

# INTD0112

## Introduction to Linguistics

Lecture #17  
Nov 4<sup>th</sup>, 2009

### Announcements

- Thanks for the LAP proposals. They are all fine, and about languages from different language families, which adds to the diversity of the project. I look forward to your presentations and reading your reports.
- Speaking of presentations, can we have an “extended” session on Nov 30<sup>th</sup>?
- We’re ending the syntax/semantics/acquisition part today, and I’m thinking of doing sociolinguistics next week and then historical linguistics, which is a slight change from the original syllabus. Is that ok with everyone?

### Christopher: The polyglot savant

- Able to communicate and translate between 15-20 languages. Excerpts from the movie *Fragments of Genius*.
- Experience with learning Berber.
- Experience with learning Epun (an impossible human language). Click [HERE](#) to watch.
- Want to learn more? Read *Mind of a Savant: Language, Learning and Modularity*, by Neil Smith and Ianthi-Maria Tsimpli.

### Puzzle of the day

- Ok. Here’s a new puzzle for you:  
*I will discuss her problem with John.* (How many meanings?)
- Right, 2:  
Reading 1: *She has a problem with John. I'll discuss it.*  
Reading 2: *She has a problem. I'll discuss it with John.*
- Now let us replace *her* with *his*:  
*I will discuss his problem with John.*
- In principle, we expect the sentence to be four-way ambiguous, but actually it is not. Only three readings are possible. Think about it with a friend! See if you can explain away the puzzle after today’s class.

### Transition from last class

- A theory of UG makes predictions regarding child language, which we can then falsify by observing what children “naturalistically” do, or by setting up experiments to elicit data from them. A wug experiment. Click to watch!
- UG makes two main predictions about child language.

### Prediction #1

- The so-called Continuity Hypothesis:  
“Child language can differ from adult language only in the same ways adult languages differ from each other.”
- Some discussed evidence from English-learning children: Wh-doubling, the Bennis optative, and negation.

## Prediction #2

- “Whenever a universal principle of UG is at work, children will **not** produce non-adult forms.”
- We talk about this today with regard to the principles governing the semantics of coreference in human language, or what is called “binding.”

## BINDING

## A note on convention

- Before we discuss binding, just a quick note on “convention”: To indicate coreference between two elements in a sentence, linguists use the convention of subscripting both elements with the same index, e.g.,  
John<sub>i</sub> said that he<sub>i</sub> already had lunch. (*John = he*)  
John<sub>i</sub> said that he<sub>j</sub> already had lunch. (*John ≠ he*)
- A more economical way to represent the two possible readings of the sentence is by using the slash notation with subscripts:  
John<sub>i</sub> said that he<sub>i/j</sub> already had lunch.
- When coreference is not possible, we indicate that by putting the \* on the subscript itself:  
He<sub>\*i/j</sub> said that John<sub>i</sub> already had lunch.

## Binding!

- Now, let’s revisit some English examples from early in the semester on the difference between reflexives and other kinds of pronouns.

## Reflexive and pronominal Binding

- John<sub>i</sub> hurt himself<sub>i/\*j</sub>  
(*himself* has to refer to John; it cannot refer to someone else)
  - John<sub>i</sub> hurt him<sub>\*i/j</sub>  
(*him* cannot refer to John; it has to refer to someone else.)
- Structure-independent rules?
    - A reflexive must corefer with a preceding noun.
    - A pronoun cannot corefer with a preceding noun.

## Reflexive and pronominal Binding

- John<sub>i</sub> said that Bill<sub>j</sub> hurt himself<sub>\*i/j</sub>  
(*himself* refers to Bill, but not to John)
  - John<sub>i</sub> said that Bill<sub>j</sub> hurt him<sub>i/\*j/k</sub>  
(*him* cannot refer to Bill, but may refer to John or to someone else)
- Revised structure-independent rules:
    - A reflexive must corefer with the **closest** preceding noun.
    - A pronoun cannot corefer with the **closest** preceding noun.

## But ...

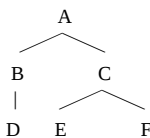
- Now consider this sentence:  
 $[[\text{John}]_i \text{'s father}]_j \text{ likes himself}_{*i/j}$   
 $[[\text{John}]_i \text{'s father}]_j \text{ likes him}_{i/*j/k}$
- How can we explain these binding facts then?  
 Can syntax help?

## Hierarchy does matter: Introducing *C-command*

- It turns out that the key to the solution is again structural.
- The solution rests on one of the fundamental notions in syntactic theory: *c-command* (the “c” stands for “constituent”).
- C-command is a tree-geometric relation, but to understand it, we need to introduce some other basic tree-geometric terms first.
- Thinking of a syntactic tree as a family tree, we use terms for family relations (on the maternal side) to refer to relations between nodes in the tree.

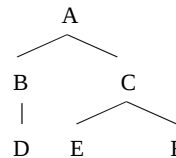
## Mothers, daughters, and sisters

- Consider the following abstract tree:



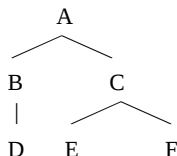
- We say:
  - A is a mother of B and C; C is a mother of E and F; and B is a mother of D.
  - B and C are sisters, and so are E and F.
  - B and C are daughters of A, and E and F are daughters of C. D is a daughter of B.

## C-command



- What's c-command then?
- C-command is the structural relation holding between a node and its sister as well as any daughter(s) of that sister.

## C-command



- “*B c-commands C, E and F,*” because C is a sister of B, and E and F are daughters of C.
- “*C c-commands B and D,*” because B is a sister of C, and D is a daughter of B.

## Solving the binding puzzles

- So, how does c-command help us in explaining the facts of binding reflexives and pronouns?
- There are three binding conditions that regulate coreference in human language. Let's start with the two relating to reflexives and pronouns first.

## Binding Conditions A and B

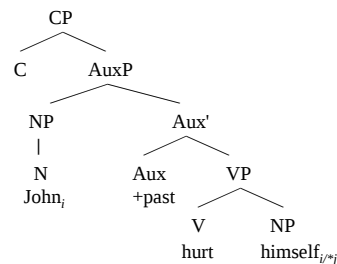
### Binding Condition A:

An anaphor (i.e., a reflexive or reciprocal expression) must be bound by a c-commanding NP in the smallest clause it is in.

### Binding Condition B:

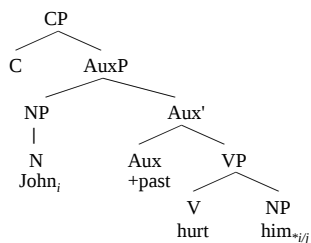
A pronoun cannot be bound by a c-commanding NP in the smallest clause it is in.

## John<sub>i</sub> hurt himself<sub>i/\*j</sub>



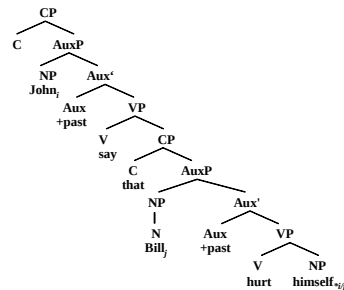
- Does binding of the reflexive *himself* obey Binding Condition A?

## John<sub>i</sub> hurt him<sub>\*i/j</sub>



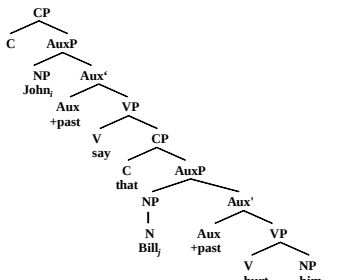
- Does binding of the pronoun *him* obey Binding Condition B?

## John<sub>i</sub> said that Bill<sub>j</sub> hurt himself<sub>\*i/j</sub>



- Does binding of the reflexive *himself* obey Binding Condition A?

## John<sub>i</sub> said that Bill<sub>j</sub> hurt him<sub>i/\*j/k</sub>



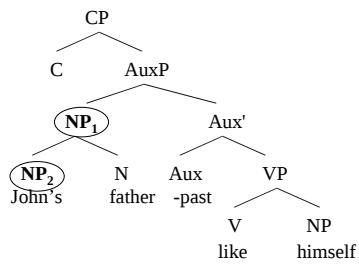
- Does binding of the pronoun *him* obey Binding Condition B?

## Now, back to the puzzling sentences

[[John]<sub>i</sub>'s father]<sub>j</sub> likes himself<sub>\*i/j</sub>.

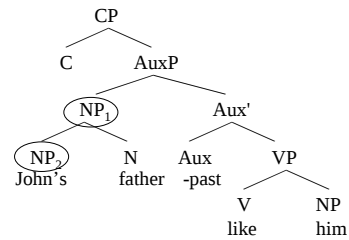
[[John]<sub>i</sub>'s father]<sub>j</sub> likes him<sub>i/\*j/k</sub>.

**[[John]<sub>i</sub>'s father]<sub>j</sub> likes himself<sub>\*ij</sub>**



- Why is binding of the reflexive by NP<sub>1</sub> possible, but not by NP<sub>2</sub>?

**[[John]<sub>i</sub>'s father]<sub>j</sub> likes him<sub>i/\*j/k</sub>**



- Why is coreference between *him* and NP<sub>2</sub> possible, but not between *him* and NP<sub>1</sub>?

## C-command matters

- Structure does matter. And linear order is irrelevant.

## Another puzzle, but this time without a discussion

- But now consider:
  - John<sub>i</sub> loves his<sub>i</sub> mother.
  - \*John<sub>i</sub> found Mary's picture of himself<sub>i</sub>.
  - cf. John<sub>i</sub> found a picture of himself<sub>i</sub>.
- You should be able to see the problems here once you draw the trees. Can you think of a solution?

## Ok, how about Condition C?

- Binding Condition C regulates coreference of referential expressions (basically NPs such as *John*, *this man*, *the tall lady with blonde hair*, etc.).

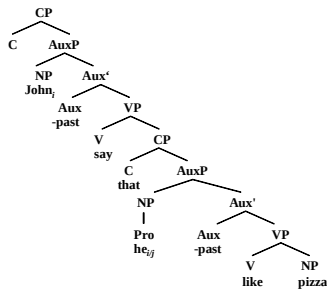
### **Binding Condition C:**

A referential expression cannot be bound by a c-commanding NP in the sentence.

## Binding Condition C

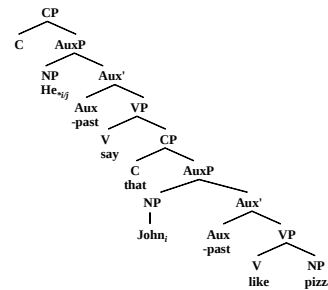
- Consider the coreference possibilities in the following two sentences from English:
  - John<sub>i</sub> says that he<sub>ij</sub> likes pizza. (he may = John)
  - He<sub>\*ij</sub> says that John<sub>i</sub> likes pizza. (he may ≠ John)
- Again a structure-independent analysis is unlikely, since linear order seems irrelevant:
  - His<sub>ij</sub> mother says that John<sub>i</sub> likes pizza. (his may = John)

**John<sub>i</sub> says that he<sub>i/j</sub> likes pizza.**



- Does coreference between *John* and *he* here obey Binding Condition C?

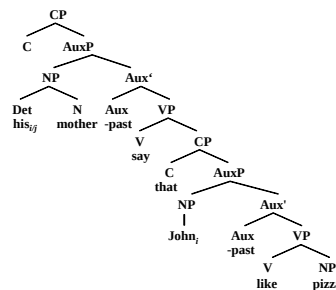
**He<sub>\*i/j</sub> says that John<sub>i</sub> likes pizza.**



- Does coreference between *John* and *he* here obey Binding Condition C?

- Now how about:  
His mother says that John likes pizza.

**His<sub>i/j</sub> mother says that John<sub>i</sub> likes pizza.**



- Does coreference between *John* and *his* here obey Binding Condition C?

## Binding Conditions and child language

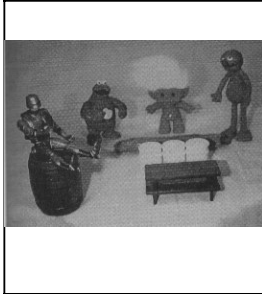
- If Binding Conditions are part of UG, then we predict that child language will also abide by it.
- But how can we test that?
- Run an experiment. How else?

## Designing the experiment

- Here's what we want to do: We want to set up a context, where Binding Condition C is violated, then elicit a response from kids to that violation.
- If kids disagree with the interpretation, then they must know the principle. If they accept the interpretation, then they do not know it.

## Testing Binding Condition C\*

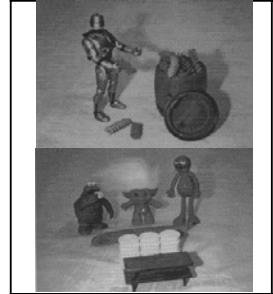
- Experimenter: This is a story about a jumping competition. The judge is Robocop. Last year he won the jumping competition, so this year he gets to be the judge. This year, these guys, Cookie Monster, the Troll and Grover are in the jumping competition. They have to try and jump over this log, the barrels and the benches over here.



\*Story and pictures were created by Stephen Crain and Rosalind Thornton, and can be found in Crain and Thornton 1998.

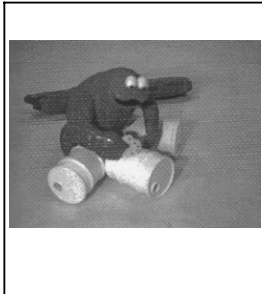
## Testing Binding Condition C

- Robocop: The winner of the competition gets a great prize, colored pasta! See, it's in this barrel right here.
- Robocop: Line up, everyone. Get ready to try and jump over all these things.



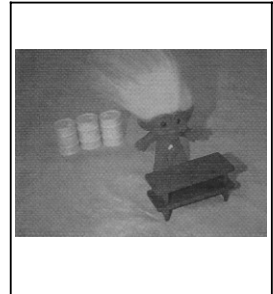
## Testing Binding Condition C

- Robocop: You go first Cookie Monster.
- Cookie Monster: OK. Here I go. I made it over the first log. Now I'll try and jump over the barrels. Oh no! I crashed into them. Oh well. I'll try and jump the benches. Phew, they weren't so hard.



## Testing Binding Condition C

- Robocop: Your turn next, Troll.
- Troll: OK. I'm a good jumper. This should be easy for me. Over the log I go. Yeah! Now I'll try the barrels. Good. I jumped over them easily. Now for the benches. Good, I didn't knock anything over!



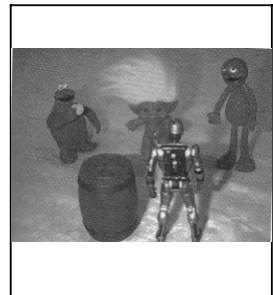
## Testing Binding Condition C

- Robocop: OK, Grover. Your turn.
- Grover: I'm a good jumper, too. Watch me! See how easily I could jump over the log? Now I'll jump over the barrels and the benches. Great. I didn't smash into anything, and I was really fast.



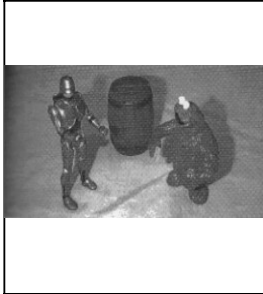
## Testing Binding Condition C

- Robocop: All right. Line up, guys. I'm ready to judge the competition. Let's see who wins this great colored pasta.



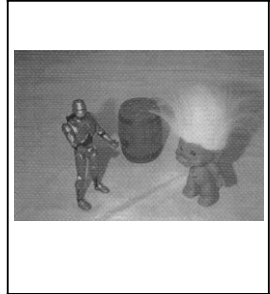
### Testing Binding Condition C

- Robocop: Cookie Monster. I'm afraid you aren't the winner. You crashed into the barrels. I think you've been eating too many cookies. You'd better eat fewer cookies and lose some weight. Then you'll be a better jumper.



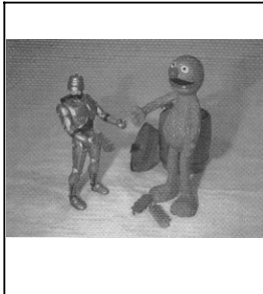
### Testing Binding Condition C

- Robocop: Troll, you jumped very well. You didn't crash into anything at all. You could be the winner. But let me judge Grover before I decide.



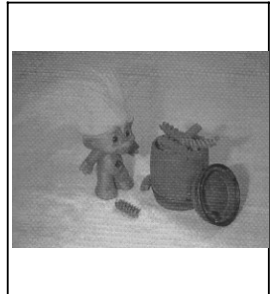
### Testing Binding Condition C

- Robocop: Grover, your jumps were very good too. You didn't knock anything down, and you were also very fast. So, I think you were the best jumper. You win the prize, this colored pasta. Well done, Grover. Great job!



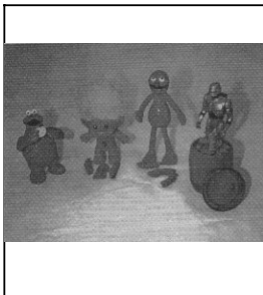
### Testing Binding Condition C

- Troll: No, Robocop, you're wrong! I am the best jumper. I think I should get the prize. I'm going to take some colored pasta for myself. [Helps himself]



### Testing Binding Condition C

- Kermit: Let me try to say what happened. That was a story about Robocop, who was the judge, and Cookie Monster, and Grover, and there was the Troll. I know one thing that happened. He said that the Troll was the best jumper.
- Child: NO, Kermit! You're wrong.



### Testing Binding Condition C

- Well, everything indicated that Kermit's sentence was true: The troll did jump well; the Troll also did say he was the best jumper; and the Troll was also eating delicious colored pasta.
- So, why wouldn't children agree with Kermit?
- Well ... seems like Prediction #2 is also borne out.

### **So, to sum up**

- Languages are different, but their variation is constrained by the general principles and parameters that UG makes available.
- Child language is subject to the same principles and parameters.
- Child language, therefore, will always fall within the realm of what is a “possible human language.”

### **Next class agenda**

- Switching gear: Time to talk about language in society. Read chapter 7 on sociolinguistics.