Ling 566
Nov 21, 2017

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

- 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*

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

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

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

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

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

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

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

What is the role of these indices?

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

Which *not*s does the rule license?

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

ADV_{pol}

Andy must <u>not</u> have been sleeping? ✓

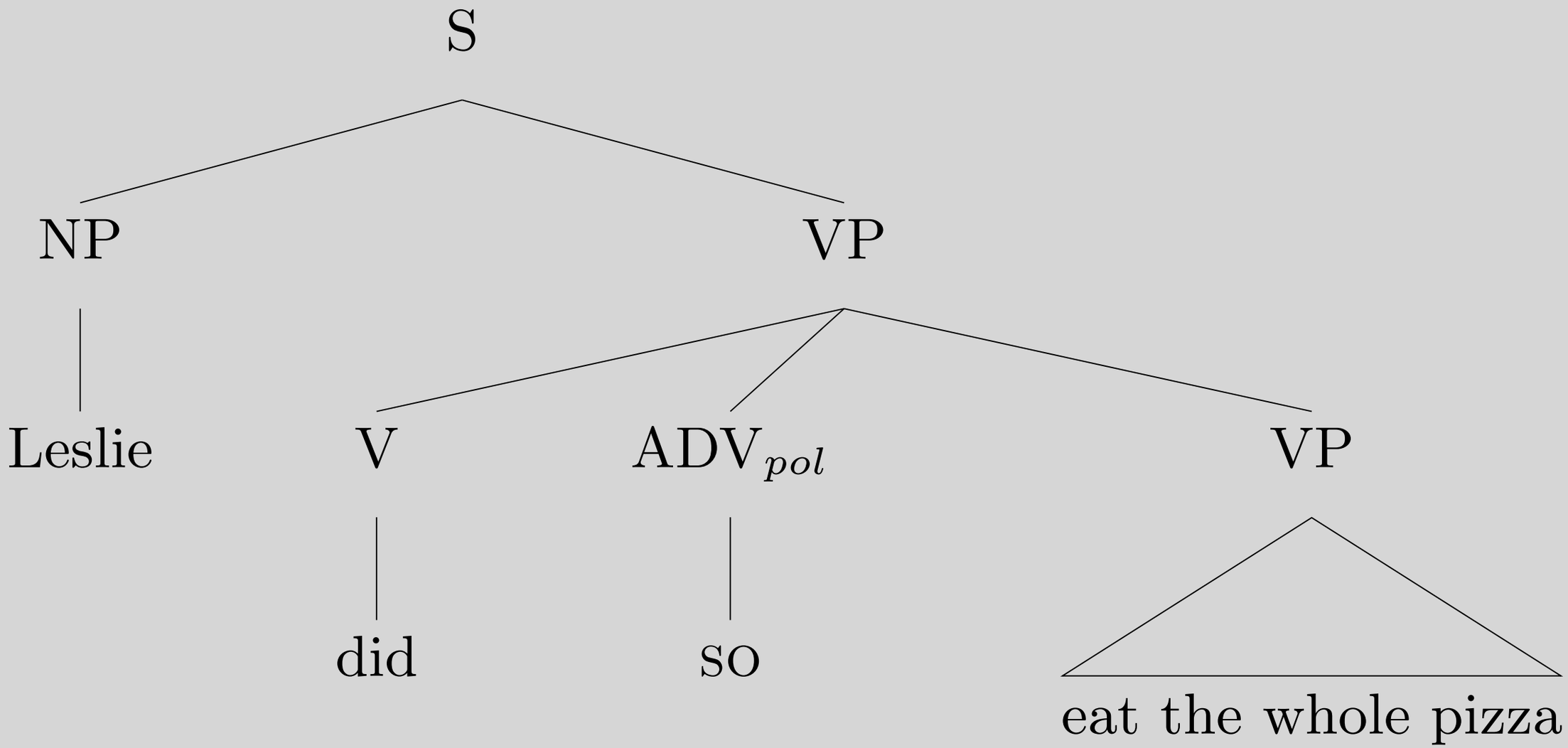
Andy must have <u>not</u> been sleeping? ✗

Andy must have been <u>not</u> sleeping? ✗

Kleptomaniacs can<u>not</u> not steal. ✓

Kleptomaniacs cannot <u>not</u> 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

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

How the Rule Yields Inverted Order

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

...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')

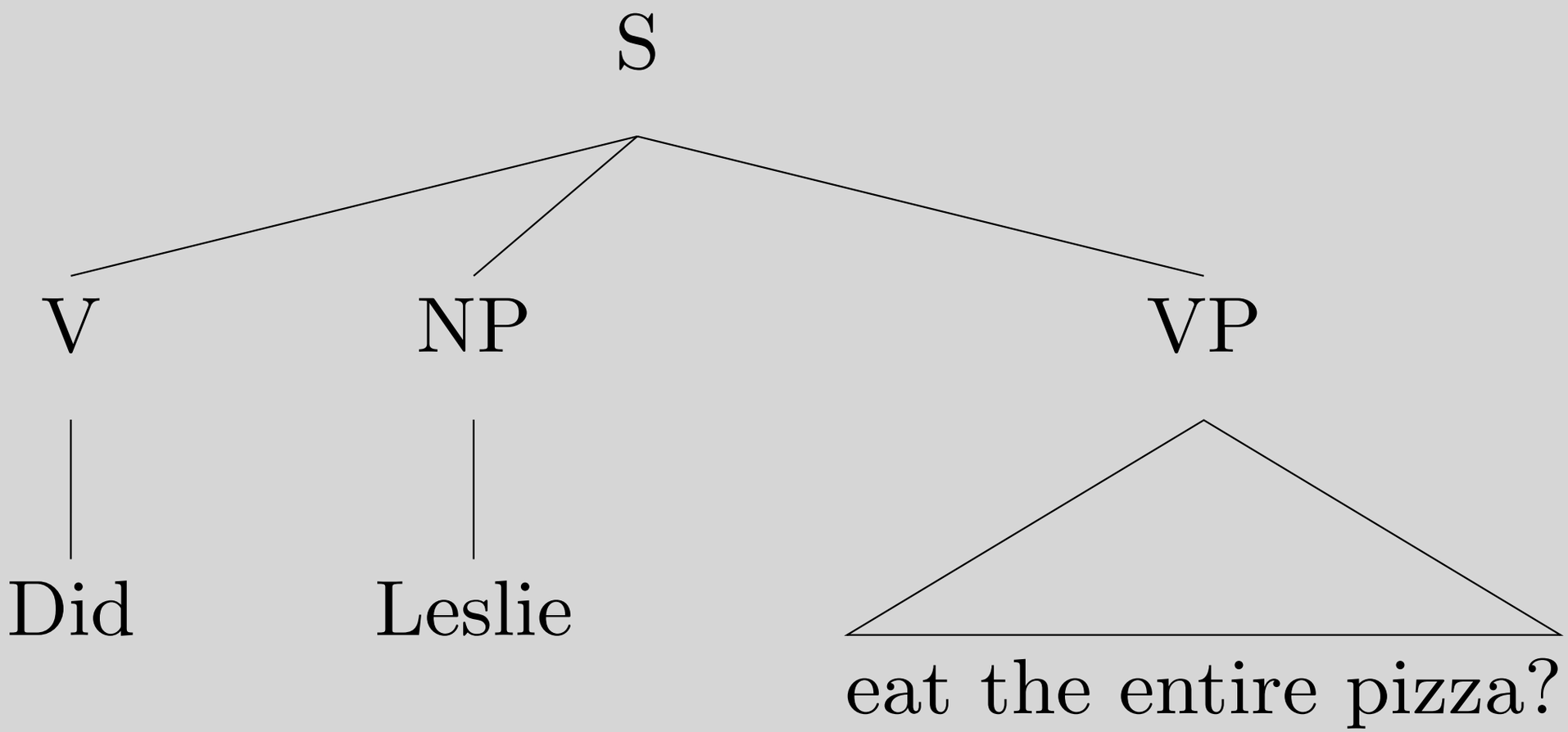
Other Cases of Inversion

- 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

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

Most of the work is in the semantics

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

Why?

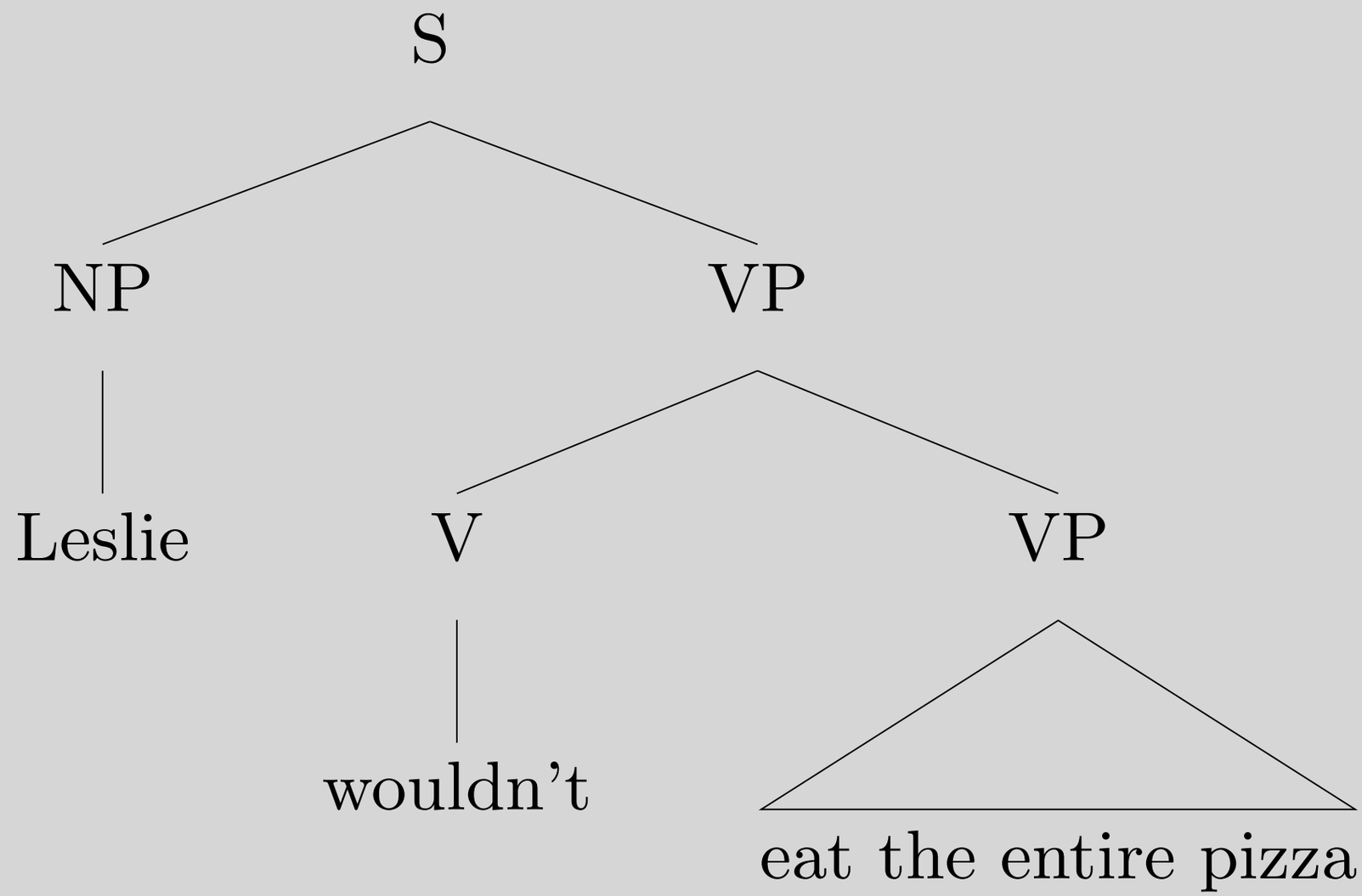
What does POL do?

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

**We can'tn't stop*

**They won't TOO mind*

Contraction: Sample Tree



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

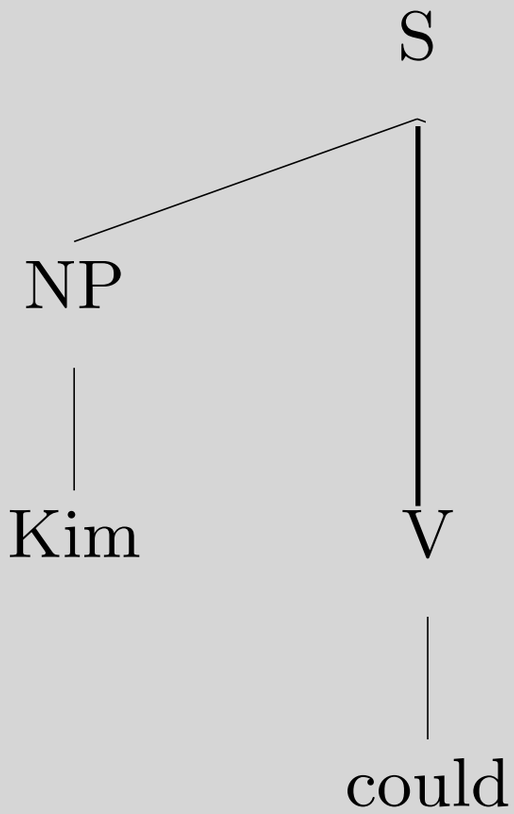
$$\left[\begin{array}{l} \textit{d-rule} \\ \text{INPUT} \quad \left\langle \boxed{1}, \left[\begin{array}{l} \textit{auxv-lxm} \\ \text{ARG-ST} \quad \langle\, \boxed{2} \,\rangle \;\oplus\; \boxed{\text{A}} \end{array}\right] \right\rangle \\ \text{OUTPUT} \quad \left\langle \boxed{1}, \left[\begin{array}{l} \textit{dervv-lxm} \\ \text{ARG-ST} \quad \langle\, \boxed{2} \,\rangle \end{array}\right] \right\rangle \end{array}\right]$$

- Note that this is a derivational LR (*d-rule*) -- that is, lexeme-to-lexeme
- This means that SYN and SEM are unchanged, by default

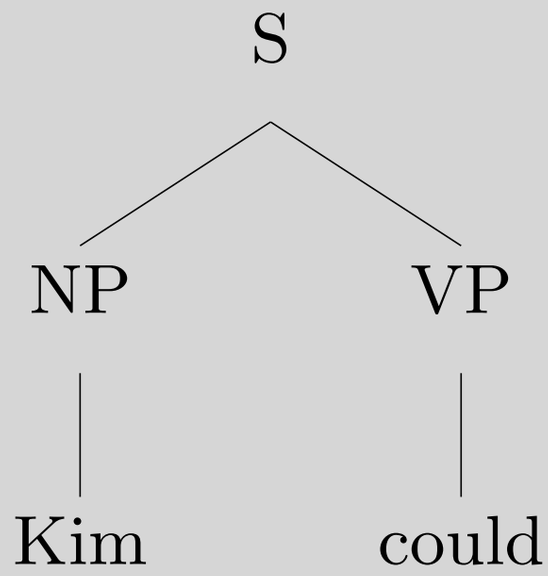
Ellipsis: A Sample Output

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

Ellipsis: A Sample Tree



Semantics of Ellipsis



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

But first

- Be sure to make use of answer keys
- Thanksgiving game: Bagels, Kim likes.
  - (Oh and: no class Thursday, HW7 due on 12/1.)

Reading Questions

- Is negation in a sentence applied to only the head verb per se and/or to the semantical situation of the verb? Since the negation indicator not has its individual semantical role, how to account for the semantics of sentences that are paraphrase of each other where negation appears to be applied to the predicate (adjective): *This sentence is not grammatical*. ~= *This sentence is ungrammatical*.

Reading Questions

- Why don't we handle contractions like we did the possessive *'s*? That is, we can just treat *n't* as it's own word that's semantically identical to *not*. Is it because only certain auxiliaries can contract?
- Do we treat other contractions the same way?

Reading Questions

- How do we get these predictions right?

(63) a. Will there be children in the audience?
b.*Will there win the game?
c. Has it annoyed people that dogs bark?
d. Are tabs kept on all linguists by the FBI?
e.*Are tabs taken on all linguists by the FBI?
f. Was advantage taken of the opportunity by students?
g.*Was advantage kept of the opportunity by students?
h. Did it continue to annoy people that nobody listened?
i.*Did it try to annoy people that nobody listened?

Reading Questions

- I'm having trouble understanding the bit on pg 407, "As a result, the inherited defeasible identity constraints 'push down' to identify the values of all other features within HEAD and SEM whose values are not specified as incompatible." Does this just mean that when we look at the inherited constraints on an output word, that they will all fill in as long as they are not "defeased"?

Reading Questions

- I was not super satisfied with the reason for the new *dervv-lxm*. In the past we've made various things defeasible to accommodate special phenomena...why is this necessary in this case?

Reading Questions

Problem 4: Negation and Inversion

Our ADV$_{pol}$-Addition and Inversion Lexical Rules can interact to allow us to generate negative questions.

A. Which of the following sentences will be licensed by our rules so far? [*Hint: Figure out what the ARG-ST value of has would have to be in each case, and then decide which of those is a possible ARG-ST given our rules and the lexical entry for have.*]
   (i) Has Pat not been sleeping?
   (ii) Has not Pat been sleeping?

B. Are these predictions of the grammar correct, according to your intuitions about the language?

In parts (C)-(E), be explicit about the effect of the lexical rules on the ARG-ST of *has* and on how this interacts with the grammar rules.

C. How does the grammar rule out the sentence it rules out?

D. How does the grammar license the sentence it licenses?

E. Does the grammar license sentence (iii)? Why or why not?
   (iii) Hasn't Pat been sleeping?