Overview

• Review of Ch 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
• Reading questions
Some Examples from Chapter 1

- She likes herself
- *She likes her.
- 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.
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 “preceeding 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):

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

• 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 A**: A [MODE ana] element must be outranked by a coindexed element.

- **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.
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

The diagram represents a sentence tree for the sentence: 'I sent a letter to myself.'

- The root node is `S` (sentence).
- The subject `NP_i` is `I` (I).
- The verb `V` is `sent` (sent).
- The object `NP_j` is `a letter` (a letter).
- The prepositional phrase `PP_i` is `to myself` (to myself).

The tree structure shows the syntactic relationships and word order of the sentence.
The ARG-ST

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

- 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*
The ARG-ST

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

- 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

• 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)

What’s the SPR value on S?
Why?
What’s the SPR value on VP?
Why?
What’s the SPR value on V?
Why?

Which nodes have ARG-ST?
Which ARG-ST matters for the licensing of yourself?
ARG-ST on *vote*

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

\begin{itemize}
  \item Is Principle A satisfied?
  \item How?
  \item Is Principle B satisfied?
  \item How?
\end{itemize}
Day 1 Revisited

• Recall

\[
\begin{align*}
F---- \text{ yourself!} & \quad F---- \text{ you!} \\
Go f---- \text{ yourself!} & \quad *Go f---- \text{ you!}
\end{align*}
\]

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

• \textit{Go f---- NP!} can only be analyzed as an imperative.
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Reading Questions

• What do you mean the rule can just get rid of the SPR requirement without realizing any SPR?

• Is there ever a need to tag the SPR of the verb in an imperative? If so, where does the matching tag go since the NP is just implied/understood and not actually there?
Reading Questions

• What about coreference resolution outside the local domain? (Resumptive pronouns, cross-sentential anaphora, etc.)

• argument marking v. predicational Ps == argument v. adjunct?

• Are there any prepositions that are only argument marking or only predicational?

• Do we need to alter the lexical entries of verbs to make sure they only get the right kind of preposition?
Reading Questions

• Why do we need part (i) of the definition of outrank? (If a node is coindexed with its daughter, their feature structures are of equal rank)

• With the PP and NP being equal rank will this mean that the NP shows up on the ARG-ST list?
Reading Questions

• How can we tell if two phrases / words are coindexed or coreferent BESIDES whether or not they must agree?
• How does this BT relate to GB's BT?
• Where do indices come from?
Reading Questions

• Regarding the ordering in (44) on p. 219: Haven't we seen in this chapter that indirect objects often precede direct objects (e.g. in "Susan told herself a story", vs. "Susan told a story to herself")? Wouldn't the indirect object outrank the direct object in this case -- or would the ordering of the ARG-ST list not match the ordering of the words in the sentence in this case?

• Do we license "Mary introduced herself to herself"?
Reading Questions

• What about VOS languages? What do we predict?
• What about long-distance anaphora?
• What about scrambling?
Reading Questions

• Why not just define the principles over SPR +COMPS?

• Why do we want ARG-ST on words other than verbs?

• Also, should it be added with an empty value when it doesn't apply or not specified at all?