

Ling 566

Nov 24, 2020

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

Poll!

- What about examples like *Not many people left*?
- What happens when you want to deny or reaffirm a sentence with no auxiliary?

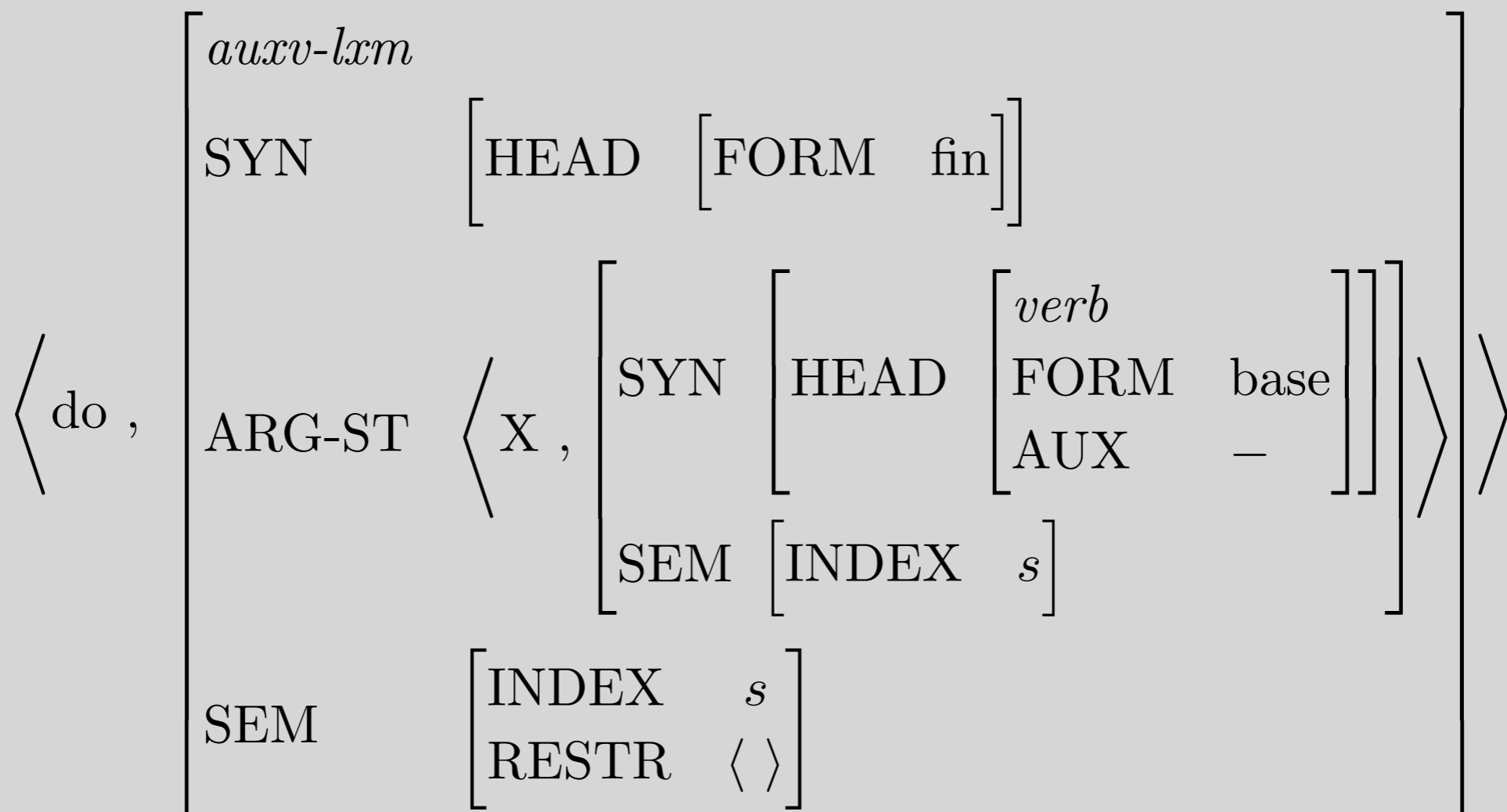
Pat left

Pat did not leave

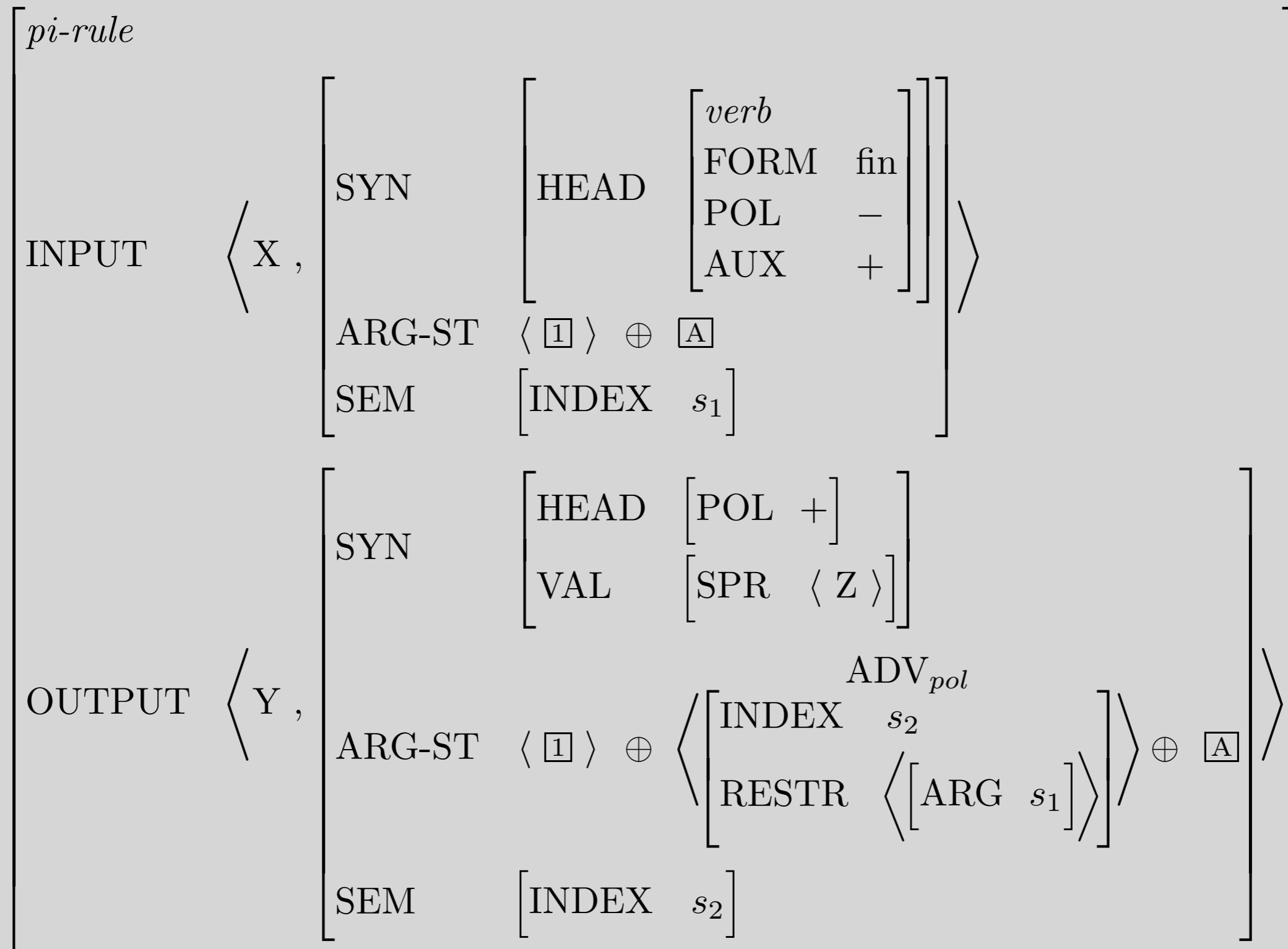
Pat did TOO leave

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*

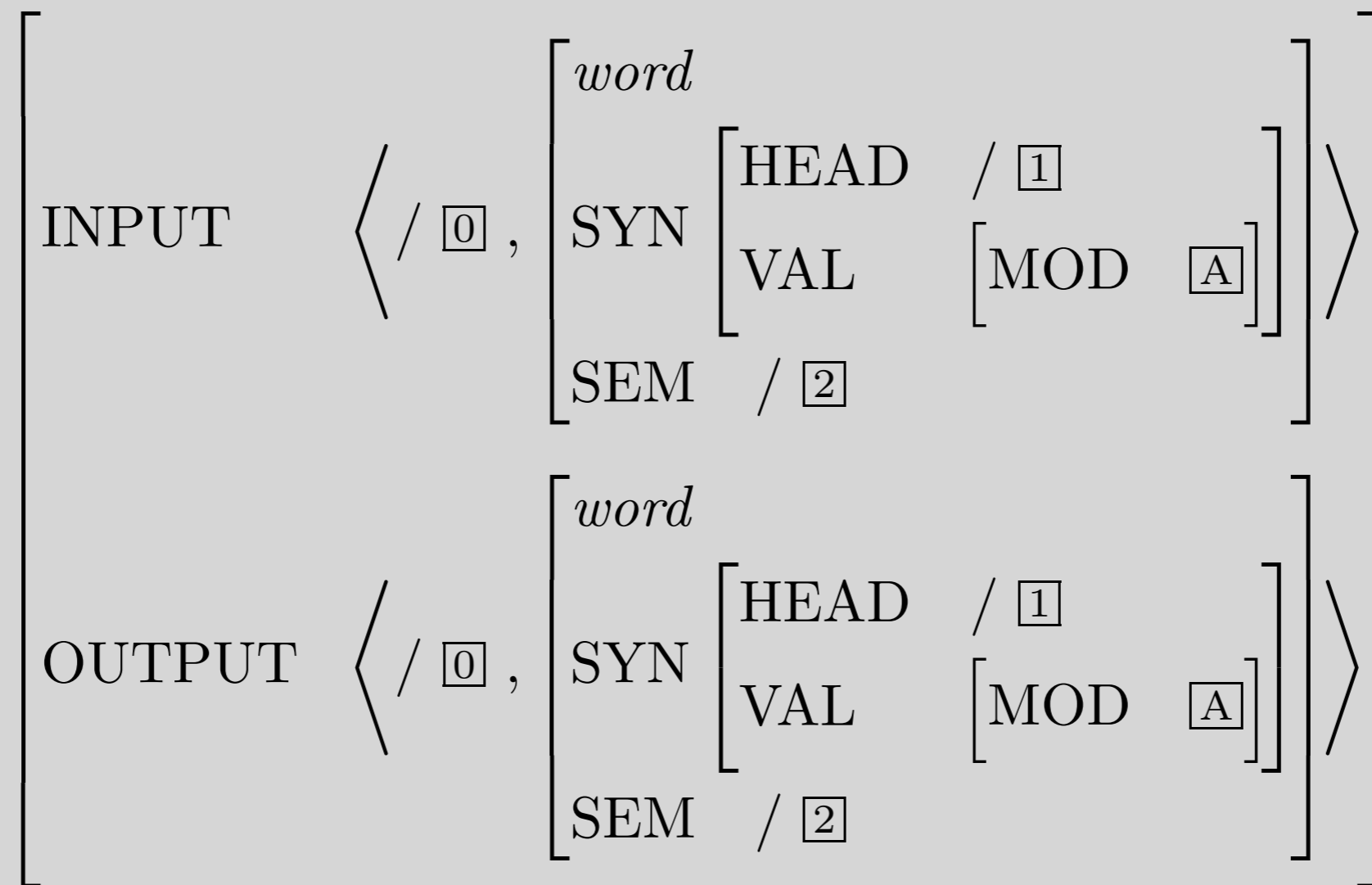


The ADV_{pol} -Addition Lexical Rule

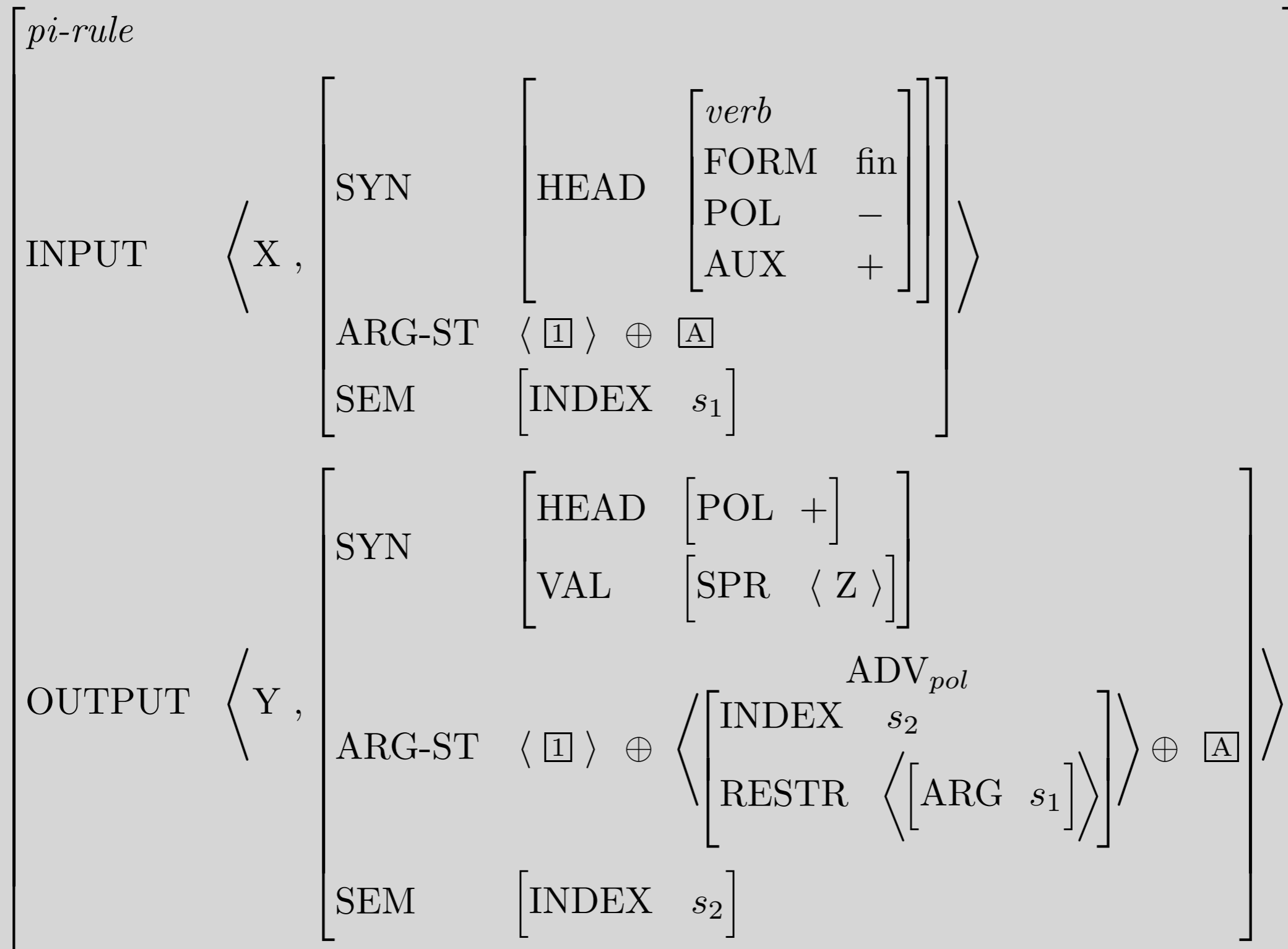


What does the type *pi-rule* mean?

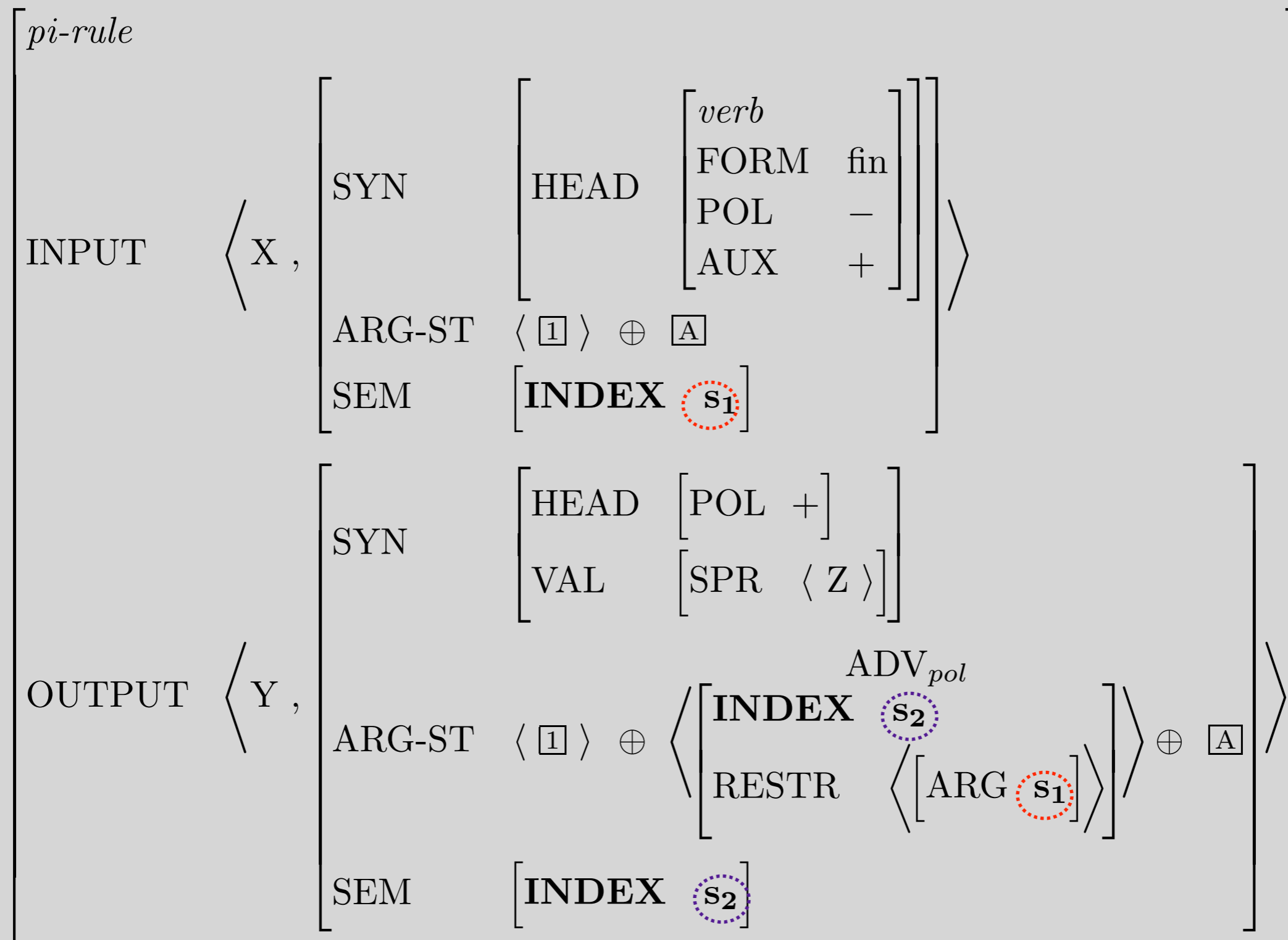
- It maps words to words (hence, “post-inflectional”)
- It preserves MOD values, HEAD values as a default, and (like other lexical rule types) SEM values as a default



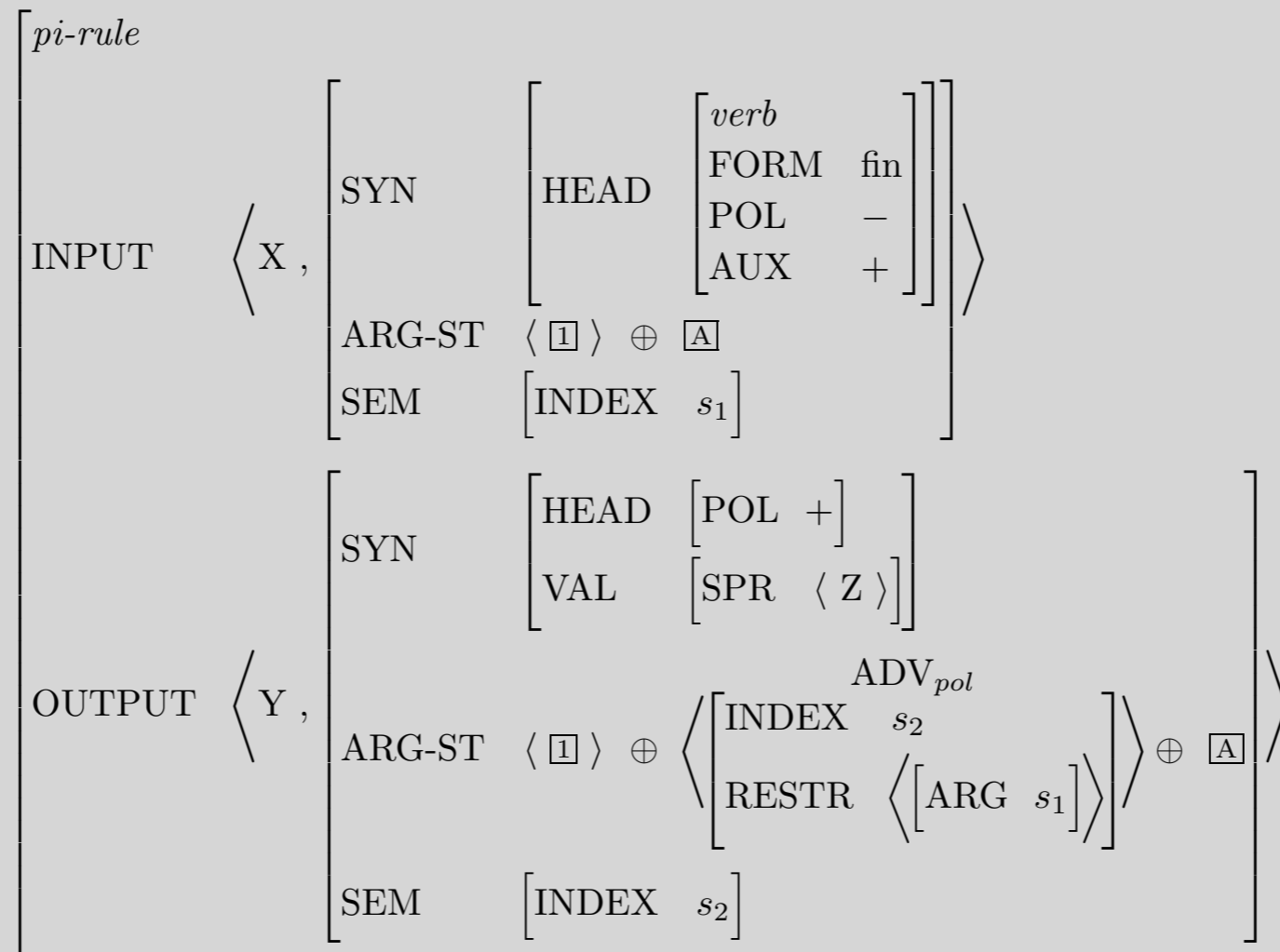
Why doesn't ADV_{pol} -Addition LR mention VAL?



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?



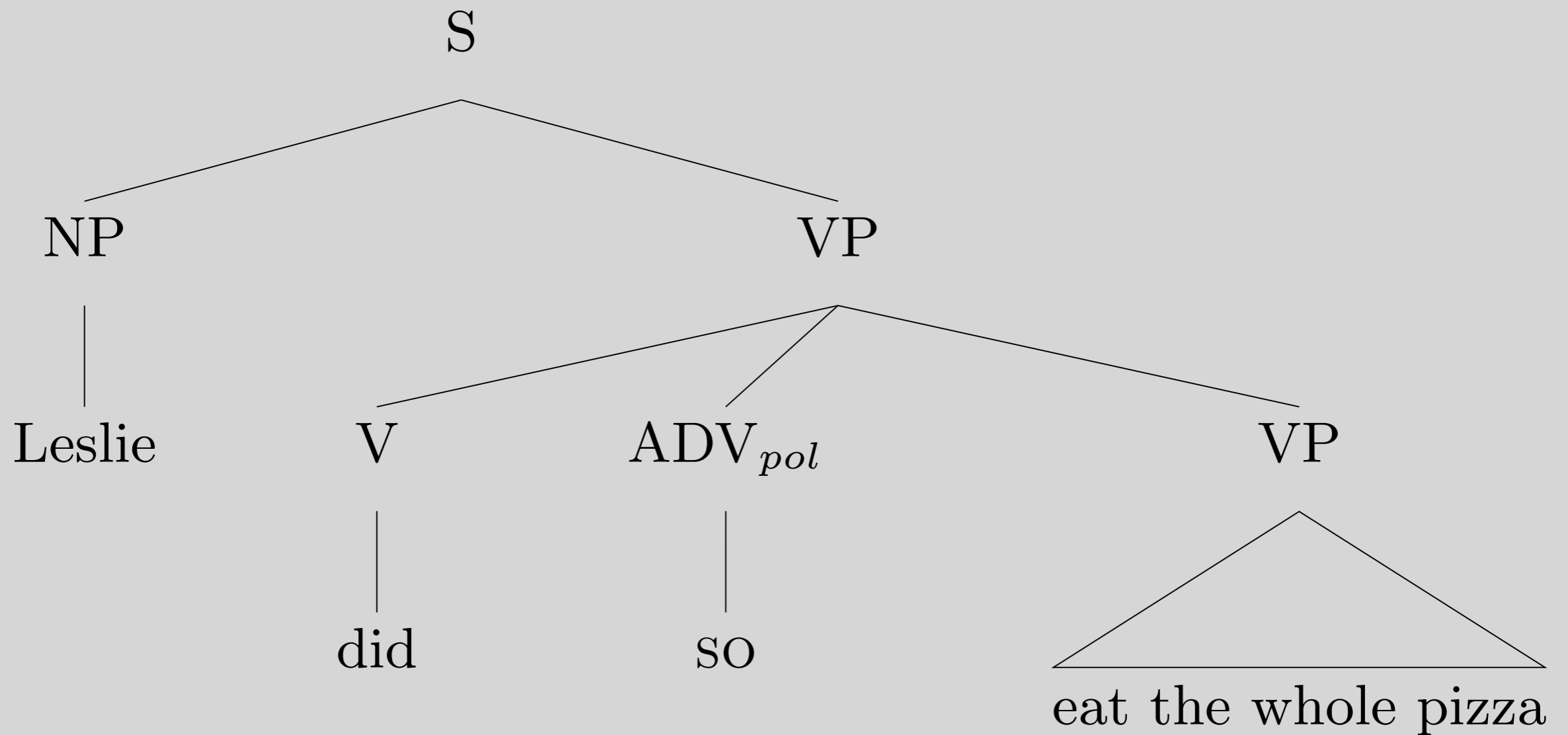
Kleptomaniacs cannot not steal.



Kleptomaniacs cannot not steal.



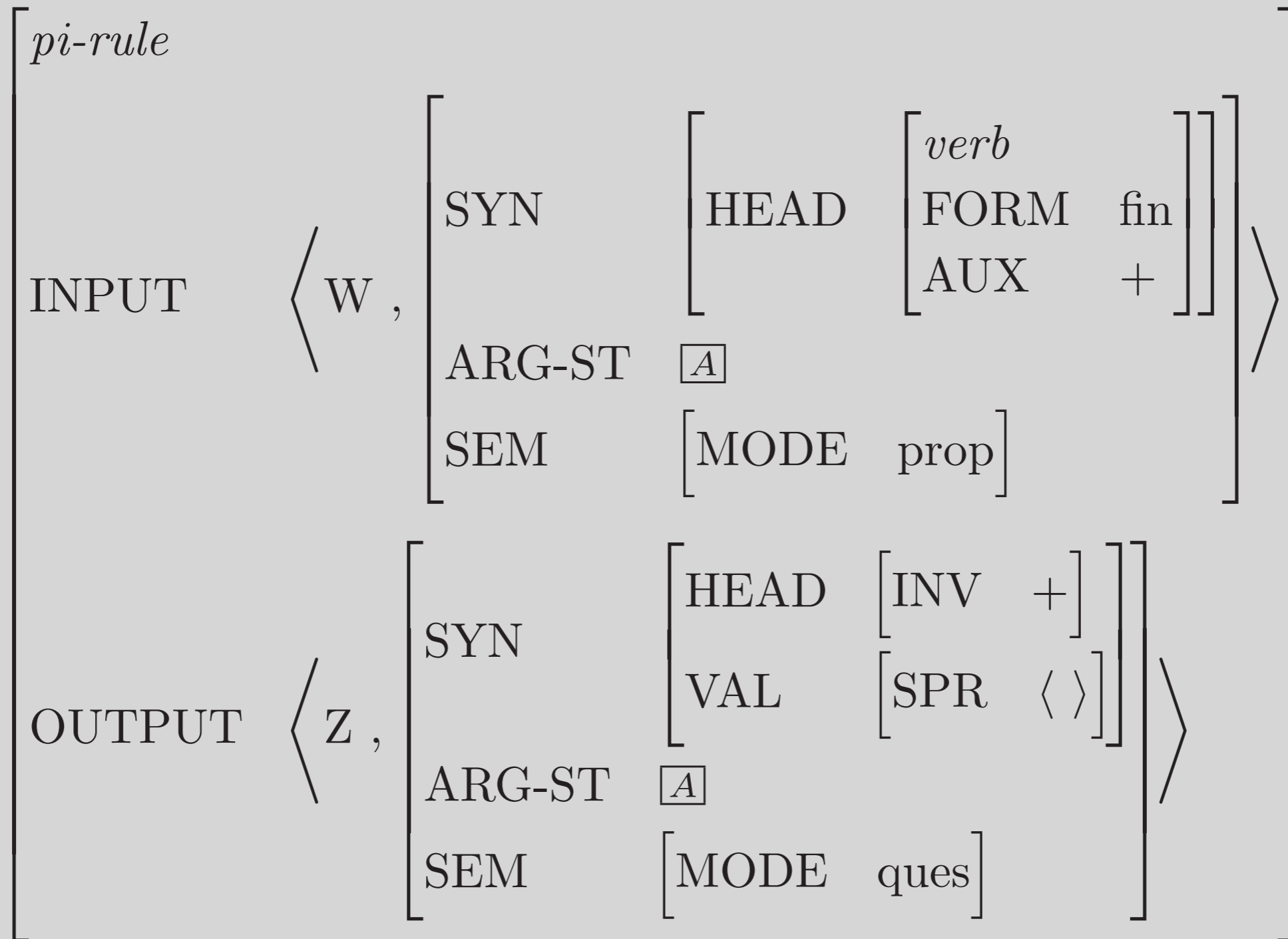
Negation and Reaffirmation: A Sample Tree



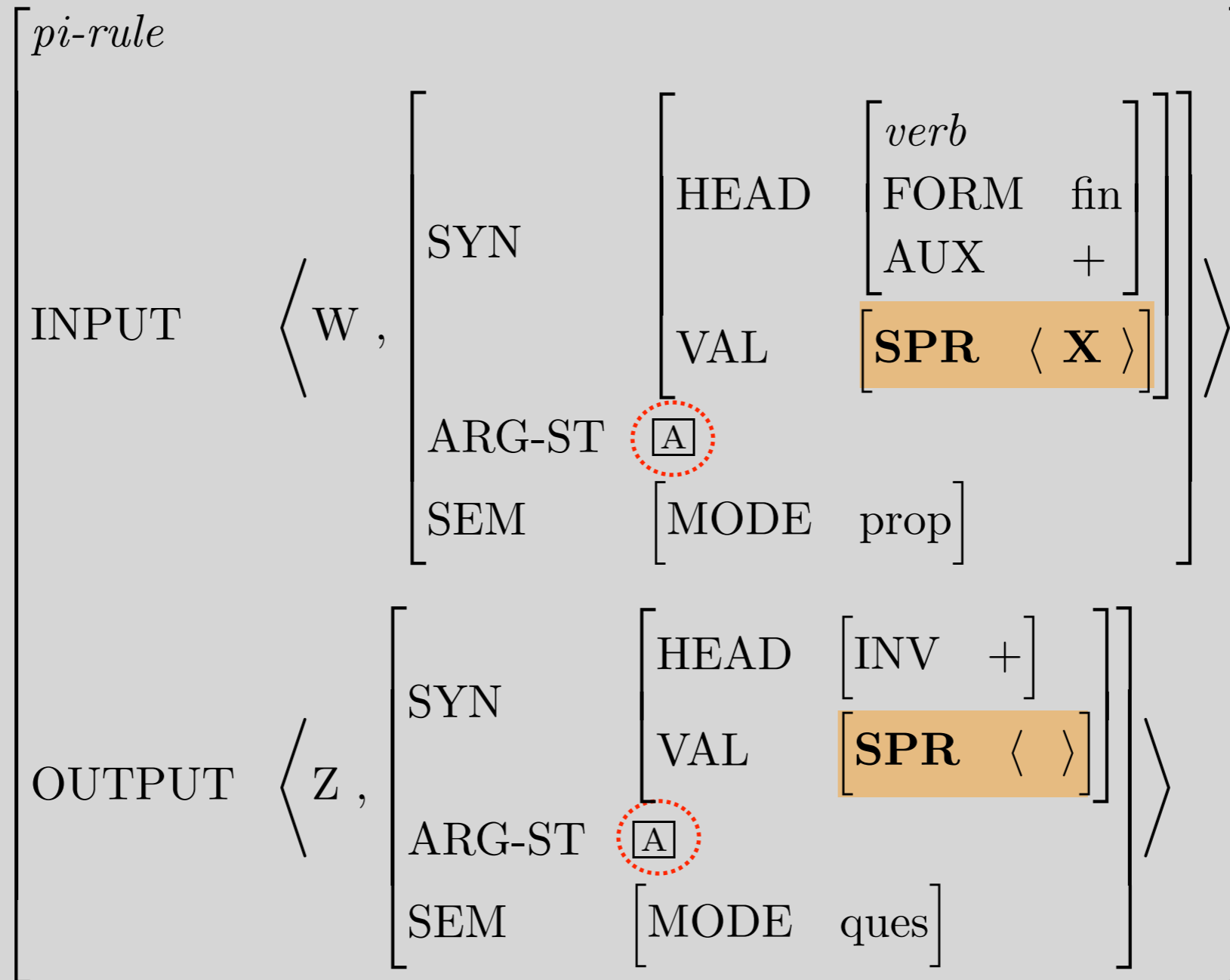
Inversion

- 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

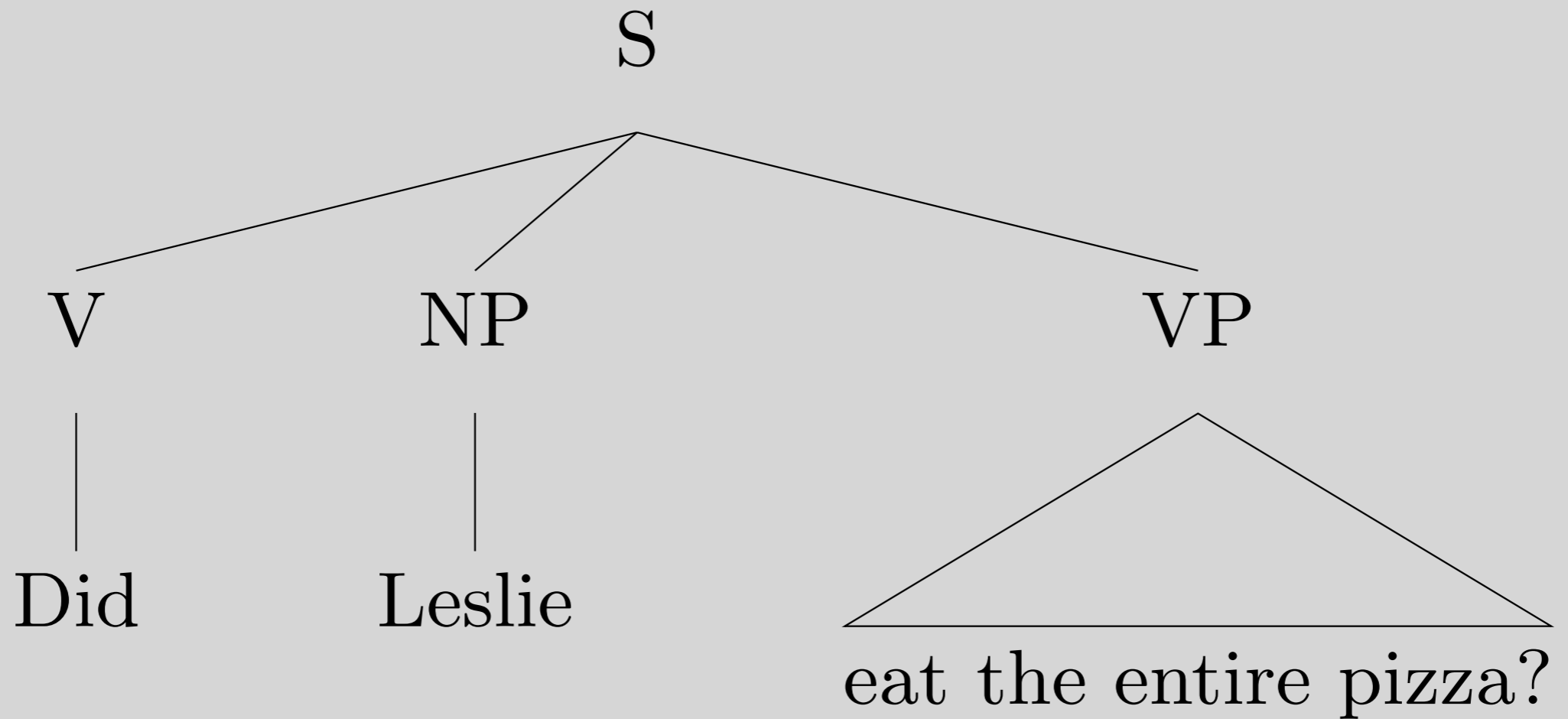
The Feature INV

- 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.

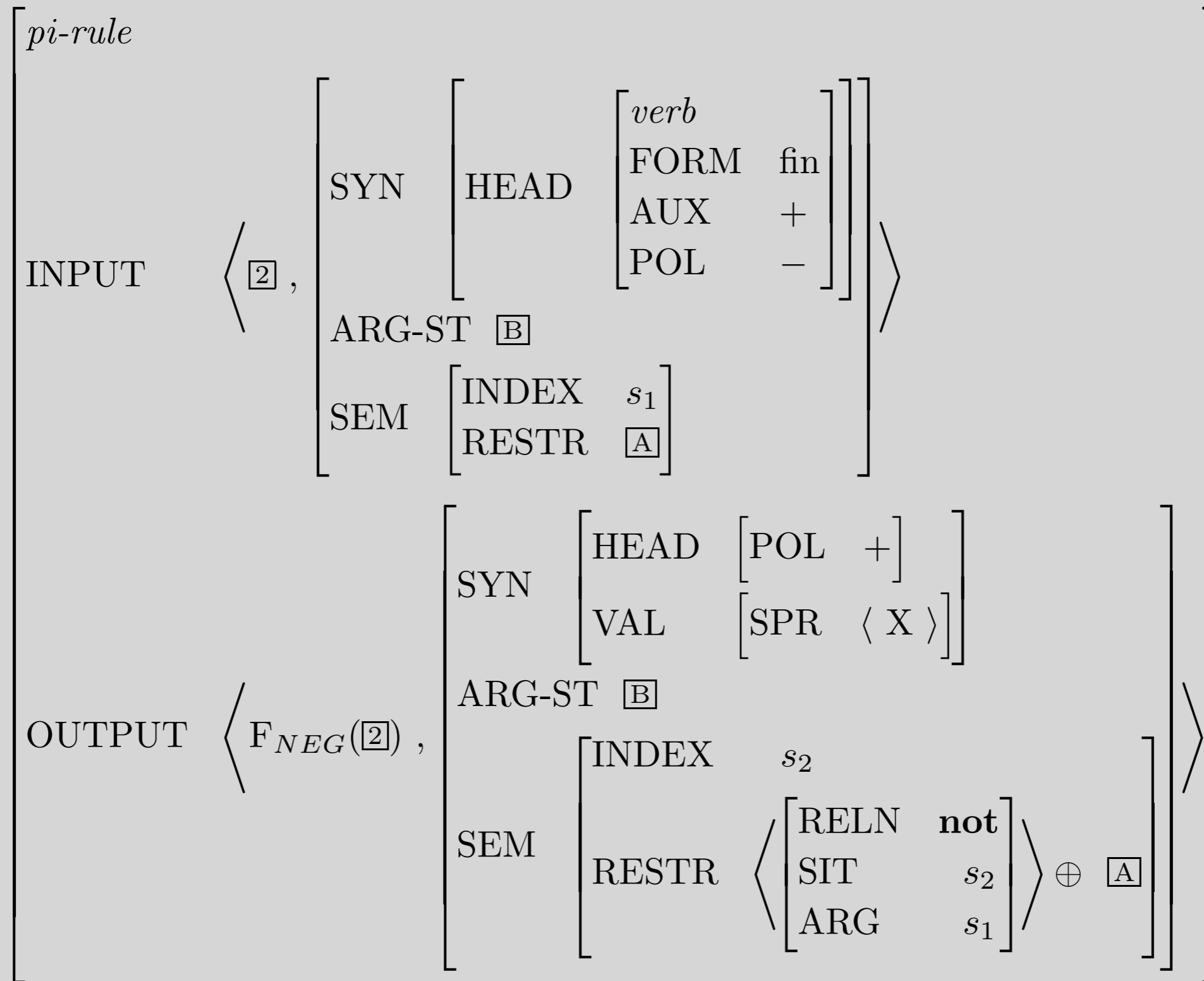
Inversion: A Sample Tree



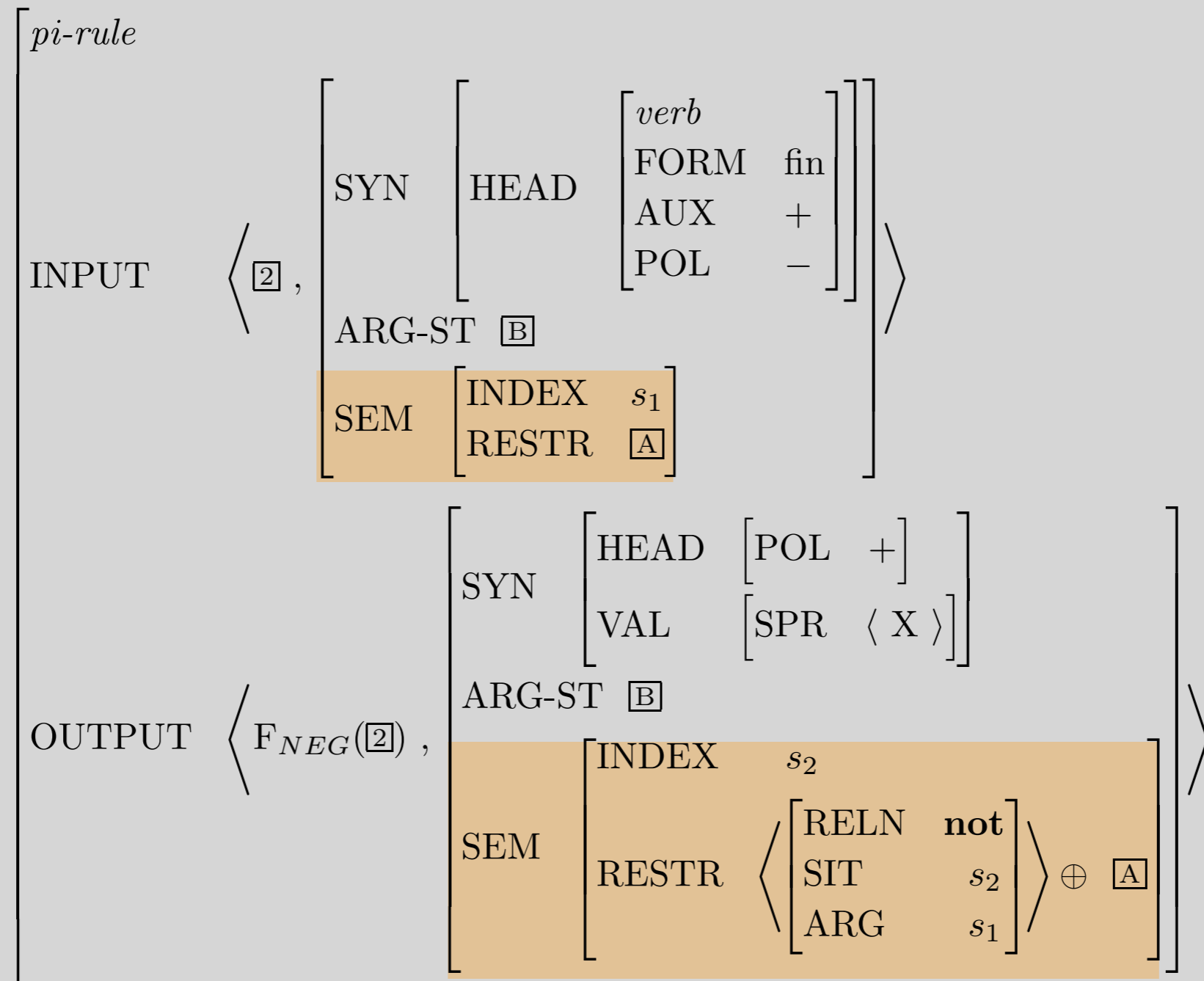
Contraction

- 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

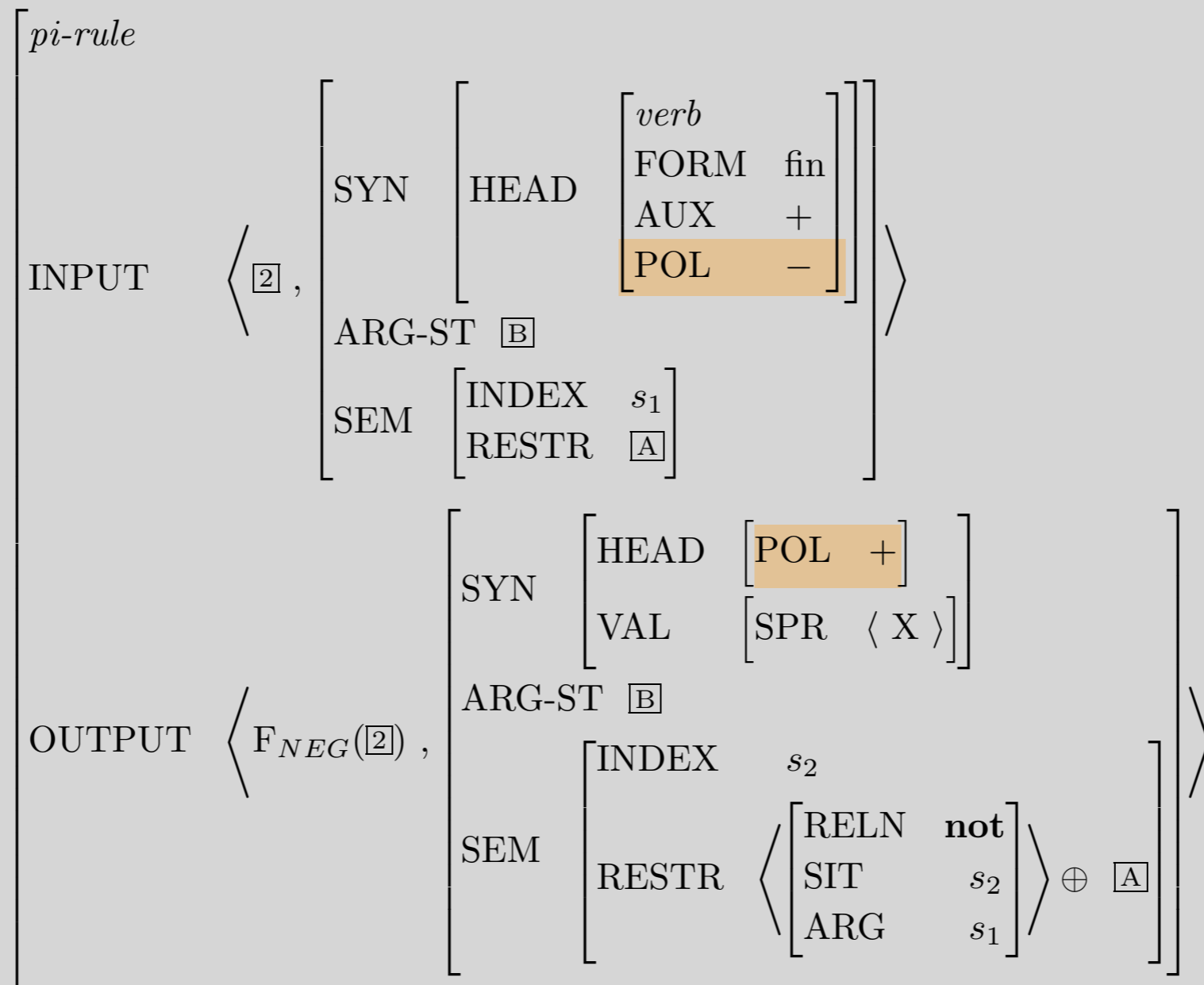


Most of the work is in the semantics



Why?

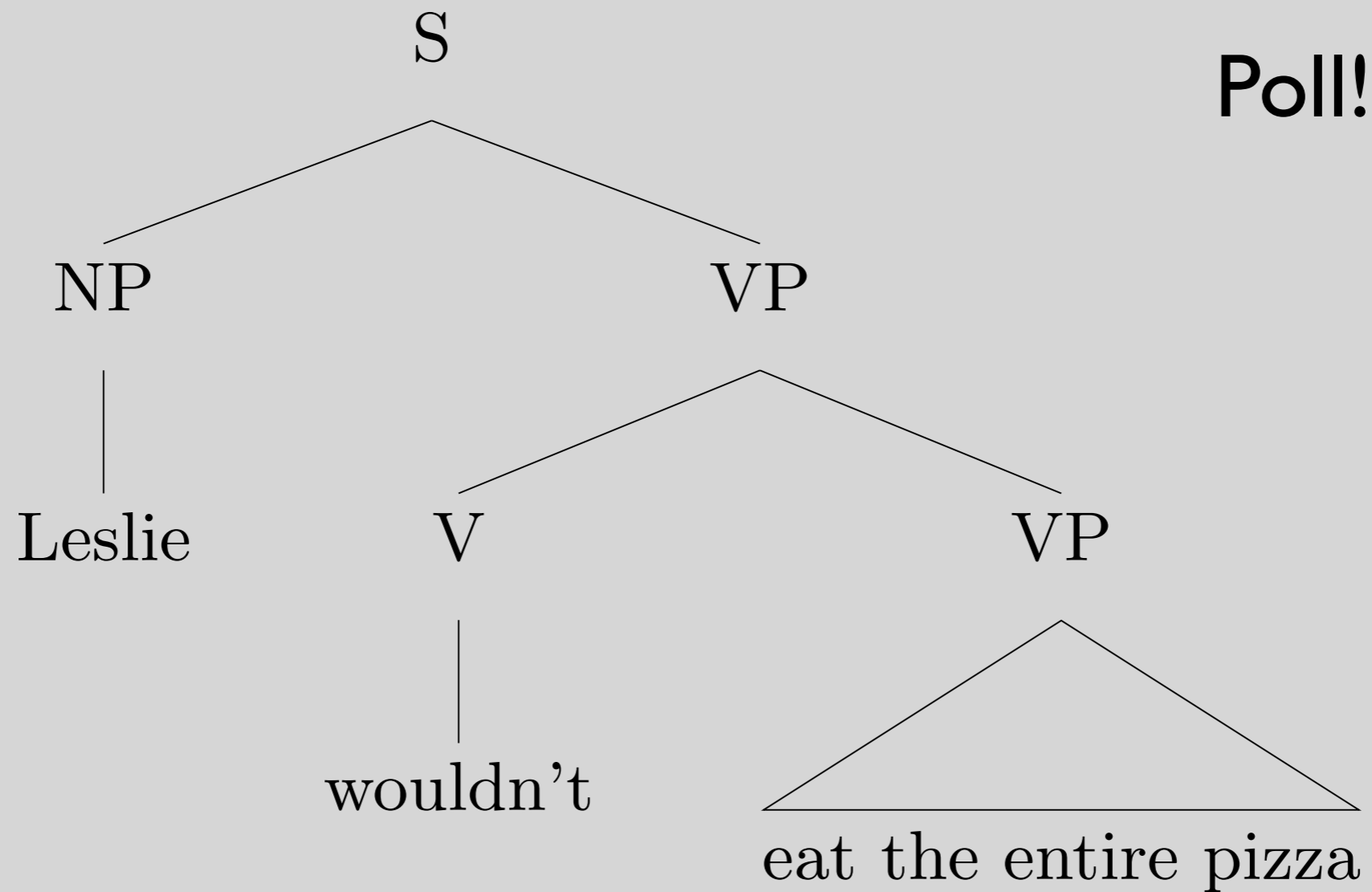
What does POL do?



**We can't stop*

**They won't TOO mind*

Contraction: Sample Tree



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

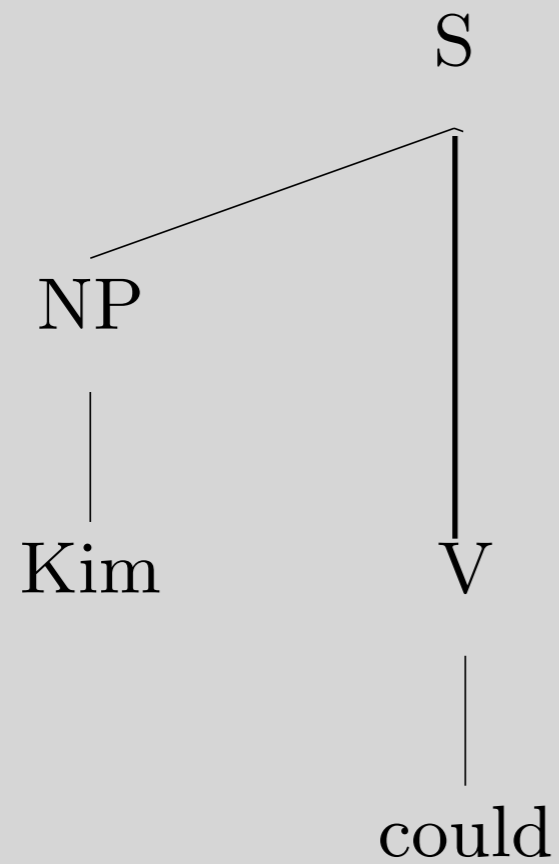
Ellipsis: A Sample Output

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

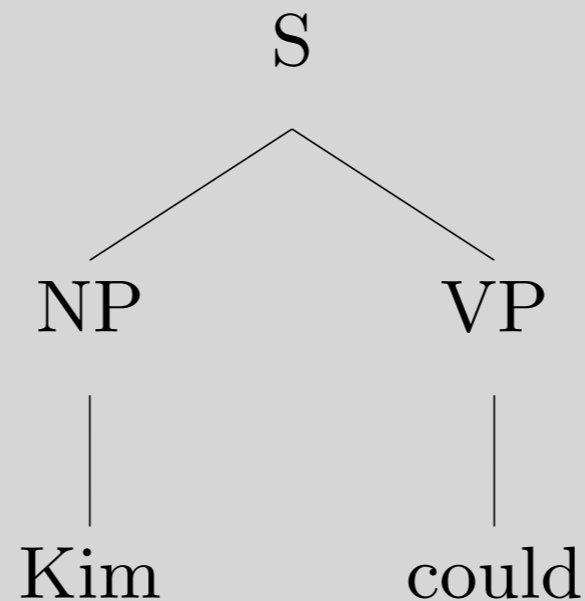
⟨ could ,

⟩

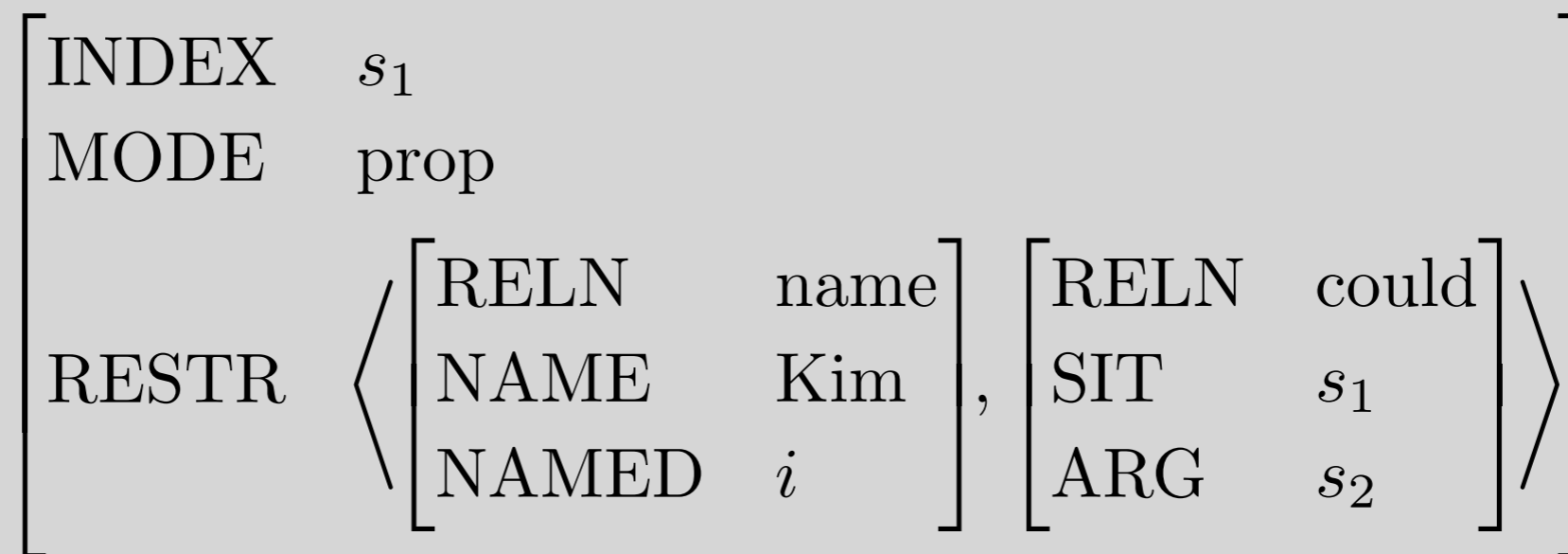
Ellipsis: A Sample Tree



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
- Reminder: **NO CLASS THURSDAY**

Reading Questions

- I wanted to check if I understand this correctly: in (51) (p. 406), does [ARG-ST <1> + A] mean that the argument structure allows for (1) only <1>, (2) <1, A>, or (3) <1, A, B, ...>? (I wanted to check if I understand the difference between <1>+A and <1, A>)

The ADV_{pol} -Addition Lexical Rule

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

Reading Questions

- In the base version of the new ADV_pol-Additional pi-rule (51), why do we need to specify SPR as $\langle Z \rangle$? Why isn't it just the same tag as the first argument of ARG-ST?
- In the Inversion and Contraction LRs, how do we know that we have a non-empty SPR in the input, since this is not explicitly specified in the rule?

The ADV_{pol} -Addition Lexical Rule

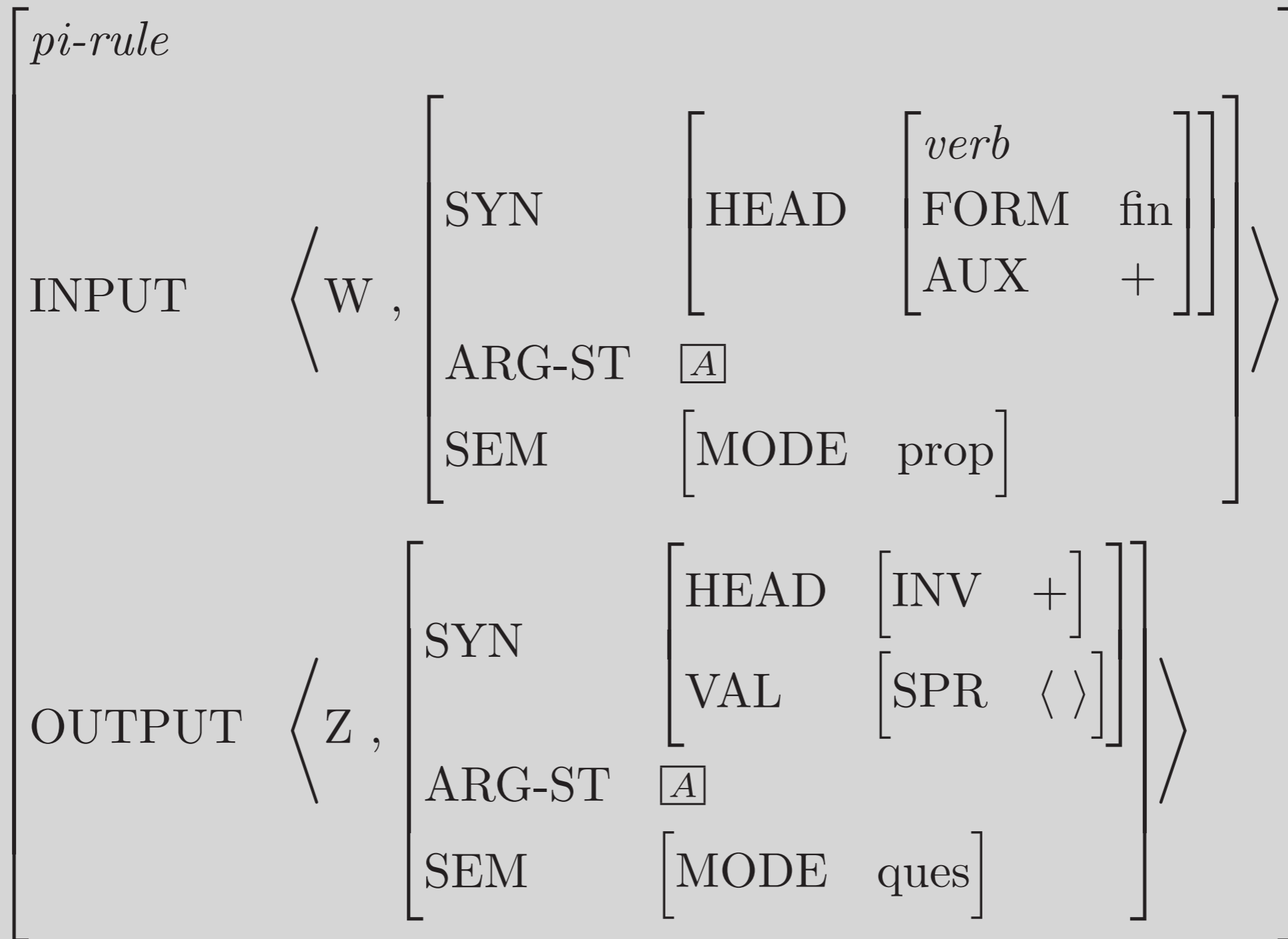
$$\left[\begin{array}{l} \textit{pi-rule} \\ \\ \\ \end{array} \right]$$

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

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

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

The Inversion Lexical Rule



Reading Questions

- I still don't quite get how the Inversion Lexical Rule allows for agreement between the inverted verb and the subject. As mentioned in the book, the SHAC doesn't apply to the outputs of the Inversion Lexical Rule, but the inputs are affected. Could you walk through and explain again how the inputs are affected and why we still functionally end up with the SHAC anyways?
- Can you explain how the inputs of the Inversion Lexical Rule are constrained by the SHAC?

Reading Questions

- For inversion, the way that the subject is treated as a complement to the auxiliary verb is a little unintuitive to me (although it does seem elegant). How did this come to be? Do you think this is how people perceive it in their mental model of language?
- For the sentence in (57) (*Can Pat tap-dance?*), is *Pat* still able to act as a specifier for *tap-dance*, even though the S in question is licensed by the HCR instead of the HSR? Does it need to?

Reading Questions

- I see MOD in VAL in (52) ADVpol Addition Lexical Rule (p.407) and (59) Inversion Lexical Rule (p. 411) in which inherited constraints were shown. Why does pi-rules include the MOD feature and what does it do (when it seems to have nothing to do with auxiliary verbs that these pi-rules govern...)?

Reading Questions

- I don't quite understand why *Shall I go downtown* cannot be the question corresponding to the proposition of *I shall go downtown*, and I am wondering which of the two distinct lexical entries for "shall" correspond to which meaning (described below (67) and before section 13.5.3) ?

Reading Questions

- Post-inflectional rules shifting specifiers to complements seems at first glance like we're dipping into transformational grammar-style movement. How do our new rules avoid the practical evidence discussed in Chapter 9 that moved us away from a transformational approach?
- I think I can understand for practical purposes the "rule-soup" analogy (at least I thought I did for a while), but after seeing more pi-rules, I could use another installment on why this isn't really transformational grammar. We still have all of these rules that link the surface form of words (and ordering of phrases, like the inversion rule), back to these broader lexical entries... and sort-of-default word-ordered-phrases, closer to their lexical entry form, then get transformed by the rules into what we see on the surface level (again, the inversion rule feels like it's transforming word order).

Reading Questions

- For the Ellipsis Lexical Rule, if the first entries in the ARG-ST are identical in the input and output, how does our grammar account for pronoun replacement of a noun, like in *Sarah wanted to understand the chapter, and she tried to.?*
- How does the Ellipsis Lexical Rule account for (72) on page 416 where there are two separate sentences?
- For ellipsis, the rule specifies the need for a specifier, so sentences like (72) *Well, I have* can happen, so how can this rule also take care of response such as "Yeah, might do", which does not contain a specifier.

Reading Questions

- I still feel a bit uncertain about deciding whether or not an adverb is POL +. Would examples like literally (when literally used in the way every single English teacher hates) or totally also be considered polarized? They seem to appear in the same environment as SO/TOO/NOT, yet also don't seem to serve the same kind of function.
- Would indeed or in fact be considered polarized adverbs? The examples with so and too in this chapter seem like something you would only hear on a playground, so I'm sort of wondering if adult/"formal" varieties of English have an impoverished set of polarized adverbs compared to the way kids speak.
- Is the distinction between Polar adverbs and non-polar adverbs always clear? Can adverbs such as never, rarely also be selected by finite auxiliaries to be their complements?

Reading Questions

- I'm curious about the motivation to analyze Negation and Contraction separately. I feel like they are adding the same properties to the semantics - negating a phrase. For example, I haven't slept and I have not slept carry the exact same meanings. Why do we need different rules for -n't and not?
- I'm wondering would that be possible to map $F_{neg}(can)$ to both can not and can't?

Reading Questions

- Sentence negation is defined as cases in which the whole clause is interpreted as being negated. Do we mean the negation of the verb phrase existing in the clause and whatever semantics it contains as opposed to the other constituents in that clause? And are we using SO/TOO vs. not as a way to identify whether the negation is constituent vs. sentential; i.e. if the sentence allows both SO/TOO and not in the same position with polarized meanings, then we are sententially negating (and that what the chapter is focusing on and treating as a modifier attaching to the left of phrases)?

Reading Questions

- It is not clear to me why the OUTPUT of the ADV_{pol}-Addition Lexical Rule has a different INDEX than the INPUT. What is this change meant to indicate?
- How would the ADV_{pol}-Addition Lexical Rule come into play to license the semantics of a phrase like, "Pat will not leave or go home and go to bed"? Looking at (52), I'm not sure if this would mean there are other ADV_{pol}'s on the output's ARG-ST list or if there would be more items on the output's ADV_{pol}'s RESTR list.

The ADV_{pol} -Addition Lexical Rule

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

Reading Questions

- The treatment of the pol ADVs in this lexical rule is differentiating two different lexical sequences of every verb, one that is POL+ and one that is POL-? I didn't really understand the argument for making the pol ADVs into mandatory complements instead of optional modifiers (where the optional modifier would then only require one lexical sequence) - is it specifically so that we can have finer control over the semantics?

Reading Questions

- Why do we make *dervv-lxm* a subtype of *verb-lxm* instead of *siv-lxm*? By definition, it seems like it would be a strict intransitive verb.
- Does *dervv-lxm* only exist to be a "dummy" lexeme of whatever the output of the Ellipsis Lexical Rule is? It has no features or constraints other than what is inherited from *verb-lxm*, and only seems to not be able to be *aux-lxm* because it can't be a *srv-lxm*. But it will still always have the feature [AUX +] because it can only exist after ellipsis.

Reading Questions

- I'm interested in exercise 4; "Why do we need the type *dervv-lxm*?" . I understand that the output of the Ellipsis Lexical Rule can't be *auxv-lxm* because that would constrain the output to be AUX +, but is it not enough to leave the output as *verb-lxm*, or is that too non-specific?
- What are the constraints of *dervv-lxm*? How is it different from *auxv-lxm*? Is it used in any other cases, other than aux verb ellipsis?
- Why do we put *dervv-lxm* directly under *verb-lxm*? Based on this Chapter, it seems that *dervv-lxm* is created just to accommodate Ellipsis Lexical Rule, then why couldn't we put *dervv-lxm* under *auxv-lxm*?

Reading Questions

- Is there any pattern to which auxiliaries take contraction? Is it dialectic and developed over time through language use?
- In the NICE properties, negation by being immediately followed by 'not' is one of the way in which auxiliary verbs differ from other verbs. How can we then account for things like 'care not' or 'fear not'? Are these sorts of formulations just somewhat archaic and not really used in modern English, or would they be considered more idiomatic?

Reading Questions

- The discussion of the ellipsis property of auxiliaries made me wonder about the relationship between constituency and ellipsis.

Who is going downtown?

(1) We are!

(2) Us!

- I felt that (1)'s grammaticality was well explained in this chapter. Maybe we could touch briefly on why (2) also seems good? Would it be for reasons completely unrelated to ellipsis?

Reading Questions

- As our grammar has become more precise we've ran into more exceptions we need to account for, and many of them have been resolved by introducing new binary head features (like INV, INF, POL). Does this trend continue so that more fully fleshed out grammars end up with hundreds of head features, or does that number stay relatively small?

Reading Questions

- Curious to know whether/how this current framework to model inversion account for the special use case of “should” for inverted conditional. e.g. should he remember his own name, we will be able to help him = if he remembers his own name, [...].

Reading Questions

Poll! (RQs)

- I've taken 571, where we used this somewhat loosely, but for my edification: how do we apply this theory automatically? Is the intent to identify lemmata from input sentences, match them to possible lexical entries and lexical rules, and then use some most-likely assignment algorithm like the Viterbi algorithm to find the most likely possible parses using the other rules and principles?