Ling 566
Nov 30, 2021

Auxiliaries cont: NICE

Overview

- NICE properties of auxiliaries
- The auxiliary *do*
- NICE properties (lexical rules)
- Reading questions

Descriptive Summary of the NICE Properties

Negation

Sentences are negated by putting *not* after the first auxiliary verb; they can be reaffirmed by putting *too* or *so* in the same position

Inversion

Questions are formed by putting an auxiliary verb before the subject NP

Contraction

Auxiliary verbs take negated forms, with *n't* affixed

Ellipsis

Verb phrases immediately following an auxiliary verb can be omitted

Negation (and Reaffirmation)

- Polar adverbs (sentential *not, so,* and *too*) appear immediately following an auxiliary

  Pat will not leave

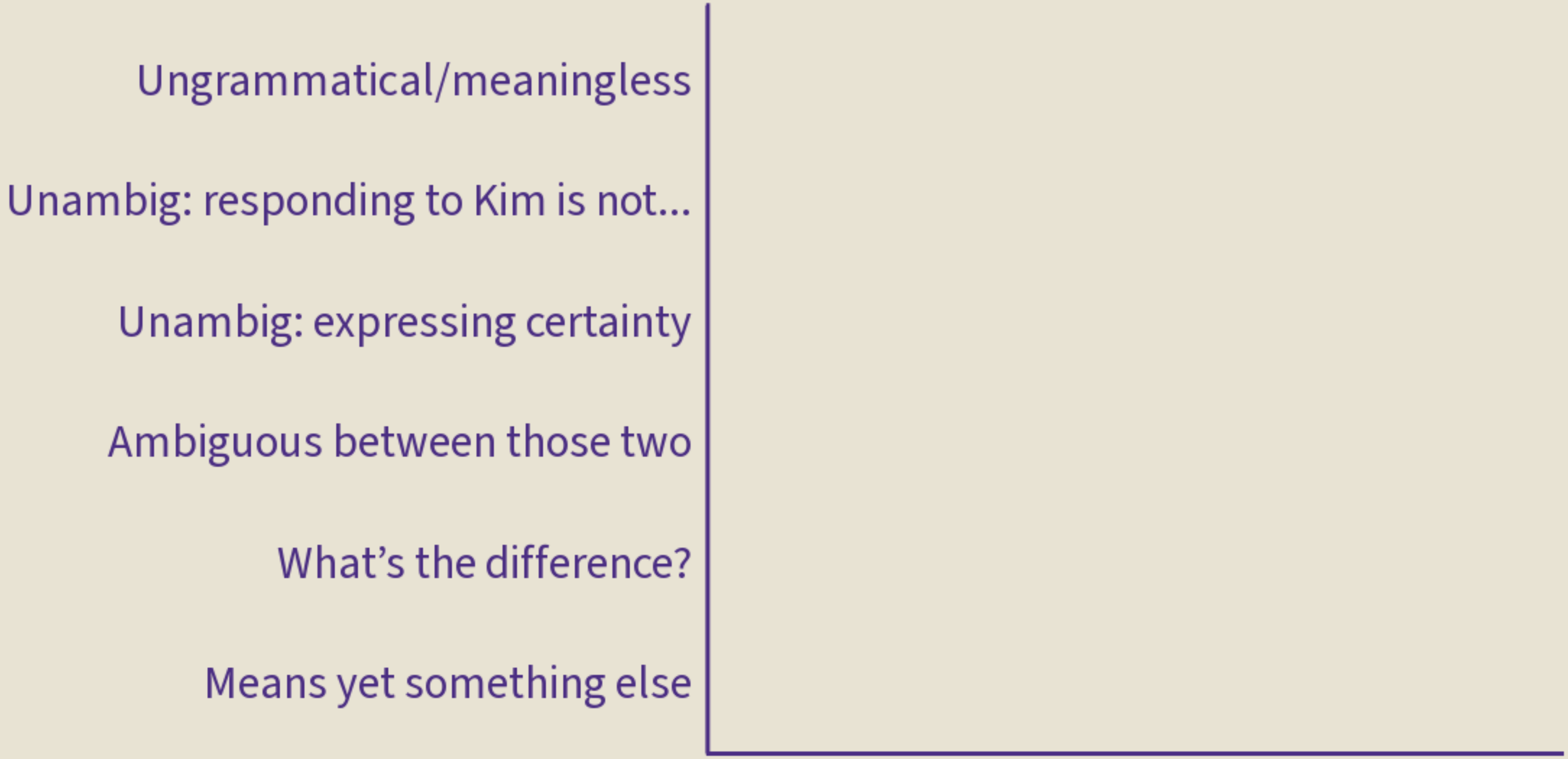
  Pat will SO leave

  Pat will TOO leave

When poll is active, respond at **pollev.com/emb**

Text **EMB** to **22333** once to join

Kim is SO going to the party



- Ungrammatical/meaningless
- Unambig: responding to Kim is not...
- Unambig: expressing certainty
- Ambiguous between those two
- What’s the difference?
- Means yet something else

Start the presentation to see live content. For screen share software, share the entire screen. Get help at **pollev.com/app**

Negation (and Reaffirmation)

- Polar adverbs (sentential *not, so,* and *too*) appear immediately following an auxiliary

  Pat will not leave

  Pat will SO leave

  Pat will TOO leave

- What about examples like *Not many people left*?

- What happens when you want to deny or reaffirm a sentence with no auxiliary?

  Pat left

  *Pat **did not** leave*

  *Pat **did TOO** leave*

The Auxiliary *do*

- Like modals, auxiliary *do* only occurs in finite contexts:
  **Pat continued to do not leave*
- Unlike modals, *do* cannot be followed by other auxiliaries:
  **Pat did not have left*

$$\left\langle \text{do}\ ,\ \begin{bmatrix} \textit{auxv-lxm} & \\ \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{FORM} & \text{fin} \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \left\langle \text{X}\ ,\ \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} & \\ \text{FORM} & \text{base} \\ \text{AUX} & - \end{bmatrix} \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \\ \text{RESTR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

The ADV$_{pol}$-Addition Lexical Rule

$$\begin{bmatrix} \textit{pi-rule} & \\ \text{INPUT} & \left\langle X\ , \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} & \\ \text{FORM} & \text{fin} \\ \text{POL} & - \\ \text{AUX} & + \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \langle \boxed{1} \rangle \oplus \boxed{\text{A}} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s_1 \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{OUTPUT} & \left\langle Y\ , \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{POL} & + \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle Z \rangle \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \langle \boxed{1} \rangle \oplus \left\langle \begin{bmatrix} & \text{ADV}_{pol} \\ \text{INDEX} & s_2 \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{ARG} & s_1 \end{bmatrix} \right\rangle \end{bmatrix} \right\rangle \oplus \boxed{\text{A}} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s_2 \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix}$$

What does the type *pi-rule* mean?

- It maps words to words (hence, “post-inflectional”)
- It preserves MOD values, HEAD values as a default, and (like other lexical rule types) SEM values as a default

$$
\begin{bmatrix}
\text{INPUT} & \left\langle /\ \boxed{0}\ ,\ \begin{bmatrix} \textit{word} & \\ \text{SYN} & \begin{bmatrix} \text{HEAD} & /\ \boxed{1} \\ \text{VAL} & \begin{bmatrix} \text{MOD} & \boxed{A} \end{bmatrix} \end{bmatrix} \\ \text{SEM} & /\ \boxed{2} \end{bmatrix} \right\rangle \\
\text{OUTPUT} & \left\langle /\ \boxed{0}\ ,\ \begin{bmatrix} \textit{word} & \\ \text{SYN} & \begin{bmatrix} \text{HEAD} & /\ \boxed{1} \\ \text{VAL} & \begin{bmatrix} \text{MOD} & \boxed{A} \end{bmatrix} \end{bmatrix} \\ \text{SEM} & /\ \boxed{2} \end{bmatrix} \right\rangle
\end{bmatrix}
$$

Why doesn't ADV$_{pol}$-Addition LR mention VAL?

$$\begin{bmatrix} \textit{pi-rule} & \\ \text{INPUT} & \left\langle \text{X}, \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} & \\ \text{FORM} & \text{fin} \\ \text{POL} & - \\ \text{AUX} & + \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \langle \boxed{1} \rangle \oplus \boxed{\text{A}} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s_1 \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{OUTPUT} & \left\langle \text{Y}, \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{POL} & + \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \text{Z} \rangle \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \langle \boxed{1} \rangle \oplus \left\langle \overset{\text{ADV}_{pol}}{\begin{bmatrix} \text{INDEX} & s_2 \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{ARG} & s_1 \end{bmatrix} \right\rangle \end{bmatrix}} \right\rangle \oplus \boxed{\text{A}} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s_2 \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix}$$

What is the role of these indices?

$$
\begin{bmatrix}
\textit{pi-rule} & \\
\text{INPUT} & \left\langle \text{X} \, , \begin{bmatrix}
\text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} & \\ \text{FORM} & \text{fin} \\ \text{POL} & - \\ \text{AUX} & + \end{bmatrix} \end{bmatrix} \\
\text{ARG-ST} & \langle \boxed{1} \rangle \oplus \boxed{\text{A}} \\
\text{SEM} & \begin{bmatrix} \textbf{INDEX} & \mathbf{s_1} \end{bmatrix}
\end{bmatrix} \right\rangle \\
\text{OUTPUT} & \left\langle \text{Y} \, , \begin{bmatrix}
\text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{POL} & + \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \text{Z} \rangle \end{bmatrix} \end{bmatrix} \\
\text{ARG-ST} & \langle \boxed{1} \rangle \oplus \left\langle \overset{\text{ADV}_{pol}}{\begin{bmatrix} \textbf{INDEX} & \mathbf{s_2} \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{ARG} & \mathbf{s_1} \end{bmatrix} \right\rangle \end{bmatrix}} \right\rangle \oplus \boxed{\text{A}} \\
\text{SEM} & \begin{bmatrix} \textbf{INDEX} & \mathbf{s_2} \end{bmatrix}
\end{bmatrix} \right\rangle
\end{bmatrix}
$$

Which *nots* does the rule license?

$$
\begin{bmatrix}
\textit{pi-rule} & \\
\text{INPUT} & \left\langle \text{X}\,,\; \begin{bmatrix}
\text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} & \\ \text{FORM} & \text{fin} \\ \text{POL} & - \\ \text{AUX} & + \end{bmatrix} \end{bmatrix} \\
\text{ARG-ST} & \langle \boxed{1} \rangle \oplus \boxed{A} \\
\text{SEM} & \begin{bmatrix} \text{INDEX} & s_1 \end{bmatrix}
\end{bmatrix} \right\rangle \\
\text{OUTPUT} & \left\langle \text{Y}\,,\; \begin{bmatrix}
\text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{POL} & + \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \text{Z} \rangle \end{bmatrix} \end{bmatrix} \\
\text{ARG-ST} & \langle \boxed{1} \rangle \oplus \left\langle \overset{\text{ADV}_{pol}}{\begin{bmatrix} \text{INDEX} & s_2 \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{ARG} & s_1 \end{bmatrix} \right\rangle \end{bmatrix}} \right\rangle \oplus \boxed{A} \\
\text{SEM} & \begin{bmatrix} \text{INDEX} & s_2 \end{bmatrix}
\end{bmatrix} \right\rangle
\end{bmatrix}
$$

Andy must $\underline{\textit{not}}$ have been sleeping? ✓

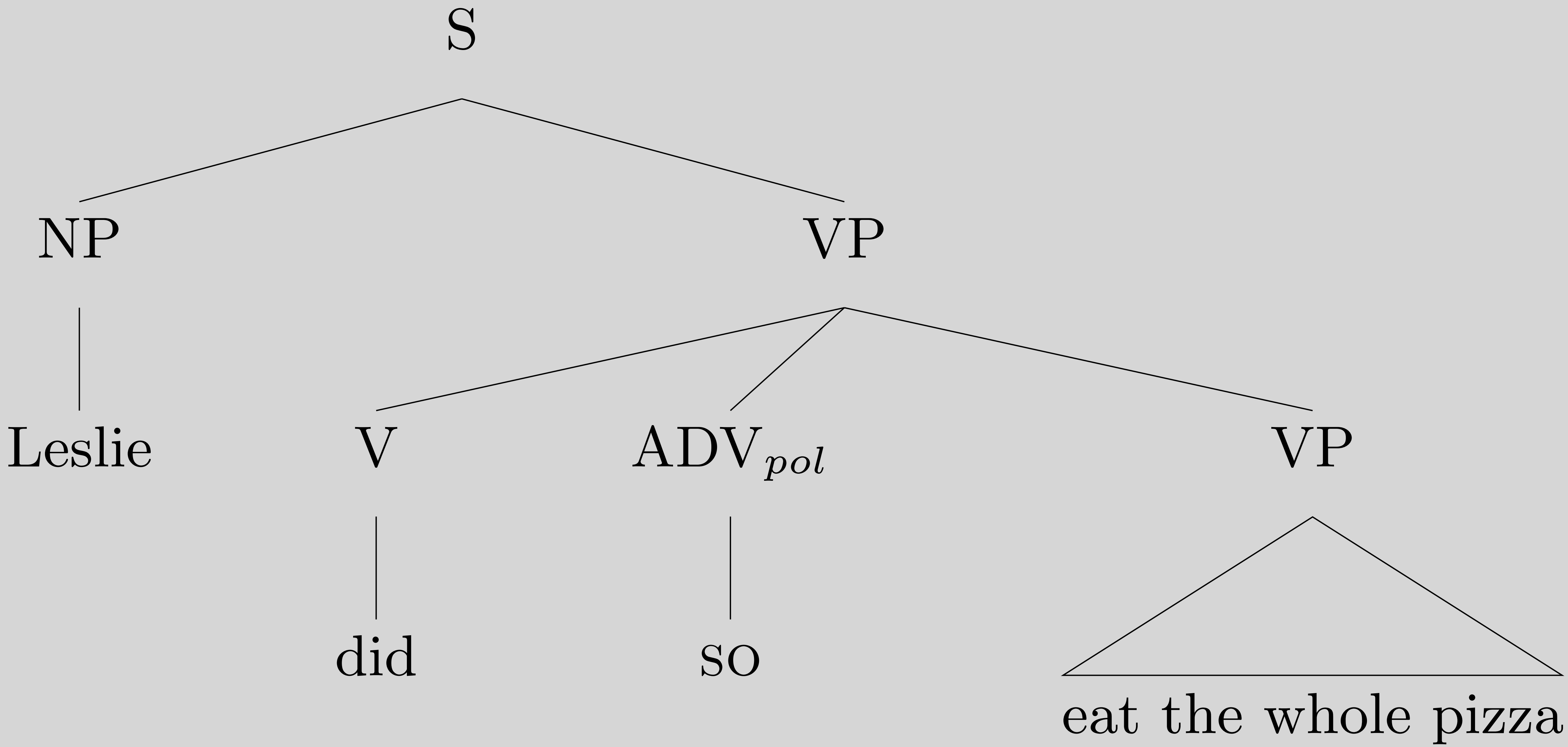
Andy must have $\underline{\textit{not}}$ been sleeping? ✗

Andy must have been $\underline{\textit{not}}$ sleeping? ✗

Kleptomaniacs can$\underline{\textit{not}}$ not steal. ✓

Kleptomaniacs cannot $\underline{\textit{not}}$ steal. ✗

Negation and Reaffirmation: A Sample Tree



Inversion

- Yes-no questions begin with an auxiliary:
  Will Robin win?

- The NP after the auxiliary has all the properties of a subject
  - Agreement: *Have they left?* vs. **Has they left?*
  - Case: **Have them left?*
  - Raising: *Will there continue to be food at the meetings?*

- What happens if you make a question out of a sentence without an auxiliary?
  Robin won
  Did Robin win?

The Inversion Lexical Rule

$$\begin{bmatrix} \textit{pi-rule} & \\ \text{INPUT} & \left\langle \text{W}\ ,\ \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} & \\ \text{FORM} & \text{fin} \\ \text{AUX} & + \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \boxed{A} \\ \text{SEM} & \begin{bmatrix} \text{MODE} & \text{prop} \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{OUTPUT} & \left\langle \text{Z}\ ,\ \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{INV} & + \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \boxed{A} \\ \text{SEM} & \begin{bmatrix} \text{MODE} & \text{ques} \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix}$$

How the Rule Yields Inverted Order

$$\begin{bmatrix} \textit{pi-rule} & \\ \text{INPUT} & \left\langle \text{W}\ , \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} & \\ \text{FORM} & \text{fin} \\ \text{AUX} & + \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \textbf{SPR} & \langle\ \textbf{X}\ \rangle \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \boxed{\text{A}} \\ \text{SEM} & \begin{bmatrix} \text{MODE} & \text{prop} \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{OUTPUT} & \left\langle \text{Z}\ , \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{INV} & + \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \textbf{SPR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \boxed{\text{A}} \\ \text{SEM} & \begin{bmatrix} \text{MODE} & \text{ques} \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix}$$

...plus the ARP

The Feature INV

- What is the INV value of inputs to the Inversion LR?
  - Perhaps surprisingly, the input is [INV +]
  - Word-to-word rules (*pi-rule*s) have default identity of HEAD features, and no INV value is given on the input
- Then what work is the feature doing?
  - It's used to mark auxiliaries that can't or must be inverted

    You better watch out *vs.* **Better you watch out*

    I shall go (*shall* ~ 'will') *vs.* *Shall I go?* (*shall* ~ 'should')

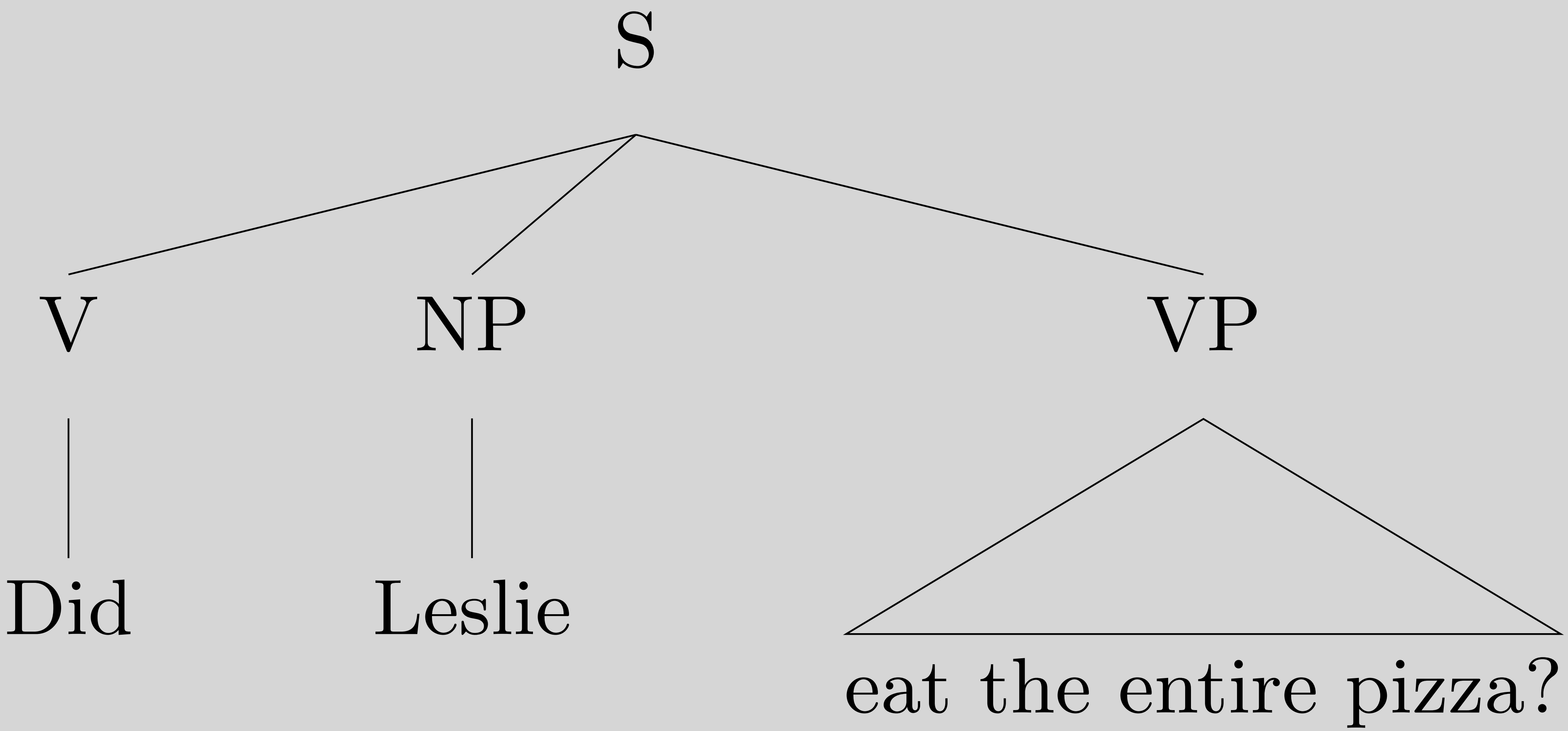
Other Cases of Inversion

- Inversion is not limited to questions
- Preposed negatives: *Never* ***have I*** *been so upset!*
- Conditionals: ***Had we*** *known, we would have left.*
- Exclamations: ***May your teeth*** *fall out!*

- Does our rule account for these?
- No. Our rule's output says [MODE ques]. And each construction has slightly different idiosyncrasies.

- How might we extend our analysis to cover them?
- Define a type of inversion lexical rules, sharing certain properties, but with some differences.

Inversion: A Sample Tree



Contraction

- There are several types of contraction in English, but we're only talking about words ending in *n't*

- It may seem like just *not* said fast, but there's more to it
  - Only finite verbs can take *n't*:
    **Terry must haven't seen us*

  - There are morphological irregularities:
    won't, not **willn't*   *%shan't*, not **shalln't*
    mustn't pronounced *mussn't*
    don't pronounced *doen't*, not *dewn't*
    **amn't*

The Contraction Lexical Rule

$$\begin{bmatrix} \textit{pi-rule} & \\ \text{INPUT} & \left\langle \boxed{2}\ , \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} & \\ \text{FORM} & \text{fin} \\ \text{AUX} & + \\ \text{POL} & - \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \boxed{\text{B}} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s_1 \\ \text{RESTR} & \boxed{\text{A}} \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{OUTPUT} & \left\langle \text{F}_{NEG}(\boxed{2})\ , \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{POL} & + \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle\ \text{X}\ \rangle \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \boxed{\text{B}} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s_2 \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{RELN} & \textbf{not} \\ \text{SIT} & s_2 \\ \text{ARG} & s_1 \end{bmatrix} \right\rangle \oplus \boxed{\text{A}} \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix}$$

Most of the work is in the semantics

$$\begin{bmatrix} \textit{pi-rule} & \\ \text{INPUT} & \left\langle \boxed{2}\,, \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} & \\ \text{FORM} & \text{fin} \\ \text{AUX} & + \\ \text{POL} & - \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \boxed{\text{B}} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s_1 \\ \text{RESTR} & \boxed{\text{A}} \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{OUTPUT} & \left\langle \text{F}_{NEG}(\boxed{2})\,, \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix}\text{POL} & +\end{bmatrix} \\ \text{VAL} & \begin{bmatrix}\text{SPR} & \langle \text{ X } \rangle\end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \boxed{\text{B}} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s_2 \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{RELN} & \textbf{not} \\ \text{SIT} & s_2 \\ \text{ARG} & s_1 \end{bmatrix} \right\rangle \oplus \boxed{\text{A}} \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix}$$

Why?

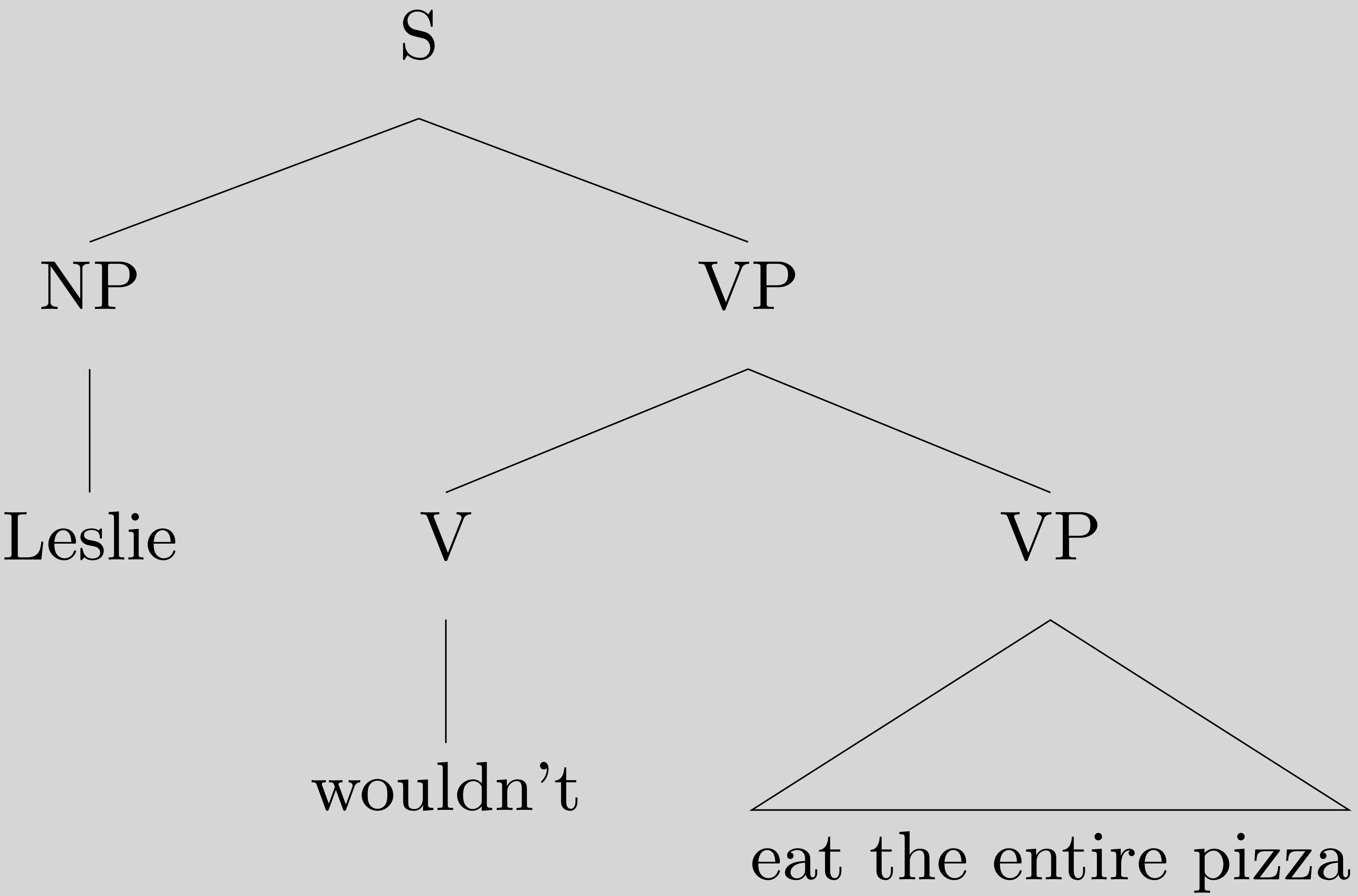
What does POL do?

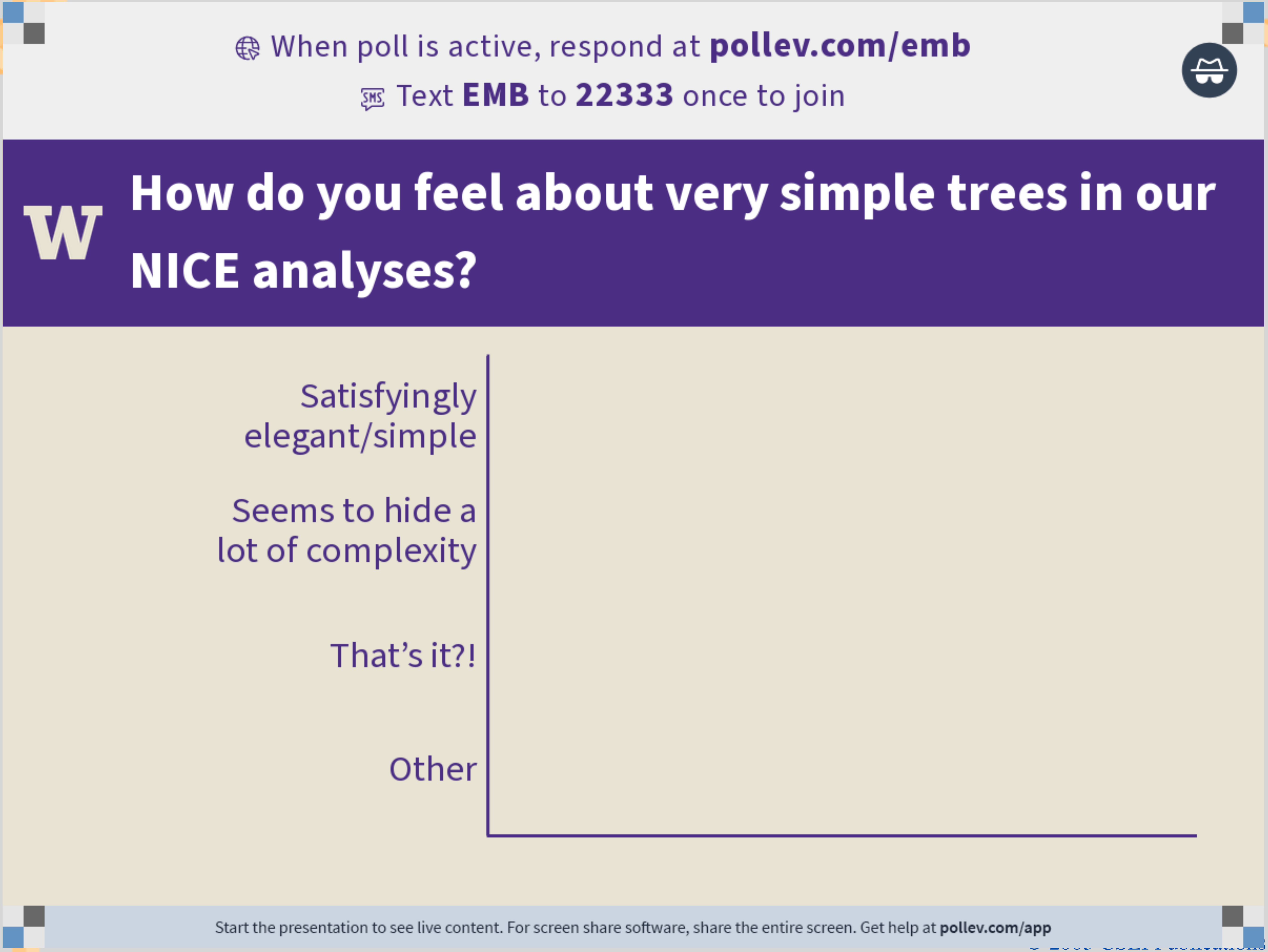
$$\begin{bmatrix} \textit{pi-rule} & \\ \text{INPUT} & \left\langle \boxed{2}\,, \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} & \\ \text{FORM} & \text{fin} \\ \text{AUX} & + \\ \text{POL} & - \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \boxed{B} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s_1 \\ \text{RESTR} & \boxed{A} \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{OUTPUT} & \left\langle \text{F}_{NEG}(\boxed{2})\,, \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{POL} & + \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \text{ X } \rangle \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \boxed{B} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s_2 \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{RELN} & \textbf{not} \\ \text{SIT} & s_2 \\ \text{ARG} & s_1 \end{bmatrix} \right\rangle \oplus \boxed{A} \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix}$$

**We can'tn't stop*

**They won't TOO mind*

Contraction: Sample Tree





When poll is active, respond at **pollev.com/emb**

Text **EMB** to **22333** once to join

How do you feel about very simple trees in our NICE analyses?

Satisfyingly elegant/simple

Seems to hide a lot of complexity

That’s it?!

Other

Start the presentation to see live content. For screen share software, share the entire screen. Get help at **pollev.com/app**

Ellipsis

- Ellipsis allows VPs to be omitted, so long as they would have been preceded by an auxiliary

* *Pat couldn't have been watching us, but Chris*

- Unlike the other NICE properties, this holds of all auxiliaries, not just finite ones.

- What is the elliptical counterpart to a sentence with no auxiliary?

Whenever Pat watches TV, Chris watches TV
Whenever Pat watches TV, Chris does

The Ellipsis Lexical Rule

$$\begin{bmatrix} \textit{d-rule} & \\ \text{INPUT} & \left\langle \boxed{1}\, , \begin{bmatrix} \textit{auxv-lxm} & \\ \text{ARG-ST} & \langle \boxed{2} \rangle \oplus \boxed{A} \end{bmatrix} \right\rangle \\ \text{OUTPUT} & \left\langle \boxed{1}\, , \begin{bmatrix} \textit{dervv-lxm} & \\ \text{ARG-ST} & \langle \boxed{2} \rangle \end{bmatrix} \right\rangle \end{bmatrix}$$

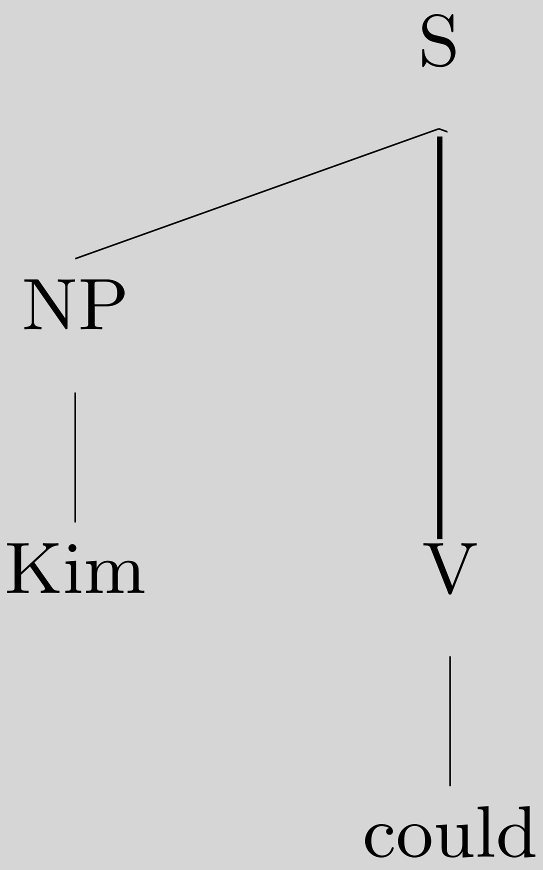
- Note that this is a derivational LR (*d-rule*) -- that is, lexeme-to-lexeme

- This means that SYN and SEM are unchanged, by default

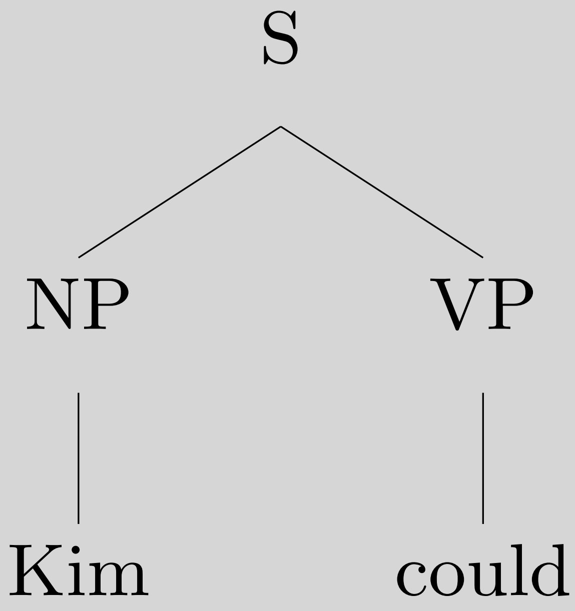
Ellipsis: A Sample Output

$$\left\langle \text{could}\ ,\ \begin{bmatrix} \textit{dervv-lxm} & \\ \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix}\text{FORM} & \text{fin}\\ \text{AUX} & + \\ \text{POL} & - \\ \text{AGR} & \boxed{1}\end{bmatrix} \\ \text{VAL} & \begin{bmatrix}\text{SPR} & \langle\ [\text{AGR}\ \boxed{1}]\ \rangle\end{bmatrix}\end{bmatrix} \\ \text{ARG-ST} & \langle\ \text{NP}\ \rangle \\ \text{SEM} & \begin{bmatrix}\text{MODE} & \text{prop}\\ \text{INDEX} & s_1 \\ \text{RESTR} & \left\langle \begin{bmatrix}\text{RELN} & \text{could}\\ \text{SIT} & s_1 \\ \text{ARG} & s_2\end{bmatrix}\right\rangle\end{bmatrix}\end{bmatrix}\right\rangle$$

Ellipsis: A Sample Tree



Semantics of Ellipsis


S

NP

VP

Kim

could

What is the SEM value of the S node of this tree?

$$\begin{bmatrix} \text{INDEX} & s_1 \\ \text{MODE} & \text{prop} \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{RELN} & \text{name} \\ \text{NAME} & \text{Kim} \\ \text{NAMED} & i \end{bmatrix}, \begin{bmatrix} \text{RELN} & \text{could} \\ \text{SIT} & s_1 \\ \text{ARG} & s_2 \end{bmatrix} \right\rangle \end{bmatrix}$$

Note: s_2 has to be filled in by context.

Infinitival *to* Revisited

- VP Ellipsis can occur after *to*:

We didn't find the solution, but we tried to.

- This is covered by our Ellipsis LR if we say *to* is [AUX +].
- Since AUX is declared on type *verb*, it follows that *to* is a verb.

do Revisited

- Chomsky's old analysis: in sentences w/o auxiliaries...
  - Tense can get separated from the verb in various ways
    - Negation/Reaffirmation inserts something between Tense and the following verb
    - Inversion moves Tense to the left of the subject NP
    - Ellipsis deletes what follows Tense
  - When this happens, *do* is inserted to support Tense

- Our counterpart:
  - NICE properties hold only of auxiliaries
  - *do* is a semantically empty auxiliary, so negated, reaffirmed, inverted, and elliptical sentences that are the semantic counterparts to sentences w/o auxiliaries are ones with *do*.

Summary

- Our analysis employs straightforward mechanisms
  - Lexical entries for auxiliaries
  - 3 new features (AUX, POL, INV)
  - 4 lexical rules
- We handle a complex array of facts
  - co-occurrence restrictions (ordering & iteration)
  - the NICE properties
  - auxiliary *do*
  - combinations of NICE constructions

Overview

- NICE properties of auxiliaries
- The auxiliary *do*
- NICE properties (lexical rules)
- Reading questions

Reading Questions

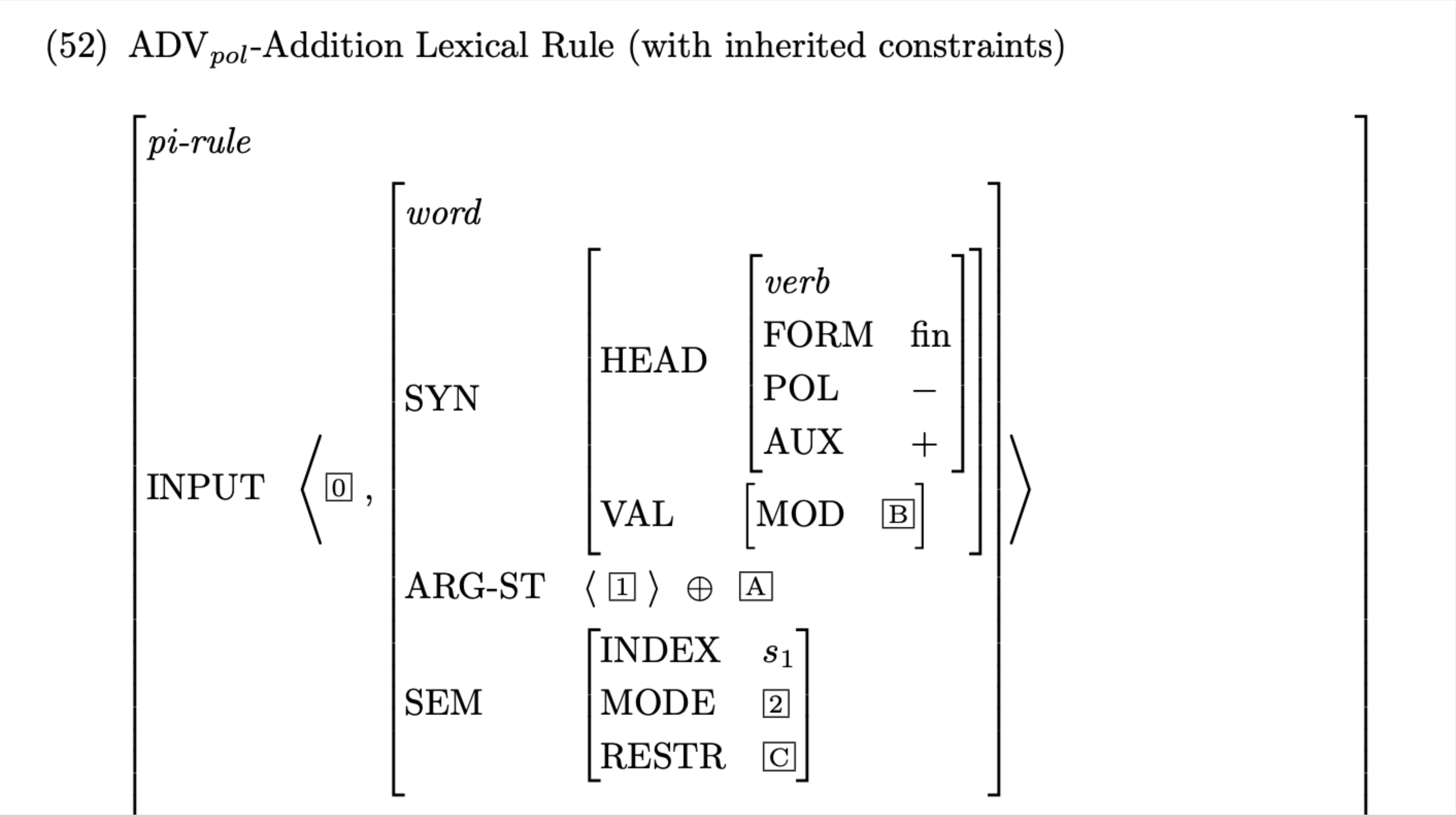
- In *Is Kim happy?*, *happy* has *Kim* as its specifier, but does the Head-Specifier Rule every apply? Because it seems like just the Head-Complement Rule gets applied and 'happy's specifier requirement vanishes without the application of the Head-Specifier Rule.

Reading Questions

- On the bottom of p 407, I’m confused about what it means that “the inherited defeasible constraints ‘push down’ to identify values of all other features within HEAD and SEM whose values are not specified as incompatible”. Is this just saying that anything that isn’t explicitly marked as changing (like POL - becoming POL +) will just be passed down like normal?

pi-rule

$$\left[\begin{array}{ll}
\text{INPUT} & \left\langle /\ \boxed{0}\ ,\ \left[\begin{array}{ll} \textit{word} & \\ \text{SYN} & \left[\begin{array}{ll}\text{HEAD} & /\ \boxed{1} \\ \text{VAL} & \left[\text{MOD}\quad \boxed{\text{A}}\right]\end{array}\right] \\ \text{SEM} & /\ \boxed{2}\end{array}\right]\right\rangle \\
\text{OUTPUT} & \left\langle /\ \boxed{0}\ ,\ \left[\begin{array}{ll} \textit{word} & \\ \text{SYN} & \left[\begin{array}{ll}\text{HEAD} & /\ \boxed{1} \\ \text{VAL} & \left[\text{MOD}\quad \boxed{\text{A}}\right]\end{array}\right] \\ \text{SEM} & /\ \boxed{2}\end{array}\right]\right\rangle
\end{array}\right]$$



(52) ADV$_{pol}$-Addition Lexical Rule (with inherited constraints)

$$\left[\begin{array}{ll} \textit{pi-rule} & \\ \text{INPUT} & \left\langle \boxed{0}\,, \left[\begin{array}{ll} \textit{word} & \\ \text{SYN} & \left[\begin{array}{ll} \text{HEAD} & \left[\begin{array}{ll} \textit{verb} & \\ \text{FORM} & \text{fin} \\ \text{POL} & - \\ \text{AUX} & + \end{array}\right] \\ \text{VAL} & \left[\text{MOD} \;\; \boxed{\text{B}}\right] \end{array}\right] \\ \text{ARG-ST} & \langle \boxed{1} \rangle \oplus \boxed{\text{A}} \\ \text{SEM} & \left[\begin{array}{ll} \text{INDEX} & s_1 \\ \text{MODE} & \boxed{2} \\ \text{RESTR} & \boxed{\text{C}} \end{array}\right] \end{array}\right] \right\rangle \end{array}\right]$$

$$\left[\text{OUTPUT}\ \left\langle \boxed{0}\ ,\ \begin{bmatrix} \textit{word} & \\ \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix}\textit{verb} & \\ \text{FORM} & \text{fin}\\ \text{POL} & + \\ \text{AUX} & +\end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle\ \boxed{1}\ \rangle \\ \text{COMPS} & \langle\ \boxed{3}\ \rangle \oplus \boxed{A} \\ \text{MOD} & \boxed{B}\end{bmatrix}\end{bmatrix} \\ \text{ARG-ST} & \langle\ \boxed{1}\ \rangle \oplus \left\langle \overset{\boxed{3}\text{ADV}_{pol}}{\begin{bmatrix}\text{INDEX} & s_2 \\ \text{RESTR} & \left\langle \begin{bmatrix}\text{ARG} & s_1\end{bmatrix}\right\rangle\end{bmatrix}} \right\rangle \oplus \boxed{A} \\ \text{SEM} & \begin{bmatrix}\text{INDEX} & s_2\\ \text{MODE} & \boxed{2} \\ \text{RESTR} & \boxed{C}\end{bmatrix}\end{bmatrix} \right\rangle \right]$$

Reading Questions

- Why did we not fill in the ARP on the INPUT in (52)? Why are we showing it on the output?

Reading Questions

- For (51) the ADVpol-Addition Lexical Rule, I wasn't clear about why the specifier value was <Z>. The footnote on (52) says "The lexical rule doesn't constrain the length of either the specifier or complements list of the input. On the other hand, it does specify that the output must be [SPR <Z>]. This is to ensure the ARP has the desired effect" (406). Is this just saying that its just there to ensure that there is a specifier for the output? And if that's the case, I still don't understand why it wouldn't be coindexed with the first value of the ARG-ST list.

The ADV$_{pol}$-Addition Lexical Rule

$$\begin{bmatrix} \textit{pi-rule} & \\ \text{INPUT} & \left\langle X\ , \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} & \\ \text{FORM} & \text{fin} \\ \text{POL} & - \\ \text{AUX} & + \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \langle \boxed{1} \rangle \oplus \boxed{A} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s_1 \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{OUTPUT} & \left\langle Y\ , \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{POL} & + \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle Z \rangle \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \langle \boxed{1} \rangle \oplus \left\langle \overset{\text{ADV}_{pol}}{\begin{bmatrix} \text{INDEX} & s_2 \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{ARG} & s_1 \end{bmatrix} \right\rangle \end{bmatrix}} \right\rangle \oplus \boxed{A} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s_2 \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix}$$

Reading Questions

- I do not like that a new feature (POL) was added to the HEAD of verb-lxm simply so that we can prevent the ADVpol - Addition Lexical Rule to be used more than once. The mechanics of the lexical rule should be contained in the lexical rule. Especially since POL +/- really only means this verb has or does not have an ADVpol in its ARG-ST and this will only happen for auxiliary verbs and even then its optional. Could we not have changed how lexical rules are written in order to enforce a "use only once" constraint? or maybe a way to specify if ADVpol is already in the ARG-ST then it is explicitly not allowed to be INPUT to the rule?

Reading Questions

- Why is the ellipsis rule a derivational rule and not inflectional?
- I am still a little confused about why we are having ADVpol-Addition Lexical Rule, Inversion Lexical Rule, and Contraction Lexical Rule as pi-rule. Could you explain a little more?

Reading Questions

- It seems odd to me that *is*, *Kim* and *happy* are on the same level in *is Kim happy* tree after inversion LR, since the tree for *Kim is happy* shows clearly the complement and specifier relations but the inverted sentence does now. Does that mean lexical sequence of the words (in particular the ARG-ST) gives us more information than the structure of the tree?

Reading Questions

- I am wondering how to construct wh-questions since this is one of the homework I came across in LING 571. Would that be similar to Inversion Lexical Rule? (Like: We remove one subject/object/prepositional phrase in the ARG-ST of the INPUT word, and put a W-word (e.g. what, where) in the SPR in the OUTPUT word?)

Reading Questions

- What auxiliary words are included in ellipsis but not in other properties by removing [FORM fin] constraint? I could only think of infinitival *to*.

Reading Questions

- I'm curious about why the book chooses to analyze ellipsis through a derivational rule that removes its complements altogether. Since the complements are part of their interpretation, it feels like they are still there even though they are not explicitly pronounced. Wouldn't it be possible to create a rule similar to the Imperative Rule, (where the verb has a second person specifier even though this is never actually pronounced), allowing the auxiliary verb to have unpronounced complements in some situations?

Reading Questions

- Is this chapter's solution for ellipsis designed so that a richer analysis of pragmatics could be combined with it later? Or is it intended to simply cordon off what is (for our purposes) an area of needless complication? (It feels like the latter is the case. Removing complements is a dissatisfactory solution since they would seem to essential to the ellipsis' interpretation. It's hard to imagine, at least for the time being, how this could be extended to account for pragmatic factors in detail.)

Reading Questions

- When we were learning about imperatives, the subject was not explicitly mentioned, but we as humans have learned to understand it as 2nd person. Is this unsaid subject knowledge similar to how we know what the incomplete clause is referencing in ellipisis?

Reading Questions

- The text states that the Inversion Lexical Rule changes the semantic mode from prop to ques. Does this change have any effect on/specify anything about the RESTRs of the OUTPUT of this rule?

Reading Questions

- When we talk about "highest predication," are we referring to first on the RESTR list or just highest on the tree (p. 409, (55)).

Reading Questions

- Does our grammar allow sentences like "Kim isn't not happy"? If yes, would the RESTR list of S has two entries with RELN not?
- Why do the ADV_pol addition and Contraction rules manipulate the INDEX values?

The ADV_{pol}-Addition Lexical Rule

$$
\begin{bmatrix}
\textit{pi-rule} & \\
\text{INPUT} & \left\langle \text{X}\ , \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} & \\ \text{FORM} & \text{fin} \\ \text{POL} & - \\ \text{AUX} & + \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \langle \boxed{1} \rangle \oplus \boxed{\text{A}} \\ \text{SEM} & \begin{bmatrix}\text{INDEX} & s_1\end{bmatrix} \end{bmatrix} \right\rangle \\
\text{OUTPUT} & \left\langle \text{Y}\ , \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix}\text{POL} & +\end{bmatrix} \\ \text{VAL} & \begin{bmatrix}\text{SPR} & \langle \text{Z} \rangle\end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \langle \boxed{1} \rangle \oplus \left\langle \overset{\text{ADV}_{pol}}{\begin{bmatrix} \text{INDEX} & s_2 \\ \text{RESTR} & \left\langle \begin{bmatrix}\text{ARG} & s_1\end{bmatrix} \right\rangle \end{bmatrix}} \right\rangle \oplus \boxed{\text{A}} \\ \text{SEM} & \begin{bmatrix}\text{INDEX} & s_2\end{bmatrix} \end{bmatrix} \right\rangle
\end{bmatrix}
$$

The Contraction Lexical Rule

$$
\begin{bmatrix}
\textit{pi-rule} & \\
\text{INPUT} & \left\langle \boxed{2}\ , \begin{bmatrix}
\text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} & \\ \text{FORM} & \text{fin} \\ \text{AUX} & + \\ \text{POL} & - \end{bmatrix} \end{bmatrix} \\
\text{ARG-ST} & \boxed{\text{B}} \\
\text{SEM} & \begin{bmatrix} \text{INDEX} & s_1 \\ \text{RESTR} & \boxed{\text{A}} \end{bmatrix}
\end{bmatrix} \right\rangle \\
\text{OUTPUT} & \left\langle \text{F}_{NEG}(\boxed{2})\ , \begin{bmatrix}
\text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{POL} & + \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \text{ X } \rangle \end{bmatrix} \end{bmatrix} \\
\text{ARG-ST} & \boxed{\text{B}} \\
\text{SEM} & \begin{bmatrix} \text{INDEX} & s_2 \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{RELN} & \textbf{not} \\ \text{SIT} & s_2 \\ \text{ARG} & s_1 \end{bmatrix} \right\rangle \oplus \boxed{\text{A}} \end{bmatrix}
\end{bmatrix} \right\rangle
\end{bmatrix}
$$

Reading Questions

- The contraction as listed in the NICE properties only accounts for the negative contractions like *don't* and *won't*. I'm curious about contractions as in *I'm curious* or *She's going to the store*. Are we going to address those sorts of contractions?
- I'm also curious about contractions like *'d* for *would* and *'ve* for *have* (AUX +)!
- I was wondering the same thing, plus how we could handle multiple contractions in one word (e.g. *wouldn't've*)

Reading Questions

- I see the statement of a comprehensive treatment of ellipsis would take the book too far afield, but I'm pretty curious about how this grammar can handle ellipsis without some sort of transformational component involving unpronounced parts. It kind of seems like turning the *auxv-lxm* into a *dervv-lxm* is covering up for a transformation. Maybe I'll feel different if we use these lexemes types for other constructions later on.

Reading Questions

- p. 412, it states that the lexemes *be*, *have*, and *do* are subject to the SHAC but that the outputs of the Inversion Lexical Rule are words that do not inherit this constraint. Instead, they are related by the Inversion Lexical Rule to other lexical sequences. Doesn't the reasoning for why these words agree with their complements heavily imply movement in these inverted sentences?

Reading Questions

- Is it true that *dervv-lxm* does not introduce any constraints of its own? *dervv-lxm* seems similar to *siv-lxm*. What is the motivation for having this lexeme type?

Reading Questions

- Exercise 4, p. 417, addresses why we need *dervv-lxm*, and it makes sense why *auxv-lxm* wouldn't work as an output type for Ellipsis LR. However, as mentioned, the *siv-lxm* won't work either because the [AUX -] inherited from verb-lxm can't be overridden by Ellipsis LR. The inability to override the [AUX -] must be due to the fact that Ellipsis LR requires [AUX +]. But why don't we explicitly say it in the rule? Or is it implied in the LR?

Reading Questions

- How does HPSG deal with negative polarity items? E.g
  - **Kim ate any cake.*
  - *Kim did not eat any cake.*
- IIRC from my undergrad MP syntax course, NPIs must be c-commanded by a negative element. Do we have an equivalent principle for this using ARG-ST and Outranking similar to the Binding Principles?