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Ling 566

Oct 22, 2024

Binding Theory, Imperatives

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_i likes her_i.*
- *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 (would like?) a single list with both subject and complements.
- We introduce a feature ARG-ST, with the following property (to be revised later):

$$\left[\begin{array}{l} \text{SYN} \\ \text{ARG-ST} \end{array} \left[\begin{array}{l} \text{VAL} \\ \boxed{A} \oplus \boxed{B} \end{array} \left[\begin{array}{l} \text{SPR} \\ \text{COMPS} \end{array} \left[\begin{array}{l} \boxed{A} \\ \boxed{B} \end{array} \right] \right] \right] \right]$$

- This is a constraint on the type word

Notes on ARG-ST

- It's neither in SYN nor SEM.
- It only appears on lexical items (not appropriate for type *phrase*)
- No principle stipulates identity between ARG-STs.



How do you feel about ARG-ST?



Seems useful and/or intuitive

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Seems redundant to SPR/COMPS

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I'm reserving judgment

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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.

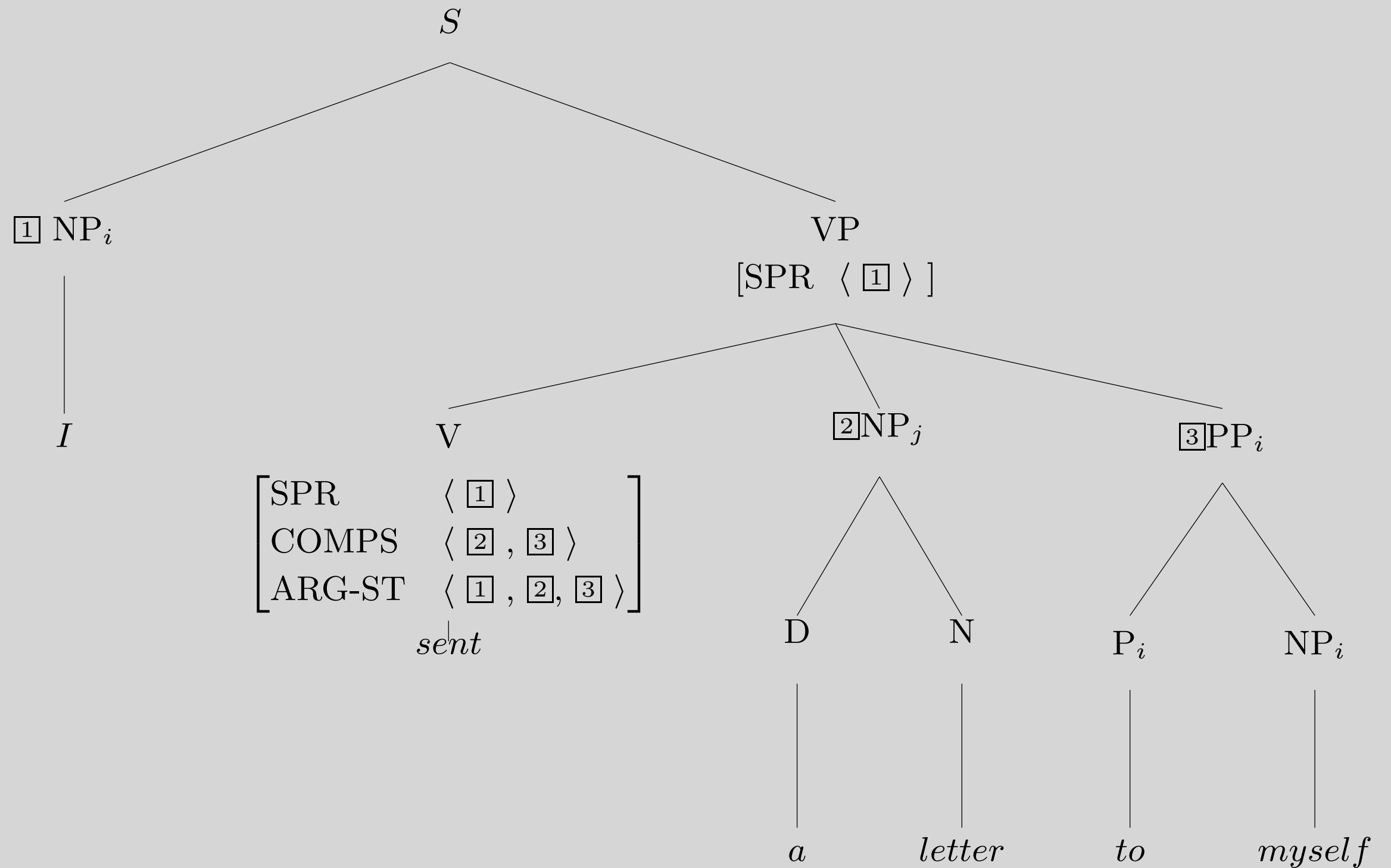
Two Types of Prepositions: a Formalization

- 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.
- Predicational 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

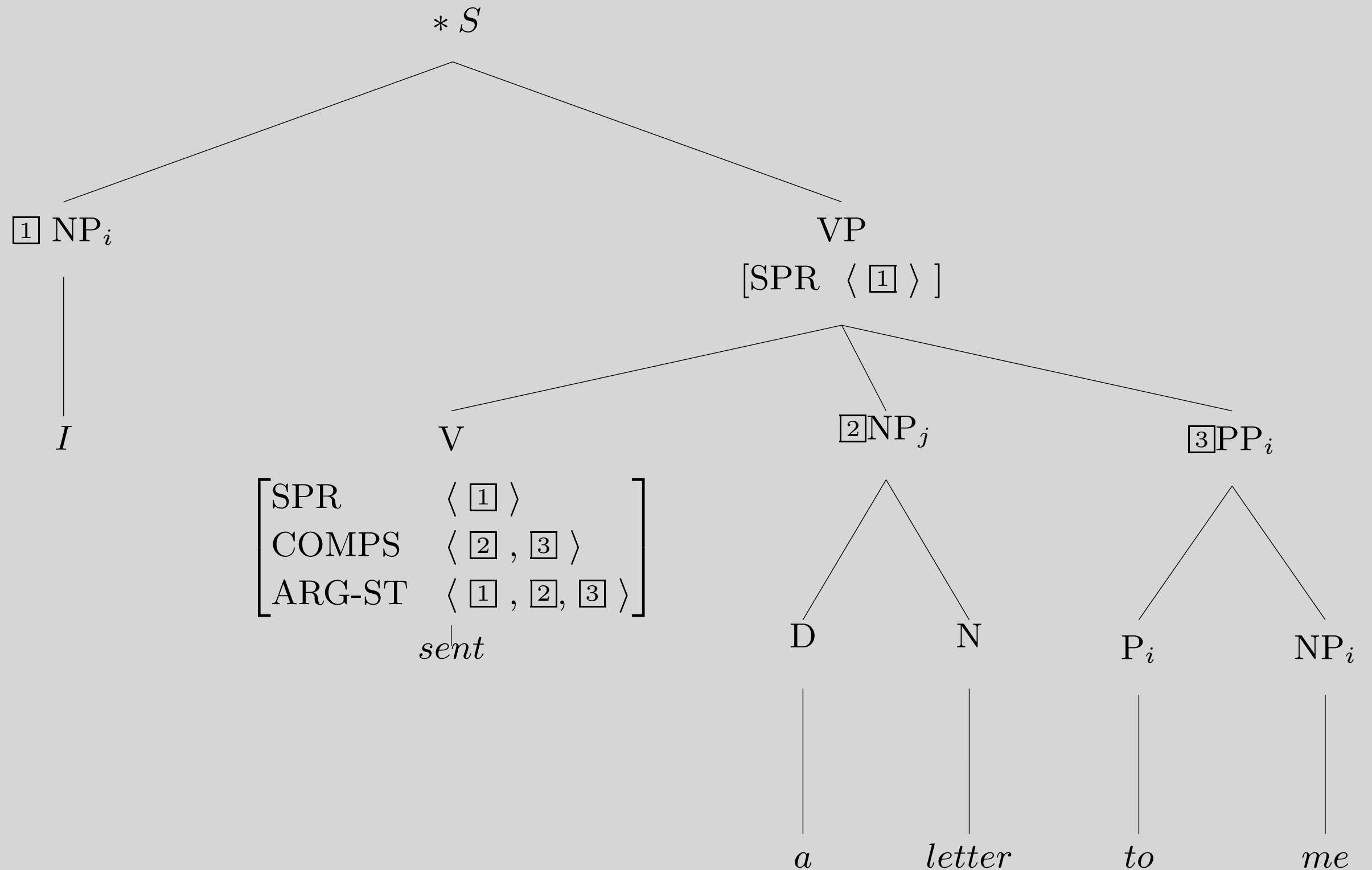


The ARG-ST

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

- 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*

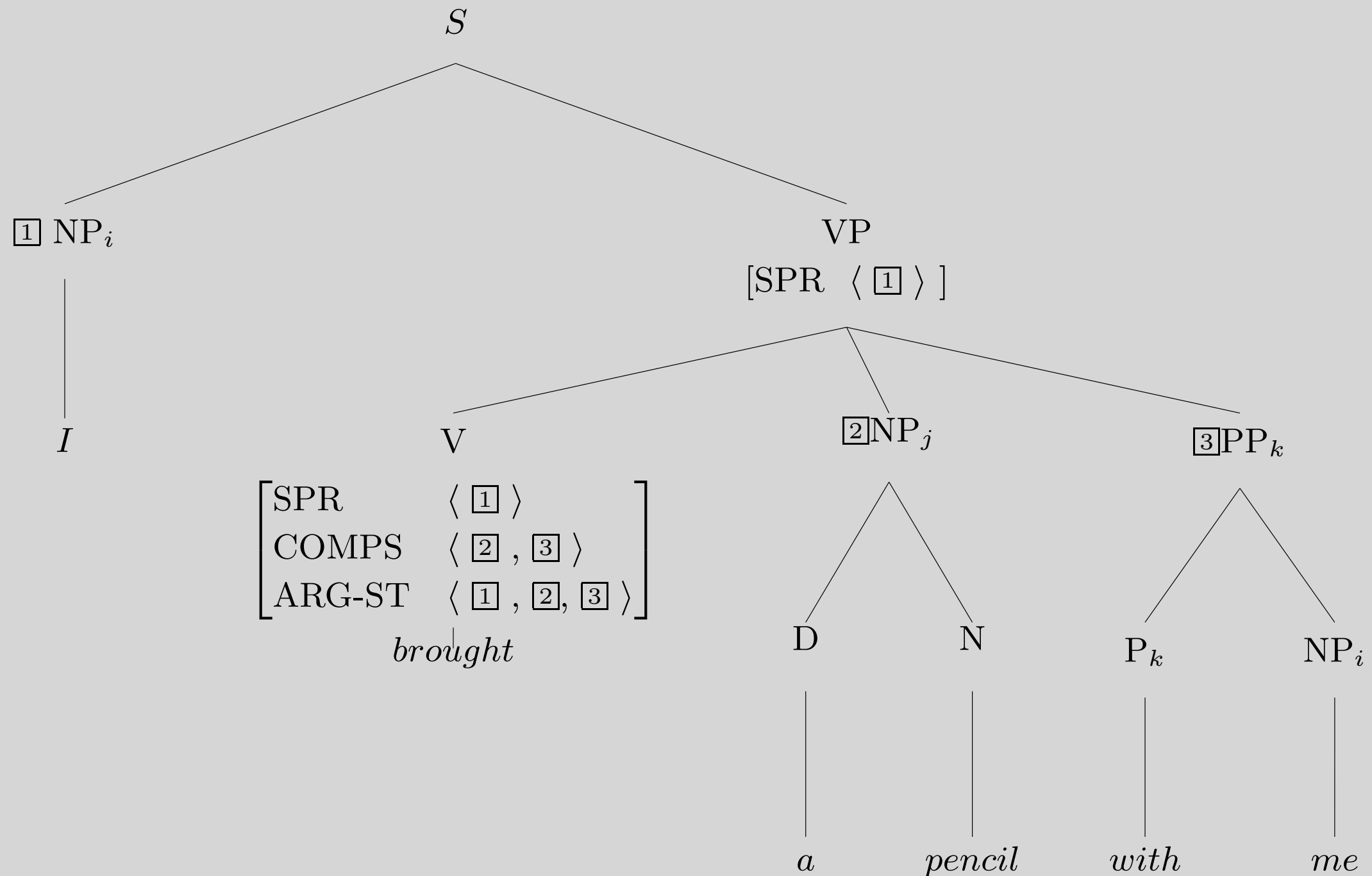


The ARG-ST

$$\left[\text{ARG-ST} \left\langle \begin{array}{c} \text{NP}_i \\ \left[\text{MODE ref} \right] \end{array}, \begin{array}{c} \text{NP}_j \\ \left[\text{MODE ref} \right] \end{array}, \begin{array}{c} \text{PP}_i \\ \left[\text{MODE ref} \right] \end{array} \right\rangle \right]$$

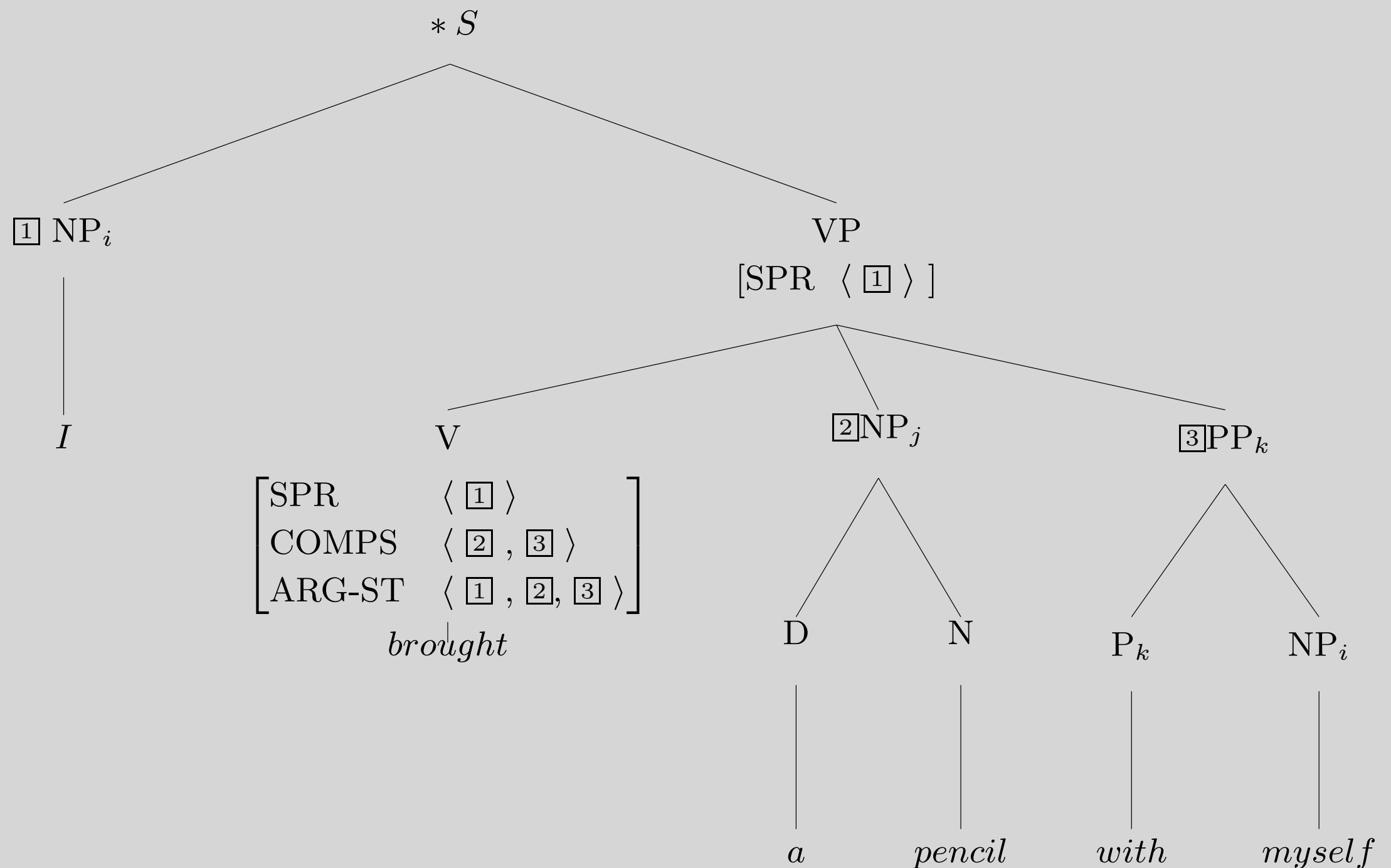
- The PP is outranked by the first NP.
- *me* has the same rank as the PP.
- So, *me* is outranked by the first NP.
- Therefore, Principle B is violated.

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***

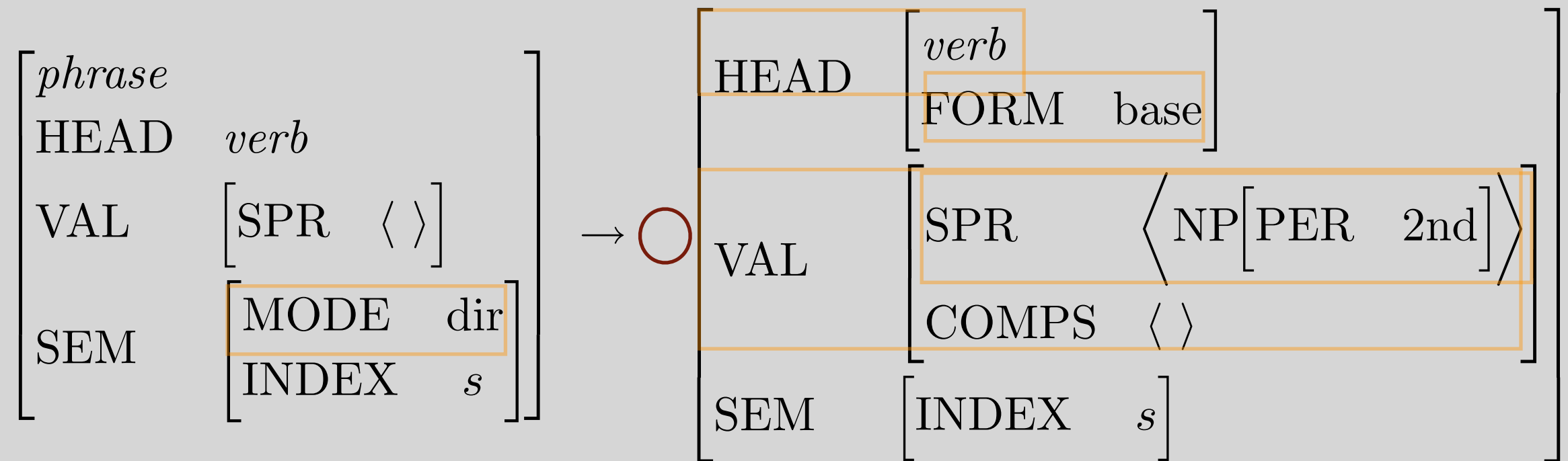
- Have the verb in base form

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?

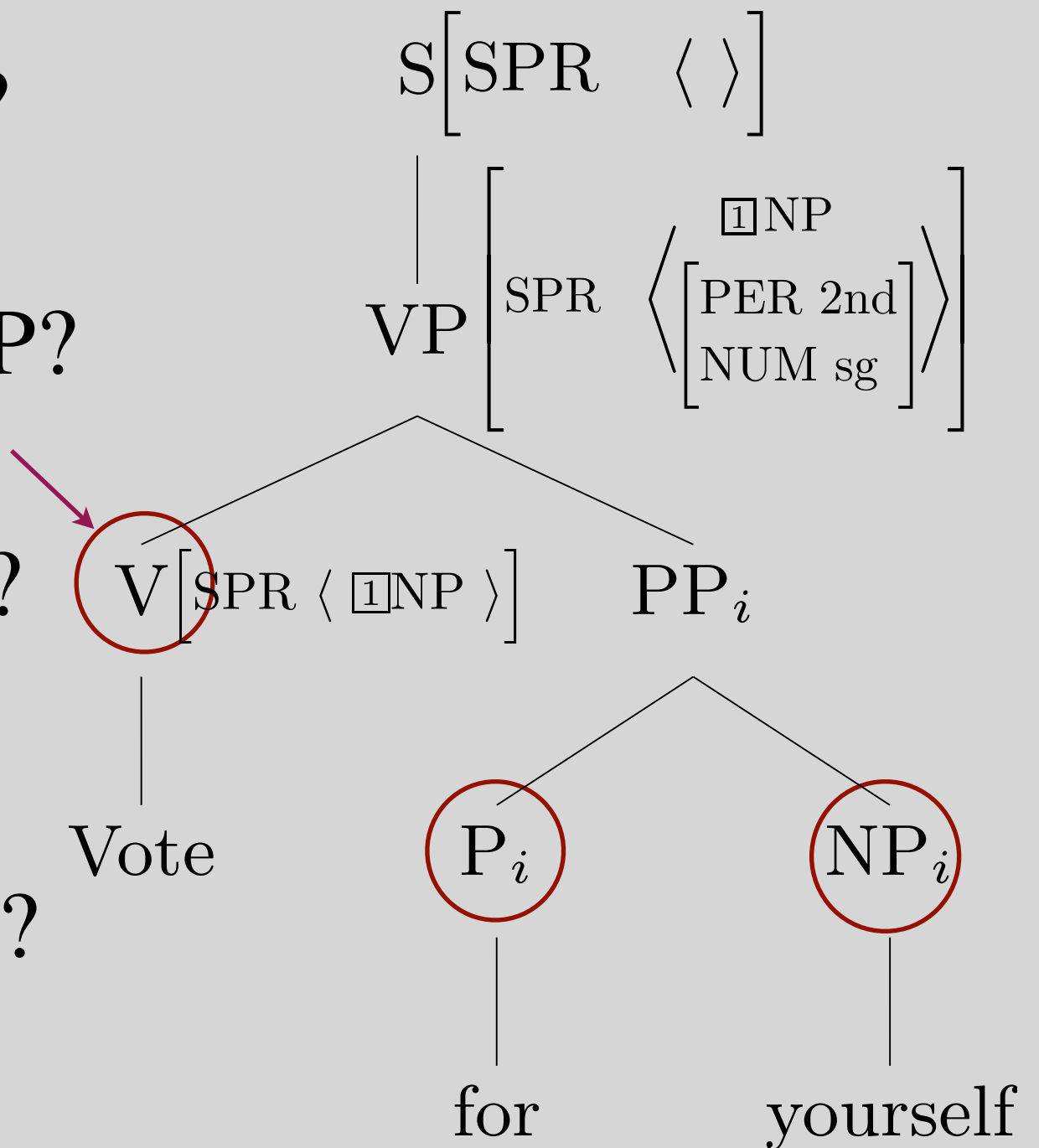
Why?

What's the SPR value on V?

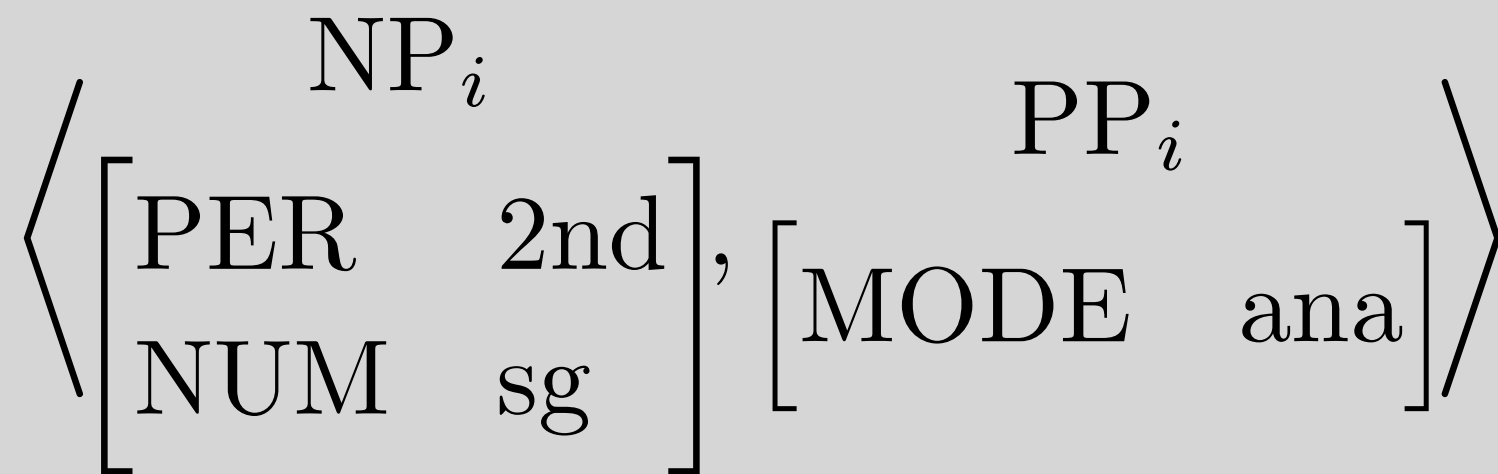
Why?

Which nodes have ARG-ST?

Which ARG-ST matters for
the licensing of yourself?



ARG-ST on *vote*



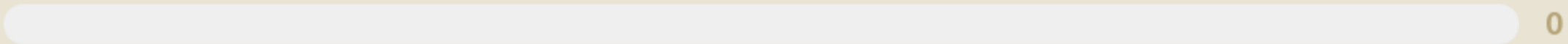
- Is Principle A satisfied?
- How?
- Is Principle B satisfied?
- How?



The Imperative Rule just does away with that SPR requirement, without providing an overt constituent:

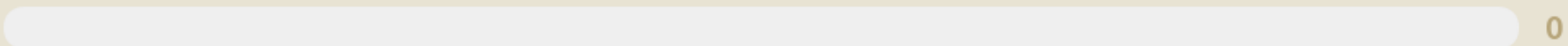


Sneaky!



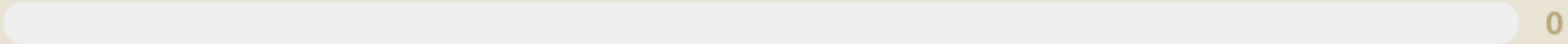
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Unfair! The verb needed that SPR!



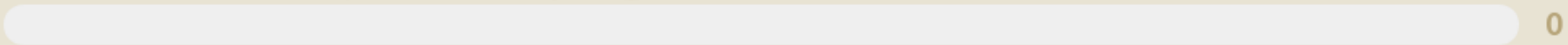
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Confusing! How can a requirement just go away?



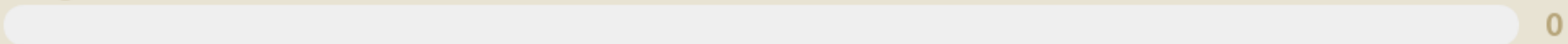
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Subtle! I can see it works, but it's still surprising



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Elegant!



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Day 1 Revisited

- Recall

F---- yourself!

Go f---- yourself!

F---- you!

**Go f---- you!*

- *F--- NP!* has two analyses
 - As an imperative
 - As a truly subjectless fixed expression.
- *Go f---- NP!* can only be analyzed as an imperative.

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RQs: AAP

- Is there a reason why the AAP is not considered a binding principle?
- How does Anaphoric Agreement Principle (AAP) principle improve upon the alternative of simply adding an agreement stipulation to Principle A?

RQs: AAP

- I don't quite understand the point at the end of the page about: "Since Principle B only says which expressions must NOT be coindexed with nonreflexive pronouns, it says nothing about cases in which such pronouns ARE legally coindexed with something." and how this applies to example 20. Maybe I'm missing some understanding of the relationships between the NPs in this sentence.
- (20) *I_i thought nobody liked him_i

RQs: ARG-ST on words only

- On pg.207 the text states that "These relations can be stated once and for all on the ARG-ST of the lexical head. There is no need to copy the information up to higher levels of the tree, and so ARG-ST is posited only as a feature of words, not phrases." without further details. I am a little curious about this point. Why should we posit this in our theory? Are there other considerations that prevent us from treating the ARG-ST as a feature of phrases?

RQs: ARG-ST on words only

- I'm curious where else this is true in the rules and principles we have already learned. I'm also curious why this is not true for most of our rules and principles. I'm confused why the phrases and words in our trees are identical, it seems redundant to use NP and VP sometimes.

RQs: Prepositions

- It feels a bit odd, and perhaps a bit redundant, to posit two kinds of lexical entries for prepositions. It seems somewhat akin to when we posited atomic values of `itr`, `str`, and `dtr` for COMPS back in Chapter 3, like we're missing some generalization. Is this actually not a big deal?

RQs: Coordination

- What would the ARG-ST look like for a sentence in which a PP phrase has mixed anaphoric and non-anaphoric complements? How would MODE and INDEX values be passed up to the PP in, for example, the sentence “She bought a pizza for herself and the children.”?

RQs: Coindexing v. coreference

- I am not sure I understand the difference between coindexing and coreference. In the feature structure, what would indicate two things are coreferential when they are not coindexed?

RQs: Coindexing v. coreference

- (21) The solution to this problem is rest and relaxation.
- If the example were changed to just have 'rest' instead of 'rest and relaxation', would it still just be coreferential? It stresses the singular vs plural NP for why they are only coreferential, but to me it seems like if it were singular vs singular NP it would have the same outcome. Is that correct?

RQs: Coindexing v. coreference

- Does this appear differently in other languages? Are there examples where coindexing and coreference always go together?
- I'm familiar with the idea of coreference but struggling to understand coindexing. How can we tell whether two things are supposed to share an index, apart from referencing the same entity?

RQs: Imperatives

- Given that the Imperative Rule is nonheaded, are directives like "Protect yourself!" also truly nonheaded? Does a phrasal head have to exist, even if it is implied?

RQs: Imperatives

- Under my impression, HPSG prefers avoiding single-branch tree, but we still introduced a single-branch rule anyway in this chapter. An alternative to me here is to use a null subject, which HPSG also prefers avoiding. Therefore, I am wondering how HPSG weighs these undesirable constructions and whether there is any theoretic reason to choose one over the other.

RQs: Gradient grammaticality

- After reading the more nuanced development of our language model in 7.4 on anaphora, I was curious about the representation of sentences with varying acceptability in our grammar. For example, long-distance binding in Mandarin can elicit different grammaticality judgments in native speakers. If only some speakers accept the sentence, should we choose to represent the possibility with our grammar? What's a good standard for what to include and what not to include?

RQs: Multilingualism

- Do different languages have different binding principles in this system? I noticed all of the chapter's problems dealt with English.

RQs: NLP applications

- In the context of NLP tasks, are the new principles and the ARG-ST feature applied exclusively to anaphora resolution, or can they also be used for coreference resolution?