

Principles and Parameters in Natural Language
Prof. Rajesh Kumar
Department of Humanities and Social Sciences
Indian Institute of Technology, Madras

Lecture -36
Principles of Binding Theory

We will look at binding theory, the remaining aspects of it. What is binding theory mean in one sentence. A theory around interpretation of noun phrases. Interpretation, in other words could mean relationship between two of them, or two noun phrases in a sentence dependent on one another, for their references or interpretations, are there relationships between two or not, If there is, what kind of relationship, if there is not how independent are they, is what we mean by interpretations, and this is what we formalize. And this is what when gets formalized is called binding theory, which is an important component of principles and parameters approach of natural language.

(Refer Slide Time: 01:20)

So far ...

- We have looked at anaphors (reflexives and reciprocals), pronouns, and r-expressions.
- We have looked at the domain of occurrence of these elements in language.

Questions

-In Binding Theory, we will discuss some aspects of the interpretations of anaphors, pronouns and r-expressions.



So, yesterday we looked at reflexives and reciprocals, which we called together anaphors and pronouns, and r-ex r-expressions, which mean referential expression. In short we saw the examples of these things, and then we saw some examples, where we find them dependent on one another. And in some we saw they are not dependent and one another right. So, we need to understand this in a little bit more formal sense, and then we will

look at it, look at how to basically formalize what aspects of it is interpretation, help us formalize these things.

(Refer Slide Time: 02:15)

Classification

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



So, let us see this is what we saw yesterday. Pronominal elements; like himself, herself, itself are anaphors; he, she, it, they, his, her, you, yours. These are pronominal elements, and then independent noun phrases NPS. Like John; the student, the teacher, these are computers phones, these are referential expressions, which were we have seen that.

(Refer Slide Time: 02:48)

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



Anaphors; that is reflexives and reciprocals, they have to depend on something else in the sentence for their interpretations. R-expressions do not have to depend on anything in the sentence for their interpretations and pronouns have. Absolutely pronouns are little bit tricky, where they are sometimes dependent on something else for interpretations and sometimes they are not.

It has three parts each part is called principle A, principle B and principle C. Principle A deals with anaphors, principle B deals with pronouns and principle C deals with r-expressions. Principle A, the A in principle A has nothing to do with anaphor, it is just in alphabetical order. Now not even in alphabetical order, it says in a particular order, principle A for anaphors, principle B for pronounced, principle C for a R-expressions. We saw these examples.

(Refer Slide Time: 04:00)

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.



Where we know John is an R expression, himself is a reflexive, him is a pronoun. Looking at sentence number 2, we saw it is ambiguous and it is not good, only in one interpretation where him is dependent on John, then it is not good if him is not dependent on someone else, then its and likewise we saw other examples.

(Refer Slide Time: 04:46)

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?

Then we stopped with this when we said there are prob, the problem is that we see some specific configurations for a specific configuration governing occurrence of these elements, it is not fair.

To simply say some, a couple of things about these things, it requires some serious attention and then we see that, there the configuration is different for different categories, and when we want to, And once we look at that these sentences; that is grammaticality or ungrammaticality of these sentences with respect to those configurations, then we see that the grammaticality or ungrammaticality of these sentences can be explained with binding theory, because such a. Look at it at the configurations of these sentences, help us understand not only the distribution of these things, these elements, rather what underlyingly. What are the things that underlyingly governed, and then we put them as what we call binding theory.

So, let us look at some more issues related to this.

(Refer Slide Time: 06:30)

Indices and antecedents

- Anaphors and pronouns are **referentially dependent**; they can (or must) be **co-referential** with another NP in the sentence.
- The way we indicate that two NPs are co-referential is by means of an **index**, usually a subscripted letter.
- Two NPs that share the same index (that are **co-indexed**) share the same referent.



- John_i saw himself_i in the mirror.

Anaphors and pronouns, let us first look at anaphors; that is reflexives, is called referentially dependent, rather we can also say they are co referential. What do we mean by that? The way it has something to do with, the way we indicate them, which is the two noun phrases have same index. And the way we do it, we put same index for the two noun phrases, and then we say they are co referential and co indexed both, which is when we say John saw himself in the mirror himself and John have same index; do you see that, with the subscript I we are putting, we are indicating co referentiality. This is all that we mean when we say co indexed, to describe co referentiality simple right.

we can say the same thing with words that himself in this sentence refers to John, but to show that configurationally, we are putting indices on both, same indices and both of them. If we want to show that they are not co index with one another, then we put two different indices at two different NPS.

(Refer Slide Time: 08:25)

Indices and antecedents

- $John_i$ saw $himself_i$ in the mirror.
- An index functions as a “pointer” into our mental model of the world.
- *John* here is a name that “points” to our mental representation of some guy, John, which we notate by giving the pointing relation a label (“i”).
- *himself* here shares the same pointing relation, it “points” to the same guy John that *John* does.
- ~~So~~ any two DPs that share an index (pointing relation) *necessarily* refer to the same thing.

You can see that these are in this sentence; they are co indexed with one another. These things are just not that important. You can just take a look at this, and see what we mean by them.

(Refer Slide Time: 08:50)

Antecedents and Co-indexing

- $John_i$ saw $himself_i$ in the mirror.
- The **antecedent** is the NP from which a reflexive or pronoun draws its reference.
- *John* is the antecedent for *himself*. *John* and *himself* are co-indexed.

Now let us look at this, and this is something which I have just talked to you; that is the. There is another word that I want to introduce to you, which I think I referred yesterday; antecedent, when two NPS are co indexed with one another, they carry same index for a reflexive pronoun. The antecedent is the NP that precedes it. Am I right? When I say

antecedent means something that precedes it right. Antecedents by definition cannot follow right. So, when we understand antecedent in that context of precedence, and not following, we need to bring in the structure of the sentence in our mind too; that is the antecedent is always going to be higher in the structure than the reflexive ok.

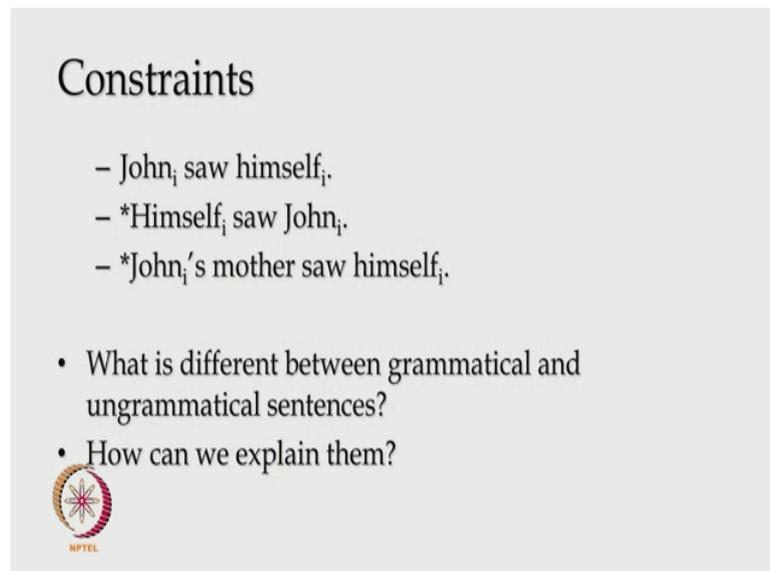
Student: Can you one given example where the pronoun is co index with the.

I am coming to that; pronouns are co indexed with one another yeah.

Student: (Refer Time: 10:21).

Yeah I am coming to that, coming to that.

(Refer Slide Time: 10:32)



Constraints

- John_i saw himself_i.
- *Himself_i saw John_i.
- *John_i's mother saw himself_i.

- What is different between grammatical and ungrammatical sentences?
- How can we explain them?



Let me first introduce referential. Sorry reflexive stew in little bit more details and then I am coming to principle B, when we talk about pronounce, do we sorry.

Student: you know the same principles (Refer Time: 10:50) both pronouns and reflexives can be co indexed.

Pronoun both can be co indexed.

Student: (Refer Time: 10:57) given examples of (Refer Time: 10:58).

Right.

Student: So, reflective.

Right right.

Student: So, can you (Refer Time: 11:00).

What you are saying we did not have examples in the same place, and that is what I am telling you. I am coming to that, I do not have any example ready from the top of my mind, but I am coming to it, coming to that example in a couple of minutes. So, do these things follow any constraint? Now in this, in the second sentence also, you see they are co indexed right. If which is to say, we just cannot put one condition that they must be co indexed.

John and himself must be co indexed does not guarantee grammaticality of the sentence in sentence two they are co indexed, but the sentence is not grammatical right look at look at we even if we talk about precedence right is not giving us an answer we can say antecedent must always precede is not giving us an answer because look at the third sentence John's mother saw himself is that sentence good it is just what is the, why is the sentence not good it has an antecedent they are co indexed what is wrong with that sentence.

Student: (Refer Time: 12:23) John's mother, John's mother

The antecedent appears to be.

Student: (Refer Time: 12:25).

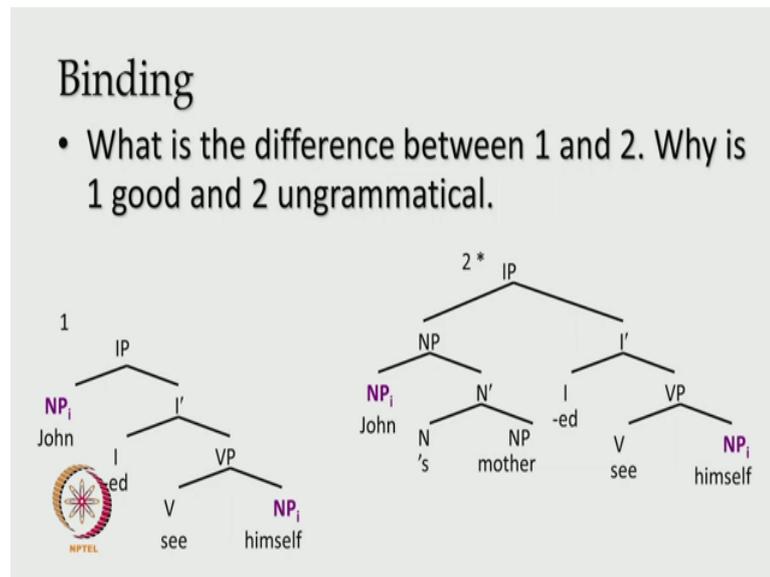
John's mother.

Not.

Student: John.

John that is the problem. In other words, even if the reflexive himself looks like, it can have it is antecedent only John, because it is himself, it does not have access to that. In a configurational sense, when you draw the structure of the sentence, then you will realize that it does not fulfill certain aspects for being antecedent, for this reflexive, what are the other aspects that it does not fulfill, and how do we explain this thing look at this.

(Refer Slide Time: 13:12)



These two structures, and then you will be able to see why. So, what is the difference between 1 and 2? Why is one good and two not good; that is why is one grammatical in the two ungrammatical the. See the difference between the two structures; John precedes in both the cases. John is co indexed in both the cases; the argument is we need to say something else.

In order to define the domain for reflexives, and it is antecedent to occur, we need to say something else and that something else, again you might have guessed by now is taking us to hold on. There is one more thing which I am presenting to you without saying it, that we are talking about the sentence. So, we are saying, they must be co indexed, the antecedent must precede. And we are also saying that they must be within the same sentence, still we find some sort of ungrammaticality.

Then we need to talk about what is missing here, is what we need to add to explain ungrammaticality of two, and what we need to say is the antecedent, everything else that we have said is still true, but we need to add that the antecedent must c-command the reflexive, the antecedent must c-command the reflexive is antecedent John c-commanding the reflexive in two. Do we remember the definition of c-command, try. What is the definition of c-command?

Student: (Refer Time: 15:24).

What are the two requirements for c-command?

Student: A c-commands B, A does not dominate B

A does not dominate B, and B does not dominate A.

Student: and first branch (Refer Time: 15:33).

Hold on; one part A does not dominate B, and B does not dominate A. Does A dominate B into A that is NP? John does not dominate NP himself, they are co indexed right they are. There is an antecedent, and even if we look at c-command, John does not dominate himself, and himself does not dominate John; clear, what is the second condition for c-command.

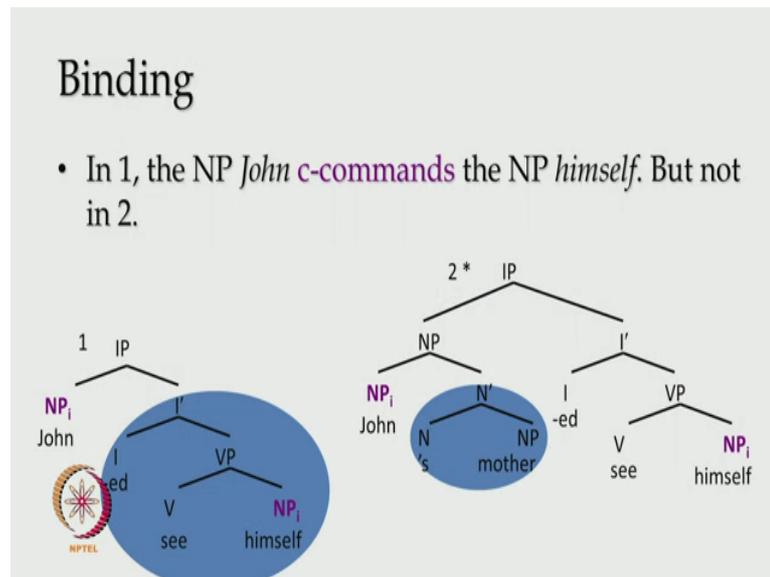
Student: The first round dominating John should also dominate (Refer Time: 16:16).

This is where it does not. So, the first branching node dominating A must also dominate B, that condition of c-command is not being fulfilled here into the first branching node, dominating A is.

Student: NP.

NP which is not dominating the, which is not dominating B. Therefore, John does not c-command himself; therefore, despite being within the same sentence, despite being co indexed with one another, and despite John being the antecedent of himself, the sentence is ungrammatical. Therefore, configurationally speaking what becomes the most significant constraint on the presence; that is occurrence of an anaphor within the same domain is being in c-commanding domain, that an anaphor must be in the c-commanding domain of it is antecedent A, reflexive must be in the c-commanding domain of it is antecedent, then the sentence is grammatical. Can I ask you a question at this point, when we have a sentence like? Let me come back to that question little later.

(Refer Slide Time: 17:57)



So, we this is what we talked in one. The NP John c-commands, NP himself clear; do you agree that NP John c-commanding NP himself, it is a John is not dominating himself and himself is not dominating John, that was the reason why I wanted you to understand for the first time. In the first place, the relationship called dominance and precedence. So, NP John does not dominate NP himself, and himself does not definitely does not dominate NP John that is quite obvious.

However, the first branching node dominating NP, which is IP, also dominates himself. Therefore, there in the c-commanding domain, therefore, it is good, and you have seen why that is not grammatical; however, somebody answered this question. Somebody said that the antecedent looks like the entire NP in their spec position; that is John's mother right. If we are talking about the entire NP, then that NP c-commands the reflexive the NP downstairs, but John's mother saw himself. If we say the whole NP is the antecedent for it then what is the violation

Student: Agreement.

Not the agreement indexes, indices is the problem, John's mother and himself two cannot carry the same index. As long as they are carrying the same index, then it is going to run into difficulty.

Student: Sir what happens it is a John's father saw himself?

John's father saw himself, then with the sentence would be grammatical.

Student: Then using the structure two (Refer Time: 20:12).

John does not C command, John's father whole NP c-commands, that is to say you see here, is what we are talking about, you are saying John's father saw himself, the sentence is the, is the sentence right. First John's father saw himself, what we are saying is this NP becomes the antecedent right, and then they are co index this NP c-commands this. If we allow this NP to c-command, the same this NP himself, then it is like number one. Then there is no problem, the whole no matter how big, that NP is John's father, it is definitely potentially big as you can see. If we allow it to be the antecedent of this, then there is no problem that NP C is in the c-commanding relationship with a reflexive. Therefore, that is that sentence is allowed ok.

Student: Sir how do you (Refer Time: 21:12) John's (Refer Time: 21:13).

What the reason was, you are saying why have we put it on the shade, oh how the branching has worked. Let us see I have tried to simplify it, I know I understand your objection, that how is that an NP first. I just wanted to keep the whole thing as an NP, but then I will not be able to get then I want to be able to separate John from John's mother. So, it is like a genitive phrase, and since I have not talked about genitive case and genitive phrase, I did not want to get into that, and then make my point right. So, what I have done is, this is a complex, NP is a big NP, where I see your main objection is in the head position of that, NP y is not an NP, and y is something else right.

So, but take it as an NP as a big NP, where one NP is in the spec position of the whole phrase; that is John, this is the, that is the main point m. I am trying to show that, because the NP John is in non c-commanding domain with the reflexive. The sentences is ungrammatical; however, I agree with you that I am not answering the complexity of this NP in details, right down, because it is definitely not, it is called you see there is another term which is called DP, and it is called determiner phrase right. And in that determiner phrase in their spec position, and NP is allowed. And in the head position a case marker like off or apostrophe will be allowed, but I did not want to use the term dp either. Therefore, I changed the term db to NP, just to make my point all right ok.

(Refer Slide Time: 23:31)

Binding

- When an NP c-commands the anaphor and is co-indexed with it, the NP first is said to binds the anaphor.

The diagram shows two syntax trees. The left tree is for the sentence "Peter saw himself". The root is IP, which branches into NP_i (Peter) and I'. I' branches into I (ed) and VP. VP branches into V (see) and NP_i (himself). A blue oval highlights the NP_i "Peter" and the NP_i "himself", with a red asterisk indicating binding. The right tree is for the sentence "Peter's mother saw himself". The root is IP, which branches into NP and I'. NP branches into NP_i (Peter) and N'. N' branches into N ('s) and NP (mother). I' branches into I (ed) and VP. VP branches into V (see) and NP_i (himself). A blue oval highlights the NP_i "Peter" and the NP_i "himself", but a red asterisk is placed above the IP root, indicating that binding does not occur because "Peter" does not c-command "himself".

And then you have, you know that when NP c-commands the anaphor and it is co indexed with it, and the NP first is say.

So, this is the configuration in which we say; now we can. I want to introduce one more term to you, we can say the antecedent John in one; that is peter here binds the anaphor NP, if it is in, if N, if the antecedent and the anaphor that is reflexive or in c-commanding domain, then we can say NP antecedent NP binds the anaphor and with that.

(Refer Slide Time: 24:18)

Binding

- Definition:** A binds B iff
 - A c-commands B
 - A is co-indexed with B

The diagram shows two syntax trees. The left tree is for the sentence "John saw himself". The root is IP, which branches into NP_i (John) and I'. I' branches into I (ed) and VP. VP branches into V (see) and NP_i (himself). A blue oval highlights the NP_i "John" and the NP_i "himself", with a red asterisk indicating binding. The right tree is for the sentence "Peter's mother saw himself". The root is IP, which branches into NP and I'. NP branches into NP_i (Peter) and N'. N' branches into N ('s) and NP (mother). I' branches into I (ed) and VP. VP branches into V (see) and NP_i (himself). A blue oval highlights the NP_i "Peter" and the NP_i "himself", but a red asterisk is placed above the IP root, indicating that binding does not occur because "Peter" does not c-command "himself".

We can say this is what, where the term binding comes from, that if I want to say antecedent binds the reflexives, what do we need. The word binding should itself be not difficult thing for you, but when we say binding in a technical sense, we say they must be under c-commanding domain. Then the antecedent binds the NP with the two condition, where the antecedent must c-command an antecedent, must be co indexed with the anaphor; that is the condition of, condition called binding.

Student: (Refer Time: 25:00) have John's mother saw herself is a sentence grammatical.

John's mother saw herself that looks grammatical to me.

Student: So, then, but there is no concept of binding and the sentence, because mother does not c-commanding.

Mother does not c-command.

Student: John's mother (Refer Time: 25:21).

John's mother the entire NP c-commands.

Student: So, may be consider as John's mother as one NP

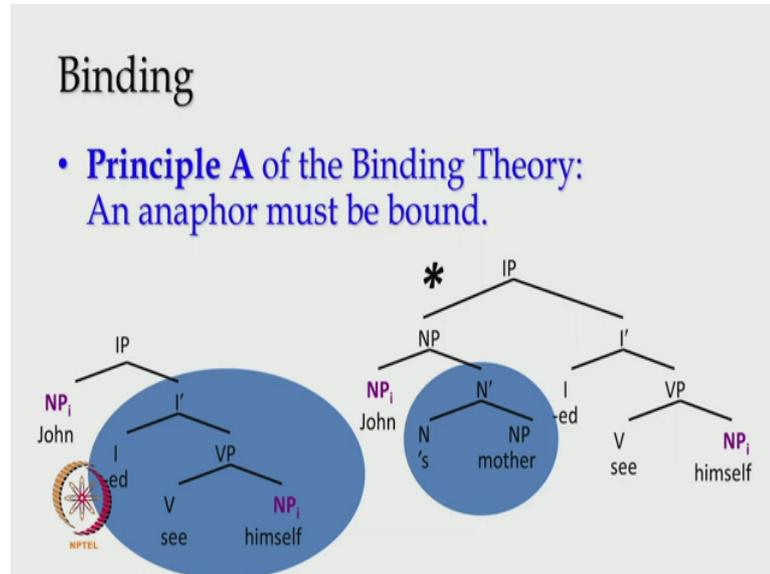
Definitely that is an NP. Look at the, look at this, this node. Though all I need to do is, to just put whole thing together, what we are saying the problem is, when this NP is co indexed or this NP is co indexed, then there is a problem of c-commanding, but if this NP is co indexed, then there is no problem of c-commanding. I think it is not, should not be complicated for you right.

Then there is no problem, and definitely that is the reason why John's mother saw herself, is because in that case we are neither talking about John not talking about mother. Of course, mother is, John's mother, but we, when he says we are not talking about mother, we are talking about just the NP. Mother is not in our case, and the reason why it became a question for you, is because you are looking at probably, just mother right, and John's mother is mother. So, this NP, mother is not seen, thus a commanding relationship with their, with the anaphor.

So, how does that configuration work? Probably that is your question, but that is not the case, the NP, whole thing John's, NP or peters NP. The NP there spec position of the IP is

in c-commanding domain, is C governing the anaphor, then it is then. There is absolutely no problem all right. So, this is what the principal A says.

(Refer Slide Time: 27:01)



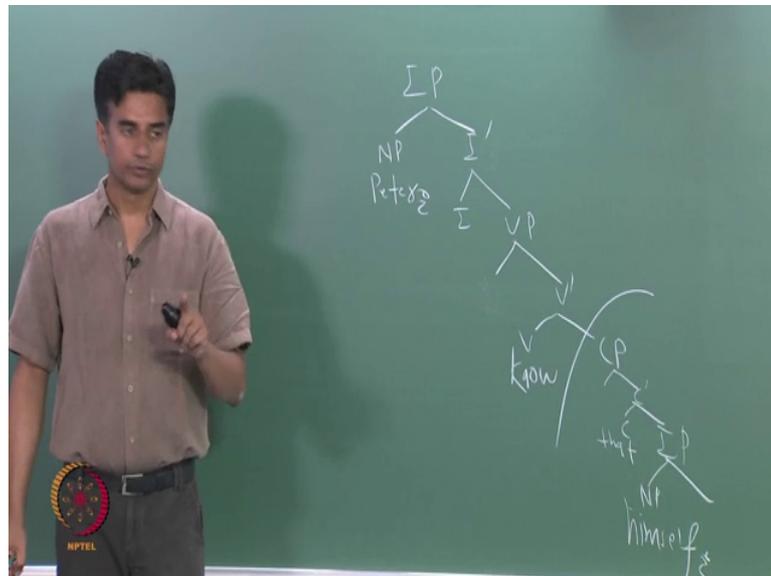
I could have just saved this thing first, and then one into the details of that. I have shown you everything, and then I am saying, stating the principle, an anaphor must be bound. In other words, reflexives and an antecedent binds an anaphor. An anaphor must be bound right.

So, if you see an anaphor in, if a sentence with an anaphor is ungrammatical high, probability is the, probably the anaphor is not bound, and that is the case in number two, that the anaphor is not bound with the right antecedent; that is the antecedent, that could pass probably bind, anaphor is not in the c-commanding domain, and we know that there are two conditions that an antecedent must fulfill, before it can bind the anaphor. And those two conditions are going same, having same in these indexes, indices and then being in the c-command domain all right.

There is one more condition on that, which I was thinking. I will tell you, and I should tell you, at this time we have a sentence; like peter knows that himself saw John, can you write this sentence. Peter knows that himself saw John, peter knows that himself saw John. In this sentence if you draw the structure of the sentence, peter and himself are co indexed right, peter and John are co. I do not have that on the screen. So, I can draw that for you as well.

So, just look at this.

(Refer Slide Time: 29:38)



We have an IP, and the problem in that IP is. I am sorry, here is our NP peter, and then we have I and VP. Here is our, let us do it properly. No, and here is our cp right, and then where is the anaphor for himself, here I am a right, here is the anaphor, and then it has further things. Peter knows that himself saw John right, here after it should be simple for you. Now look at this, yeah this is co indexed, could be co indexed with this right. This is co indexed, and is this NP c-commanding, c-commanding himself, c-commanding himself. So, they are co indexed in, there is, they are under the c-commanding domain also, why the sentence ungrammatical then.

Student: (Refer Time: 31:06) IP.

That is because you are right, beginning from here it is a different domain right. So, the two conditions that we are talking about for binding is good, but we need to say one more thing; that is the binding domain. These are the two conditions for binding, but the binding domain is within the IP. So, co indexed being in the c-commanding domain in the same IP, is the actual condition for anaphors to occur, being here in the spec position of another IP, even though it is co indexed in the c-commanding domain of it is antecedent. The problem is actually it is not in c-commanding domain.

You have seen c-command, and you have, if you remember their constraint in c-command was. What was the constraint on that kind of c-command? There was one more one constraints on the c-command, the constraint was a finite IP, we have. We talked about this constraint when we were talking about assignment of cases a finite IP becomes the barrier for a finite IP. This IP is finite IP, because we are saying, knows that himself saw John, that is a tensed IP, finite IP. So, this finite IP becomes a barrier for c-command therefore, anything be from outside this domain, this, from outside this IP intervening to c-command. Another element is not going to be possible. So, actually we are saying, actually then I said this c-commands himself is not completely right. If we ignore this constraint, then it appears to be c-commanding, but there is a constraint that it would not be c-commanding.

So, one can defend it on the basis of c-command also, but please know that the binding domain for anaphor is the same IP within the IP. And I think I have something here to say an anaphor must be bound.

(Refer Slide Time: 34:06)

- Principle-A explains why the following sentences are ungrammatical:
 - *Himself_i saw John_i in the mirror.
 - *Herself_i likes Mary_i's father.
 - *Himself_i likes Mary's father_i.
- Nothing c-commands and is co-indexed with *himself* and *herself*. The anaphors are not bound.



So, these are the sentences, you can take a look at it, and then meditate and think about this himself saw John in the mirror. The three sentences that we have just seen before is ungrammatical, because of co indexes, co indexes in and antecedent, and the reflexive issues, and in, and the issue of c-command. All of that we will be able to explain it. Here is the sentence what you were talking about; Mary's father likes himself, something like

that, in third Mary's father likes himself will be fine, but himself likes Mary's father is not good, because of the obvious reasons, that I have just explained to you.

(Refer Slide Time: 35:01)

Binding Domains

- *John_i said that himself_i likes pizza.
- *John_i said that Mary called himself_i.

- The NP *John* c-commands and is co-indexed with (=binds) *himself*, satisfying Principle A.



So, the, and this is the point that I raised the John said that himself likes pizza is not good, because it is not in the c-commanding domain. John said that Mary called himself is not good again, because the reflexive and the antecedent does not c-command the reflexive, they are not in the same domain, I wrote this thing. I hope you understand what it means, that this, the NP John's appears to be c-commanding the reflexive himself, if we do not look at this constraint, but since we know about that constraint, it is not possible for us to ignore. So, in order to dismiss this, we do not have to touch the nose through a different route. We can directly say that it does not appear to be c-commanding, because the second IP is a finite IP.

(Refer Slide Time: 36:05)

The NP *John* binds *himself* in every case.

What is the difference between 1 and 2 on one side and 3 and 4 on the other?

1. John_i saw himself_i in the mirror.
2. John_i gave a book to himself_i.
3. *John_i said that himself_i is a genius.
4. *John_i said that Mary dislikes himself_i.

 – In the ungrammatical cases, *himself* is in an embedded clause.

So, what is the difference between one and two, on one side, and three and four on the other. John saw himself in the mirror, John gave a book to himself; c-commanding co indexes and everything is fine. John said that himself is genius is out. Remember a sentence from yesterday; John said that himself is a genius, John said that Mary dislikes himself out for c-commanding reasons, and not being in the same domain.

(Refer Slide Time: 36:38)

More precise constraint:

Anaphor need to be bound and they need to be bound **locally**.

Principle A:

An anaphor must be bound in its binding domain.

Binding Domain:

The binding domain of an anaphor is the smallest clause containing it.



So, that explains more precise can. So, this is how we can put the constraints in a precise way, then it is the constraint is put in terms of locality, which is the same IP with locality

the. All we mean is the same IP and anaphor must be bound in it is binding domain, and the binding domain is the IP; the smallest clause containing it; that is both anaphor and of that is both antecedent and reflexive must be within the same smallest clause; that is the same IP, look at this pronouns.

(Refer Slide Time: 37:16)

Pronouns

- 1 *John_i saw him_i in the mirror.
- 2 John_i said that he_i is a genius.
- 3 John_i said that Mary dislikes him_i.
- 4 John_i saw him_j in the mirror.

- In the distribution of pronouns, they appear to differ from anaphors?



Now, I am coming to probably what you were looking for John saw him in the mirror is not good right. John saw him in the mirror is not good, as it is marked here in this sentence, because if we try to put same index for both, then it is not right, but with the same index the second sentence is all right you see that John said that he is a genius, it is all right John said that Mary dislikes him; that is also all right they are. So, co index, being indexed is not just a problem for the pronoun. Please raise your hands if you see that you are, that question is still not answered. John saw him in the mirror is, if the indices are not the same.

So, what is going on here in these four sentences? If I just give you these four sentences and ask you to tell something about pronouns, what can you say particularly knowing the. Now knowing the fact that you know the backgrounds of domains IP structure c-command, what can you say about these four sentences. Trust me I do not have enough time, I did not have enough time for quizzes; otherwise these are the questions for quizzes, asking you to provide generalization, giving you few sentences, but that is the kind of problem one would want to a struggle with. These are not actual problem to

make you a struggle, once you fear one thing you can write the answer in five minutes, but these are the problems to think about. So, what can we say about pronouns.

Student: (Refer Time: 39:21) different IP (Refer Time: 39:23).

They cannot be co indexed within the same domain, if they are in the c-commanding configuration in the same IP, they cannot be co indexed, if they and they are allowed to be co indexed, if they are in the different IPS.

Student: So, but (Refer Time: 39:45) is a pronoun and reflexive can be co indexed.

But at that time, I did not talk about the same domain, this is the fishy thing about pronouns that pronouns can be. We cannot say pronouns must be free like r-expressions. We can only say pronouns must be free within the same domain; that is principle B, and the principle, I am coming to that right after the slide, an anaphor must be bound in its binding domain, an anaphor pronoun must be free; that is principle b. So, they can be co indexed. Definitely they can be co indexed outside the domain within the same domain. If you try to co index them, the sentence results in ungrammaticality.

Student: John father saw him, John and him are the same domain.

That is it. So, then the John is not. So, it is not to, but then it is not in the c-commanding configuration. As long as it is not in c-commanding configuration that is fine.

Student: John would c-command him k.

No John's mother c-commands John's mother saw him try to write that, and see the C, the structure we just say. We have just seen the structure John will be under the NP, which is in the spec position. So, IP of the IP sorry specifier of the IP has an NP, and within that NP again if we by forget, then we get the John. So, the first branching node for John, is going to be NP, not the IP. Therefore, it will not be able to c-command him.

Student: John's mother (Refer Time: 41:41).

Then there is no problem, we have said that is not even a problem for anaphors. John's mother saw himself. Sorry John's mother saw herself is not a problem, and when we say John's mother saw him is not a problem because they are not co indexed, they are not co indexed.

Student: the co index, but not in the same domain.

No they are in the same, think about it slow, John's mother saw him. In this case John's mother as an NP, and him as an another NP. They are in the same domain, but they are not co indexed, John's. If John's mother is I him is j, then there is no problem. Therefore, then we say that the distribution of pronoun in the distribution of pronounce anaphor appear different, and this is the difference which says, which leads us to principle B which says a pronoun must be free in the binding domain.

(Refer Slide Time: 42:45)

Principle B

A pronoun must be free in its binding domain.

Free means not bound

1 *John_i saw him_i.

2 John_i's mother saw him_i.



Free means not bound; that is the conditions that apply for binding c-command, and co indexes must not work for them, is the meaning of being free.

So, the moment you say John saw him, and try to put the co indexes in, if the indices are not the same then the sentence is all right. And then that is what explains ambiguity. If we say it has two meanings A and B with different. In this index indices principal B explains both of them right; John's here is the, here is the sentence that we were talking about, John's mother saw him is fine. I am sorry the index is wrong, index is wrongly given. I should have put John's mother in a square bracket, and then given it the index, and then this sentence will be ok. Understand the difference between principal A and principal B.

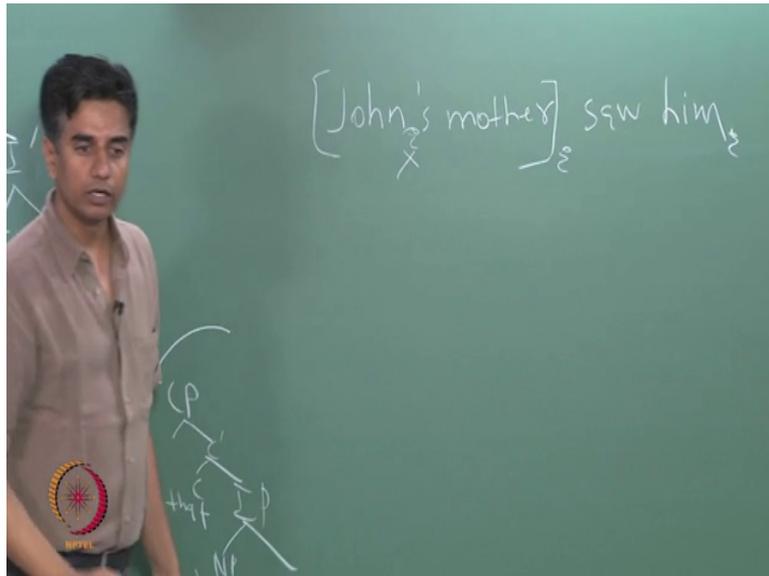
Student: (Refer Time: 44:01).

Sorry yeah.

Student: (Refer Time: 44:06).

Definitely you are talking about sentence number 2 right, two. The problem is sentence number two is he.

(Refer Slide Time: 44:13)



This is how it should have been done; John's mother saw him.

Student: John (Refer Time: 44:23).

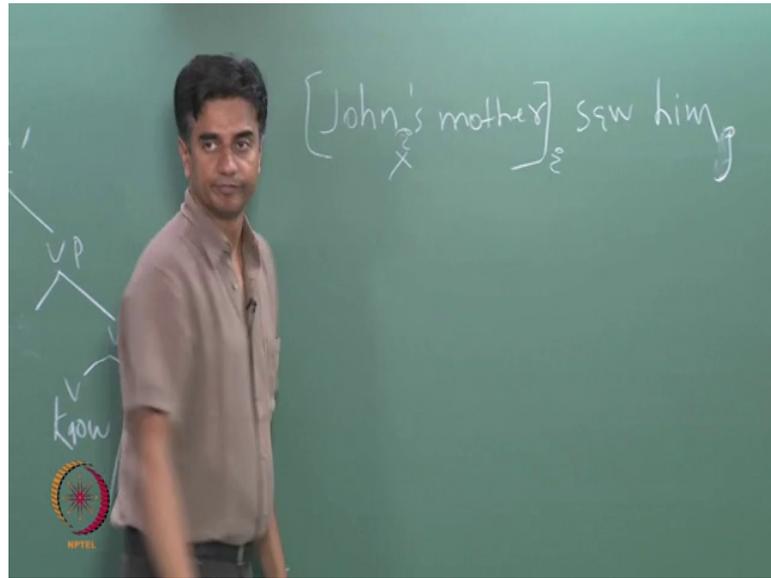
What I have done is, I put it here this is wrong, what I should have done, I should have put it here.

Student: (Refer Time: 44:34) no this is correct, because John and (Refer Time: 44:39) John's father will be (Refer Time: 44:41).

Oh right I am sorry.

Student: No that is also correct (Refer Time: 44:43).

(Refer Slide Time: 44:44)



That is also correct, because these two do not have same indices.

Student: Ha.

If this is I then this will be j. I am sorry you are right.

Student: That will (Refer Time: 44:53) John.

That will be j; yes, and right now it is, right now it is correct. I am sorry right now it is correct, because they are not in the, they can be co indexed as long as they are not in the c-commanding domain, they can be co indexed, and then there is no problem you are right. We understand principle A principle b. The differences between the two, meaning of binding, meaning of not being bound, and then bringing in c-command and the structural configuration, to explain interpretations of noun phrases, we understand this yeah.

Student: (Refer Time: 45:27) pronoun and anaphor we co indexed with (Refer Time: 45:34).

Can a pronoun and co anaphor be co indexed with one another, something like he saw himself; yes, to it this. If this can be done as long as they are still following the same constraints, they are in the same binding domain, they are co indexed, they are c-commanding one another, and within the same IP, absolutely no problem. So, that is principle B, and then finally.

(Refer Slide Time: 46:10)

Principle C

R-expressions need to be free everywhere.

Let's look at the following sentences.

- *He_i likes John_i.
- *She_i said that Mary_i fears clowns.
- His_i mother likes John_i.

Pronouns are free in the binding domains.

 The key is - R-expressions need to be free everywhere. They can't be assigned their reference from somewhere in the sentence.

Principle C to. In short give me another two minutes; says r expression needs to be free everywhere; that is for it is reference and interpretation. It does not depend on anything within the sentence, when we say must be free everywhere, we mean within the sentence must be free, when it is not free in the world. In the world; that is in the larger context. It depends on something for interpretation, but in the sentence it is free.

When you look at the sentences the he likes John. If we try to put the index together, then the sentence is wrong, why, because we are trying to get the reference for r expression John from he, where it is violating principle c. The John cannot take reference from anything within the sentence. He saw John, he likes John. So, perfectly all right sentence by itself, as long as he is I and John is j perfect. If I she, she said that Mary fears clowns, sentence could be good as long as she and Mary have different indices. His mother likes John, same problem, then in hold, on hold on what is going on. There is a problem here right. Just forgot that sentence the, I am done with my point with the first two sentences.

So, r-expressions must be free everywhere, anaphor must be bound and pronouns must be free in the binding domain, could be bound; that is could be co indexed with something outside the bound binding domain, but within the binding domain, it must be free. These are the three principles of Binding theory.

(Refer Slide Time: 48:28)

Binding Theory

- **Principle A** -- An anaphor must be bound in its binding domain.
- **Principle B** -- A pronoun must be free in its binding domain.
- **Principle C** -- An r-expression must be free.

- The **binding domain** for an anaphor is the smallest of (i) An IP that dominates it.
- **Bound**: co-indexed with a c-commanding antecedent



In which we need to understand binding domain, and what we mean by being bound with the notion of IP x bar and c-command that is all.