

# Ling 566

## Nov 19, 2019

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?

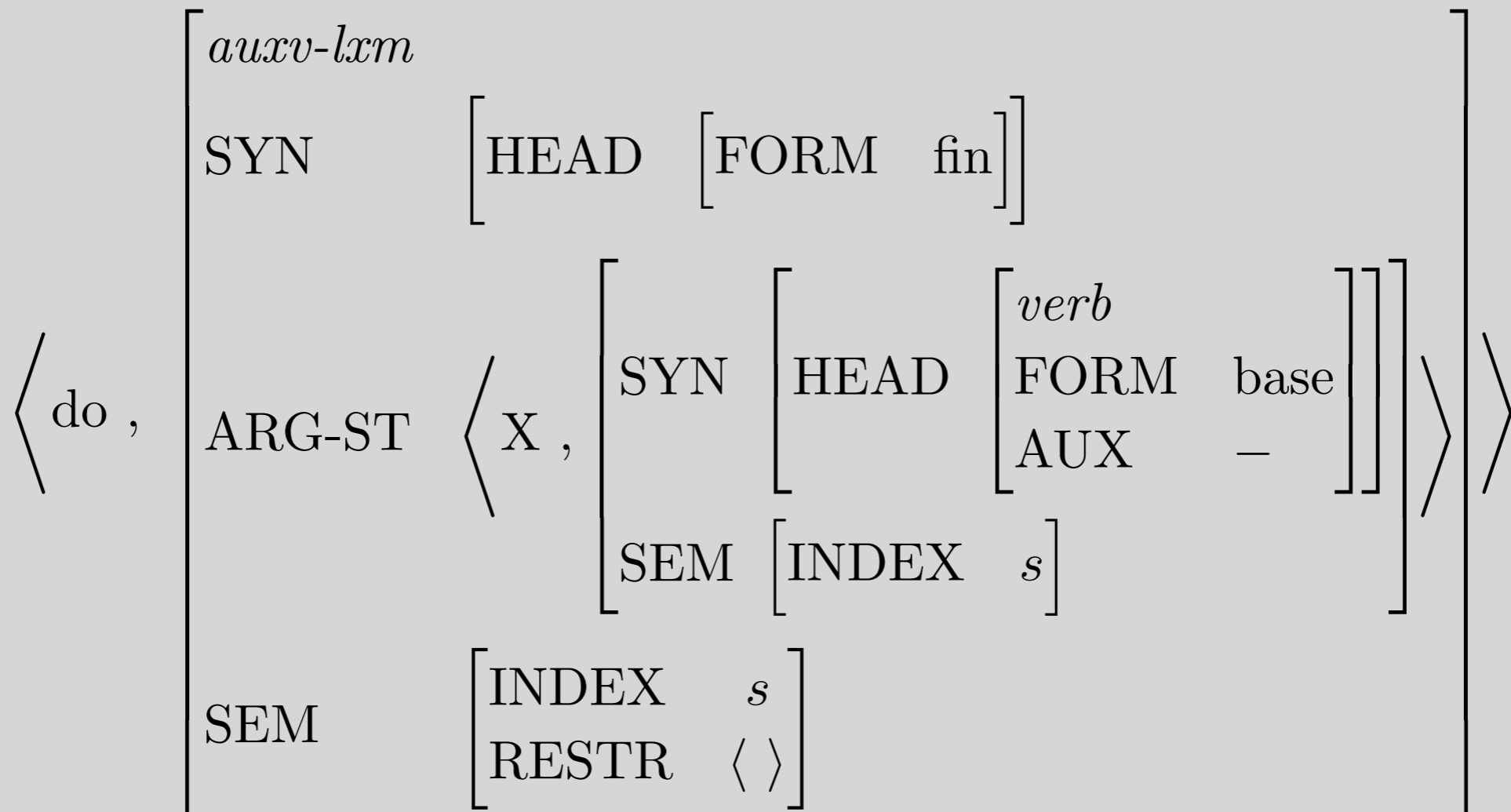
*Pat left*

*Pat did not leave*

*Pat did TOO leave*

# The Auxiliary *do*

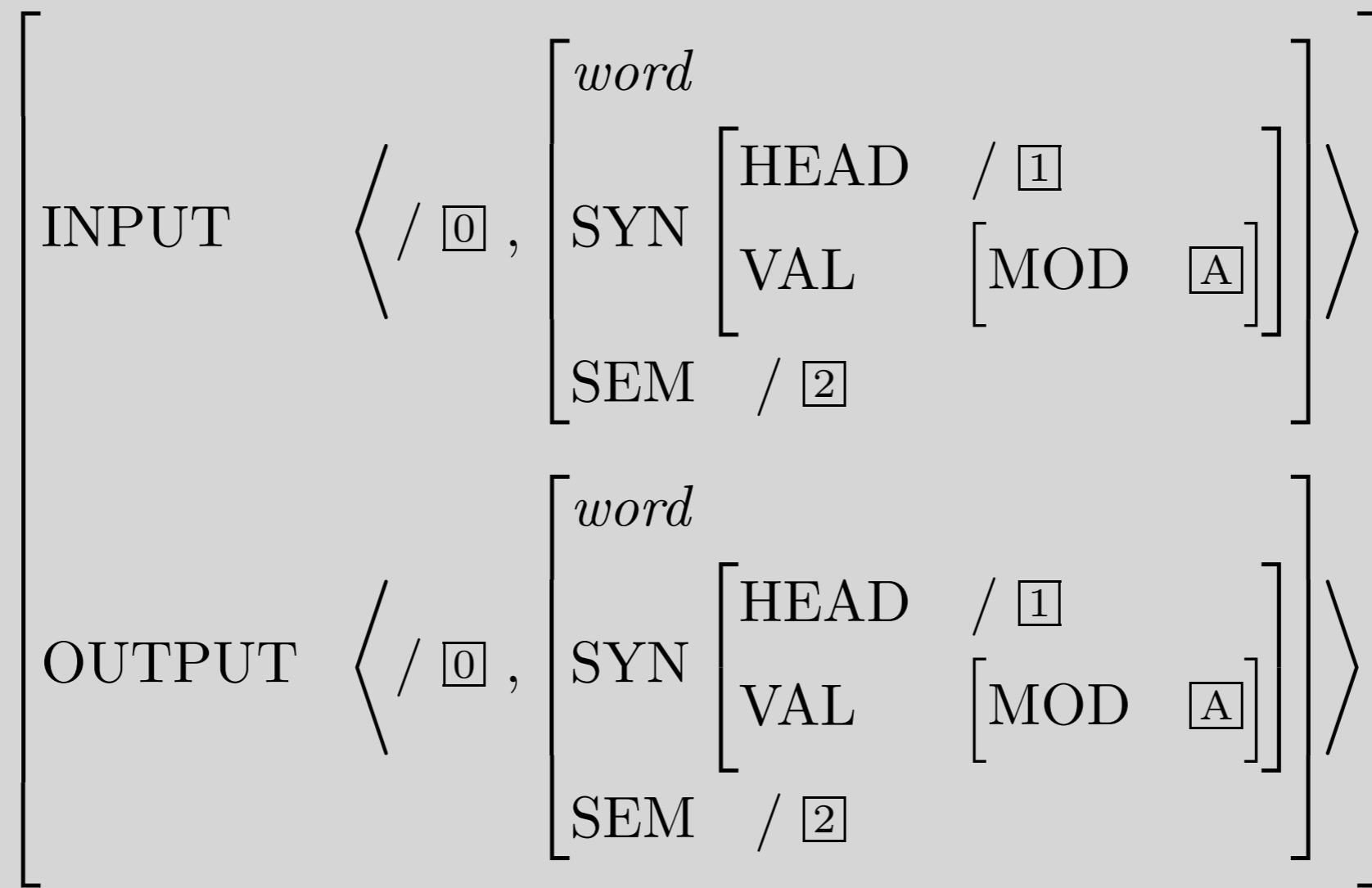
- Like modals, auxiliary *do* only occurs in finite contexts:  
*\*Pat continued to do not leave*
- Unlike modals, *do* cannot be followed by other auxiliaries:  
*\*Pat did not have left*





# What does the type *pi-rule* mean?

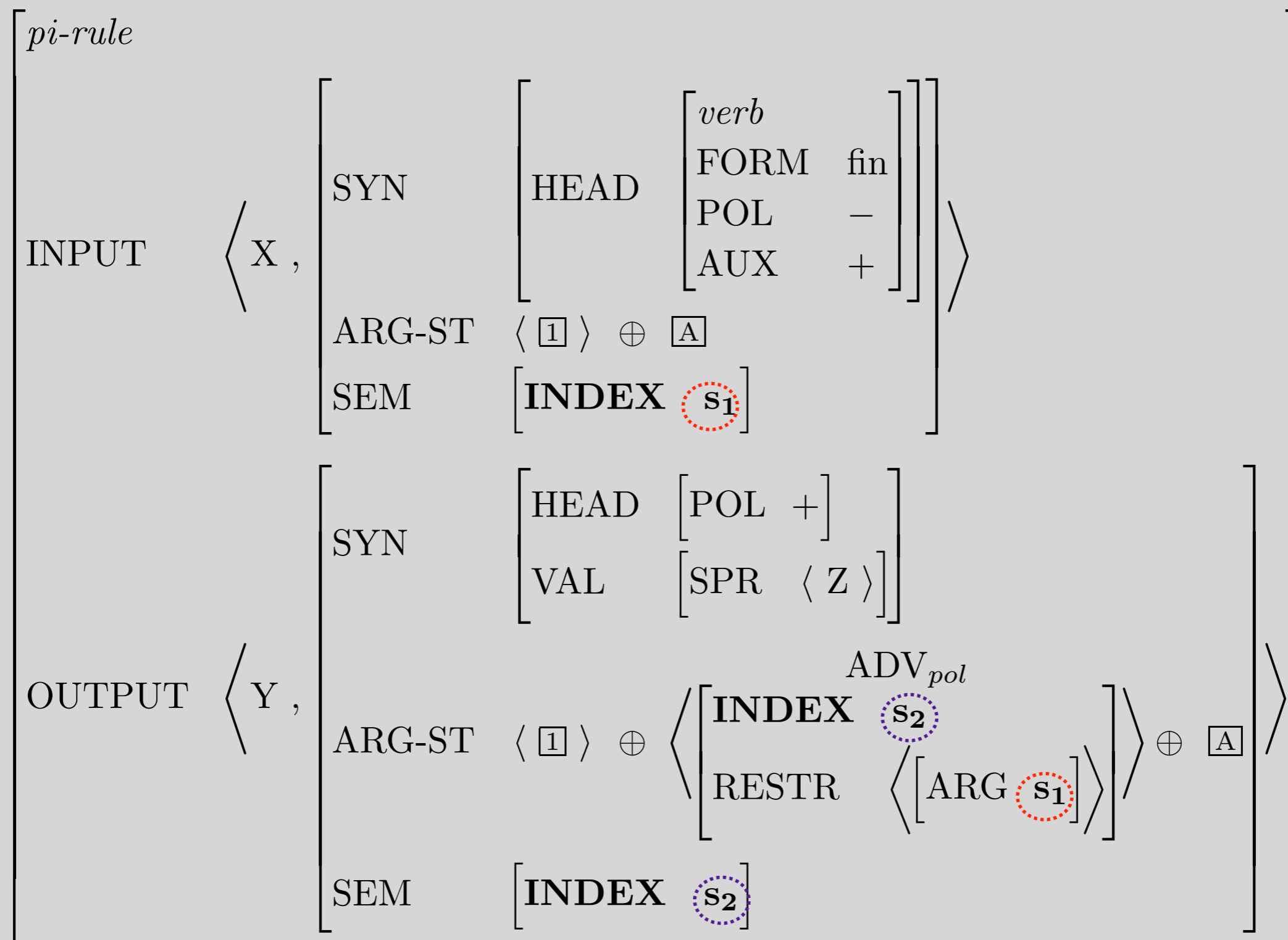
- It maps words to words (hence, “post-inflectional”)
- It preserves MOD values, HEAD values as a default, and (like other lexical rule types) SEM values as a default





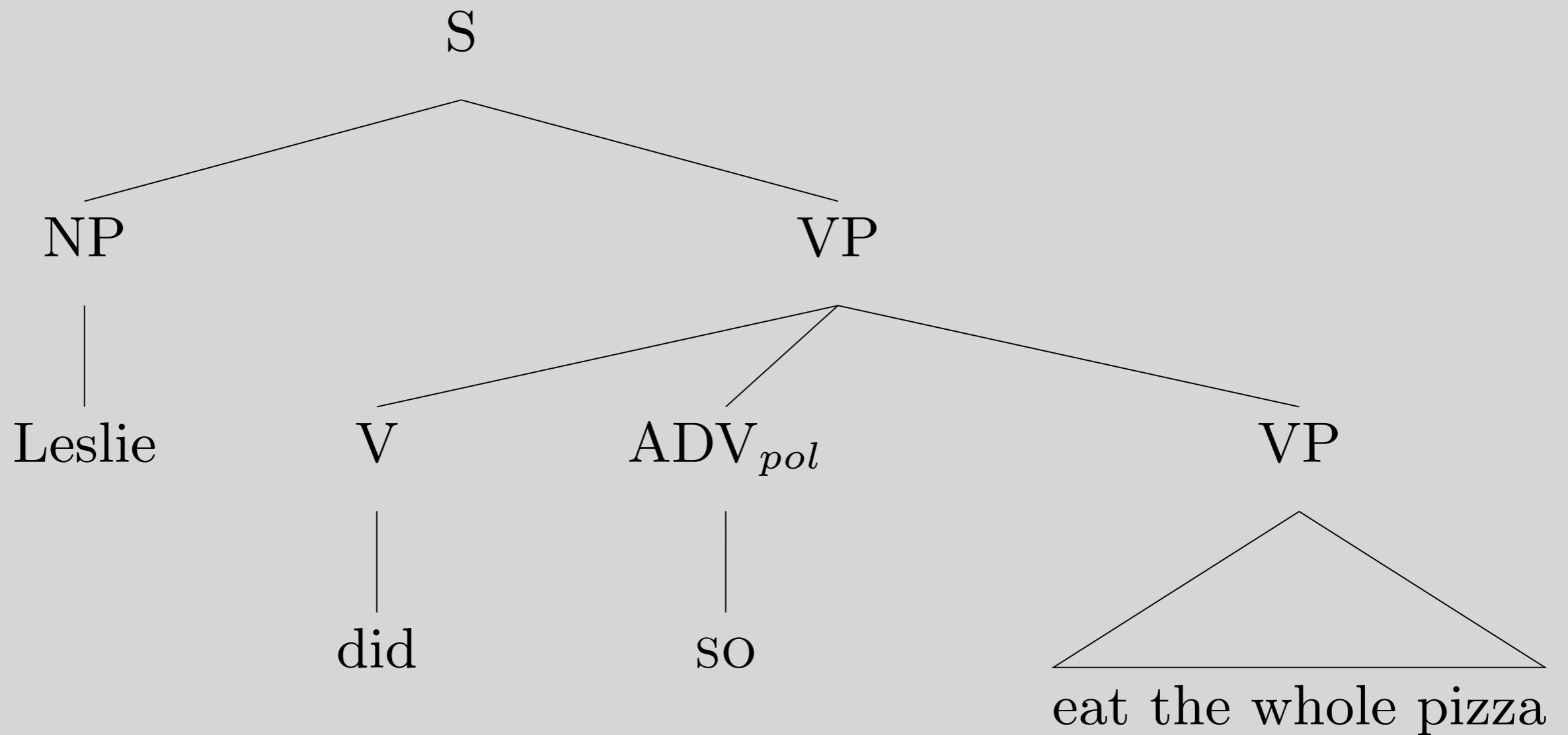


# What is the role of these indices?





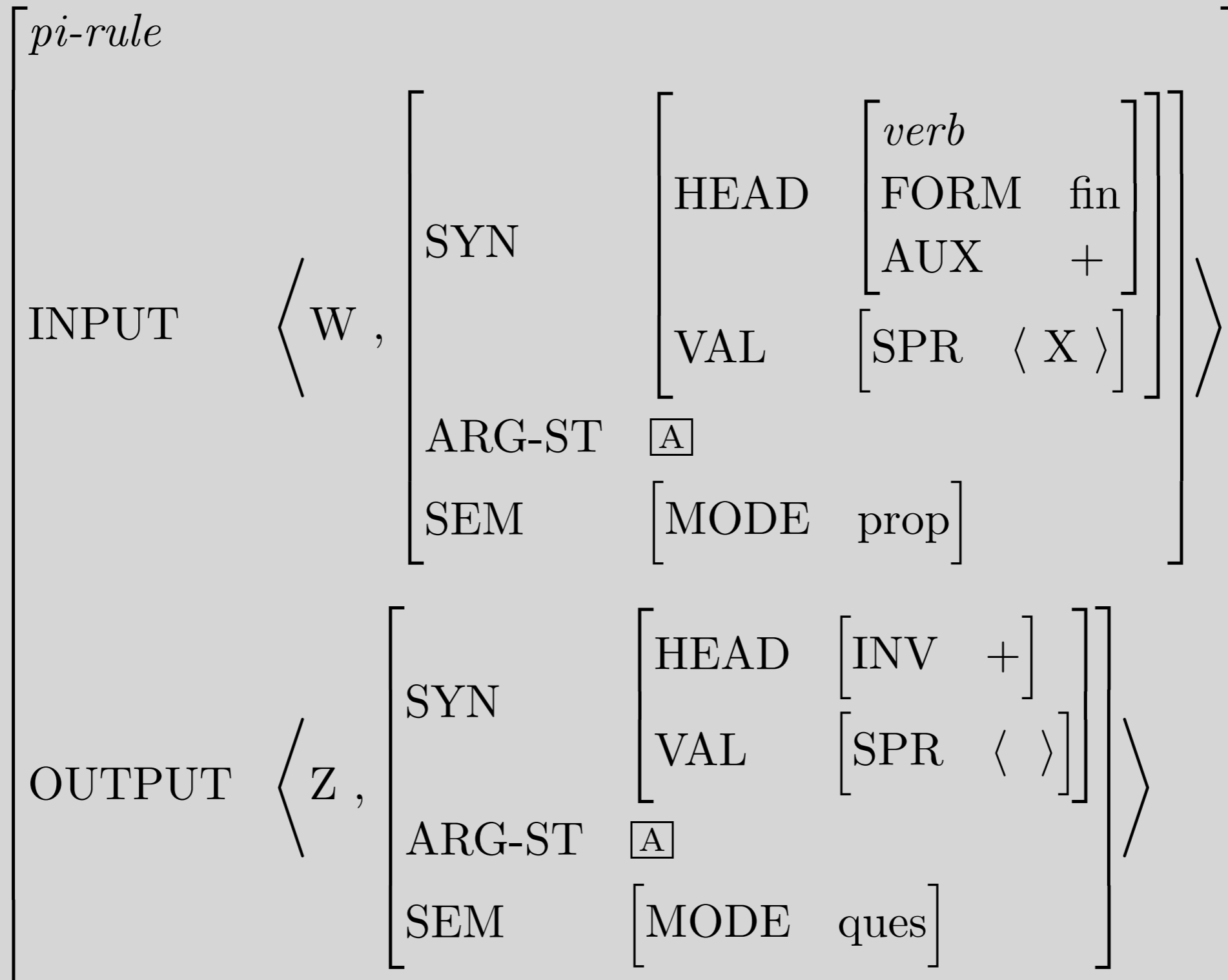
# Negation and Reaffirmation: A Sample Tree



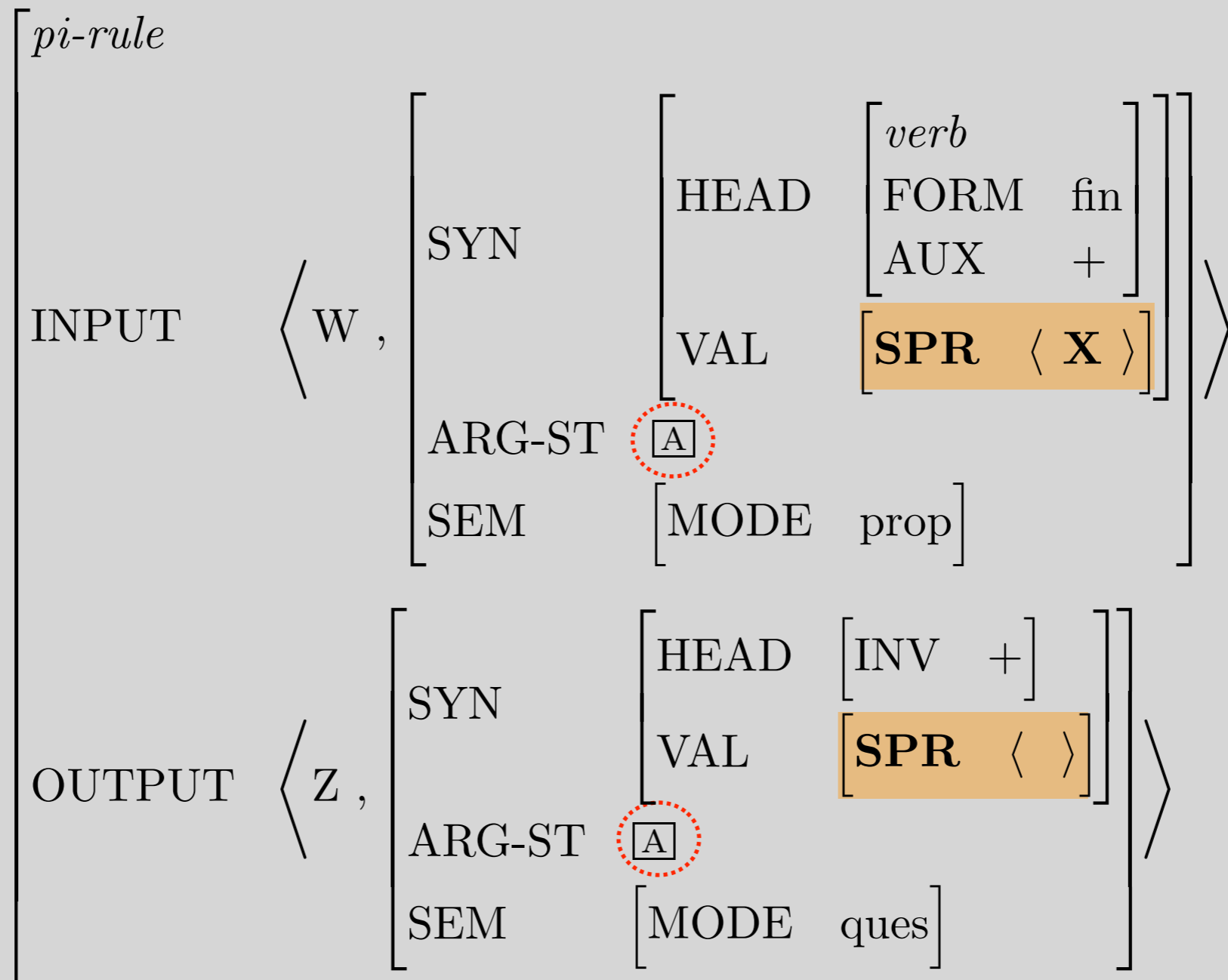
# Inversion

- 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

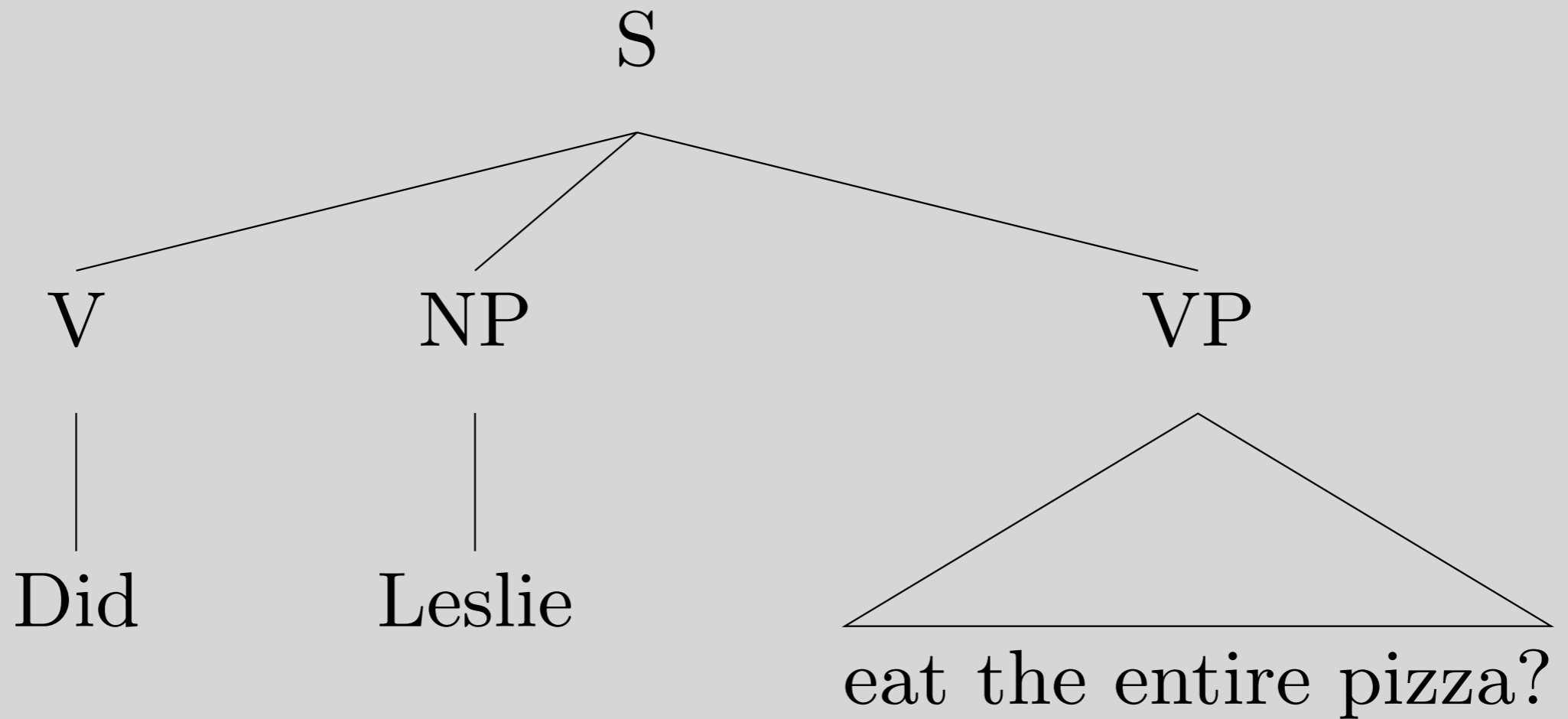
- What is the INV value of inputs to the Inversion LR?
  - Perhaps surprisingly, the input is [INV +]
  - Word-to-word rules (*pi-rules*) have default identity of HEAD features, and no INV value is given on the input
- Then what work is the feature doing?
  - It's used to mark auxiliaries that can't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



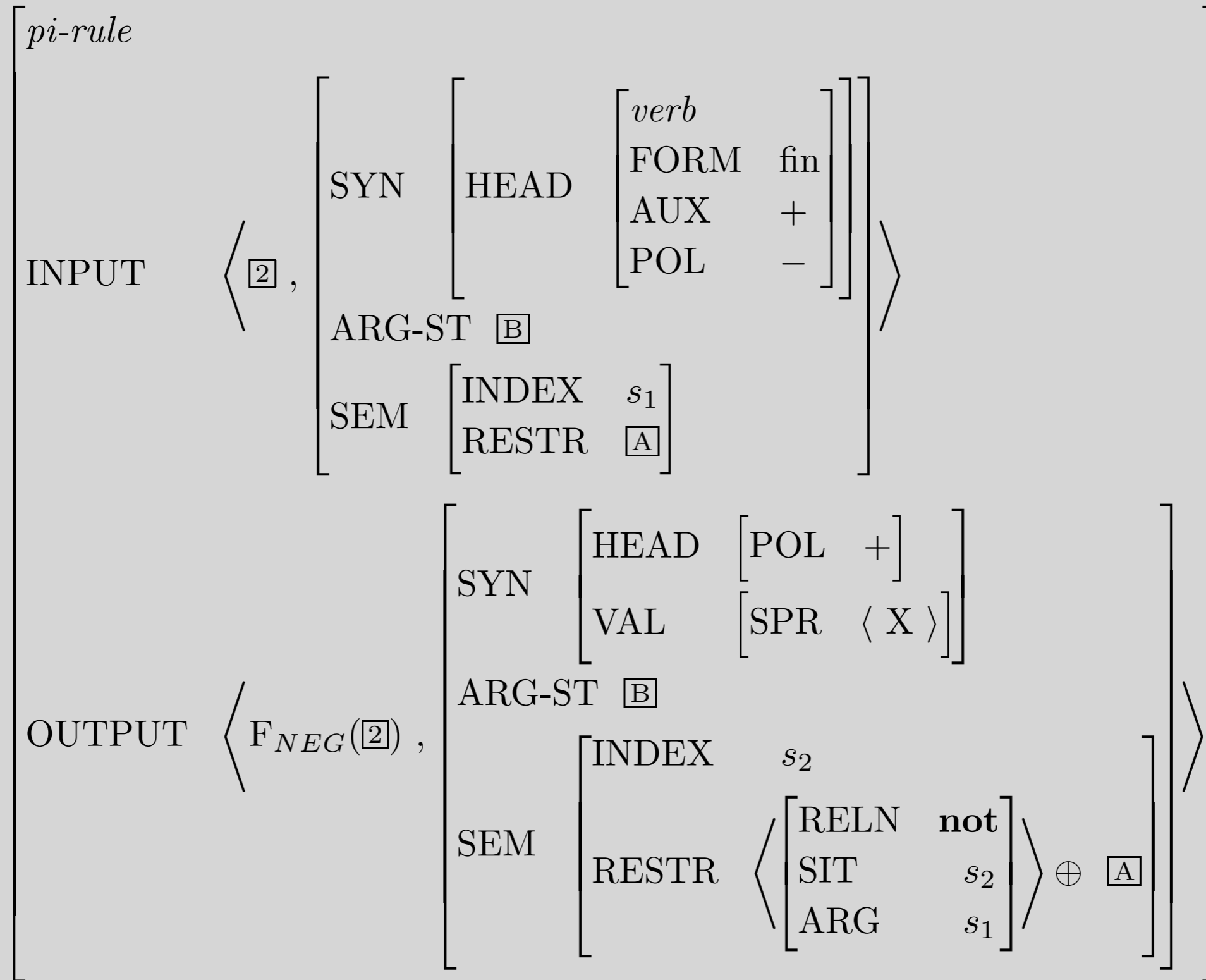
# Inversion: A Sample Tree



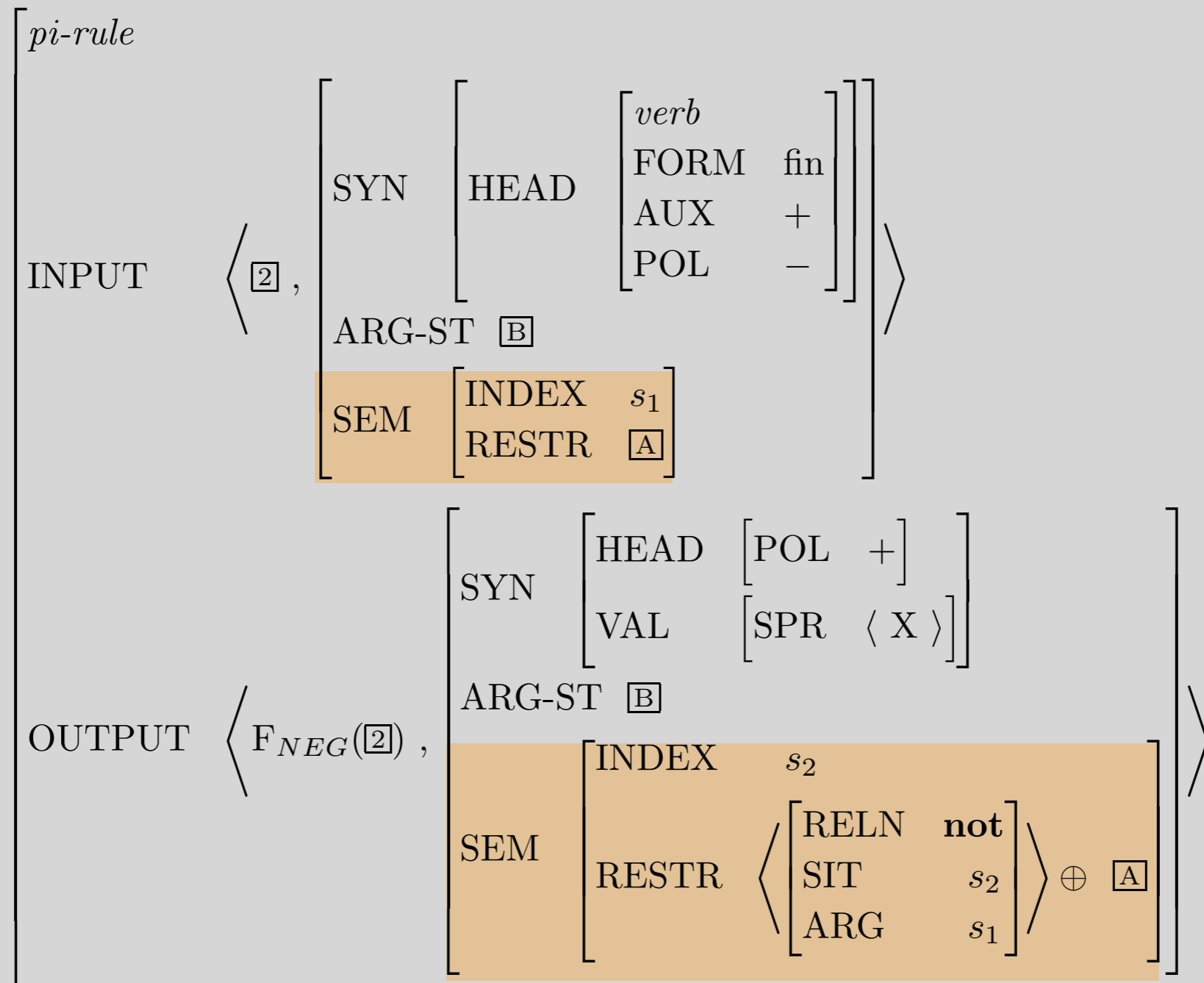
# Contraction

- 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

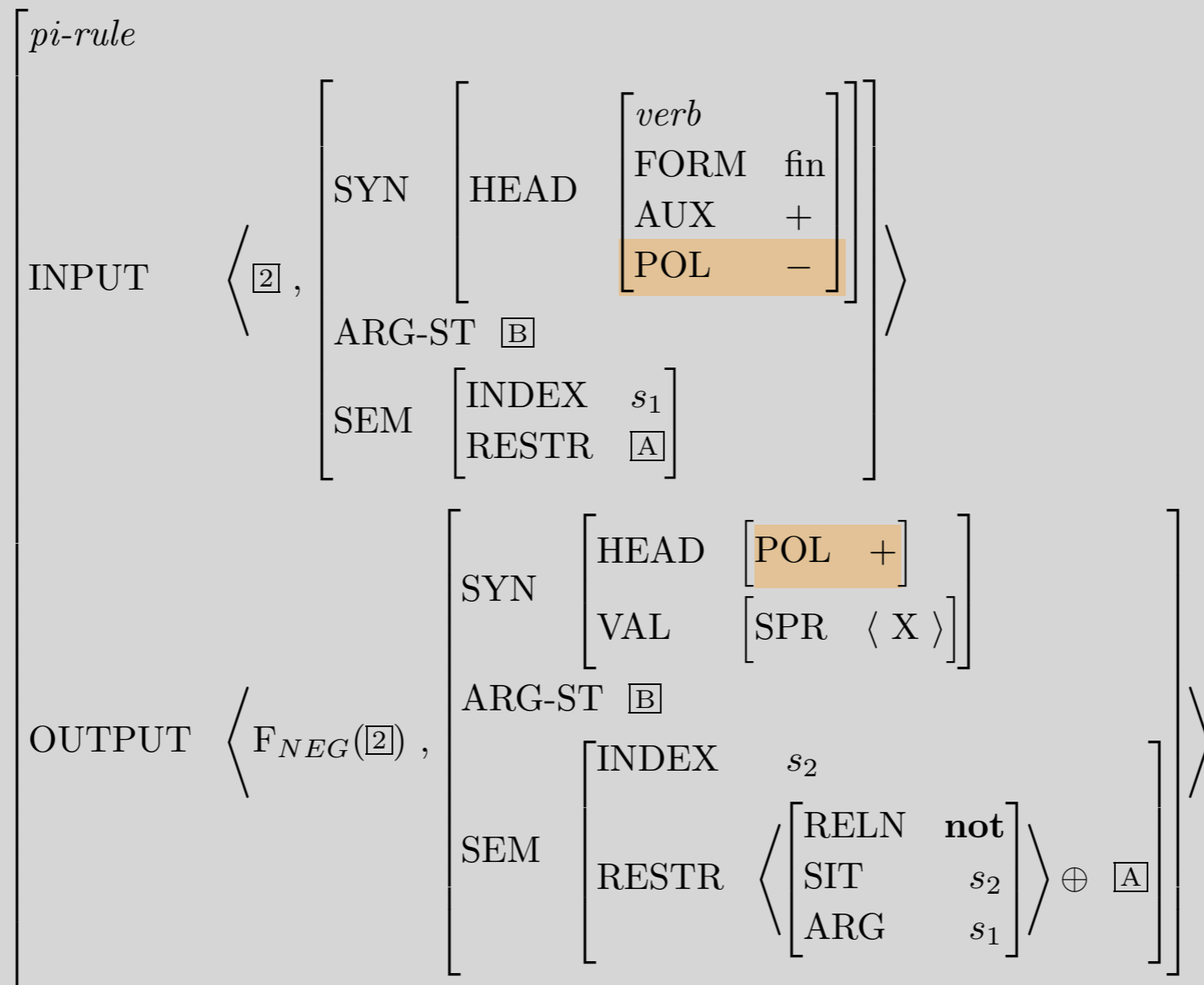


# Most of the work is in the semantics



Why?

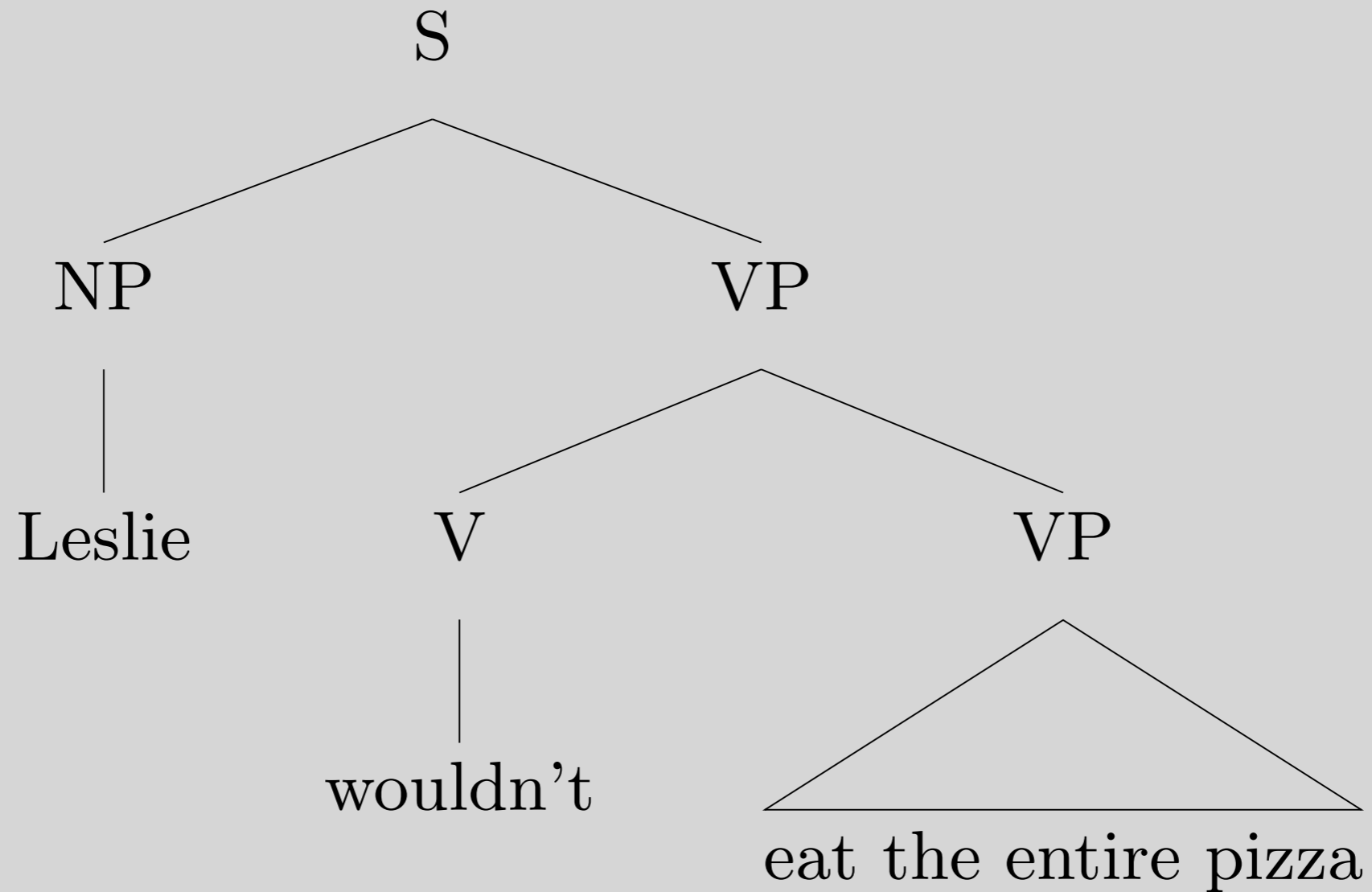
# What does POL do?



*\*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

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

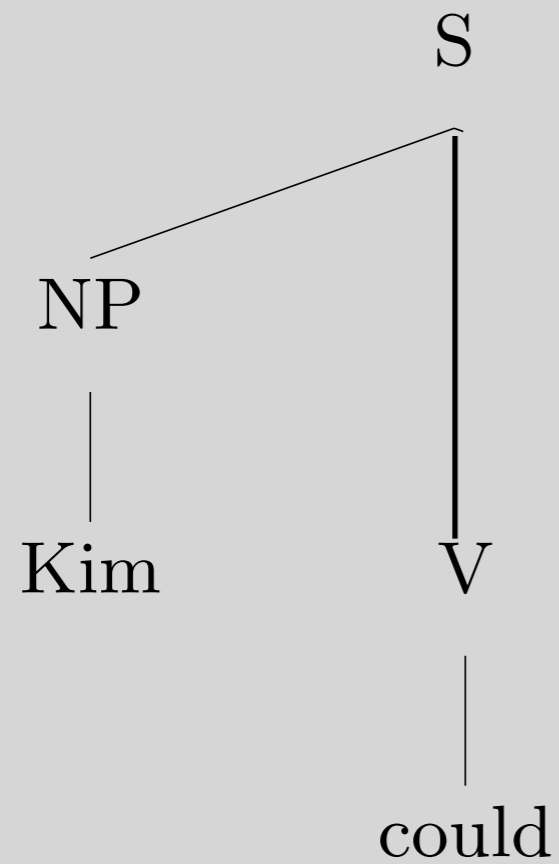
- Note that this is a derivational LR (*d-rule*) -- that is, lexeme-to-lexeme
- This means that SYN and SEM are unchanged, by default



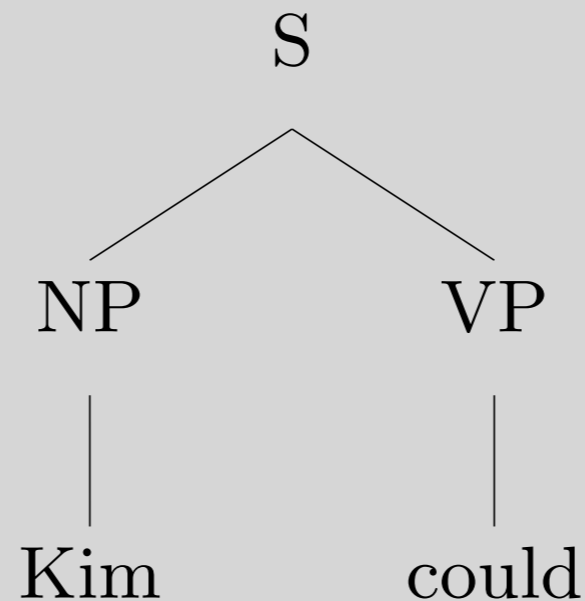
# Ellipsis: A Sample Output

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

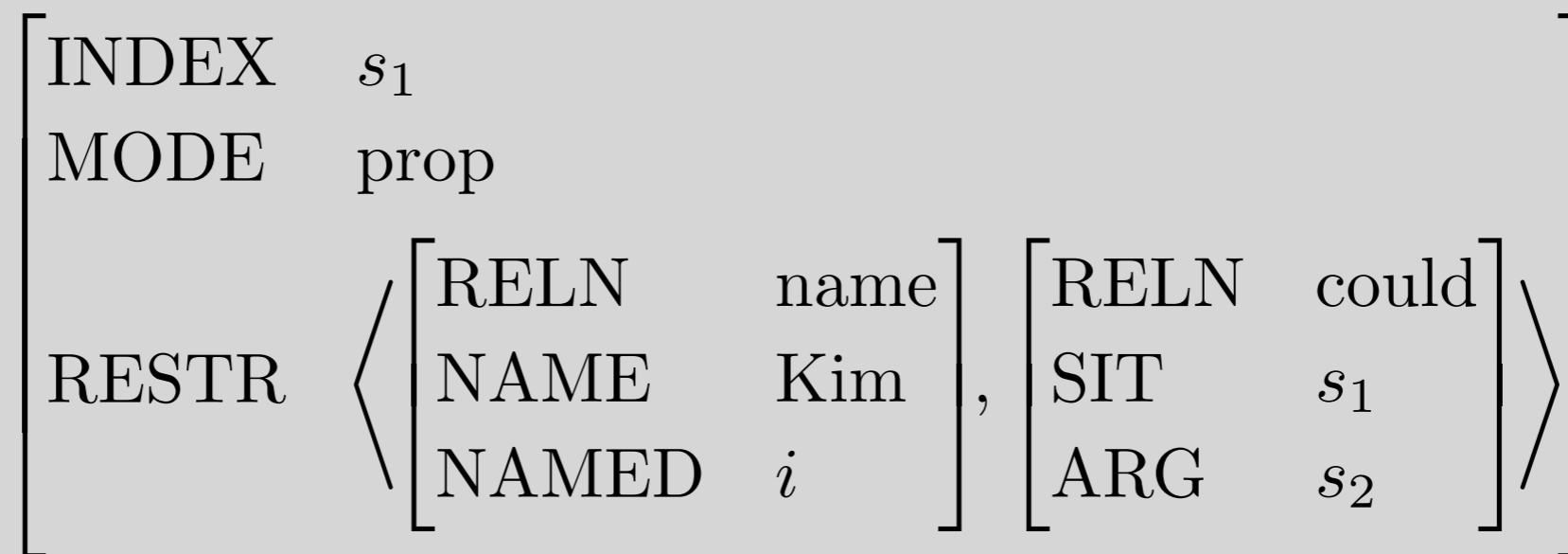
# Ellipsis: A Sample Tree



# 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

# Reading Questions

- p. 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." I found this a little confusing (probably because I don't know how to interpret "push down") - could you help clarify what it means?



# Reading Questions

- pp416 (70) The ARG-ST contains 2 arguments, where the specifier of the second argument is identified with the first argument. Am I right in saying that this isn't anything inherited via any lexical rule; but rather this is simply the definition of this lexical entry?
- [ output of contraction lexical rule for *isn't* ]

# Reading Questions

- In (66) would one of the entries for shall have its mode value set as prop while the other has mode value of ques?

(66) a. I shall go downtown?

b. Shall I go downtown?

# Reading Questions

- In the discussion of the INV feature, (66) shows two examples of the usage of "shall" with (66a) being interpreted as a simple future-time proposition. However, the word "shall" in sentences like (i) feels more like an instruction with similar semantics like the word "should" but just with a more formal register. How do we deal with this? In this case is the "shall" in (i) the same as the one in (ii)?

(i) Passengers shall remain in their seats.

(ii) Shall passengers remain in their seats?

# Reading Questions

- On p. 414, the book discussed the inversion of "shall" as a special case where the semantics change with inversion. It says "one could" account for the contrasts by positing two lexical entries for shall. This wording makes it sound like there is another option. Is this the final analysis that we will use for shall? Is there another good option? It seems like any other option would require us to change the semantics on shall as a part of the lexical rule, which would be very specific to this verb, and I don't think it would generalize well.

# Reading Questions

- Why does the Inversion Lexical Rule have both the input and output as [INV +]? What exactly does INV mean here?
- Since inverted sentences sometimes are not really questions, why make the assumption and add the MODE ques constraint? Why not make it optional?

# Reading Questions

- The text after (62) states that the complements of the auxiliary verb which follow it must adhere to the SHAC, however those words have no specifiers since they directly follow the aux verb. How will the words adhere to SHAC in this case?

[ Is/\*Am/\*Are the dog barking? ]

- How would you create inverted sentences that aren't questions? Is there a different Lexical rule for them?

# Reading Questions

- If we change the output of the contraction lexical rule to POL+, does that mean that we cannot combine polarize adverbs with contracted negation? What about an example like "Paul can do a double backflip." "He so can't!!"

# Reading Questions

- Is the ADVpol-Addition Lexical Rule implemented in other languages? Its use for negation is clearly important outside of English, but if a language implements a three-form (or four-form) affirmative/negative system and can cover reaffirmation through this system rather than equivalent 'too' or 'so' adverbs, is it worth it to implement this rule to only be used for negation? Could you specify the output constraints at another level (a negation-lxm subtype for example).



# Reading Questions

- How do we handle Yes and No: Yes, I read the book./No, I did not read the book.
- It's not intuitive to me why ADV\_pol Addition Lexical Rule applies to verbs and not the ADV\_pol words themselves.

# Reading Questions

- Given that we are "restrict[ing] our attention to sentence negation" (p. 403) and the explanation of how "a sentence like Kim is not happy will have negation as its 'highest' predication" (p. 409), does this mean that all of the sentences our grammar licenses that handle negation will necessarily have negation at their highest predication (which I think would also entail that their root S node will always share an INDEX with the word structure above not)? Or are there any cases (that we are accounting for) where that wouldn't be true?

# Reading Questions

- How do I know whether a negation is a constituent negation or sentential negation? I don't see a clear distinction between them by just looking.

# Reading Questions

- In the ADVpol-Addition Lexical Rule, the index of the INPUT, s1, essentially moves to the ARG value on the RESTR list of the second argument of the OUTPUT, and the index of the OUTPUT is s2. Since s1 no longer points to the auxiliary verb in the sentence structure, what is pointing to? It seems weird to disassociate this index value from the verb but then still use it in the predication of the adverb even though it no longer references a particular element of the sentence.

# 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

- I'm not sure this will get covered in the course, but the potential distribution of the "NOT" in examples like (39c) intrigues me. Based on the placement of the word it can have different affects over the sentence's meaning. For example:
  - Pat must have not been eating.
  - Pat must not have been eating.
- The placement of not before vs after the verb "have" seems not to have an affect on the meaning of the sentence.
- However it does appear to sort of affect the meaning when placed after been:
  - Pat must have been not eating.
- It appears that the word NOT has to appear after at least one verb:
  - \*Pat not must have been eating

# Reading Questions

- Regarding the NICE properties, why are contraction and negation analyzed in separate sections? It seems like our analysis of contractions is solely for the purpose of negation.

# Reading Questions

- Even after reading the chapter I'm still confused about the difference of n't and possessive 's. For possessive 's we have it set as a separate entity on the tree, but for n't it is instead treated as an inflectional change on the verb. Why are they considered different? Is it just because possessive 's can attach itself to non-inflectional lexemes? But then why doesn't n't act the same way as native speakers of English would recognize it as not and not necessarily a part of the lexeme?



# Reading Questions

- We see contraction with negated verbs like won't and isn't... would words like you're and I'll undergo a similar process? I imagine the rule would be a bit different because those verbs are adding the subject to it.

# Reading Questions

- I still did not catch the point that why we have to create a new type for the
- OUTPUT of Ellipsis Lexical Rule since I think we are generating a grammar that the more concise it is, the better it is. Why can't we just change the value of COMPS to achieve that goal?

# Reading Questions

- Is `dervv-lxm` only introduced as the output for the Ellipsis Lexical Rule? Are there other places it could be used?
- Doesn't `dervv-lxm` also inherit [ `AUX /-`  ], just like `siv-lxm`?

# Reading Questions

- How are the orderings of PI rules accounted for in our formalism? If a verb is transformed both by the inversion rule and the contraction rule, is there a constraint on which rule takes precedence?

# Reading Questions

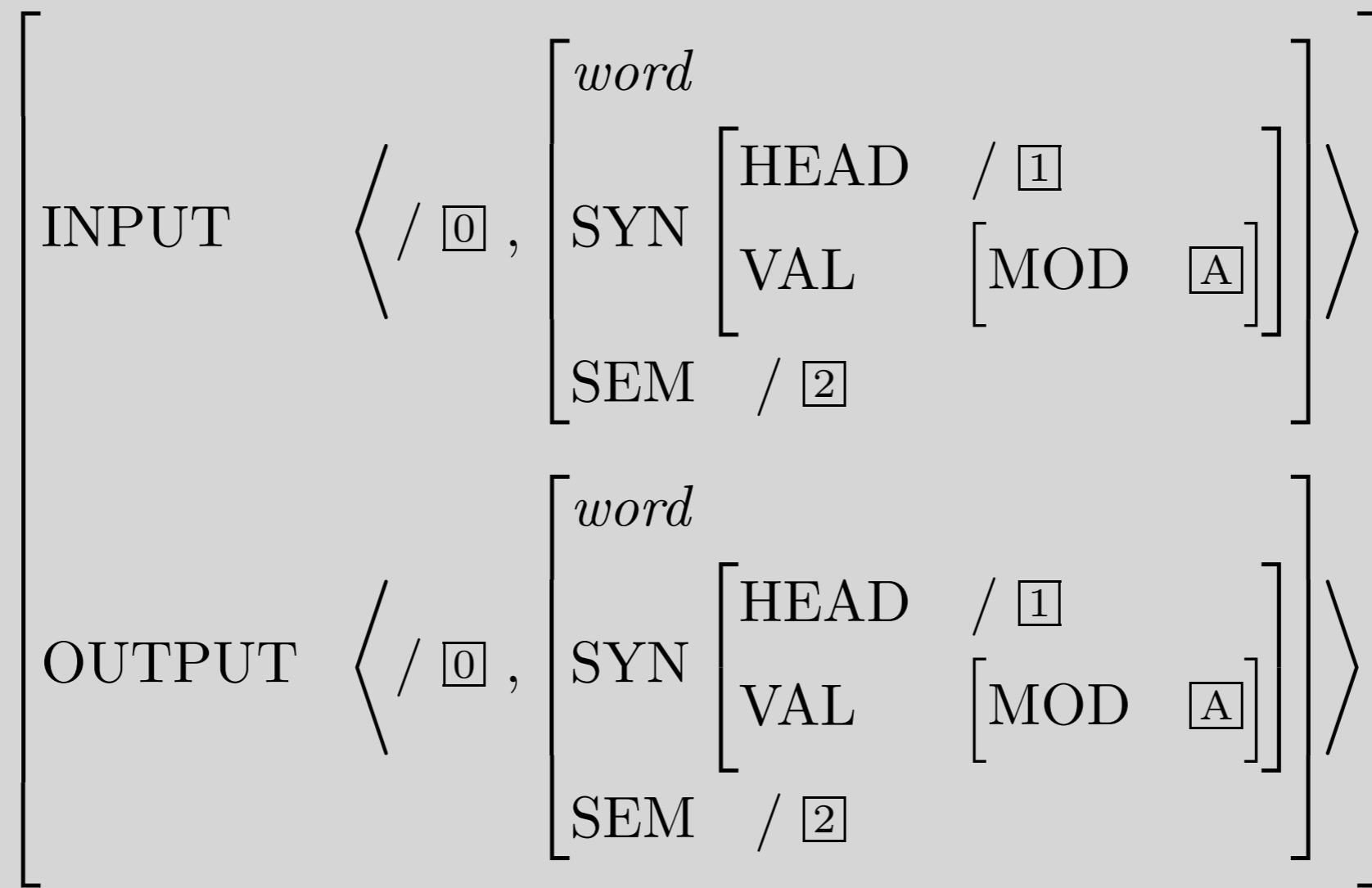
- This chapter introduced several pi-rule, but (unless I missed something) didn't go into depth explaining why these had to be pi-rules. More broadly, I feel like d-rules and i-rules were introduced with relatively well defined jobs (though of course there is some ambiguity about the distinction), but it feels a little bit like pi-rule exists just to deal with anything that doesn't fit into the i-rule or d-rule bucket. Why do the rules in this chapter work better as pi-rules?

# Reading Questions

- In (59) Inversion Lexical Rule (with inherited constraints), the INPUT and OUTPUT all have [INV +] and [AUX +], then why do we only write out AUX value in the INPUT and INV value in the OUTPUT in (58)? I'm still confused about what to present and what to omit in writing the lexical rules.

# 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



# Reading Questions

- pp 415 (68): The output of the Contraction Lexical Rule has *X* on its specifier list. I understood the abbreviations to mean that *X* is something that is largely unspecified. In this case, since *X* does not appear in the input, does it mean simply that *X* is whatever is the first argument on the ARG-ST list?
- p 411, fn 16: "Once again, we have not shown the effect of the ARP on the input, as it could be satisfied in many ways." I think I need some additional clarification on this point, perhaps as an example of one way this would happen.
- [ Inversion Lexical Rule with inherited constraints ]



# Reading Questions

- The concept of grammatical ellipses is quite fascinating to me, as it seems like something that would have heavy variation between languages, in a way that I have a hard time seeing how this concept can apply evenly in terms of a universal grammar.
- It primarily makes me think about Japanese, where the concept of "ellipses" can extend to omitting almost every part of the sentence given the correct context. If we tried to take the same approach as we did here with English it feels like we would have to go a bit overboard in licensing everything as being able to stand on its own as well as in its relevant spot in the sentence.
- I think this is a summary of how it feels like as we add more rules, we're inherently moving away from the concept of a "universal grammar". Will we be looking back at that at any point? We seem to be getting more and more specific to English as we get further in so I'm losing sight of the grand picture we discussed several chapters ago.

# Reading Questions

- I do like that we're getting into more in depth parts of the formations of the English language. I was however wondering, if the rules introduced in this chapter can apply to other languages, or are they English exclusive? Also, if they can't, how do things like inversion occur in these languages?

# Reading Questions

- As mentioned in the previous lecture, the NICE properties are English-centric and thus the lexical rules that we have to capture the NICE properties apply primarily to English. Have there been any attempts at creating more generalized lexical rules to capture the behavior of auxiliaries cross-linguistically or is there too much variation between languages that it would make more sense for us to proceed with having the equivalent of NICE properties for each language?

# Reading Questions

- French inversions are very similar to English inversions. However, phonological processes sometimes may be involved, for example, declarative *on a déjà payé*, has inverted question form *a-t-on déjà payé?* where a 't' is inserted to split two consecutive vowel segments for ease of pronunciation. I am wondering if HPSG could handle such case where components with no syntactic function being part of the OUTPUT?