

Ling 566

Nov 21, 2023

Auxiliaries cont: NICE

Overview

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

Midterm comments

- No tiny font. Please.
- No extra features. Please.
- Read all instructions and give only what's requested.
- Check your work: What rule licenses each node?
- Check your work: Do your trees match?

Midterm comments

- In a chain of identities problem, the SCP is never the answer.
- “What rules and principles constrain this PER value?” (i.e. [PER 2nd] on *show*)

Overview

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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

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W 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

Total Results: 0

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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?

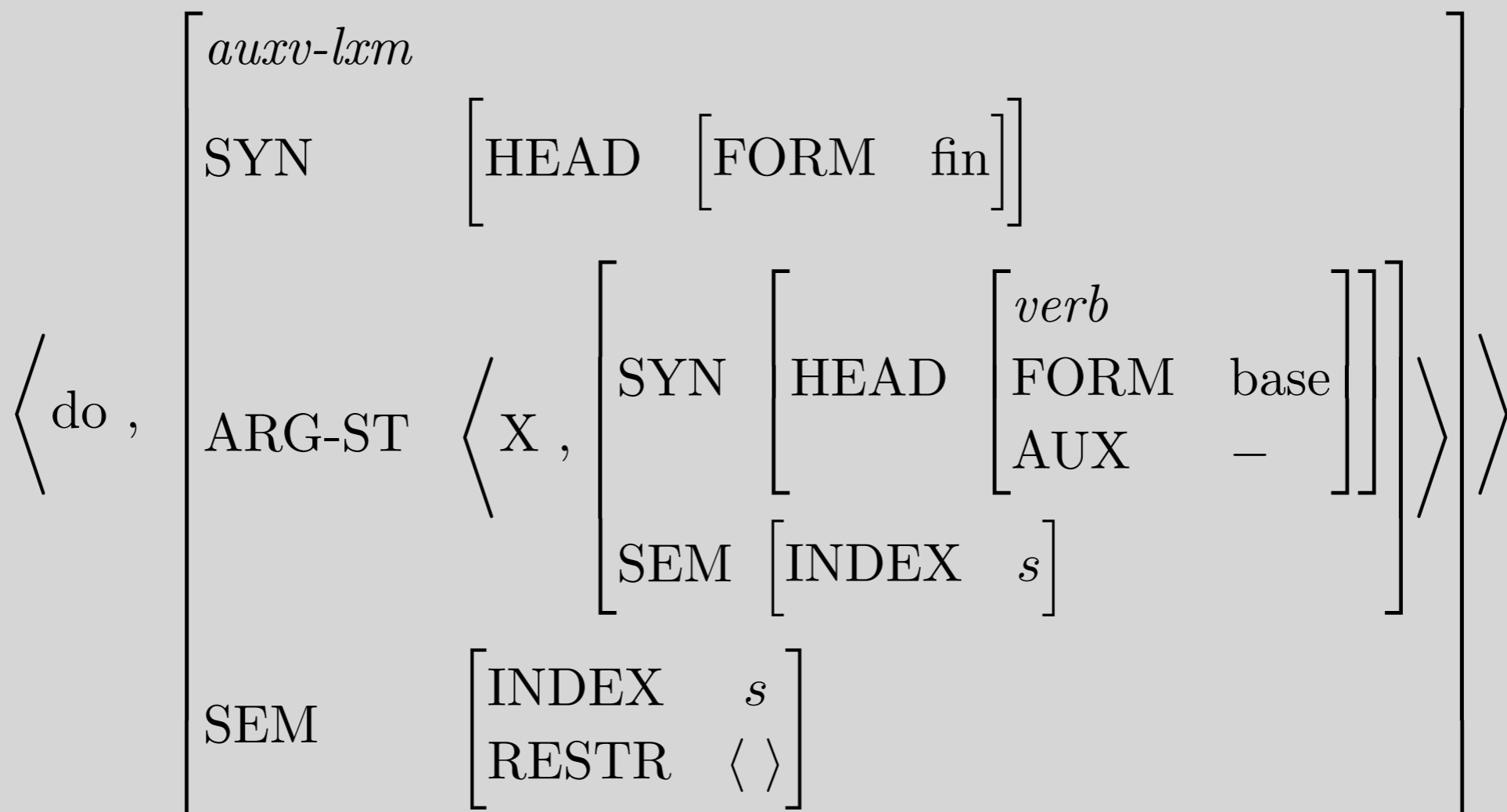
Pat left

Pat did not leave

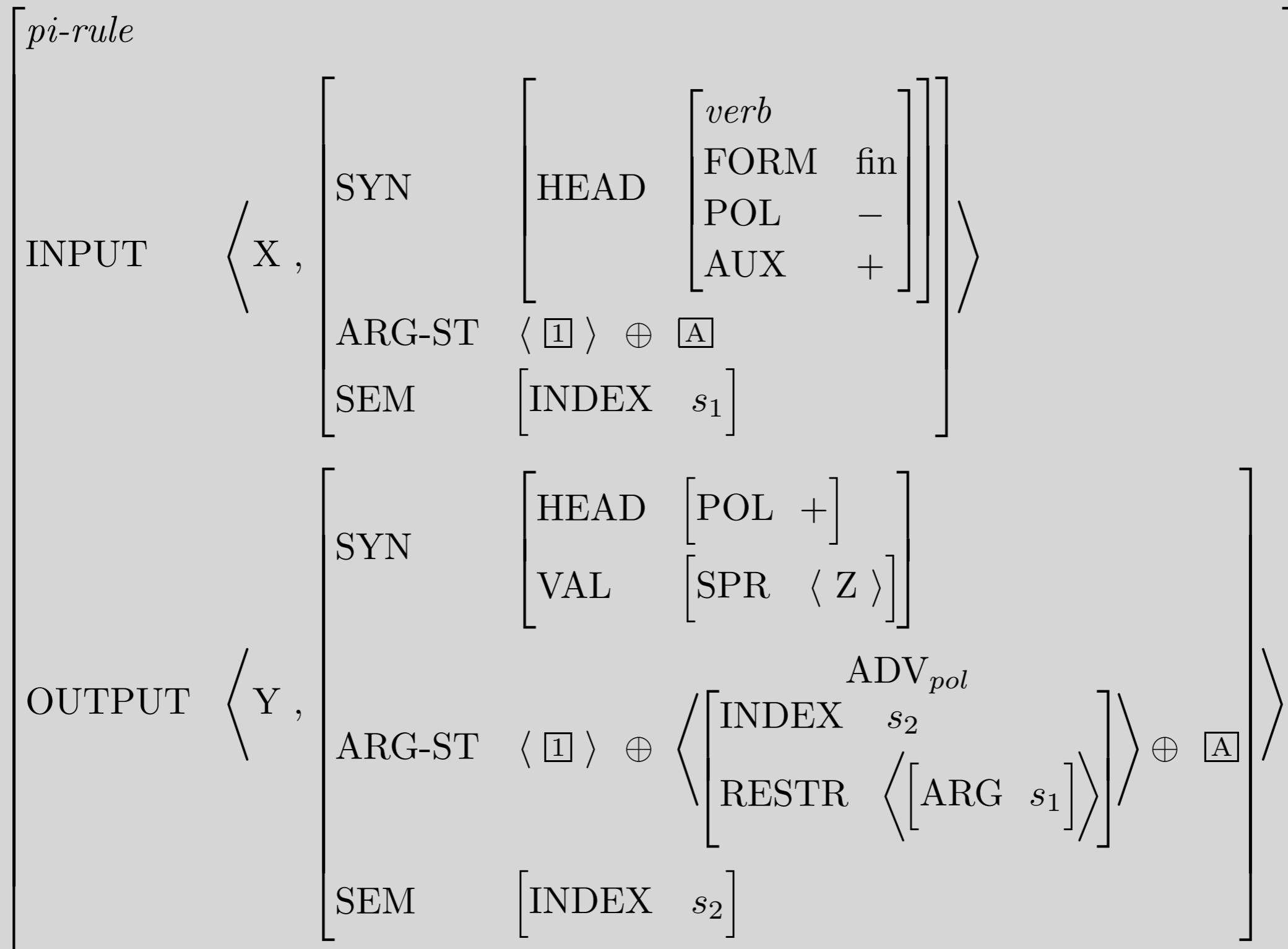
Pat did TOO leave

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*

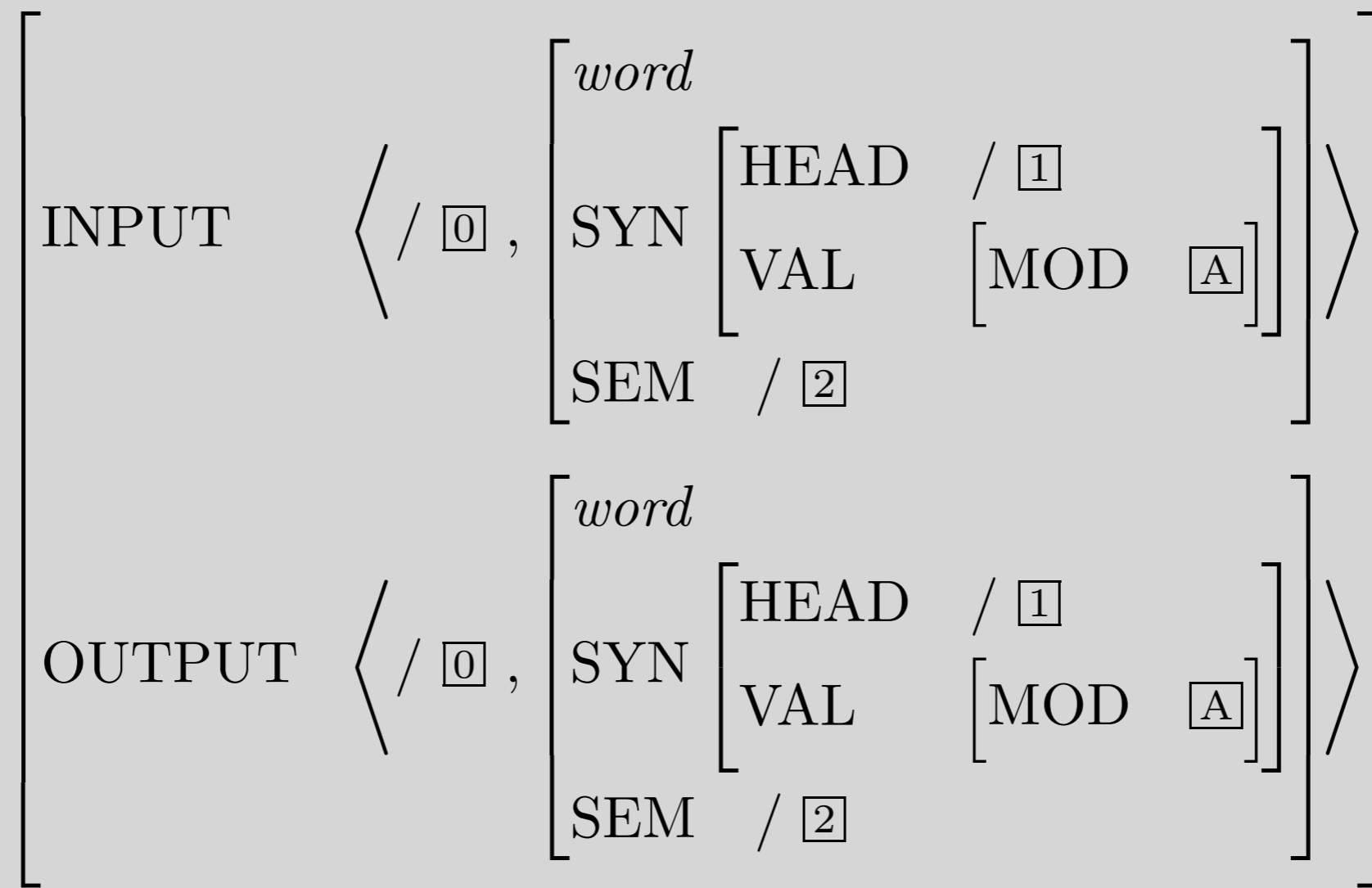


The ADV_{pol} -Addition Lexical Rule

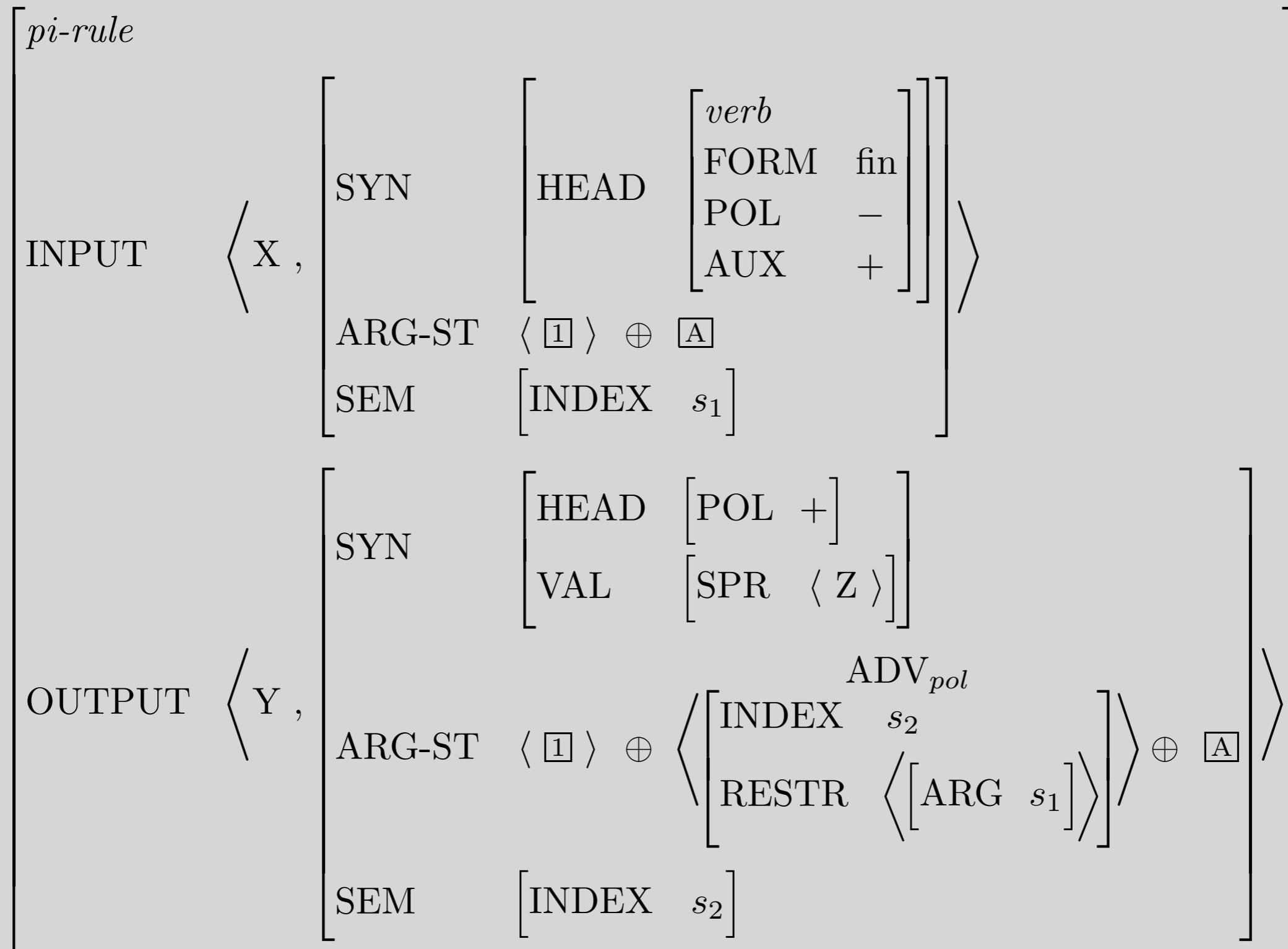


What does the type *pi-rule* mean?

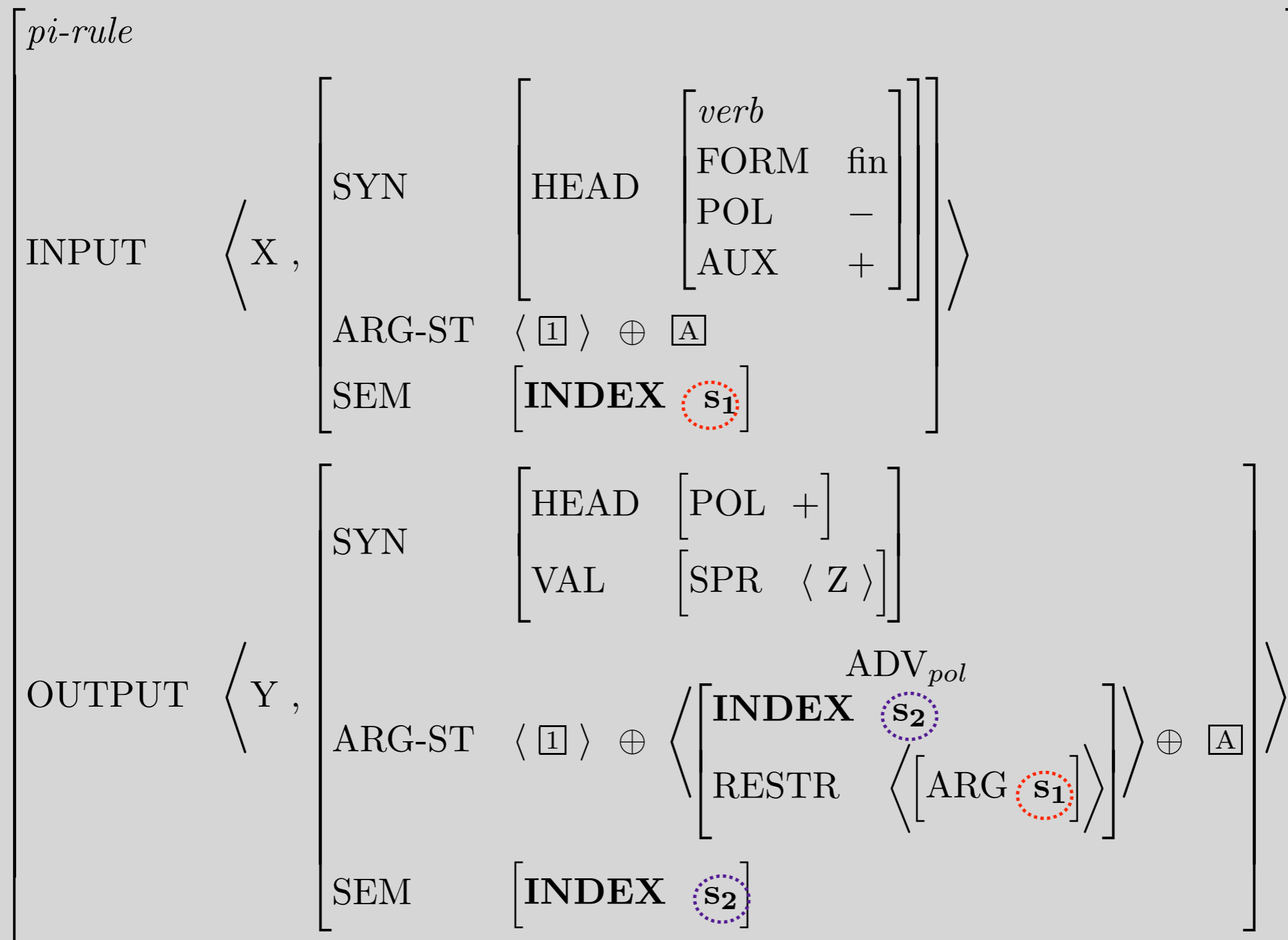
- It maps words to words (hence, “post-inflectional”)
- It preserves MOD values, HEAD values as a default, and (like other lexical rule types) SEM values as a default



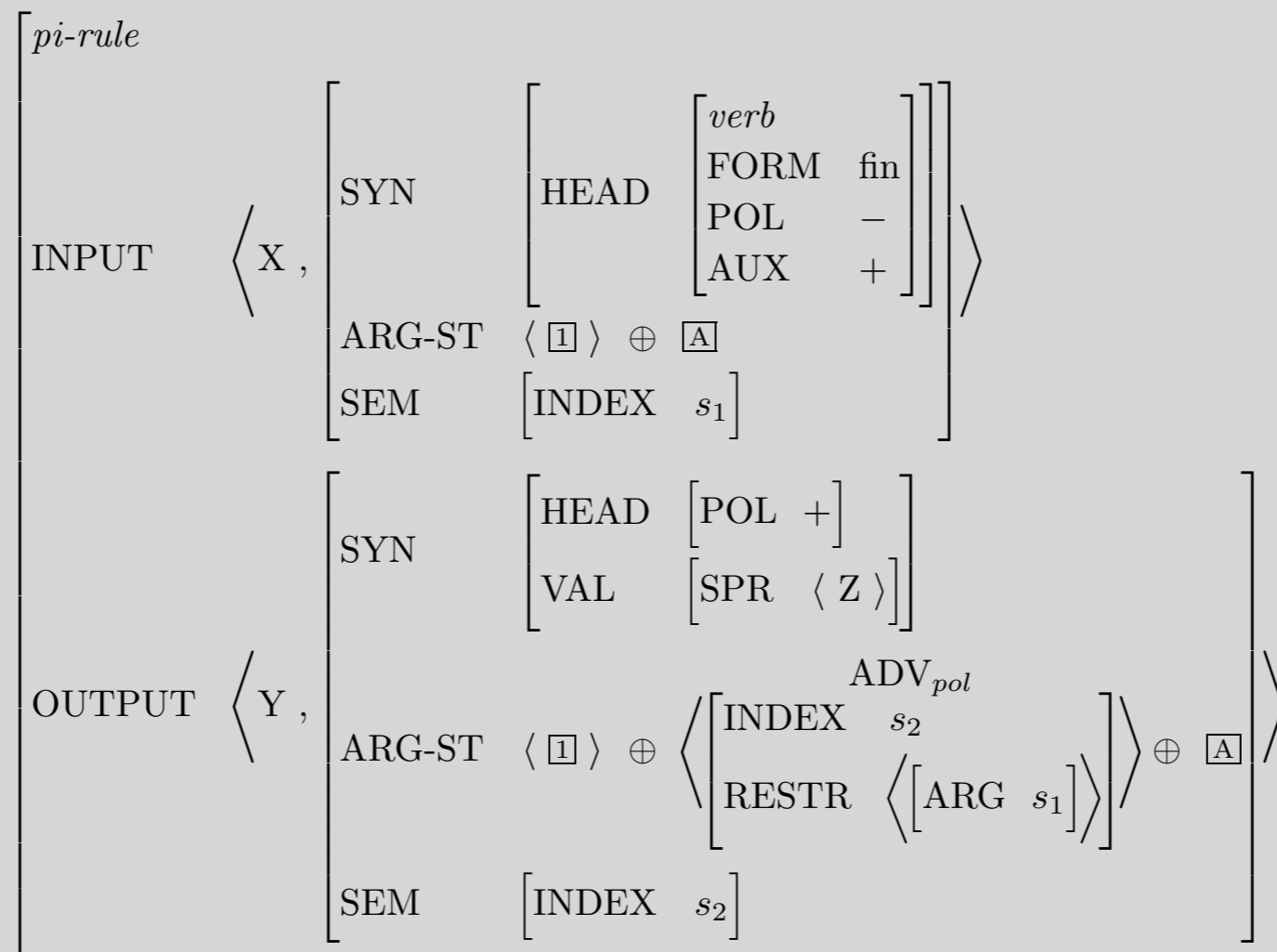
Why doesn't ADV_{pol} -Addition LR mention VAL?



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?



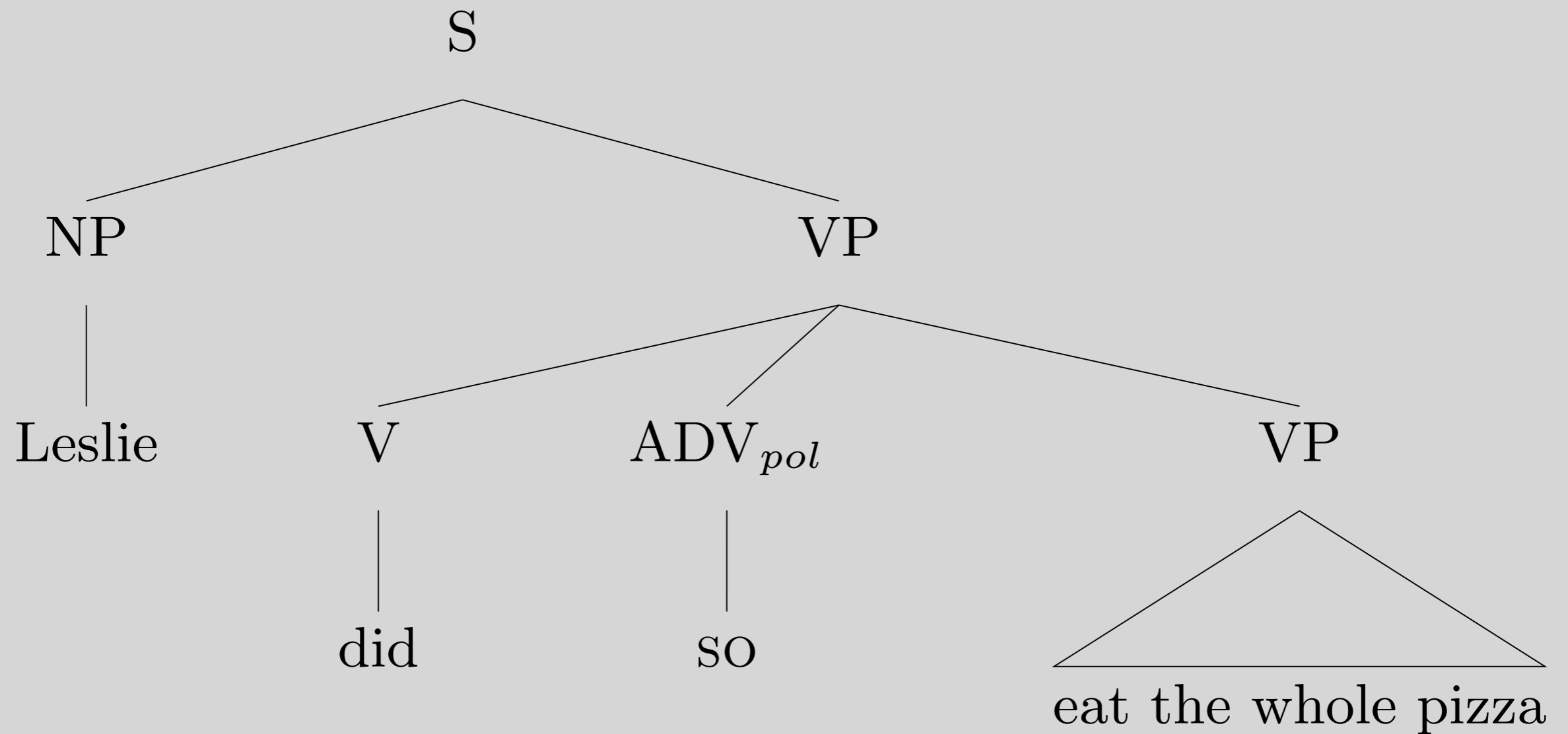
Kleptomaniacs cannot not steal.



Kleptomaniacs cannot not steal.



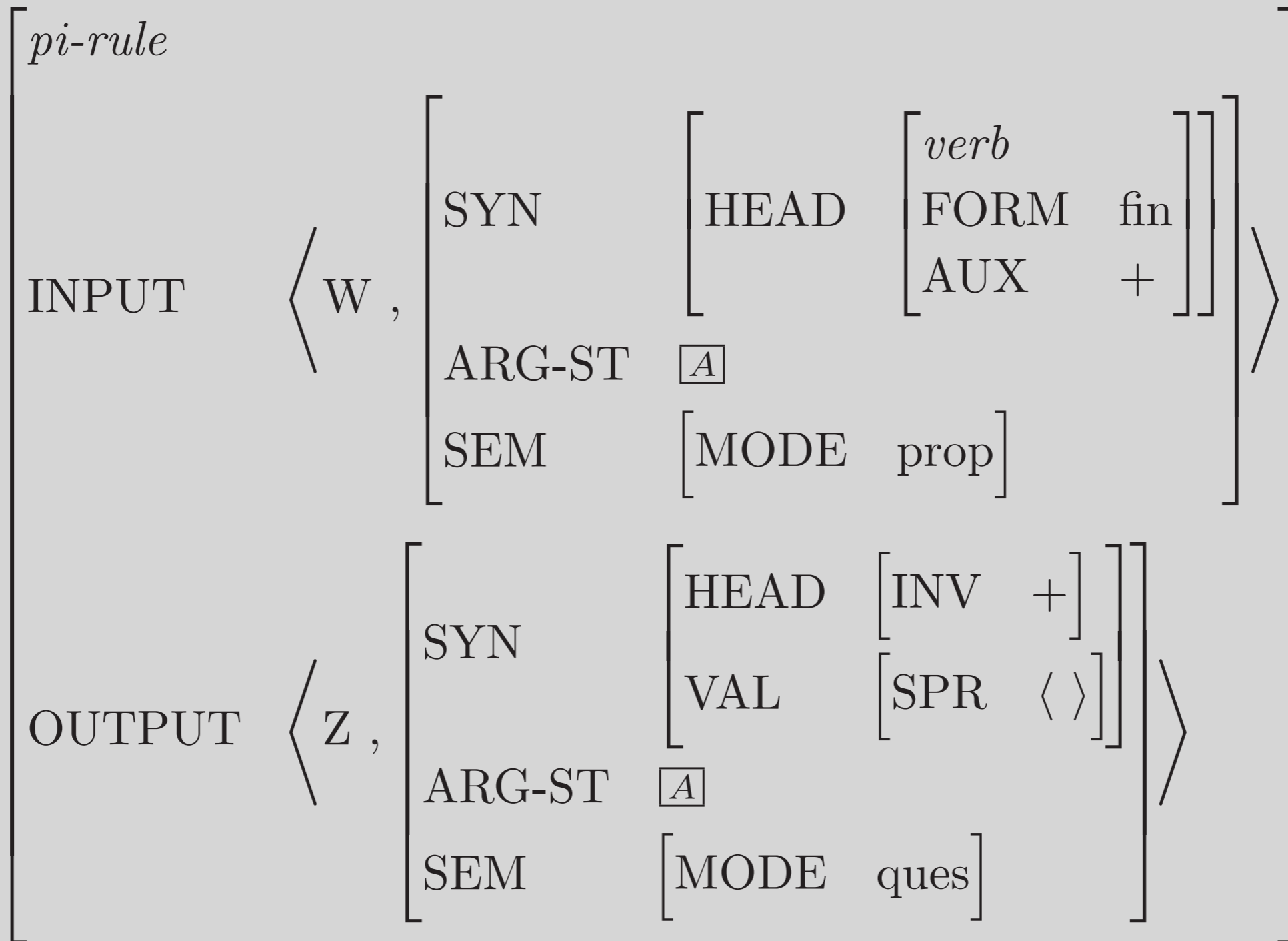
Negation and Reaffirmation: A Sample Tree



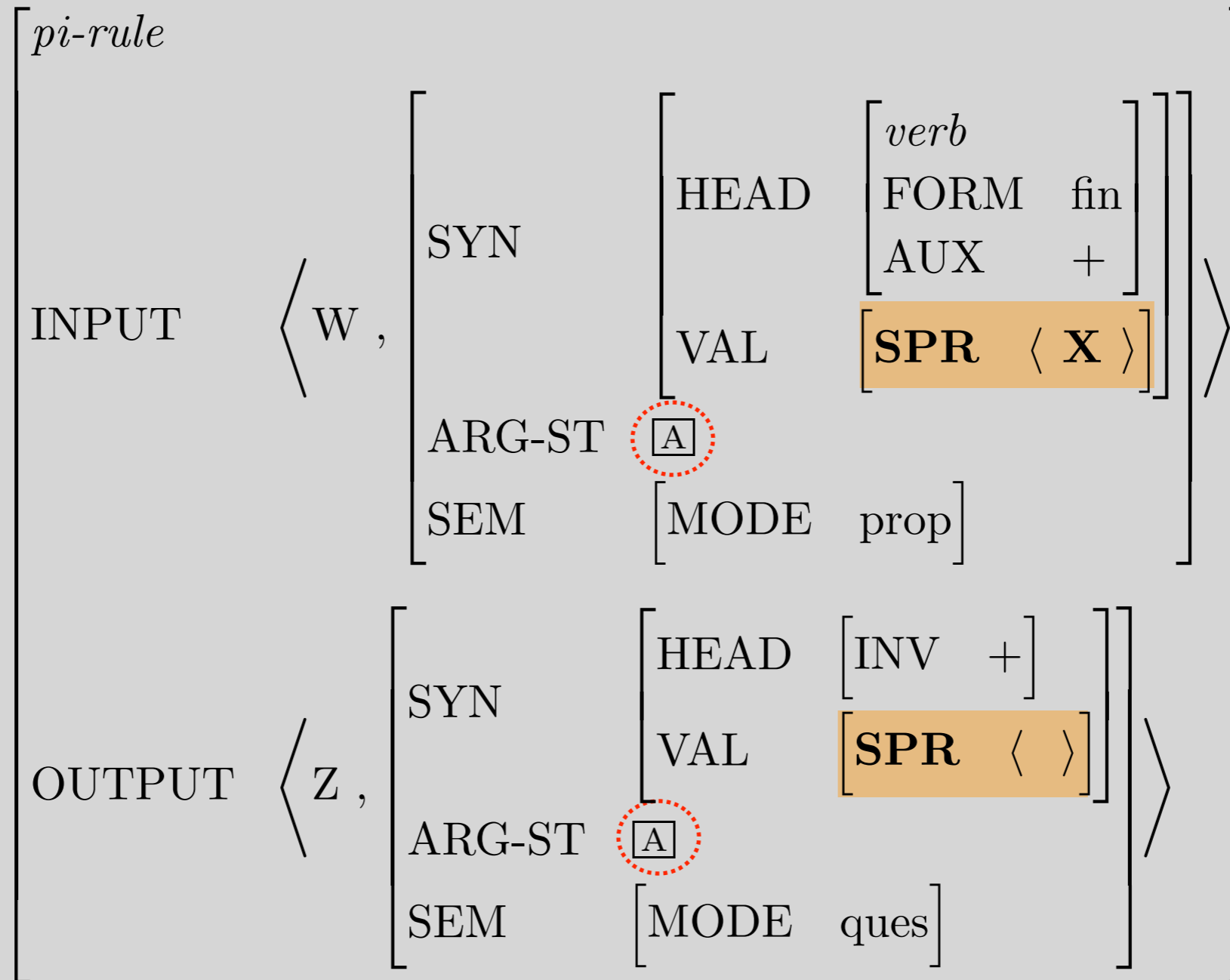
Inversion

- 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

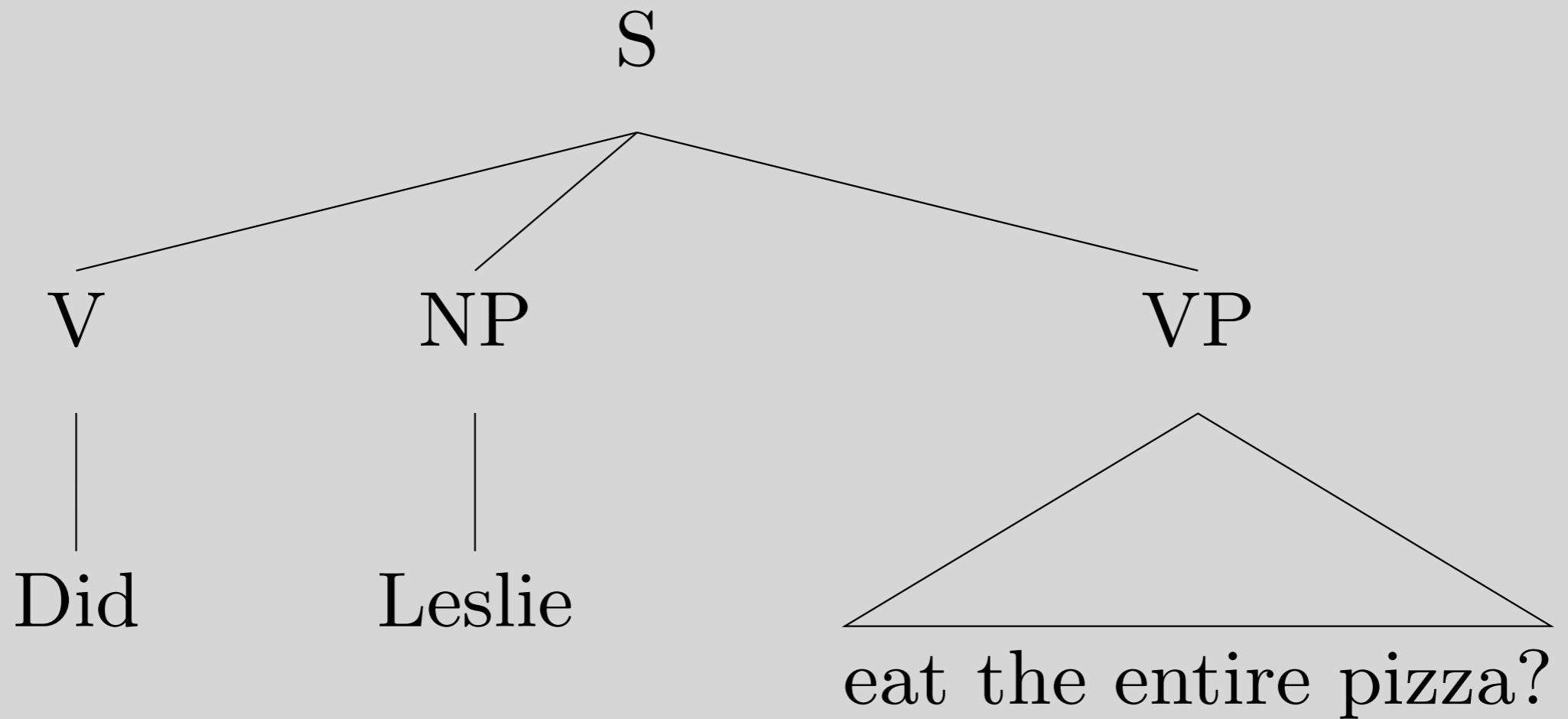
The Feature INV

- 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.

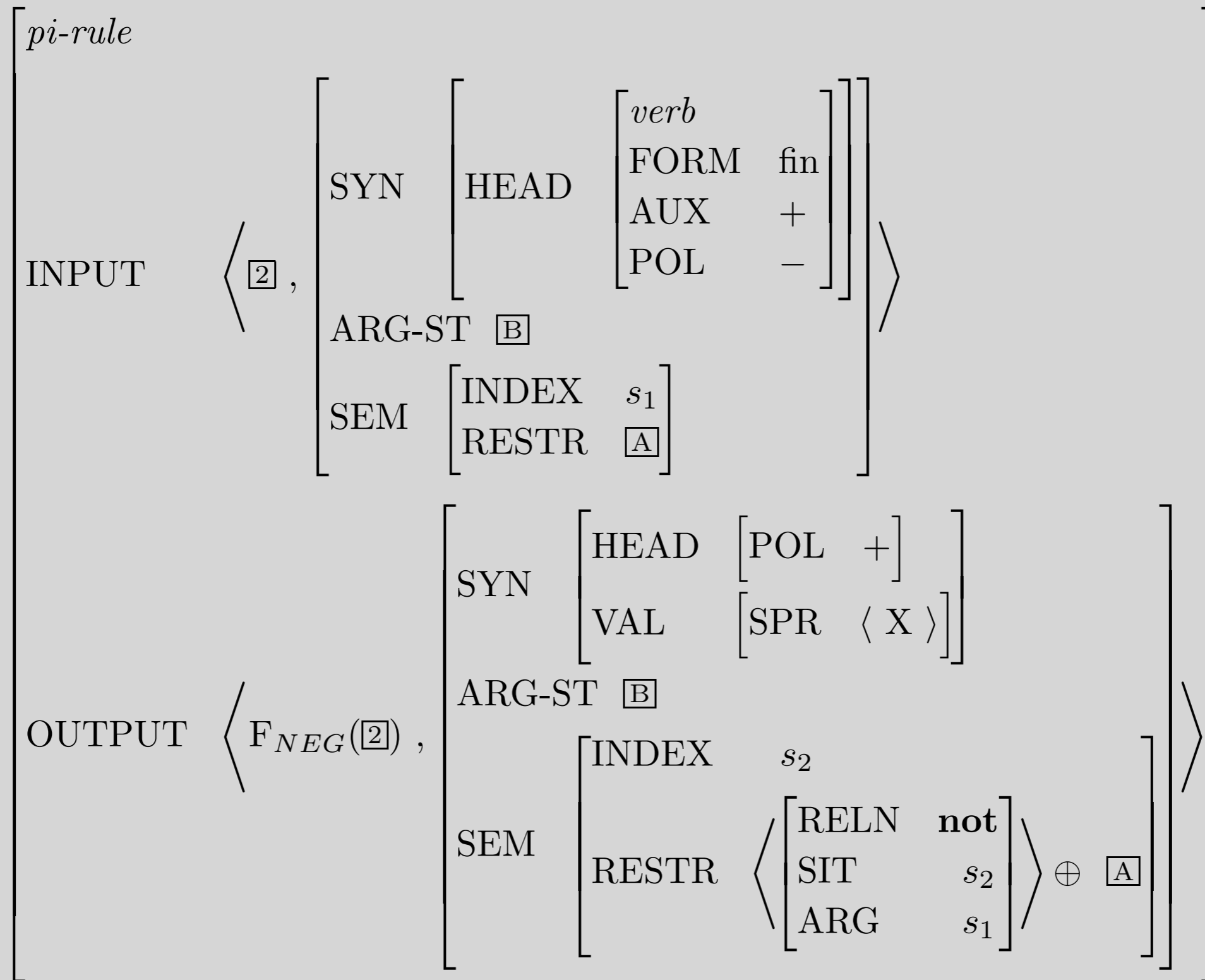
Inversion: A Sample Tree



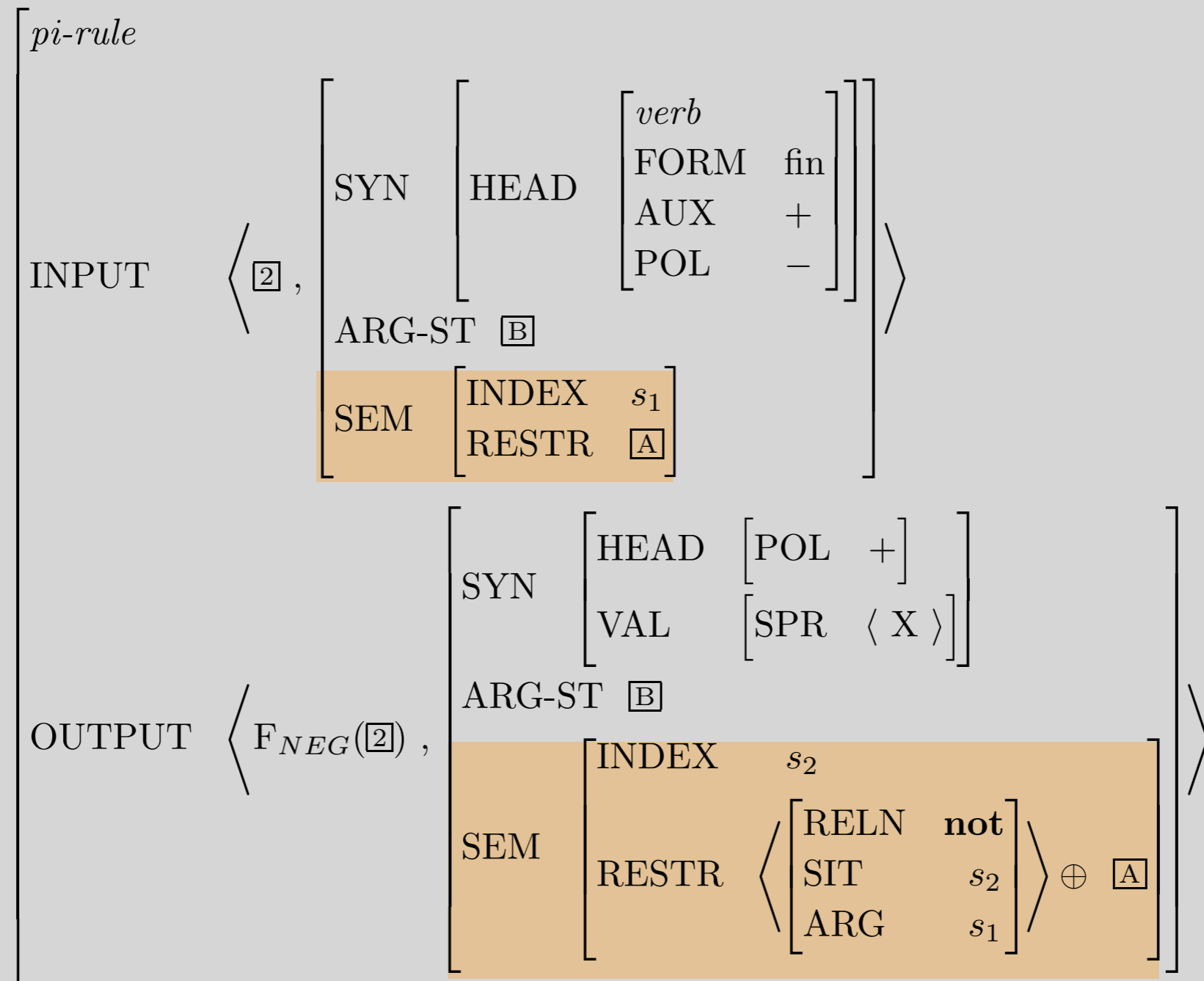
Contraction

- 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

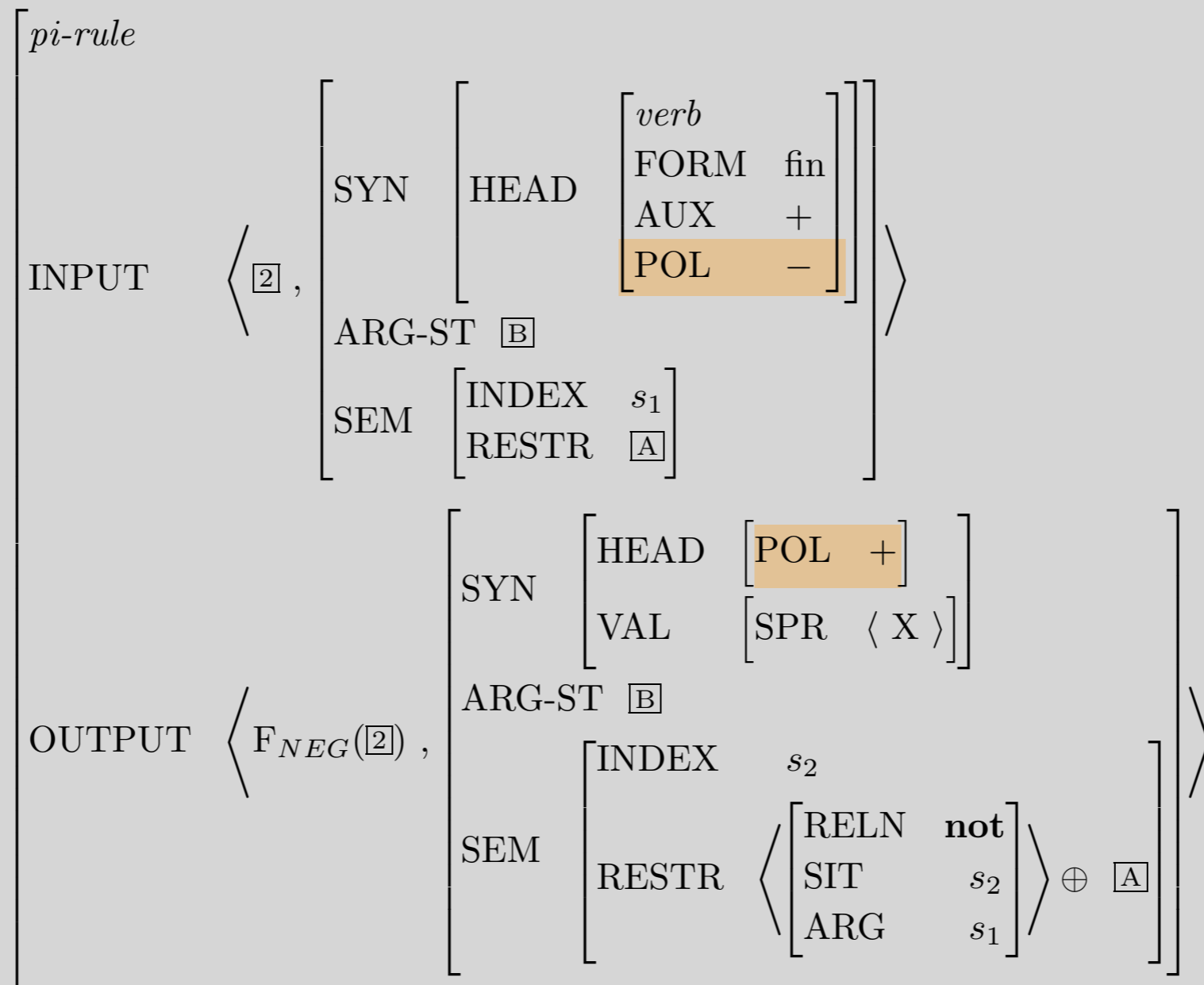


Most of the work is in the semantics



Why?

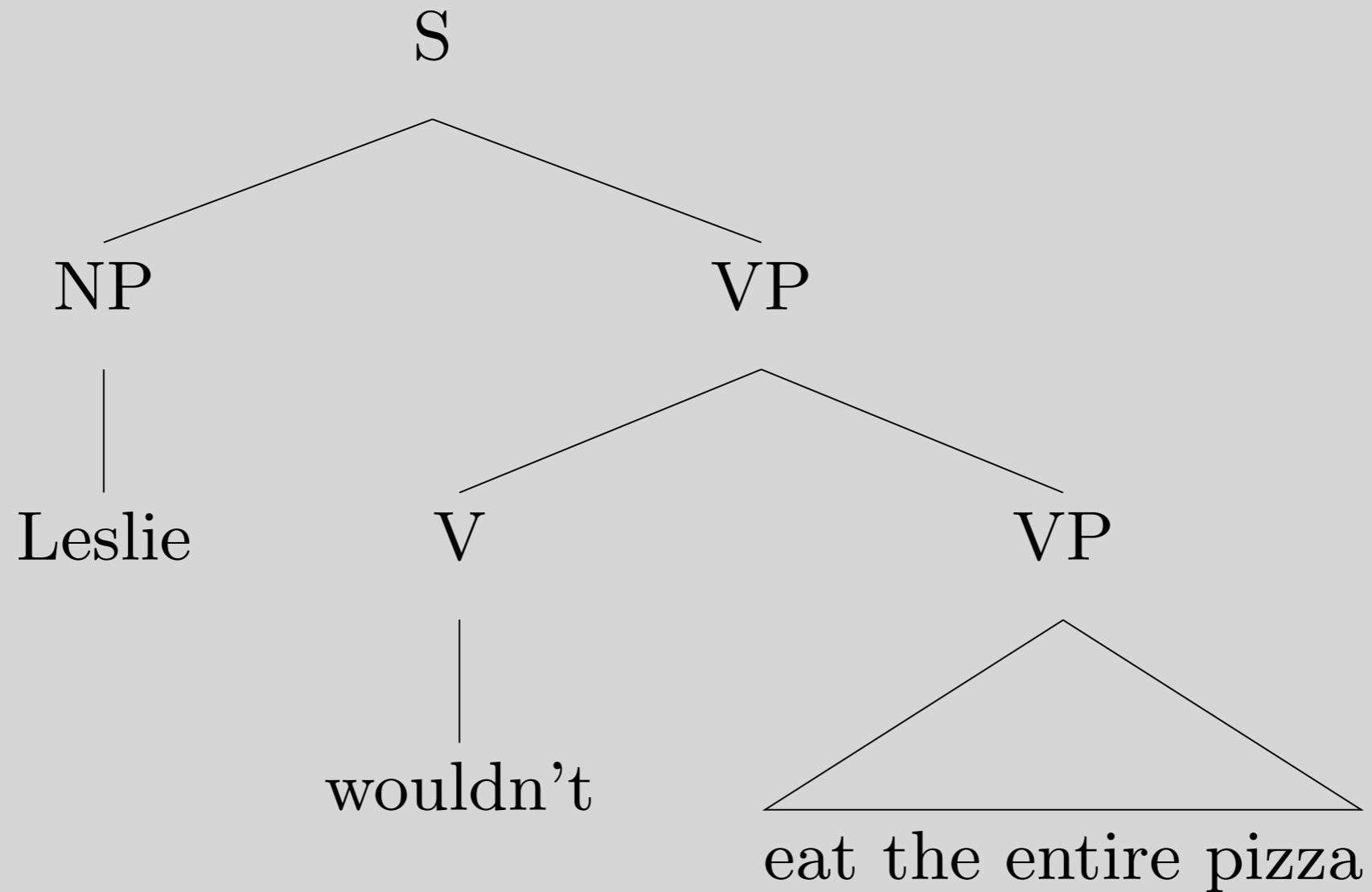
What does POL do?



**We can't stop*

**They won't TOO mind*

Contraction: Sample Tree



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W 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

Total Results: 0

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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

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

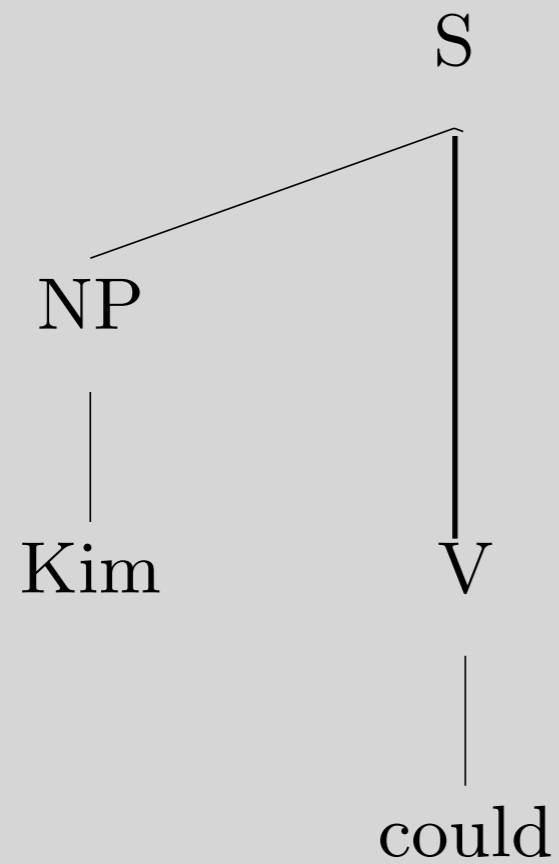
- Note that this is a derivational LR (*d-rule*) -- that is, lexeme-to-lexeme
- This means that SYN and SEM are unchanged, by default

Ellipsis: A Sample Output

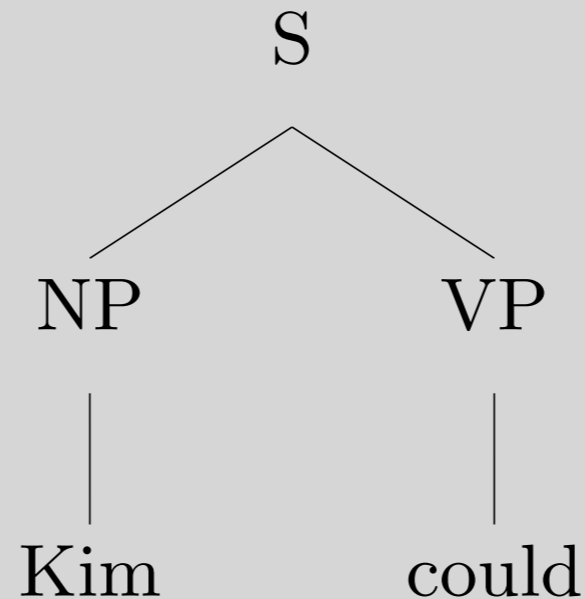
	<i>derivv-lxm</i>	
SYN	HEAD	$\begin{bmatrix} \text{FORM} & \text{fin} \\ \text{AUX} & + \\ \text{POL} & - \\ \text{AGR} & \boxed{1} \end{bmatrix}$
ARG-ST	VAL	$\left[\text{SPR} \quad \langle [\text{AGR} \boxed{1}] \rangle \right]$
SEM	$\begin{array}{l} \text{MODE} \quad \text{prop} \\ \text{INDEX} \quad s_1 \end{array}$	$\left\langle \begin{array}{l} \text{RELN} \quad \text{could} \\ \text{SIT} \quad s_1 \\ \text{ARG} \quad s_2 \end{array} \right\rangle$

$\langle \text{could} ,$

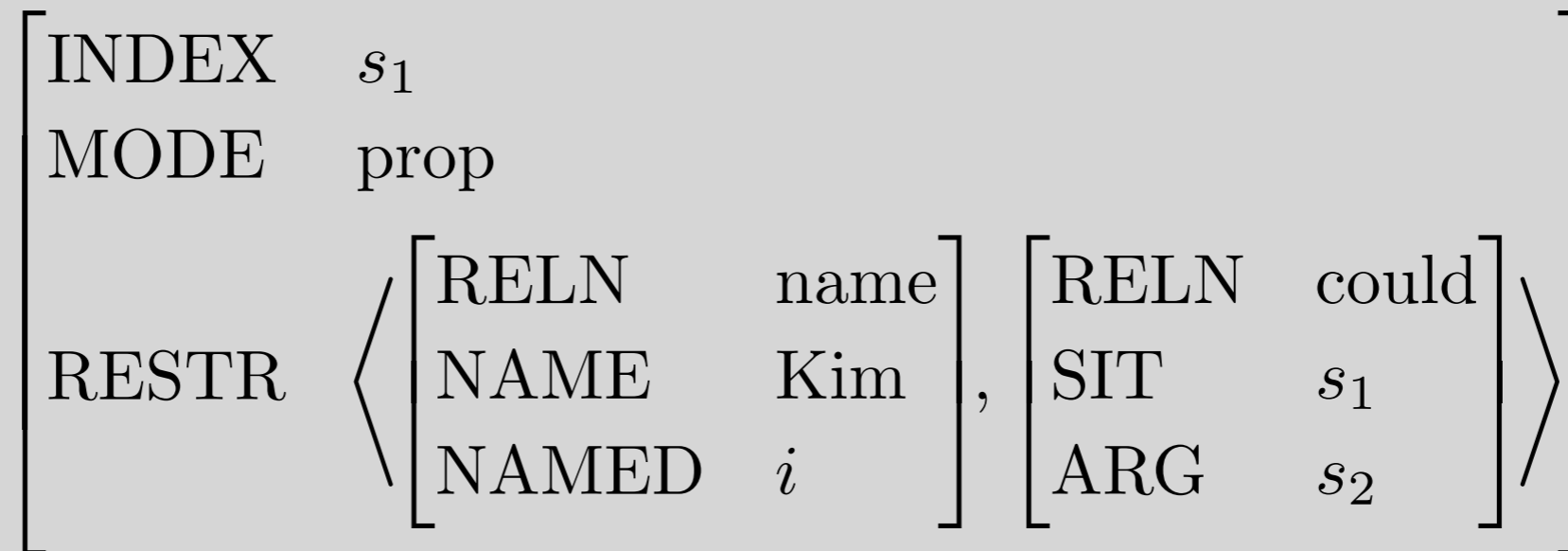
Ellipsis: A Sample Tree



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*.

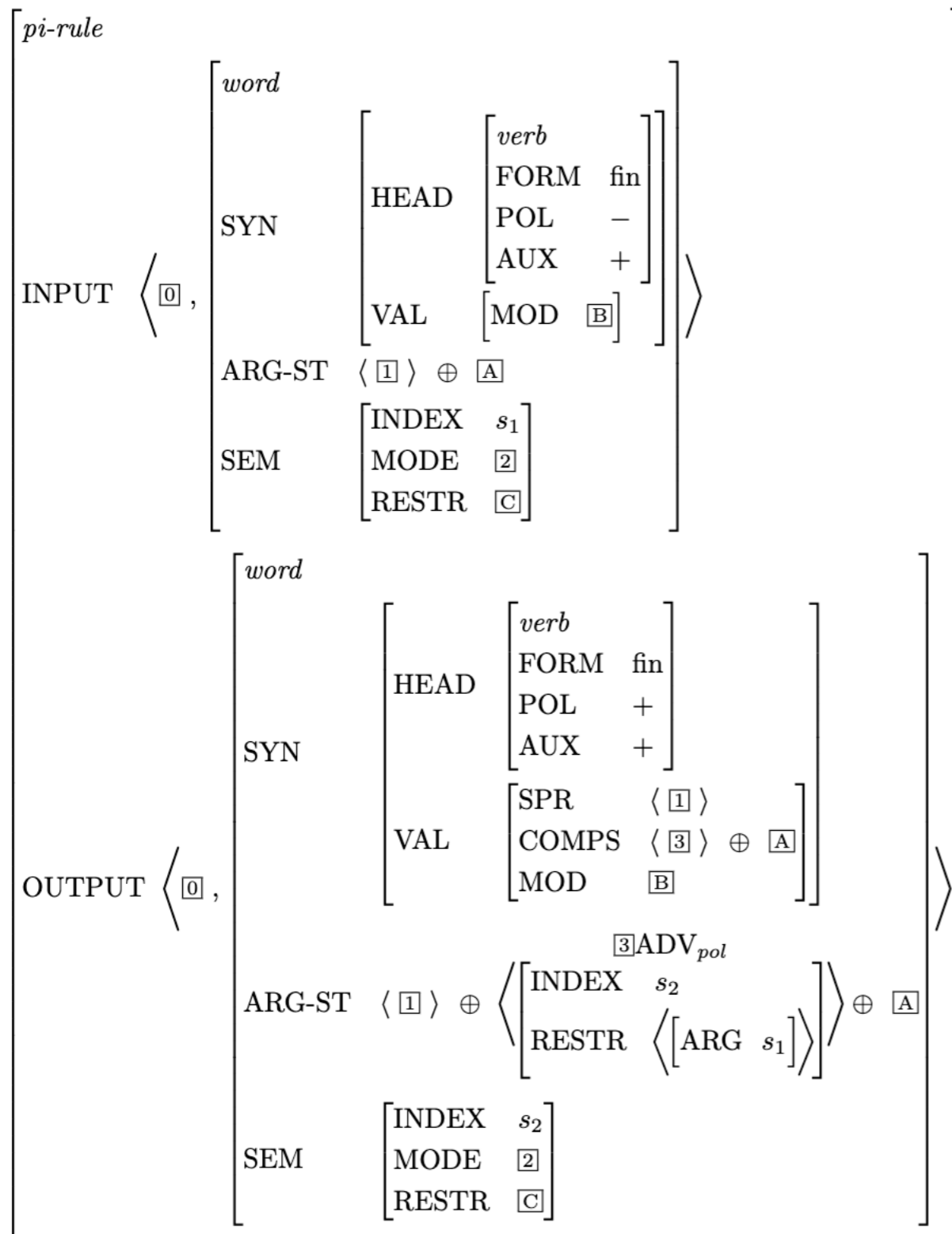
Summary

- 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

(52) ADV_{pol} -Addition Lexical Rule (with inherited constraints)



- What does ‘push down’ mean here?

Here it is important to see that the INPUT and OUTPUT specify conflicting values for POL and INDEX.¹⁴ 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.

RQs: Ellipsis

- Would the Ellipsis Lexical Rule we add in this chapter be able to license sentences like "Aki thinks he is right, and I think so too" - this is also an example with different SPRs for the VPs, so I can see how this should not be seen as an ellipsis. Could the rule be modified and then extended to the above example though, if we fix the following: (1) the INPUT does not seem to be a regular auxv-lxm (2) too appended at the end seems not like the removal of $\backslash\text{fbox}\{2\}$ on ARG-ST done in the OUTPUT for this rule.

RQs: Ellipsis

- What is the purpose of including s2 as the ARG value in (76) and (77) if it is not associated with any predication? The text states it is supplemented with material from the surrounding linguistic context, but I was under the impression (perhaps incorrectly) that this was not something we accounted for within predications.

RQs: Ellipsis

- From (72), Ellipsis Lexical Rule applies across utterances - how do sentences with no explicit context. e.g. "Well, I have." (which is grammatical by itself), reference whatever was said previously?

RQs: Ellipsis

- I wonder how the ellipsis is resolved in NLP practice. In my intuition, it is a task similar to coreference resolution (though I am unsure whether my intuition is correct.) Does it have similar solutions to coreference resolution in practice?

RQs: Ellipsis

- Can the Ellipsis Lexical Rule in the book (pg. 417, (73)) account for multiple auxiliary verbs referencing the same verb? It looked like the output of the ELR isn't compatible with its own input, so it didn't look like you could chain it together directly anyways.
- "We asked them to open the window, and they tried to, and we tried to, and Sam tried to, but no one could."

RQs: Inversion

- On page 412, it says "the outputs of the Inversion Lexical Rule are words, and as such do not inherit this constraint." But I notice that in previous chapters we actually applied SHAC to words. So what is the logic here?
- In the Inversion Lexical Rule (with inherited constraints) (p. 411), both the INPUT and OUTPUT are [INV +]. Why is this?

RQs: Inversion

- When talking about the Inversion Lexical Rule and the SPR of AUX verbs becoming the first element of the COMPS list, it feels like we're equating SPR as "the element before the verb" and COMPS as "the element(s) after the verb". Is this not only language-specific but also intuitively wrong? Is the only thing that distinguishes SPR and COMPS in English their position relative to the verb?

RQs: Inversion

- Why does the inversion lexical rule need to be a pi-rule? (I know that pi-rules input and output word-to-word, but I'm not sure why that's necessary for this rule)

RQs: Inversion

- I understand how treating the postauxiliary NP as the complement of the auxiliary verb simplifies the analysis of inversion, but it made me question the nature of the distinction between specifiers and complements. I feel like the postauxiliary NP should still be regarded as the subject of the auxiliary rather than an object, especially when considering "the Inversion Lexical Rule creates lexical sequences whose first complement has all the properties of a subject, except that it comes after the verb." (p. 413) The analysis given in the text appears to focus more on the ordering of elements and its compatibility with the phrase structure rules rather than the roles these elements play, and I'm curious if there is a justification for this approach.

RQs: Contraction

- I'm curious how HPSG handles other kinds of contractions that aren't for auxiliary verbs. We treat possessive 's as the head of a DP that requires a complement, but how do we handle the 's from it's (it is) or the 'm from I'm? Do they represent VPs, or is it a predication added to a RESTR list, and how do they look on trees?

RQs: Contraction

- On page 415, why does the output of the contraction rule specify SPR $\langle X \rangle$ when there is no SPR on the input?

RQs: Contraction + Inversion

- I'm curious about the British slang "innit".
The order of words changes:
 - That's a cat, is it not?
 - That's a cat, isn't it?
 - That's a cat, innit?
- How does our grammar handle situations where word order changes?

RQs: Semantics of negation

- I am curious to know how we would account for the different types of negation in Bloom (1970). There is Rejection "No spoon!" when a child is being offered a spoon, Non-existence such as, "No more!", when something they want is gone, and Denial like, "That's not a dog!"

RQs: Dialect/register variation

- Is it possible for a grammar to account for sub-texts such as juvenility that might make a sentence grammatically correct, but sound incorrect to certain users? On that note, would my perception of these sentences just be user-specific or dialectical?

RQs: Missing arguments

- When a second person subject is not expressed in imperative constructions, we used a grammar rule to account for this. Now when part of the VP is unexpressed, a d-rule accounts for the ellipsis. I know in other languages that argument expression can be motivated by factors such as alignment patterns. How do we know which strategy to use to account for unexpressed arguments cross-linguistically? Is the grammar rule pretty specific to imperatives?

RQs: Missing arguments

- For (51), we see that we're able to insert the POL adverb as the second element by splitting the ARG-ST into the first and other elements, and then putting it after the first. How does this translate to pro-drop languages, where the first element of the ARG-ST of verbs isn't guaranteed to be the subject?