Ling 566
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Binding Theory, Imperatives
Overview

• Review of Chapter 1 informal binding theory
• What we already have that’s useful
• What we add in Ch 7 (ARG-ST, ARP)
• Formalized Binding Theory
• Binding and PPs
• Examples
• Imperatives
Some Examples from Chapter 1

• She likes herself
• *Shei likes heri.
• We gave presents to ourselves.
• *We gave presents to us.
• We gave ourselves presents
• *We gave us presents.

• *Leslie told us about us.
• Leslie told us about ourselves.
• *Leslie told ourselves about us.
• *Leslie told ourselves about ourselves.
Some Terminology

• **Binding**: The association between a pronoun and an antecedent.

• **Anaphoric**: A term to describe an element (e.g. a pronoun) that derives its interpretation from some other expression in the discourse.

• **Antecedent**: The expression an anaphoric expression derives its interpretation from.

• **Anaphora**: The relationship between an anaphoric expression and its antecedent.
The Chapter 1 Binding Theory Reformulated

- Old Formulation:
  - A reflexive pronoun must be an argument of a verb that has another preceding argument with the same reference.
  - A nonreflexive pronoun cannot appear as an argument of a verb that has a preceding coreferential argument.

- New Formulation:
  - Principle A (version I): A reflexive pronoun must be bound by a preceding argument of the same verb.
  - Principle B (version I): A nonreflexive pronoun may not be bound by a preceding argument of the same verb.
Some Challenges

• Replace notions of “bound” and “preceding argument of the same verb” by notions definable in our theory.

• Generalize the Binding Principles to get better coverage.
A Question

• What would be a natural way to formalize the notion of “bound” in our theory?

• Answer: Two expressions are bound if they have the same INDEX value (“are coindexed”).
Two More Questions

• Where in our theory do we have information about a verb’s arguments?
  • Answer: In the verb’s VALENCE features.

• What determines the linear ordering of a verb’s arguments in a sentence?
  • Answer: The interaction of the grammar rules and the ordering of elements in the COMPS list.
The Argument Realization Principle

• For Binding Theory, we need a single list with both subject and complements.

• We introduce a feature ARG-ST, with the following property (to be revised later):

```
\begin{bmatrix}
  \text{SYN} & \text{VAL} & \text{SPR} \\
  \text{ARG-ST} & A \oplus B & \text{COMPS} & A \\
\end{bmatrix}
```

• This is a constraint on the type *word*
Notes on ARG-ST

• It’s neither in SYN nor SEM.
• It only appears on lexical heads (not appropriate for type phrase)
• No principle stipulates identity between ARG-STs.
Two Bits of Technical Machinery

- **Definition**: If $A$ precedes $B$ on some ARG-ST list, then $A$ **outranks** $B$.

- Elements that must be anaphoric -- that is, that require an antecedent -- are lexically marked **[MODE ana]**. These include reflexive pronouns and reciprocals.
The Binding Principles


• Principle B: A [MODE ref] element must not be outranked by a coindexed element.
Pronoun-Antecedent Agreement

- The Binding Principles by themselves don’t block:
  - *I amused yourself.*
  - *He amused themselves.*
  - *She amused himself.*
- Coindexed NPs refer to the same entity, and AGR features generally correlate with properties of the referent.
- The Anaphoric Agreement Principle (AAP): Coindexed NPs agree.
Binding in PPs

- What do the Binding Principles predict about the following?

  * I brought a book with me.
  * I brought a book with myself.
  * I mailed a book to me.
  * I mailed a book to myself.

- Answer: With the current formulation, only the non-reflexive pronouns should be good.
Two Types of Prepositions: the Intuition

- “Argument-marking”: Function like case-markers in other languages, indicating the roles of NP referents in the situation denoted by the verb.

- “Predicative”: Introduce their own predication.
Two Types of Prepositions: a Formalization

• Argument-marking prepositions share their objects’ MODE and INDEX values.
  • This is done with tagging in the lexical entries of such prepositions.
  • These features are also shared with the PP node, by the Semantic Inheritance Principle.

• Predicative prepositions introduce their own MODE and INDEX values.
Redefining Rank

• If there is an ARG-ST list on which $A$ precedes $B$, then $A$ outranks $B$.

• If a node is coindexed with its daughter, they are of equal rank -- that is, they outrank the same nodes and are outranked by the same nodes.
An Example

\[ S \]

\[ [\text{SPR} \langle 1 \rangle] \]

\[ \text{V} \]

\[ 2\text{NP}_j \]

\[ 3\text{PP}_i \]

\[ \text{sent} \]

\[ \text{D} \quad \text{N} \quad \text{P}_i \quad \text{NP}_i \]

\[ a \quad \text{letter} \quad \text{to} \quad \text{myself} \]
The ARG-ST

\[
\text{ARG-ST} \left\langle \left[ \text{MODE ref} \right], \left[ \text{MODE ref} \right], \left[ \text{MODE ana} \right] \right\rangle
\]

- The PP is outranked by the first NP. (Why?)
- *myself* has the same rank as the PP. (Why?)
- So, *myself* is outranked by the first NP. (Why?)
- Therefore, Principle A is satisfied.
Replacing *myself* with *me*

```
* S
  [SPR ⟨ 1 ⟩ ]

I

V
  [SPR ⟨ 1 ⟩ ]
  [COMPS ⟨ 2 , 3 ⟩ ]
  [ARG-ST ⟨ 1 , 2 , 3 ⟩ ]
  sent

NP_i

NP_j

PP_i

D

N

P_i

NP_i

a

letter

to

me
```
The ARG-ST

\[
\begin{bmatrix}
\text{ARG-ST} \\
\langle \text{MODE ref}, \text{MODE ref}, \text{MODE ref} \rangle
\end{bmatrix}
\]

- The PP is outranked by the first NP.
- *me* has the same rank as the PP.
- So, *me* is outranked by the first NP.
- Therefore, Principle B is violated.
Another Example

• Here $I$ does not outrank $me$, so Principle B is satisfied.
Replacing *me* with *myself*

- Here *I* does not outrank *myself*, so Principle A is violated.
Imperatives

• Have the internal structure of a VP

  * Leave!
  * Read a book!
  * Give the dog a treat!
  * Put the ice cream in the freezer!

• Function as directives

• Have the verb in base form

  * Be careful! not *Are careful!

• Allow 2nd person reflexives, and no others

  * Defend yourself! vs. *Defend myself/himself!
The Imperative Rule

\[
\begin{bmatrix}
\text{phrase} \\
\text{HEAD} \quad \text{verb} \\
\text{VAL} \quad \text{SPR} \langle \rangle \\
\text{SEM} \quad \text{MODE} \quad \text{dir} \\
\end{bmatrix}
\rightarrow
\begin{bmatrix}
\text{HEAD} \\
\text{FORM} \quad \text{base} \\
\text{VAL} \quad \text{SPR} \langle \text{NP[PER 2nd]} \rangle \\
\text{SEM} \quad \text{COMPS} \langle \rangle \\
\end{bmatrix}
\]

- Internal structure of a VP
- Directive function
- Base form
- Only 2nd person reflexives

- Note that this is not a headed rule. Why?
- Answer: It would violate the HFP and the SIP.
Imperative example
(Combining constraints again)

\[
S \left[ \text{SPR } \langle \rangle \right]
\]

\[
\text{VP} \left[ \text{SPR } \langle \langle \Pi \text{NP} \rangle \rangle \right]
\]

\[
\text{V} \left[ \text{SPR } \langle \langle \Pi \text{NP} \rangle \rangle \right] \quad \text{PP}_i
\]

\[
\text{Vote} \quad \text{P}_i \quad \text{NP}_i
\]

\[
\text{for yourself}
\]
ARG-ST on *vote*

\[
\left\langle \begin{bmatrix} \text{PER} & 2\text{nd} \\ \text{NUM} & \text{sg} \end{bmatrix}, \begin{bmatrix} \text{MODE} & \text{ana} \end{bmatrix} \right\rangle
\]

- Is Principle A satisfied?
- How?
- Is Principle B satisfied?
- How?
Day 1 Revisited

• Recall
  \[ F---- \text{yourself!} \quad F---- \text{you!} \]
  \[ \text{Go } f---- \text{yourself!} \quad * \text{Go } f---- \text{you!} \]

• \( F---- \text{NP!} \) has two analyses
  • As an imperative
  • As a truly subjectless fixed expression.

• \( \text{Go } f---- \text{NP!} \) can only be analyzed as an imperative.
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• Next time: The lexical hierarchy