far ...

- While looking at linguistic theory in the framework of Principles and Parameters, we have looked at X-bar Theory, Case Theory, Theta Theory, and Displacement/movement.
- We have looked at the evidence and motivations for movement?
- We have looked at the examples of Wh-movement and NP-movement

Questions

- We will discuss Binding Theory?
- We will discuss some aspects of the interpretations of noun phrases.



We while looking at linguistic theory we have been looking at several things we know in first we looked at empirical facts of language in terms of, it is structure at the level of sounds words and sentences we started looking at that and then we started looking at what is it that we call principles of language, parameters of language and what is it that

the whole approach called principles and parameters in natural language that does in terms of explaining abstract phenomena underlying language. In other words abstract rules underlying language and finally how does it really work, what do we mean when we say human mind has a great role to play in learning of language, it is a unique phenomena we do not know how we end up speaking so much that we speak, we do not know how everybody speaks the same way in one language within the language or beyond boundaries of languages.

We will look at several things we barely touched a couple of issues while talking about differences between I language and E languages about E language because larger chunk of what we ought to discuss in discourse within the framework of this course was related to I language therefore, we are still sticking with how I language works and what is it that a particular linguistic theory provides us with to understand natural language and when and continuation of that we are going to be looking at binding theory what is it that we call a binding theory, the like I have been telling you all the time names are names, names mean anything only in the context like we have discussed about words to that they are arbitrary they acquire meaning when we provide the meaning they do not mean anything by themselves there is no reason why something should be called that thing.

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Some examples ...

- John saw himself.
- *John saw him.
- John thinks that Mary likes him.
- *John thinks that Mary likes himself.
- John thinks that he is a genius.
- *John thinks that himself is a genius.



So, same thing applies here; however, let us look at what we mean by binding theory we begin with looking at some examples by even before we look at example just a sentence

about binding theory. It is about interpretation of noun phrases, in a sentence that is within a sentence and the reason why we are saying within a sentence is because the minimum unit of discussion, the minimum unit for evaluation of anything or explanation of any sort of syntactic type is coming from a sentence that is a sentence is a minimal unit of a study for understanding I language for understanding structure of language therefore, when we say interpretation of noun phrases we mean interpretation of noun phrases within a sentence.

We are going to look at them and if now before we look at more of that in details let us look at some of these sentences, stars in the beginning of these sentences represent their ungrammaticality; that means, these sentence the starred sentences are not grammatical according to the intuitive judgments of native speakers or for that matter this much intuition even we have as a non native speakers of English that these sentences are not good.

What are these sentences and I have also put some of the things with colors for us to see, so that we can understand the things that we are referring to, in the sense that what are the things that we are talking about when we say interpretation of noun phrases. We have a first sentence John saw himself right in this sentence there are 2 parts one is John the other is himself assuming that we know about the grammatical relations where one is the subject the other is the object.

If we look at the grammatical category that is the category of a lexical item John is a noun phrase right and is himself right by the way we are talking about this kind of a phrase for the first time in that in this class what is the meaning of himself, and if it is a noun phrase we are giving it a broader term which calls which is called noun phrase right, but what type of thing is this is it somewhere very close to a pronoun because we have seen something similar of that sort which is let us look at the next sentence John saw him, do you see any similarity between him and himself similarity between them right there is there is some sort of similarity between them right; however, there is a difference too and the difference between the 2 leads the second sentence to ungrammaticality.

However independently the second sentence is not ungrammatical you see the point independently the second sentence is not ungrammatical and these things have meanings

in terms of grammaticality of or ungrammaticality of a sentence given the interpretations of noun phrases.

Let us move little bit slow in order to understand this thing not that we are trying to understand the sentence we are trying to understand a phenomena. So, there is a similarity between him and himself him is a pronoun right therefore, we can say himself is also something like a pronoun therefore, it is qualifies to be a noun phrase all right; however, him is a canonical to pronoun and we are not that sure about himself it looks like a pronominal element, but not that sure about it.

Now, a word about ungrammaticality of the second sentence I said and you agree with that that independently the sentence is not ungrammatical, but this sentence is marked ungrammatical here can you tell me a little bit why this sentence under which circumstances this sentence sounds ungrammatical and under which circumstances this is all right we know this thing.

So, can somebody quickly tell me in 2 sentences the thus the sentence John saw him right is ungrammatical if we mean John by him right if him stands for someone else in discourse then it is all right this sounds trivial, but hang on we will come back to that it has something to talk about the interpretations of noun phrases that is to say in the first sentence there is a relationship between John and himself, in the second sentence there may be or may not be if we try to establish relationship between John and him then the sentence is bad and if we leave them independent then there is nothing wrong with a sentence right, that is that is the part we need to keep in mind.

Third one John thinks that Mary likes him right sentence is good right now it has independent noun phrases like John Mary and then it has a pronoun him who does this pronoun him refer to.

Student: John.

Clearly John.

Student: John.

Right clearly and now comparing with the first sentence sorry I do not have numbers here, but I am sure you can follow comparing with the previous sentence that is John saw

him the third sentence is good. In the second sentence him could not be associated with John therefore, the sentence is ungrammatical, but in the third sentence it is to associate him with John do you see the point and the sentence is completely all right.

This must have some there must be something going on here all right we will come back to that story in a moment in the next sentence John thinks that Mary likes himself is bad right, this sentence is not grammatical not just because of Mary and himself not just because of that; however, that is true if we say John thinks that Mary likes herself then the sentence is good, but keeping my keep in mind even if we put let us say we put Peter in place of Mary in that sentence the sentence is good right John thinks that peter likes himself.

In that case I do not have that sentence here therefore, I am just telling you in that case; however, himself has something to do with Peter not with John see this thing in that context my point is look at the previous sentence again him can refer back to John in the previous sentence, but himself cannot refer back to John in the sentence that we are talking about get my point.

Then last 2 sentences John thinks that he is a genius sentence is good right now who does he refer to in this sentence.

Student: John.

It could be John could it be anyone else also.

Student: (Refer Time: 12:49) yes

Can be anyone else also right, comfortably we can say this sentence could be ambiguous, could have at least 2 different meanings right very nice. Now, how does 2 different meaning come from we do not want to go into the details of semantics, but just as a note here how does the ambiguity pop up, ambiguity comes in by the interpretation of the pronoun he, if we interpret it independently then it has a different meaning then the sentence has an it has a different meaning if we interpret this pronoun with reference to John then it has a different meaning right get it all right.

Finally John thinks that himself is a genius is not a good sentence right which is to say that himself in order to refer to John there seems to be some problem. Now look at the

first sentence John saw himself is perfectly all right, but when we say John thinks that himself is genius is not a good sentence. In other words there is no problem establishing some sort of relationship between John and himself in the first sentence; however, in the last sentence it is not really possible to establish that connection between John and himself these are very simple sentences I hope I have given you in simple terms the interpretation of these elements in color which you know as noun phrases and pronouns and nouns and stuff like them and the ambiguity that comes out of them the reasons why these the sentences that are marked with the stars may be ungrammatical.

We however, what we need to understand what we mean by interpretation of noun phrases in syntactic terms is the following what allows reference between John and himself in sentence one and what stops reference between himself and John in the last sentence, what is the problem if the pronoun him refers to John in the second sentence. These are the theoretical points that we need to discuss with the apparatus that we have seen so, far which are at least the phrases I am sorry x bar scheme right and then we will see does existing apparatus give us explanation to these things and are those explanations convincing enough all right so that is the purpose and that is how we look at binding theory.

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Classification

- Anaphors: *himself, herself, itself...*
- Pronouns: *she, he, her, his, it ...*
- R-expressions: *John, the student ...*



The terms like himself, herself, itself are called these are reflexives; these terms are called reflexives or reflexive pronouns because they reflect back to something. In a

sentence for these kinds of pronominal elements to appear like himself, herself, itself, themselves, they need to co refer to some other elements in the sentence, they need to co refer to something else in the sentence. In other words they need to depend on something else for their interpretations therefore; these are called reflexives or reflexive pronouns.

Now, here I have put the term anaphors is a theoretical term in government and binding in principles and parameters which means reflexives and reciprocals together, do you understand when I say the term reciprocals.

Student: (Refer Time: 17:15).

Sorry.

Student: Back to itself.

That is right no back to itself is reflexive, reciprocals are terms like each other if we say something John and Mary like each other the term each other is called a reciprocal term which refers back to John and Mary. When we say John and Mary like itself the sentence is not good because itself is a reflexive right and it needs something called like a reciprocal. So, that the elements like reflexives and reciprocals both together are called in anaphors however, like always I give you this freedom that these terms are not that important what is important is phenomena.

He, she, her, his, it, these are simple pronouns there is a typo his is not italics has got no meaning it is just a typo. The terms like John, Mary, computer, classroom, students, that these terms which are like nouns they are called R expressions we can still call them nouns we are not changing anything that I only want you to know they are called R expressions because they are R expressions mean Referential expressions.

They also receive their interpretations in sentences when we use the sentence when we use noun phrases like these, they receive a particular meaning in a sentence and bare with me I will tell you what we mean by that the reference of an reflexive it is dependent on something in the sentence; however, the reference of a referential expression like John is not dependent on anything in the sentence rather it is dependent on something in the entire world which is the following with one more sentence about it do you know how many John s are there in this world no right nobody knows.

But if we end up talking right and I ask you did you know what happened to John yesterday right this conversation between us and this small extraction of this sentence has a reference to John out of all the infinite John s in the world the speaker and hearer knows about the reference of the John in the sentence right we say we infinite John s. In the world we know who we are talking about this is why it is called R expressions in other words it receives its reference from rest of the world in a given discourse which for which it does not have to depend on any other component of a sentence making sense it is not a very complicated thing that I am discussing it is a very simple idea it simply means these terms have their independent references they are not dependent on anything else.

Student: Sir there all nouns are R expressions.

All nouns are R expressions that is right no one no noun is a pronoun no noun is a reflexive yes, true absolutely right.

Student: So, if I talking in general terms like say computers are very smart

Right

Student: So, there computer is computer is not NRA.

It is

Student: It is need a.

It is r expression it refers to all the computers of the world.

Student: So, it is not we are not trying specify (Refer Time: 21:44).

No definitely not the being a specific and providing a specific reference I at the example that I gave you was definitely of a specific reference and the reason I was giving that example is because I wanted to you are right I should have said that also whether we want to go all the way down to one out of infinite or we want to put all in finite together everything is possible with our expression.

That will be the feature of an r expression, when we say computers are a smart, are we leaving any computers out of this thing did this with that sentence the reference of the

word computers is to definitely all the computers of the world right true absolutely right. Now just look at the specificity and breadth of the references that it is providing and that we are capable of providing in a sentence right and still it is independent for it is reference right clear reflexives, pronouns and nouns.

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Binding Theory

- Module of grammar/theory regulating NP interpretations is called Binding Theory.
- Binding Theory has three Principles. They govern distribution of NPs.
- They are called:
 - Principle - A
 - Principle - B
 - Principle - C



I have already told you about this thing I wanted to talk about this little later, but it is important to at least refer to this part that a particular module of this theory which regulates noun phrase interpretations is called binding theory and this when we go again in details and see this theory has 3 parts and each part is called is given a name like Principle A, Principle B and Principle C should not be very difficult for you to guess by now that A B and C would finally, end up referring to the 3 sets that I have shown you. The principle A will be talking about reflexives, principle B will be talking about pronouns and principle C will be talking about our expresses.

What is it that they have to talk is also very simple I will show you that, but still the internal mathematics not really in the sense of mathematics, but the internal structure the each one of these principles depends on how we look at structure and that that we are going to show you that that I will show you clear this thing.

The again I repeat this thing that the when we try to regulate the interpretation of a noun phrase in a sentence this is the part which is called binding theory and we are going to be

talking about the governing distributions of noun phrases in a sentence are they related, are they not related, this is part of binding theory.

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Anaphors

- An **anaphor** does *not* get its meaning from the open world – it depends on something within the sentence.

– **John** saw **himself** in the mirror.

– **Mary** bought **herself** a sandwich.




Let us look at them independently again before we look at these principles and x bar theory. So, a reflexive or an or an anaphor now does not gets it is meaning from the open world unlike R expression that I just gave you. It depends on something within the sentence and I want to draw your attention in particular when we say within the sentence we do not mean it in a light sense, we mean in the sense of strict definition of a sentence see my point strict definition of a sentence, we do not mean it lightly that anything could be a sentence and now who knows it better than you what a sentence means.

Sentence is not an ordinary looking thing in a in the grammar of natural language sentence has it is a specific meaning right. John saw himself in the mirror the term himself is a reflexive and John is an r expression or forget about R expression right now John is a noun; himself needs to depend on John in this sentence and not on anything else in the entire world this is why it is called reflexive. Mary bought herself a sandwich the interpretation of the term herself a reflexive and anaphor has to depend on Mary whoever that Mary is in the entire world given the 2 sentences the grammaticality of the 2 sentences tells you that the referential part is taken care of right this is what is the meaning of a reflexive or an anaphor.

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Pronouns

- A **pronoun** doesn't refer to something in the open world too. However, it may get its reference from somewhere else and does not need to depend on something within the sentence.
 - **John** told Mary that **he** likes pizza.
 - **Mary** wondered if **she** agreed.
- ...but it doesn't *need* to be something in the sentence. Mary concluded that **he** was crazy.

Now, when we talk about pronouns we have talked about it very briefly and we have talked about it is description in any grammar whether we are looking at English grammar or a Hindi grammar, what have we been told about pronouns it is a term which is stands for a noun I am not saying that what you have been told or what we know about it is wrong that is fine.

But we need to look at it in little bit more details in the following sense this is not this is not complete description of pronoun, but this is at least good enough to begin with which is a pronoun is it is really little bit fishy it is not exactly like reflexives which is reflexives strictly depend on it is interpretation within the sentence we were looking at R expressions.

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R-expressions (Referential Expressions)

- R-expressions are NPs like *John*, *Mary*, or *the professor*, *the student*, or *a pretty girl*, which get their meaning by referring to something in the world.
- Most NPs are R-expressions.



And I am going to show you that also I am coming back to pronoun, when we look at R expressions there is nothing fishy about it the NPs like John, Mary or student, professor, a pretty girl or computers anything in a as a noun phrase may or may not have a reference outside the sentence, but within a sentence it receives its interpretation from the whole sets available anywhere in the world.

Another significant point is it cannot be without a reference in a sentence, that is a noun phrase must have a reference to something in a sentence clear. I do not mean to say more than what I am saying right now, but I do want you to understand that the things that I am saying some of them may sound pretty obvious, but they have meaning for theoretical explanation the explanatory capacity of the theory depends on these premises even though they sound intuitive for example, I gave you a description of an anaphor or a reflexive that it needs to depend on something you may say it is a trivial point.

We see that John likes himself the interpretation of himself depends on John right you can say it is pretty simple point, but that is the point the simplicity of that point lies in the fact that one needs to depend on the other and no matter how obvious it is it has meaning for the explanatory capacity of the theory see understand my point.

So, please bare with this and it is good that these things are these things may look simple to you and not too complicated all right.

Student: Sir.

Yeah go ahead.

Student: You told that the (Refer Time: 30:47) should have some reference (Refer Time: 30:48).

Right.

Student: When you say the sentence like John thinks that he is genius when he is interpreted as some someone else.

Answer into that.

Student: And John (Refer Time: 30:58) difference.

No John still have a difference think about it.


Student: Thinks.

John thinks he is genius right in this sentence you are saying there are 2 possibilities one where John and he are related that is when we are talking about the same person. In that case he gets interpretation from John, stop talking about he for a moment and talk about John, John still gets independent reference from the world.

That is to say the interpretation of one prime or one a, in the interpretation of one a the reference of he depends on John not the other way around, in one b the reference of he comes from somewhere else not from John still the reference of John is not dependent on he, get the point the common thing between one a and one b is in both the cases John is independent of he whereas, in one he is dependent on John in b he is not dependent on John making sense right and is this part clear to everybody R expression.

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Pronouns

- A **pronoun** doesn't refer to something in the open world too. However, it may get its reference from somewhere else and does not need to depend on something within the sentence.
 - **John** told Mary that **he** likes pizza.
 - **Mary** wondered if **she** agreed.
- ...but it doesn't *need* to be something in the sentence.
 Mary concluded that **he** was crazy.

And that is the going back to that point that is the precise thing for which I ended up saying there is no fault of these pronouns I ended up saying the story of pronoun seems little bit fishy right and that is the fishiness which gives us ambiguity for example, in other words. So, a pronoun does not refer to something in the open world that is the first feature of a pronoun, it does not refer to something in the open world that is it is strikingly different from R expressions.

When we say John thinks he is intelligent right he in interpretation b may not depend on John right, but for it is interpretation it depends on something which the speaker in the hearer knows right it may depend on Peter it may depend on Bill it may depend on anybody, but it depends on something that the speaker and hearer knows about therefore, it is not independent in the world it is reference is limited and known right even when it is not referring to the available NP in the sentence for it is interpretation we do not have to go too far not the whole world that is the that is the meaning of the first sentence.

However it may get it is reference from somewhere else and does not need to depend on something within the sentence and that is what your example was talking about and I gave you it may depend on something in the sentence it may not depend on something within the sentence and that is what creates a little bit of fishiness and we do not mean it in a sarcastic or a bad way when we say fishiness we simply say we simply mean that this flexibility gives us ambiguity, ambiguity very loosely speaking is a strength of

language, ambiguity is never a problem, an ambiguity is not only the strength of language ambiguity is allowed within the language never lose the track that we are talking about human mind, ambiguities are allowed in language because language is one of the finest product of human mind and the strength of human mind can still gets get correct interpretation no matter how ambiguous the sentence is trying to be am I making sense and like I said and that is the reason why I said right in upfront that we are talking about ambiguity in a very non technical sense because the whole technical this description of ambiguity comes in the branch of semantics.

It can be mathematically coded or decoded it can be mathematically simulated the ambiguities and it is a very fascinating branch of a study of language on it is own. So, since we have not been talking about semantics in great details and I have restricted myself to syntax and then I on the basis of that restrictive description I told you that now you know what is sentence means and you have seen how long hours we have spent discussing a sentence right we have not discussed meaning in that since therefore, I am talking about meaning in semantics in low sense.

However given the fact that language is product of human mind and the capacity of human mind ambiguity no matter how difficult is a very simple phenomena of human mind. It does not I mean we need to figure out ambiguity, but our mind does not it figures out very categorically look at that sentence also John thinks he is intelligent right we are talking about this as a sample as an example right when someone says this kind of sentence in the context does that person even need to say anything there this time I mean he by he I do not mean John.

We do not need to say these things we know very clearly whether it is interpretation a or interpretation b without even getting oblique reference to any one of these things, just allow me one more a small point it is not just about the interpretation of sentences the capacity of human mind is fascinating which you already know I am only referring to them is fascinating in the sense that with sentences, it reads things that we do not even say have you must have heard things like sometimes people say something they mean something else have you heard this thing and it happens in day to day life. In other words such a phenomena is a very normal pattern in society or within people among people, human mind has got absolutely no problem figuring those things out you look at political

discourse or political context as an example or a very ordinary context of our day to day conversations.

I may say many things without saying anything of that sort and then you understand exactly what I say that is the fascinating capacity and relationship between meaning language and human mind of which we have not discussed much and when I say we have not discussed much I mean not in a technical sense to simulate how the underlying mathematics of that sort works, I conclude by saying that part that we have not discussed here.

But people have worked on that due to a great deal it is a time of computer you are free to Google and look at some of the things that branch is called semantics and there is another related branch which is called mathematical linguistics and there are books after books written where you look at a book of mathematical linguistics it looks like geometry or algebra, it will probably not even give you a single sentence like these that you see here on the screen and it talks with the mathematical notations in the entire paper or in the entire book talking about meanings and the interpretation of meaning.


In that context we are talking about a very small fraction of interpretations all right give me another couple of minutes before we stop, I am glad that you had already asked this question which I have here John told Mary that he likes pizza, he is sometimes dependent on John sometimes independent on John. Mary wondered if she agreed in this case this story is little bit different and what is the difference of the in the story she as the pronoun is categorically someone else, given the nature of the verb wonder right the interpretation of she is not dependent on Mary therefore, the sentence is not ambiguous.

Same thing is clear from the last sentence Mohan concluded that he was crazy right I mean we do not if he refers to Mohan then he need he does not need to conclude that right in other words nobody needs to conclude that that person himself is crazy rather even if you try very hard you would not be able to conclude that right because nobody concludes that that nobody reaches that kind of conclusion and anyway I hope you understand what I mean you we have looked at referential expressions.

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The problem

- There are very specific configurations in which anaphors, pronouns, and R-expressions can/must be used.
- Even though both *he* and *himself* could refer to *John* below, you can't just choose freely between them.
 - John saw himself.
 - *John saw him.
 - John thinks that Mary likes him.
 - *John thinks that Mary likes himself.
 - John thinks that he is a genius.
 - *John thinks that himself is a genius.

 Binding Theory answers: When do you use anaphors, pronouns, and R-expressions?

So, what is the problem in fact, we have been talking about the problem all along I have not waited for the problems to give you as part as in one place. So, there are various specific configurations in a sentence or beyond the sentence in which anaphors pronounce and R expressions can or must be used, you understand the meaning of configurations specific configurations right which is the meaning of a specific configuration is very simple, did you read something that is in the red please read that and then you will understand what I mean by a specific configuration.

If a specific configuration is not clear here it is the use of himself must be within the sentence, if you use this thing across sentences then it is not going to work this is why and again I am sorry that I do not have numbers, but we can find things this is why the look at the last sentence. Last sentence is not good because himself is not part of the same ip, now I start talking about sentences in terms of ip, even though if we say last sentence has 1 ip 1 and ip 2 even though they are related ip 2 is the compliment of v of ip 1, ip 2 in the last sentence is the complement of v of the ip 1 am I speaking to you right without the structure is that, that is should be clear.

So, even if that is true himself is part of ip 2 right and that is from ip 2 the reflexive in ip 2 and it is the other thing that it refers back to that is called antecedent that technically call antecedent. So, reflections in ip 2 and antecedent in ip 1 is not allowed that is what we mean by a specific configuration, the specific about this configuration is must be

within the same ip 2 of them must be in the same ip their interpretations across ips are not allowed.

There is another problem related to the last sentence which and you can see and you can guess and then I stop there and we will discuss this further tomorrow, himself if you look at ip in terms of ip 1 and ip 2, you can see it can never be allowed in this specifier position of an ip, in the second ip it is in the spec of ip that is a specifier position of the ip 2 what is that position for a spec of ip.

Student: Subject.

Subject it can an expression of that sort can never be part of subject can never be subject as part of a sentence and it is no big discovery it simply means if something depends on interpretation for it is antecedent, then it is antecede the antecedent by definition means something that precedes it right and the moment it becomes the first element in the sentence where is the antecedent in the sentence right therefore, if there is one position where it can never occur is there spec ip in ordinary sentence also some way I just gave you that anaphors, reflexives must be within the same sentence right antecedent and reflexive must be within the same sentence. Someone can say himself likes John both of them are within the same sentence are they no, the only reason for that is spec of ip is not for reflexives because it needs an antecedent clear more and know more about it tomorrow.

Thank you.