Binding Theory

Describing Relationships between Nouns

(slides by Andrew Carnie)
Binding Theory

- Describes the conditions on the structural relations between nouns.
- Concerned with three types of nouns:
  - R-expressions (proper names, common nouns)
  - Pronouns. (he, she, it, his, one, them, him etc)
  - Anaphors. (eg. himself, herself, themselves)
- These NPs are semantically distinct, but they also have different syntactic distributions.
R-expressions

- Express content
- An NP that gets it meaning by referring to an entity in the world.
  - e.g. Bill Clinton, Travis, The woman in the blue suit, a teddy bear, purple shoes.
Anaphors

- An NP that obligatorily gets its meaning from another NP in the sentence.
- Heidi bopped herself on the head with a zucchini
- myself, yourself, himself, herself, itself, oneself, ourselves, yourselves, themselves, each other.
Pronouns

- **Pronoun**: An NP that may (but need not) get its meaning from another word in the sentence. It can also get its meaning from a noun previously mentioned in the discourse, or by context.

- Art said that *he* played basketball
  - Art said that Art played basketball
  - Art said that David played basketball

- I, me, you, he, him, she, her, it, one, we, us, they, them, his, her, our, my, its, your, their.
Antecedent

- **Antecedent**: An NP that gives its meaning to a pronoun or anaphor.

- **Heidi bopped herself on the head with a zucchini**

  - antecedent
  - anaphor
Indexing

- Means of representing the meaning of an NP
- Each index (plural: indices) represents a different reference.
  a) [Colin]_i gave [Andrea]_j [a basketball]_k
  b) [Art]_i said that [he]_j played [basketball]_k in [the dark]_l
  c) [Art]_i said that [he]_i played [basketball]_k in [the dark]_l
  d) [Heidi]_i bopped [herself]_i on [the head]_j with [a zucchini]_k

- Start at the left and assign each NP an index starting with i and working down the alphabet.
Co-indexing & Co-reference

- Two NPs that have the same index are said to be co-indexed.
- Two NPs that are co-indexed are said to co-refer (that is, refer to the same entity in the world)
  
a) [Art]$i$ said that [he]$j$ played [basketball]$k$ in [the dark]$l$
  
b) [Art]$i$ said that [he]$i$ played [basketball]$k$ in [the dark]$l$
Syntactic Restrictions on Anaphors

- Heidi\textsubscript{i} bopped herself\textsubscript{i} on the head with a zucchini:
- [Heidi\textsubscript{i}'s mother]\textsubscript{k} bopped herself\textsubscript{k} on the head with a zucchini.
- *[Heidi\textsubscript{i}'s mother]\textsubscript{k} bopped herself\textsubscript{i} on the head with a zucchini.

The antecedent for an anaphor can be the subject of the sentence, but not an NP inside the subject.

let’s look at this distinction in terms of structural relations
Heidi bopped herself

S
NP
N Heidi
VP
V bopped
NP
N herself

C-commanded by NP

S
NP
V bopped
NP
N Heidi’s

Not C-commanded by NP

S
NP
V bopped
NP
N herself

Not C-commanded by NP
Binding

- This fact is captured by binding.

- \textbf{Binds}:
  - A binds B if and only if
  - A c-commands B \textit{AND}
  - A and B are co-indexed.

- \textbf{Note}: binding is not the same as co-indexing!!! (co-indexing has same index; binding requires a c-command relationship between the co-indexed elements.)

- Binding is a SPECIAL kind of c-command. It is c-command with co-indexing.
The Principle that deals with anaphors

- Principle A (to be revised): An anaphor must be bound
- In English: An anaphor must be c-commanded and co-indexed by an antecedent.
Heidi bopped herself

mother bopped herself

Coindexed? yes

C-command? yes

:: Bound

Coindexed? yes

C-command? no

:: NOT Bound

VIOLATES PRINCIPLE A
Locality restrictions on anaphor binding

- Heidi$_i$ danced with herself$_i$
- *Heidi$_i$ said that Art danced with herself$_i$
  - (cf. Heidi$_i$ said that Art danced with her$_i$.)
- *Heidi$_i$ said that herself$_i$ danced with Art
  - (cf. Heidi$_i$ said that she$_i$ danced with Art)
Heidi danced with herself

important difference!
Binding domain

- **Binding domain**: The clause containing the anaphor

  - This definition is overly simplistic, and not really accurate at all. But it will do for the purposes of this course.

- **Binding Principle A**: An anaphor must be bound in its binding domain.
Heidi danced with herself

Heidi said

Coindexed? yes
C-command? yes
Bound in domain? yes

VIOLATES PRINCIPLE A
A (more) intuitive characterization???

- Principle A imposes TWO restrictions:
  1) The anaphor must be bound
     = both c-commanded and coindexed
  2) AND The anaphor must be bound (find its antecedent) within its own clause (the binding domain)

Note that the restriction is not that an anaphor needs to be bound alone. An anaphor can be bound, yet the sentence still ungrammatical, if it isn’t bound locally.
Pronouns

- Heidi\textsubscript{i} bopped her\textsubscript{k} on the head with the zucchini
- *Heidi\textsubscript{i} bopped her\textsubscript{i} on the head with the zucchini
- Heidi\textsubscript{i} said that she\textsubscript{i} danced with Art
- Heidi\textsubscript{i} said that she\textsubscript{k} danced with Art.

- *Only restriction on pronouns: they cannot be bound within their clause*
Pronouns

- **Free**: Not bound
- **Principle B**: Pronouns must be free in their Binding Domain.
Heidi danced with her.

Coindexed? yes  C-command? yes : Bound  Free in domain? no

VIOLATES PRINCIPLE B
Heidi danced with her.

Heidi said … she j…

Coindexed? no :: not Bound  Coindexed? no :: not Bound
Free in domain? Yes               Free in domain? Yes
R-expressions

- *Heidiᵢ kissed Miriamᵢ
- *Artᵢ kissed Geoffᵢ
- *Sheᵢ kissed Heidiᵢ
- *Sheᵢ said that Heidiᵢ was a disco queen.

**Principle C:** R-expressions must be free (everywhere)
She danced with Heidi

She said… Heidi i…

Coindexed? yes
C-command? yes  \[ \vdash \text{Bound} \]
Free? no

VIOLATES PRINCIPLE C
Summary

- Antecedent, Anaphor, index, pronoun, R-expression, co-reference

- **Binds:**
  - A binds B if and only if
  - A c-commands B \textit{AND}
  - A and B are co-indexed

- **Free:** not bound

- **Binding domain:** The clause containing the anaphor
Summary: The binding principles

- **Binding Principle A**: An anaphor must be bound in its binding domain.

- **Binding Principle B**: Pronouns must be free in their binding domain.

- **Binding Principle C**: R-expressions must be free.