

Ling 566

Nov 22, 2016

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?

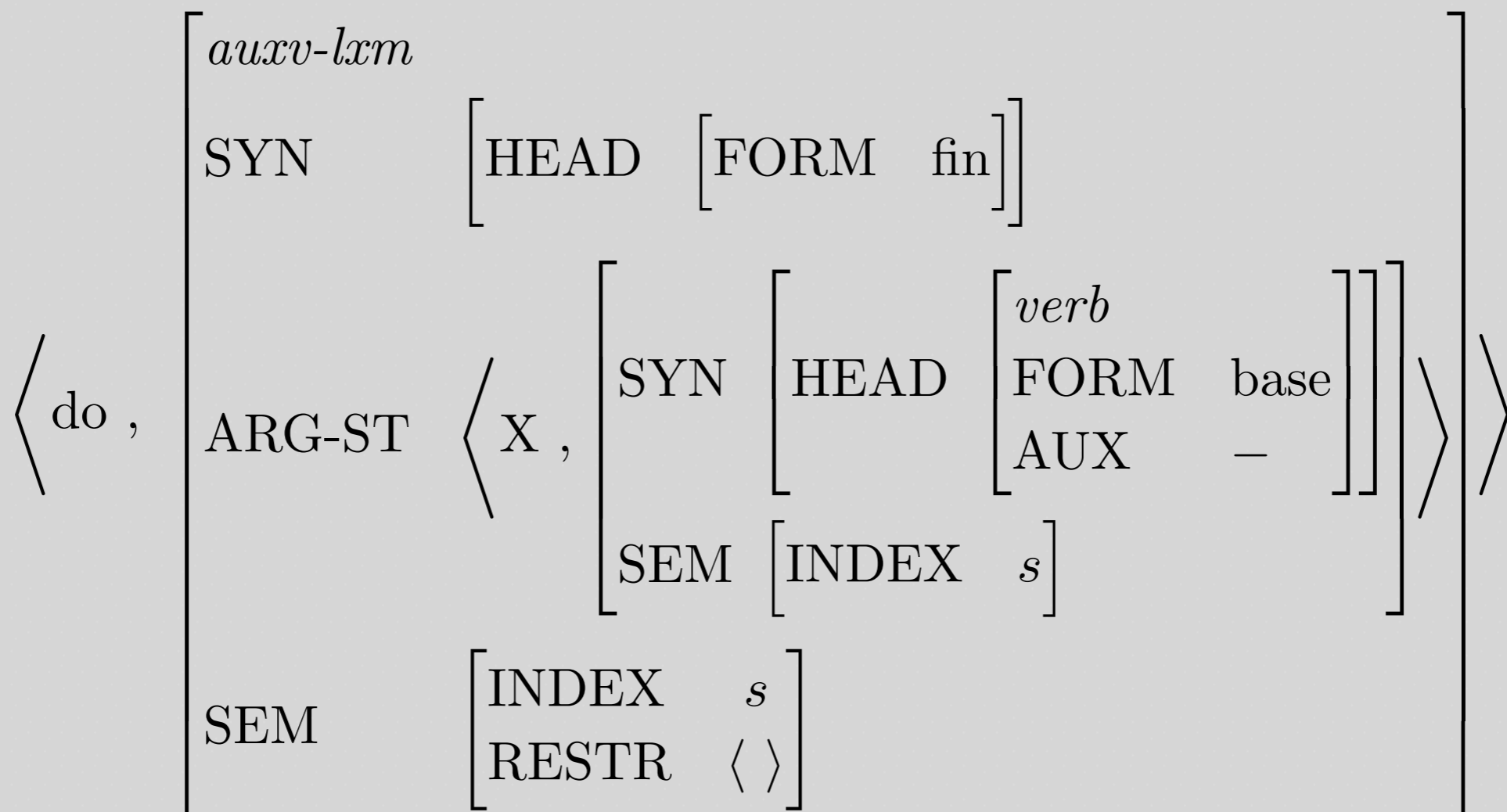
Pat left

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*



The ADV_{pol} -Addition Lexical Rule

$$\left[\begin{array}{l} \textit{pi-rule} \\ \\ \\ \end{array} \right]$$

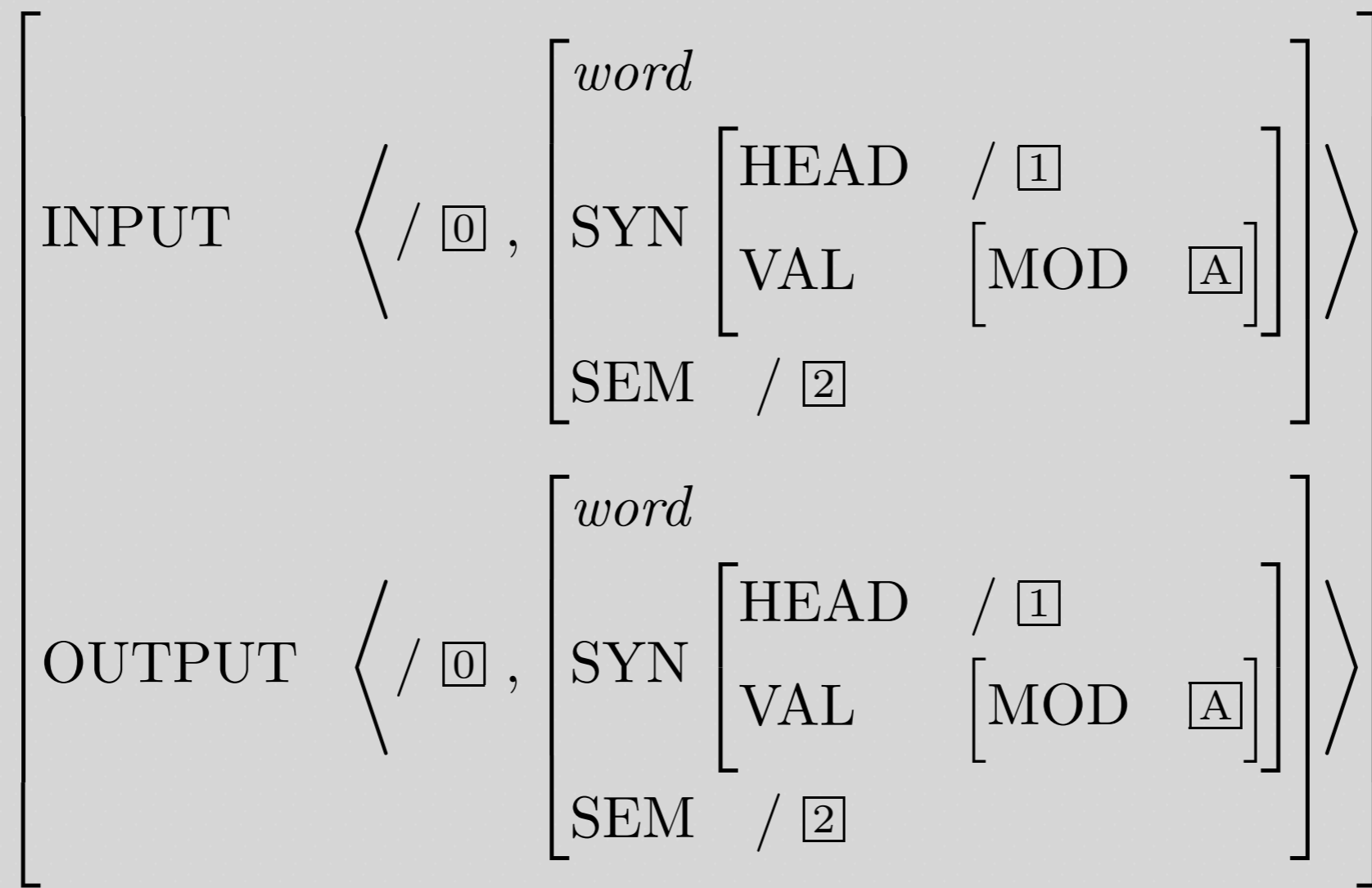
$$\left[\begin{array}{l} \text{INPUT} \\ \\ \text{OUTPUT} \end{array} \right]$$

$$\left\langle X, \left[\begin{array}{l} \text{SYN} \left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \textit{verb} \\ \text{FORM} \quad \textit{fin} \\ \text{POL} \quad - \\ \text{AUX} \quad + \end{array} \right] \right] \\ \text{ARG-ST} \quad \langle \boxed{1} \rangle \oplus \boxed{A} \\ \text{SEM} \quad \left[\text{INDEX} \quad s_1 \right] \end{array} \right] \right\rangle$$

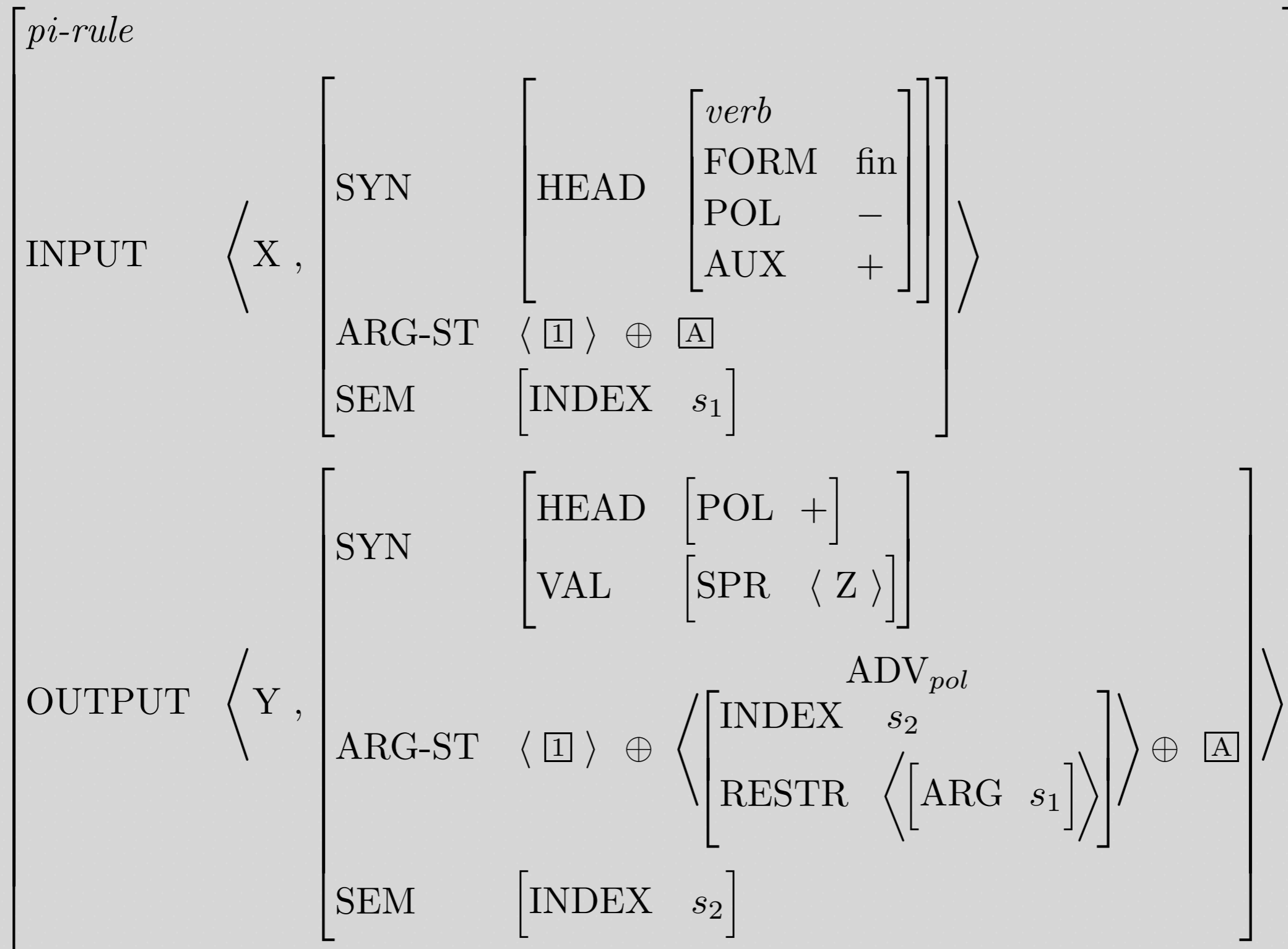
$$\left\langle Y, \left[\begin{array}{l} \text{SYN} \left[\begin{array}{l} \text{HEAD} \left[\text{POL} \quad + \right] \\ \text{VAL} \quad \left[\text{SPR} \quad \langle Z \rangle \right] \end{array} \right] \\ \text{ARG-ST} \quad \langle \boxed{1} \rangle \oplus \left\langle \begin{array}{l} \text{INDEX} \quad s_2 \\ \text{RESTR} \quad \left\langle \left[\text{ARG} \quad s_1 \right] \right\rangle \end{array} \right\rangle \oplus \boxed{A} \\ \text{SEM} \quad \left[\text{INDEX} \quad s_2 \right] \end{array} \right] \right\rangle$$

What does the type *pi-rule* mean?

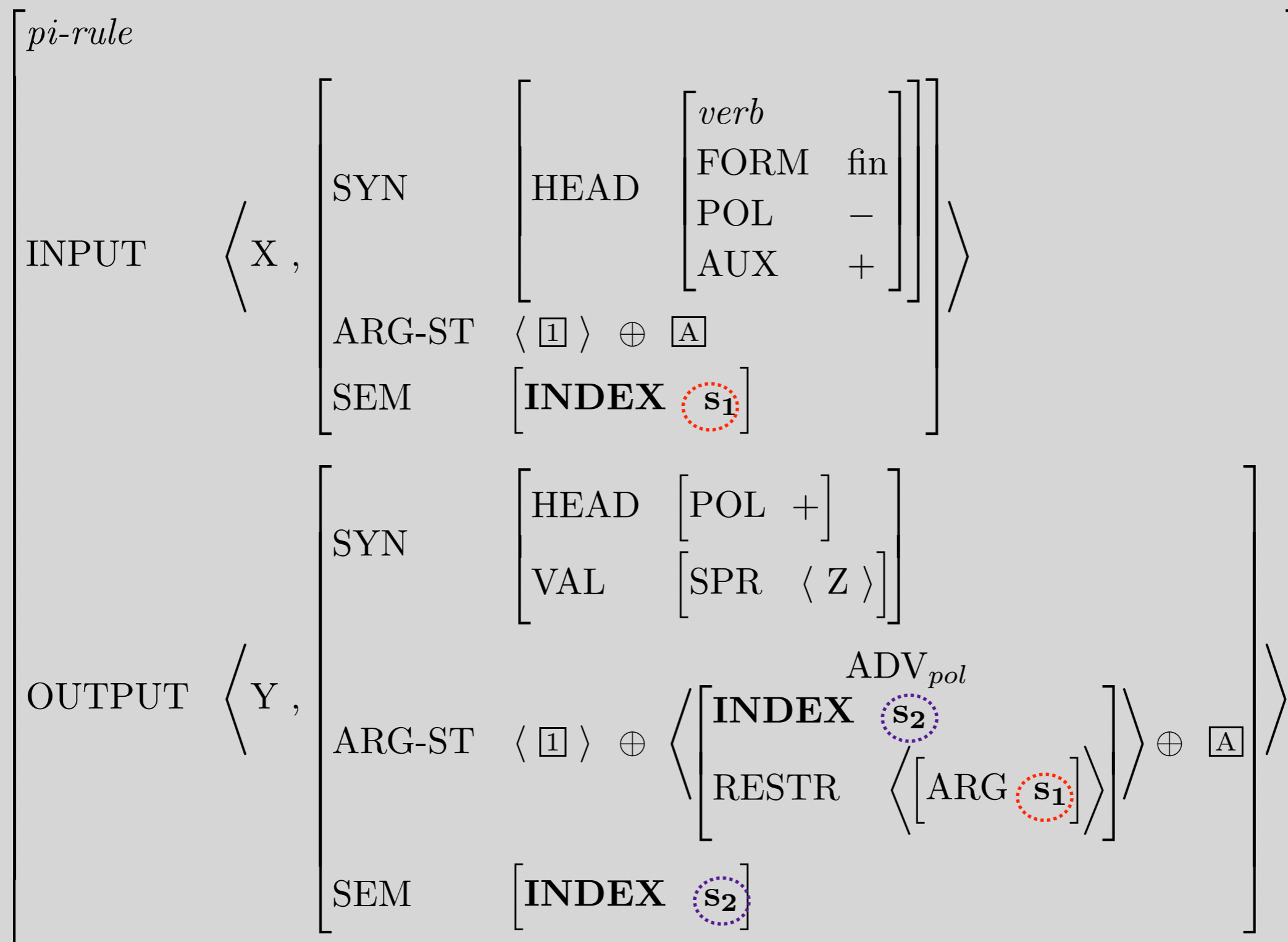
- It maps words to words (hence, “post-inflectional”)
- It preserves MOD values, HEAD values as a default, and (like other lexical rule types) SEM values as a default



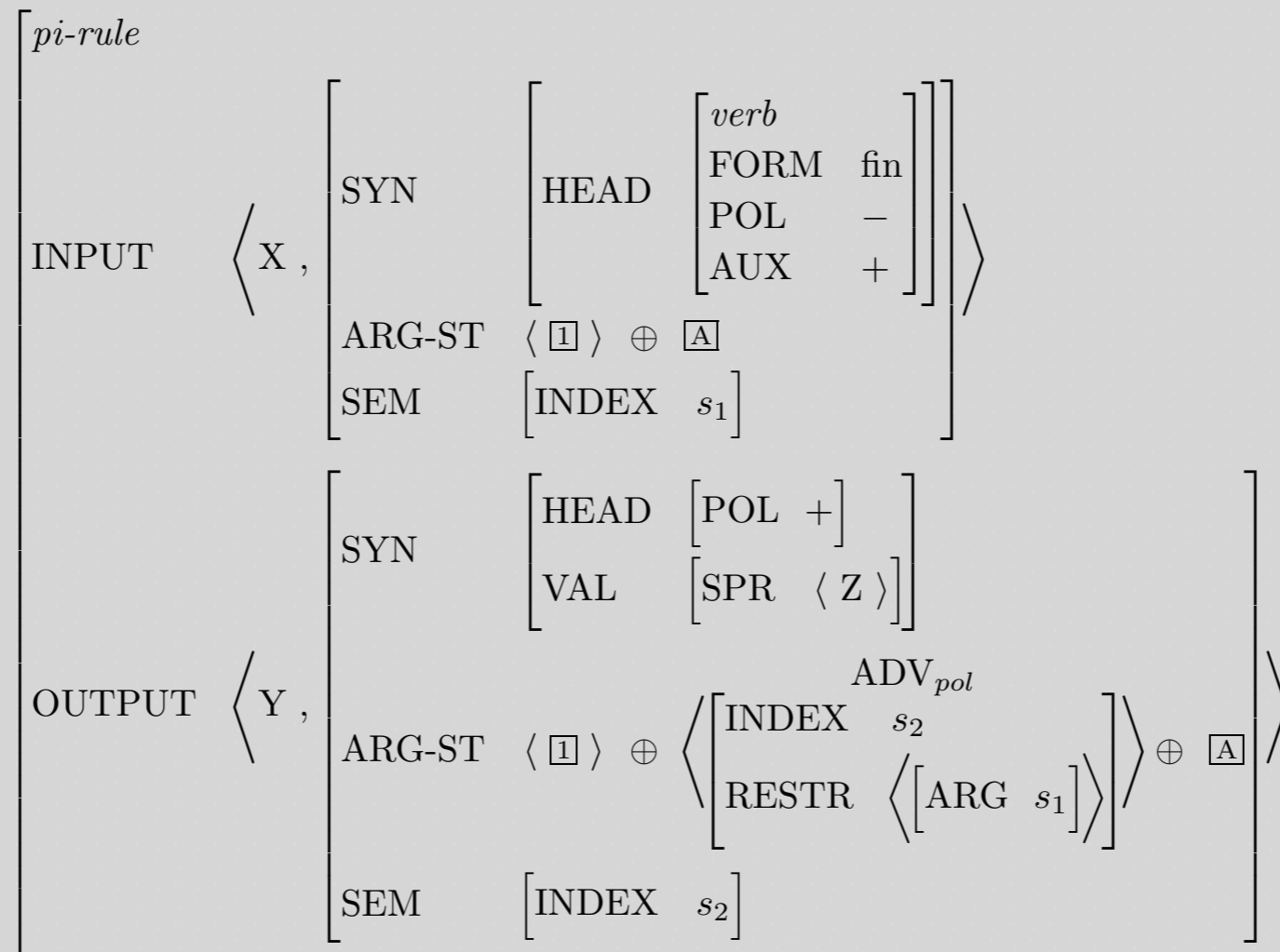
Why doesn't ADV_{pol} -Addition LR mention VAL?



What is the role of these indices?



Which *nots* does the rule license?



Andy must not have been sleeping?



Andy must have not been sleeping?



Andy must have been not sleeping?



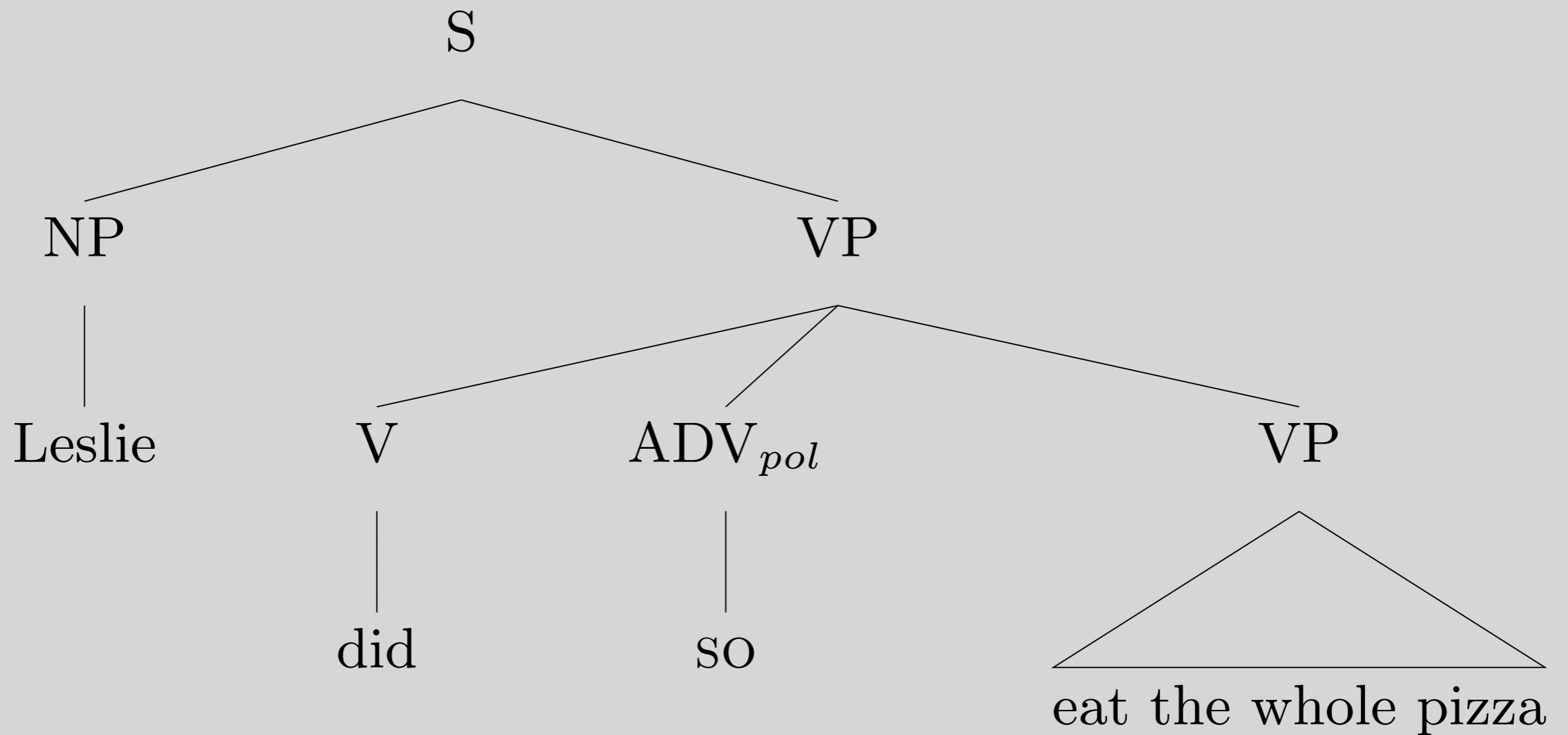
Kleptomaniacs cannot not steal.



Kleptomaniacs cannot not steal.



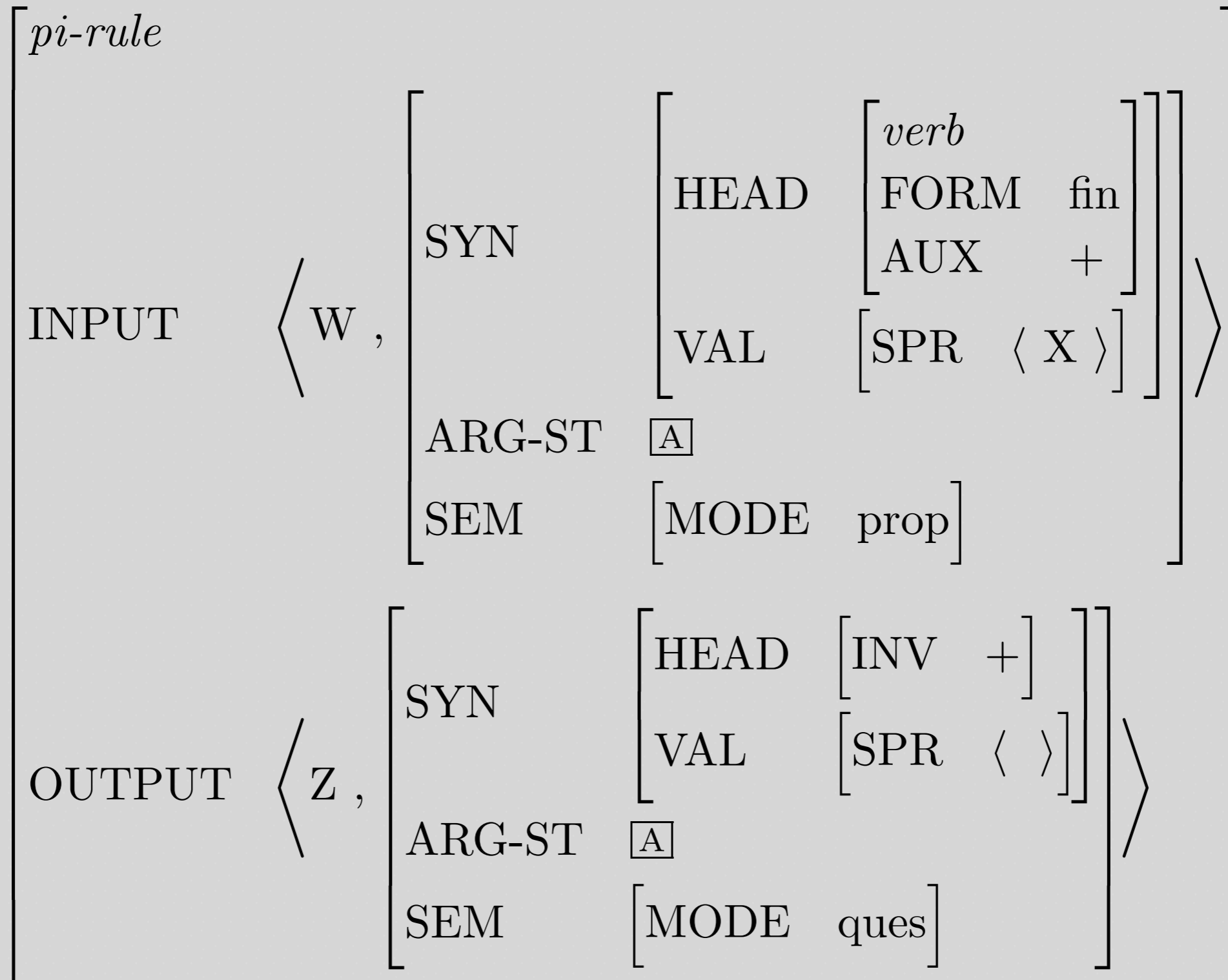
Negation and Reaffirmation: A Sample Tree



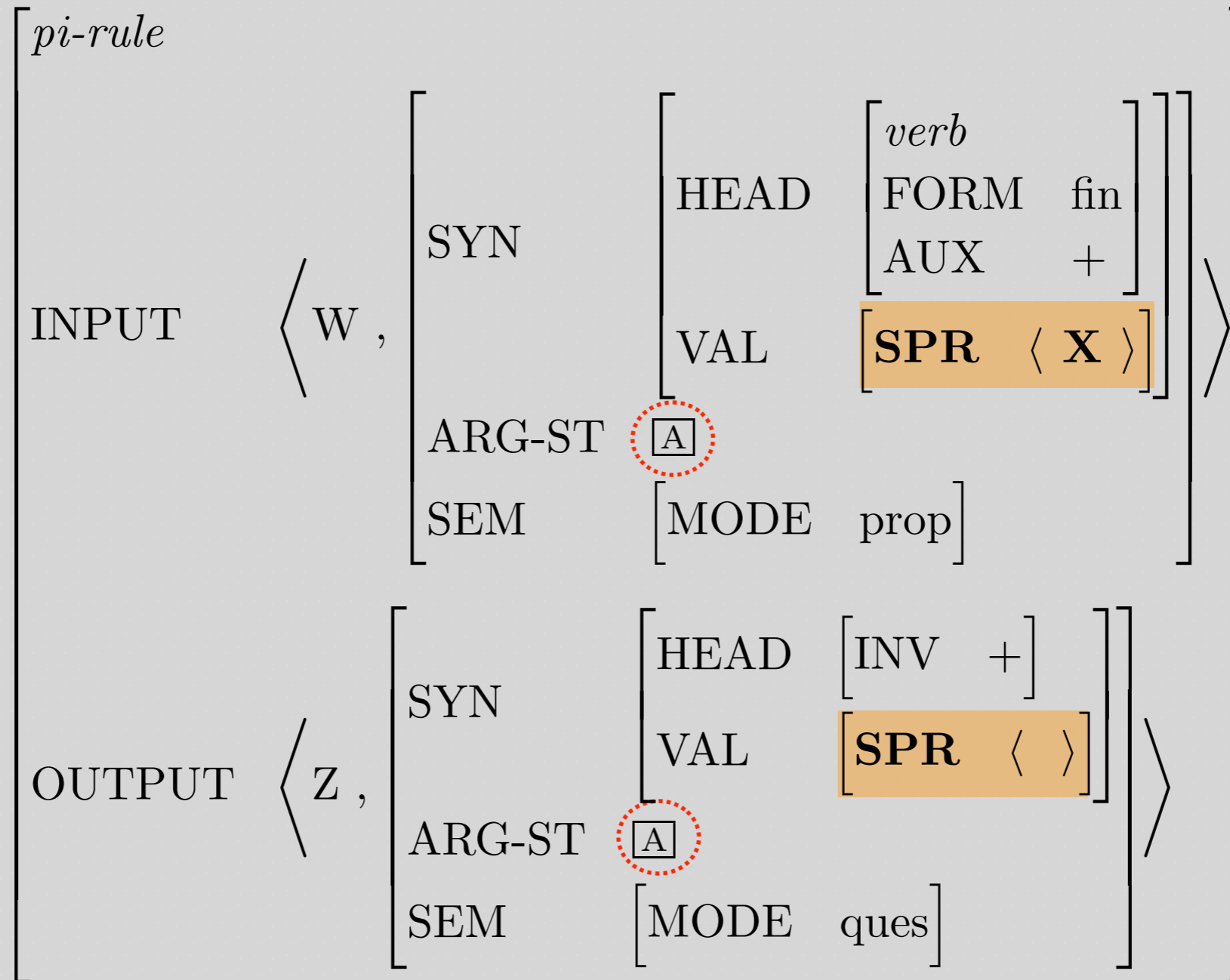
Inversion

- 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



How the Rule Yields Inverted Order



...plus the ARP

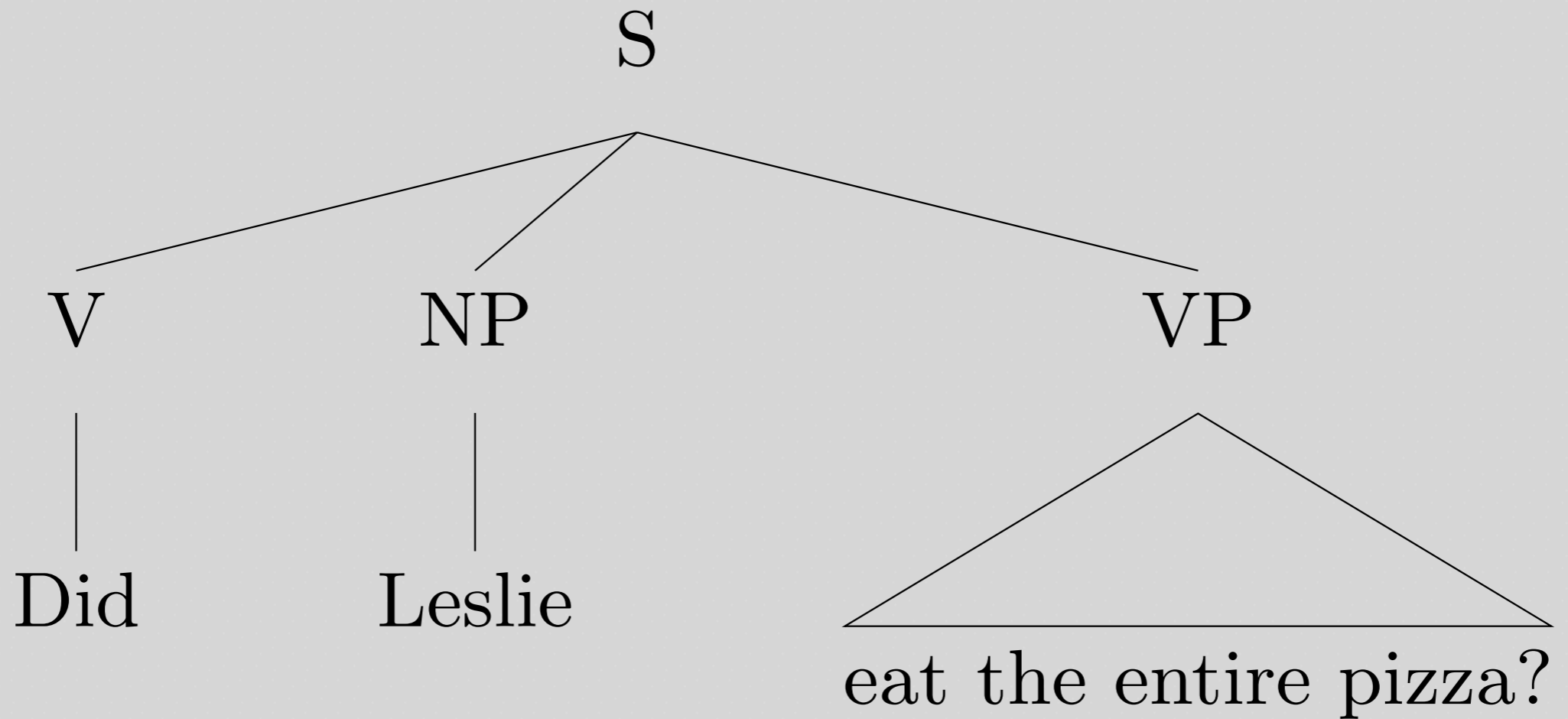
The Feature INV

- What is the INV value of inputs to the Inversion LR?
 - Perhaps surprisingly, the input is [INV +]
 - Word-to-word rules (*pi-rules*) 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.

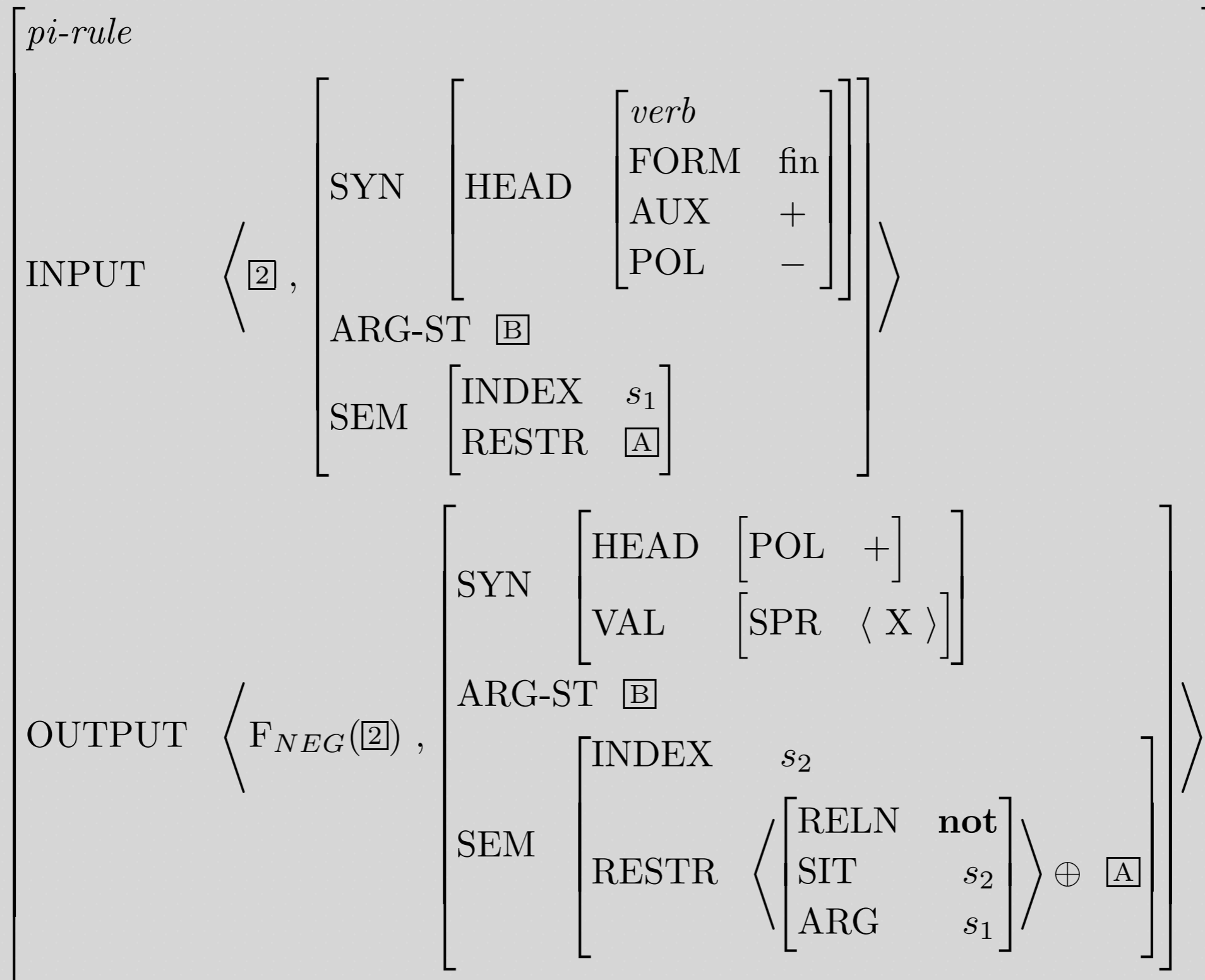
Inversion: A Sample Tree



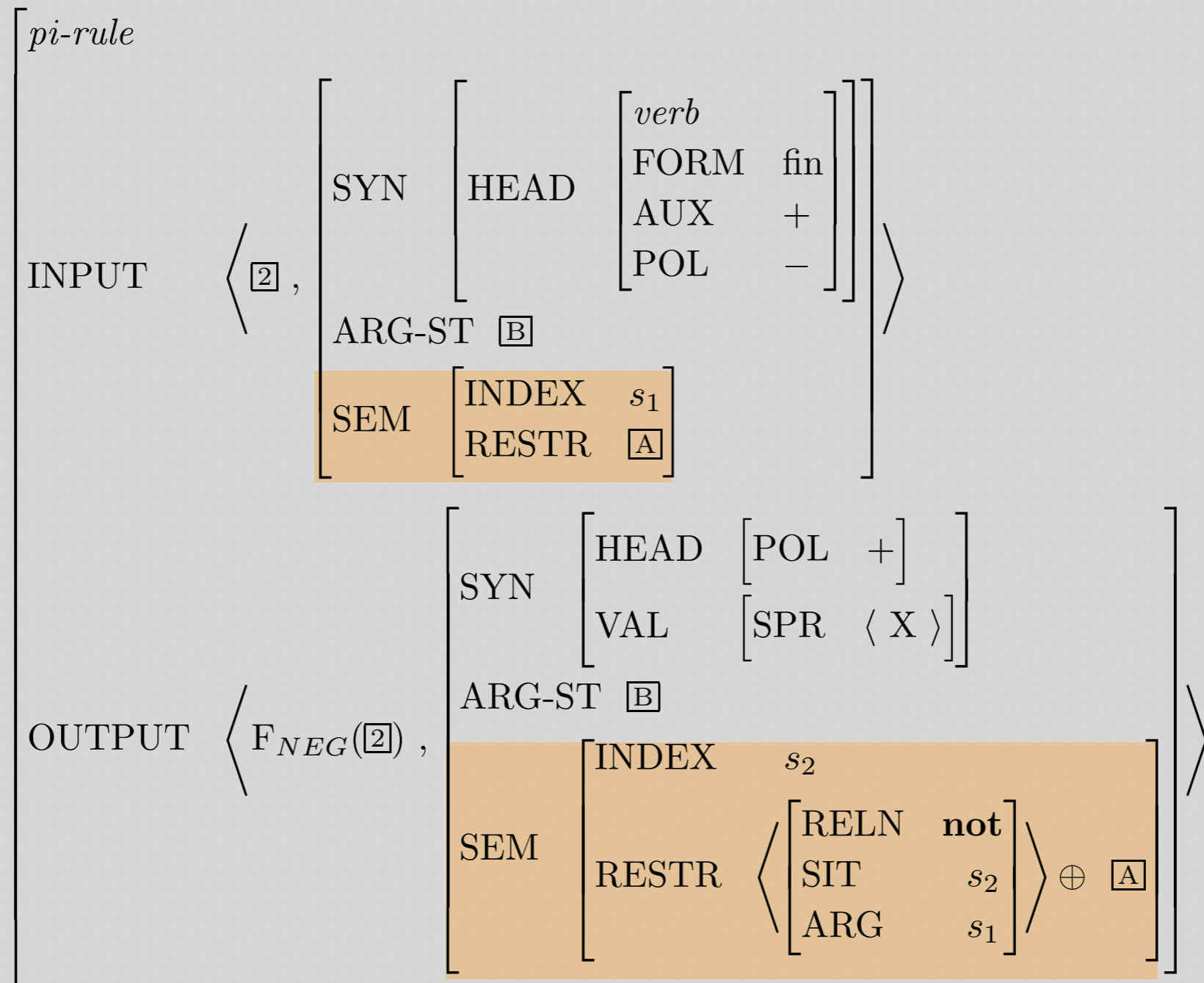
Contraction

- 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

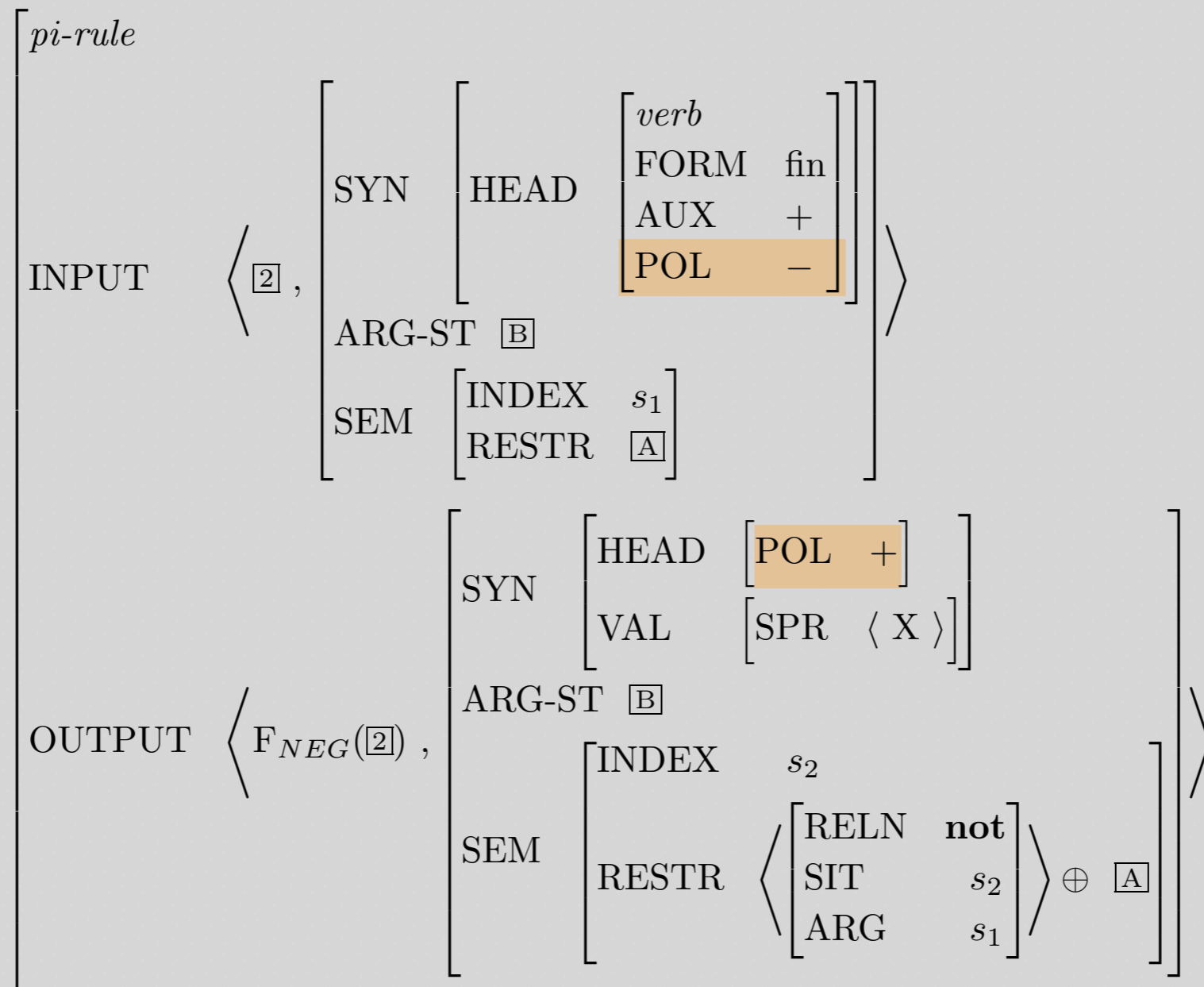


Most of the work is in the semantics



Why?

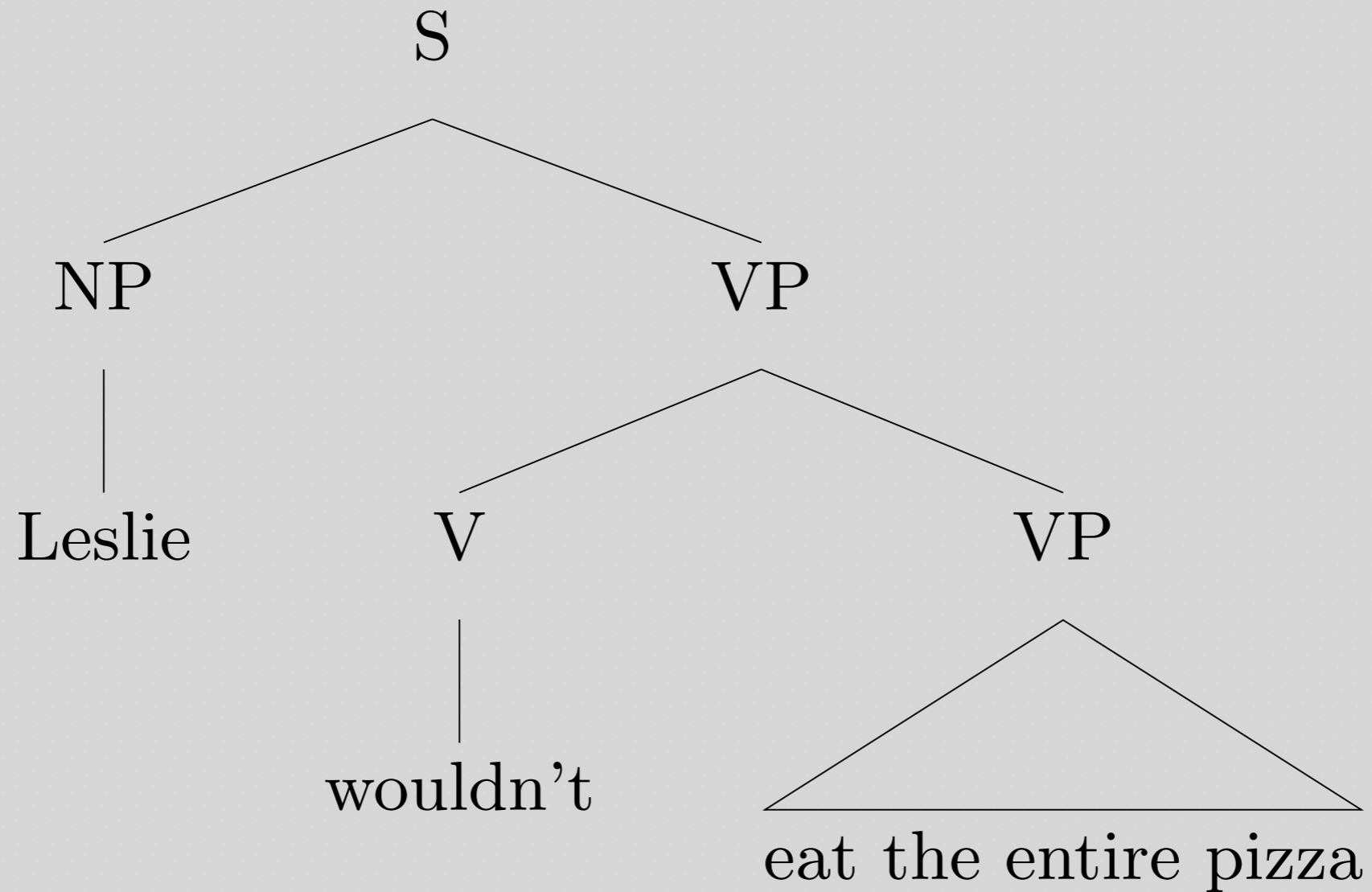
What does POL do?



**We can'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?

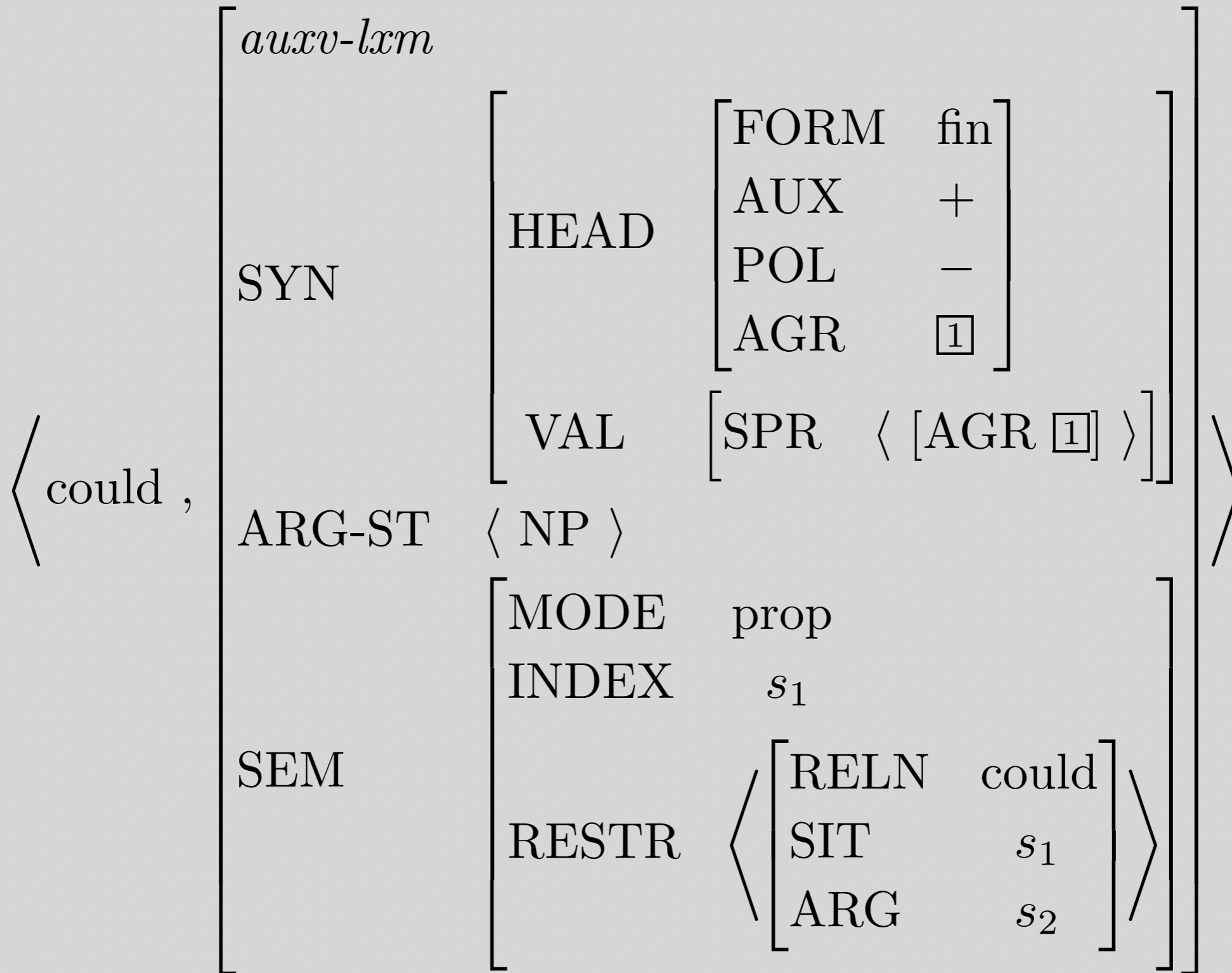
Whenever Pat watches TV, Chris watches TV
Whenever Pat watches TV, Chris does

The Ellipsis Lexical Rule

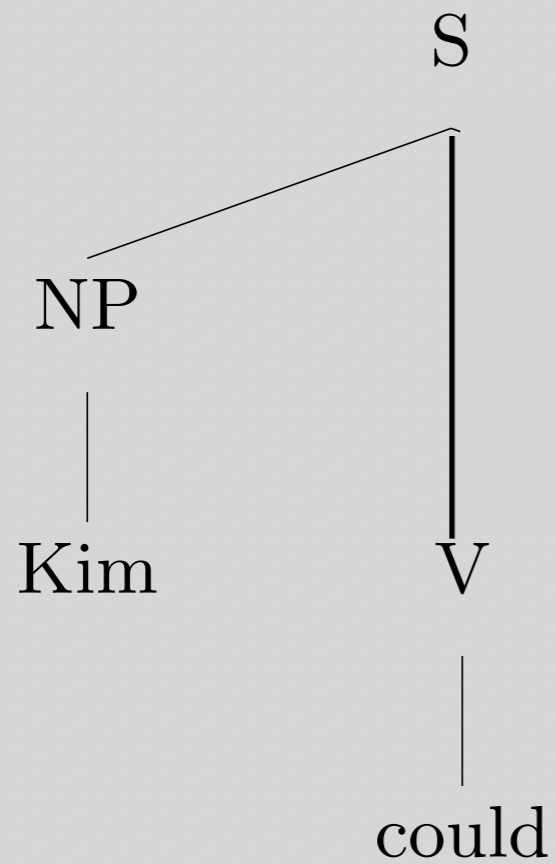
$$\left[\begin{array}{l}
 \text{INPUT} \\
 \text{OUTPUT}
 \end{array} \right. \begin{array}{l}
 \left\langle \boxed{1}, \left[\begin{array}{l}
 \text{auxv-lxm} \\
 \text{ARG-ST} \langle \boxed{2} \rangle \oplus \boxed{A}
 \end{array} \right] \right\rangle \\
 \left\langle \boxed{1}, \left[\begin{array}{l}
 \text{deriv-lxm} \\
 \text{ARG-ST} \langle \boxed{2} \rangle
 \end{array} \right] \right\rangle
 \end{array} \left. \right]$$

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

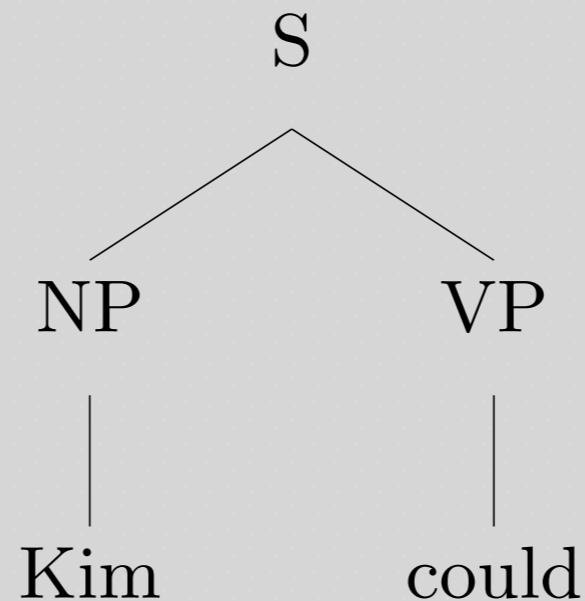
Ellipsis: A Sample Output



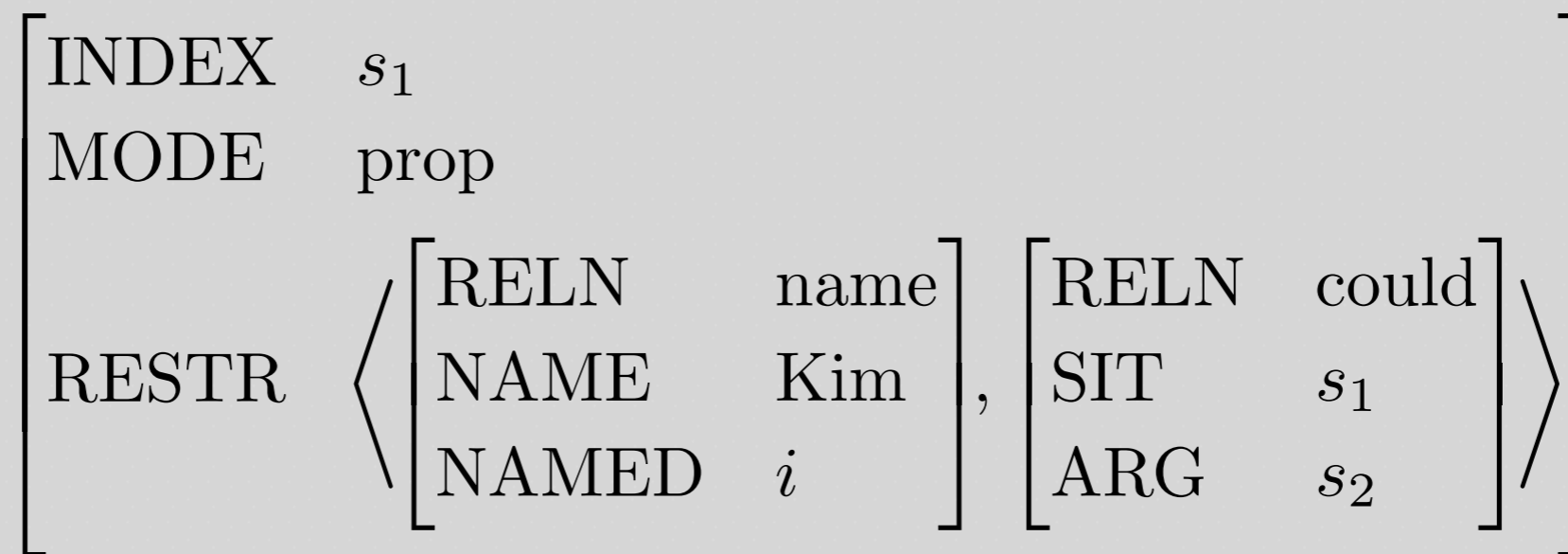
Ellipsis: A Sample Tree



Semantics of Ellipsis



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



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

- Midterms returned
- Be sure to make use of answer keys
- Thanksgiving game: Bagels, Kim likes.

Reading Questions

- Why do we classify aux verbs that do not have any inflection (such as *could* and *will*) as *verb-lxm* rather than *const-lxm*?
- Why is *better* an auxiliary?
- To account for semantic difference after inversion for aux verbs like *Shall* on p414, what would be the difference in semantics for those two lexical entries with different INV value? Do they also show semantic difference when the sentence is in the normal order (proposition)?

Reading Questions

- This raised questions for me about how semimodals would be formalized: *ought*, for example, doesn't inflect but takes an infinitive as a complement instead of a bare base form. I'm not really sure inverting it sounds right. Its negation can appear in contracted form. It can undergo ellipsis, but keeps the *to* (---*Who should drive?* --*Well, I think Steve ought to.*)

Reading Questions

- Do we want to classify rules as *d-rules* or *i-rules* whenever possible? I'm curious why all these rules are *pi-rules* except for the Ellipsis Lexical Rule, since it seems like the *pi-rule* type could have applied here too. Is there a preference for using the more constrained type because it saves you rewriting information in the statement of the rule? Does calling a rule a *d-rule* or a *pi-rule* actually imply any theoretical claims?

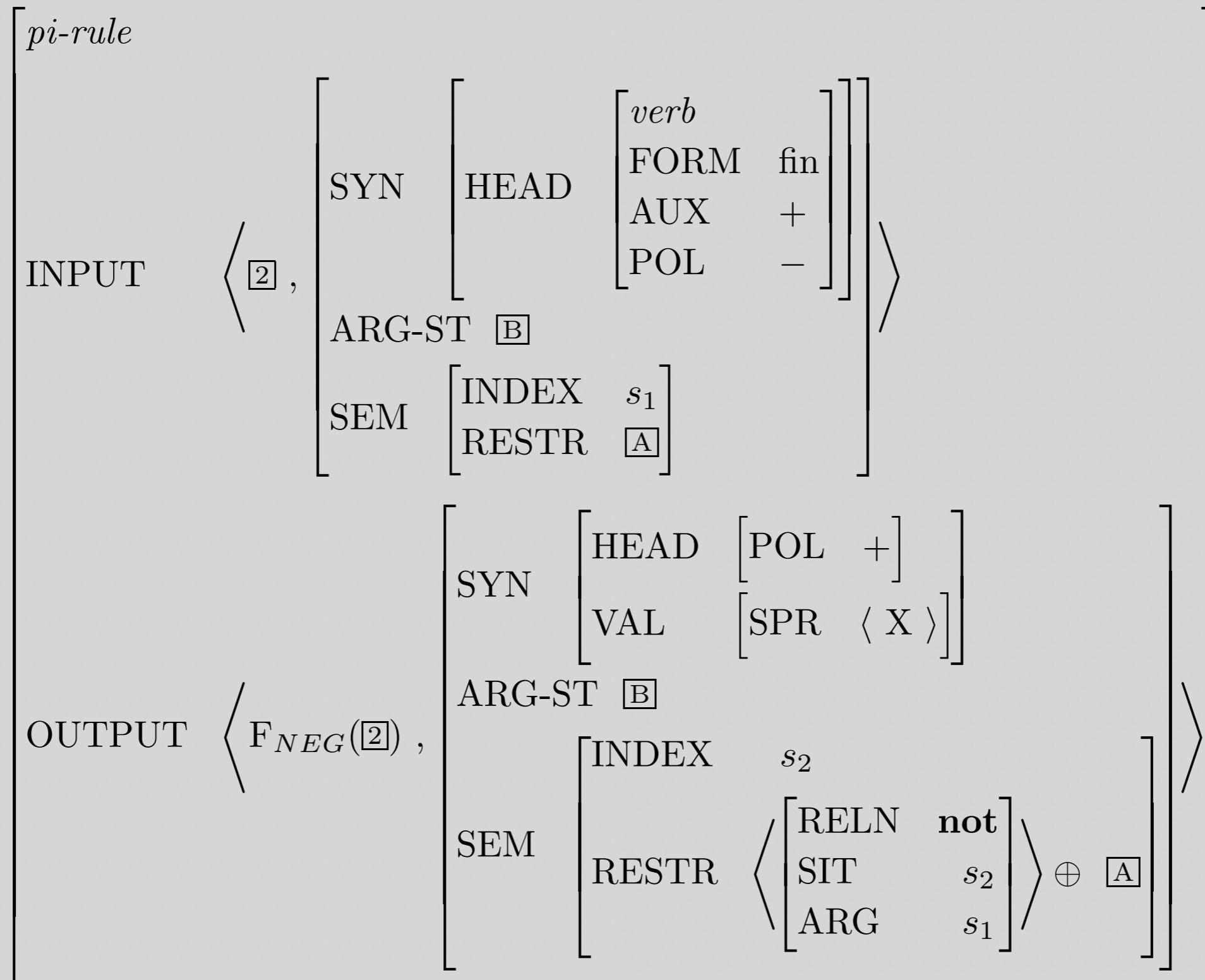
Reading Questions

- The collection of constraints on *pi-rule* seems sort of random to me, particularly identifying the MOD list between input and output. Why are these particular constraints put on the *pi-rule* type?

Reading Questions

- When introducing contraction, the books says that there are exceptions, such as **amn't* and **mayn't*. This rule seems to me to overproduce, unless F_NEG("am") produces *am not*.
- What in the Contraction Lexical Rule blocks forms like *amn't* and *mayn't*? Is it just that the morphological function not having an entry for those words makes them fail to pass through the rule? How does that work when the morphological function is on the OUTPUT side, rather than restricting the INPUT side?

The Contraction Lexical Rule



Reading Questions

- In figure (51) on page 406, in the OUTPUT, Why is the SPR value Z? Why does the rule even have to mention the specifier? The specifier doesn't change, and all of the moving around of arguments is done in ARG-ST.

Reading Questions

- When not follows an auxiliary, can we assume that is is always an instance of sentence negation?
- Since the polarity markers we're concerned with here are ones with a certain syntactic role, would we consider reaffirming adverbs like *indeed* and *absolutely*, or even *of course*, to ever act as truly polar adverbs (e.g., *Pat would indeed have left*), even though they can also behave more like sentential adverbs (e.g., *Indeed, Pat would have left*) -- and would we then just have multiple entries for these different roles?

Reading Questions

- If negation can be indicated by both the feature POL+/- (in the form of *not*), as well as through contractions (*n't*) what (in the grammar) governs which one appears where?
- How do we handle cases as given in (43)?
 - *Sandy did NOT SO write that.
 - *Sandy did NOT TOO write that.

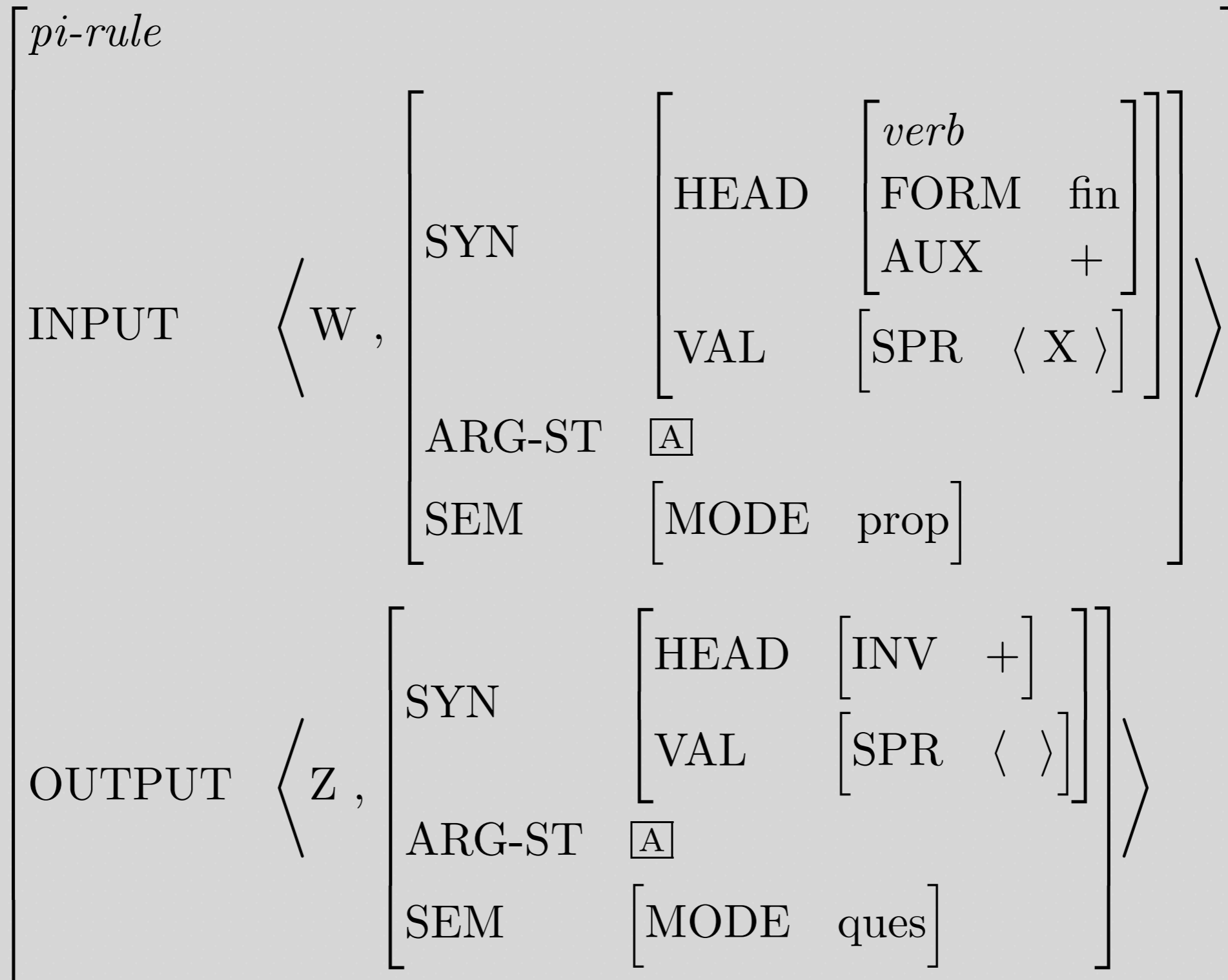
Reading Questions

- Also, I don't really get how sentences like *Leslie did SO not go to the party* are constituent negation rather than sentential negation. Is it just the addition of *SO* that makes it become constituent negation?

Reading Questions

- Intuitively, I feel that the Inversion Rule's input should be a sentence, not a word. Can you explain the reasoning behind choosing a *pi-rule* instead of a sentence rule (that doesn't exist in the grammar fragment)?
- p413 addresses how what would be the V SPR is now the first item on COMPS. How is it that we make the now COMPS still function as the subject of the V?

The Inversion Lexical Rule



Reading Questions

- Why is the ellipsis rule a *d-rule*?
- Does the ellipsis lexical rule work any differently for elliptical counterparts to sentences without an auxiliary? For example:
(i) *Their son eats dinner at five, and the dog eats dinner at five.* (ii) *Their son eats dinner at five, and the dog does too.* What ensures *do* has the appropriate tense?
- How are we handling the semantics of ellipsis?

The Ellipsis Lexical Rule

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

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

Reading Questions

- The ellipsis rule shows the deletion of the boxed A after the ARG-ST of the input. Does this mean that ellipsis can only ever remove the last argument on the ARG-ST?
- Why do we need *dervv-lxm*?

Reading Questions

- It seems like the context of a sentence also contributes to whether or not it's grammatical. Is that correct? If it is, do we have a way to model that?
- *You couldn't have lifted the heavy weight.*
- *Could too. / *Could.*

Reading Questions

- *You couldn't have lifted the heavy weight.*
- *Could too.*
- *Could not.*
- *Could.*
- Also:
 - *What would you like with that?*
 - *Gravy.*

Reading Questions

- Is *is* in *Kim isn't a doctor* really semantically empty?
- When grammar engineers look for examples of grammatical vs ungrammatical sentences to help them design rules (e.g., the SO/TOO examples in this chapter) do they usually just rely on their own knowledge of the language? Are there empirical methods that make the process easier, like mining a corpus for usage examples?