



Chapter 13, Sections 13.1-13.2

Auxiliary Verbs

What Auxiliaries Are

- Sometimes called “helping verbs,” auxiliaries are little words that come before the main verb of a sentence, including forms of *be, have, do, can, could, may, might, must, shall, should, will, and would*
- They tend to be involved in the expression of time, necessity, possibility, permission, and obligation, as well as such things as negation, affirmation, and questioning

Some Basic Facts about Auxiliaries

- They are optional
Pat tapdanced. Pat can tapdance. Pat is tapdancing.
- They precede any non-auxiliary verbs
**Pat tapdance can. *Pat tapdancing is.*
- They determine the form of the following verb
**Pat can tapdancing. *Pat is tapdance.*
- When they co-occur, their order is fixed
*Pat must be tapdancing. *Pat is musting tapdance.*
- Auxiliaries of any given type cannot iterate
**Pat could should tapdance.*

A Little History

- Chomsky's first book, *Syntactic Structures* (1957), contained a detailed analysis of the English system of auxiliary verbs
- It showed how formal analysis could reveal subtle generalizations
- The power of Chomsky's analysis of auxiliaries was one of the early selling points for transformational grammar
 - Especially, his unified treatment of auxiliary *do*
 - The relevant facts, and an analysis, will be covered next time.
- So it's a challenge to any theory of grammar to deal with the same phenomena

Two Approaches to Analyzing Auxiliaries

- Treat auxiliaries as a special category, and formulate specialized transformations sensitive to their presence
- Assimilate their properties to existing types as much as possible, and elaborate the lexicon to handle what is special about them
- We adopt the latter, following work of Ross, McCawley, and others in the 1960s and 1970s
- We treat auxiliaries as a subtype of *srv-lxm*

Consequences of Making *auxv-lxm* a Subtype of *srv-lxm*

- Auxiliaries should express one-place predicates
- Auxiliaries should allow non-referential subjects (dummy *there*, *it*, and idiom chunks)
- Passivization of the main verb (the auxiliary's complement) should preserve truth conditions
- Are these borne out?

Why call auxiliaries verbs?

- *be*, *have*, and *do* exhibit verbal inflections (tense, agreement)
- *be*, *have*, and *do* can all appear as main verbs (that is, as the only verb in a sentence)
 - Their inflections are the same in main and auxiliary uses
 - *be* exhibits auxiliary behavior, even in its main verb uses
- Modals (*can*, *might*, *will*, etc.) don't inflect, but they occur in environments requiring a finite verb with no (other) finite verb around.

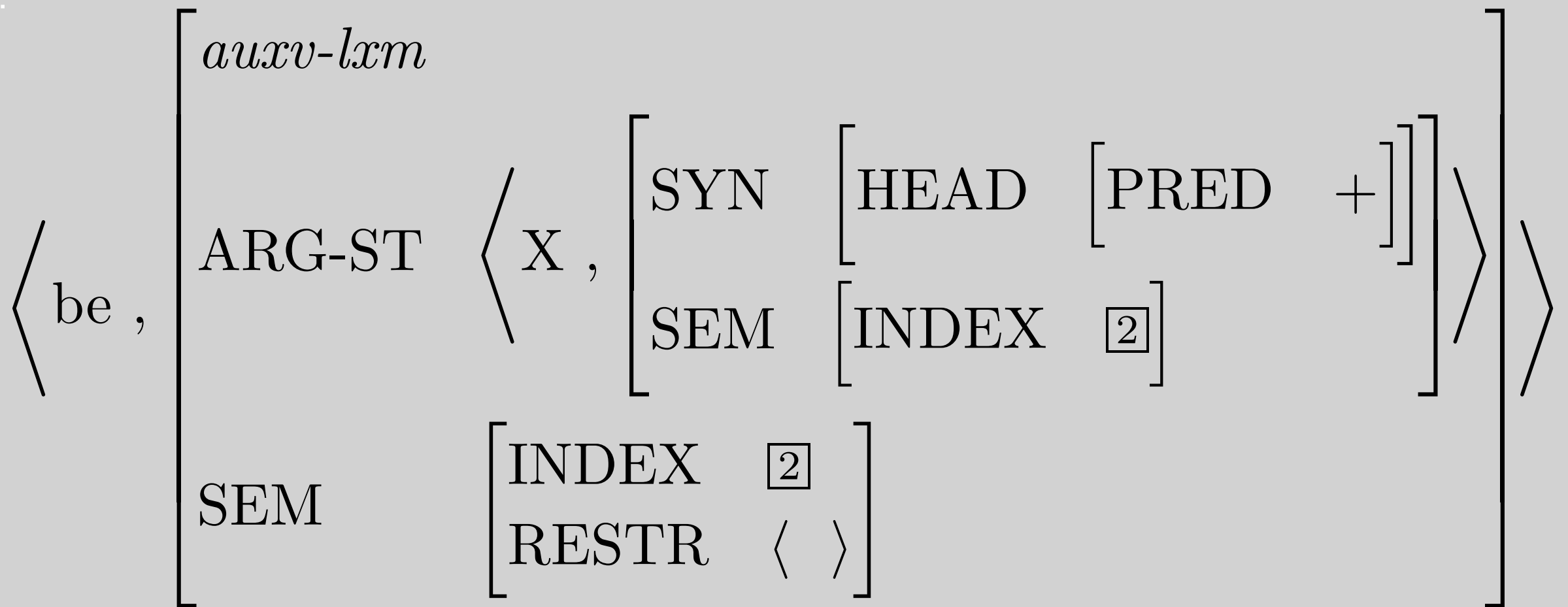
What's special about auxiliaries?

- Unlike other subject-raising verbs we have looked at, their complements aren't introduced by *to*
- The modals and *do* have defective paradigms
- There are restrictions on the ordering and iterability of auxiliaries
- They have a set of special characteristics known as the NICE properties, which we'll discuss next time

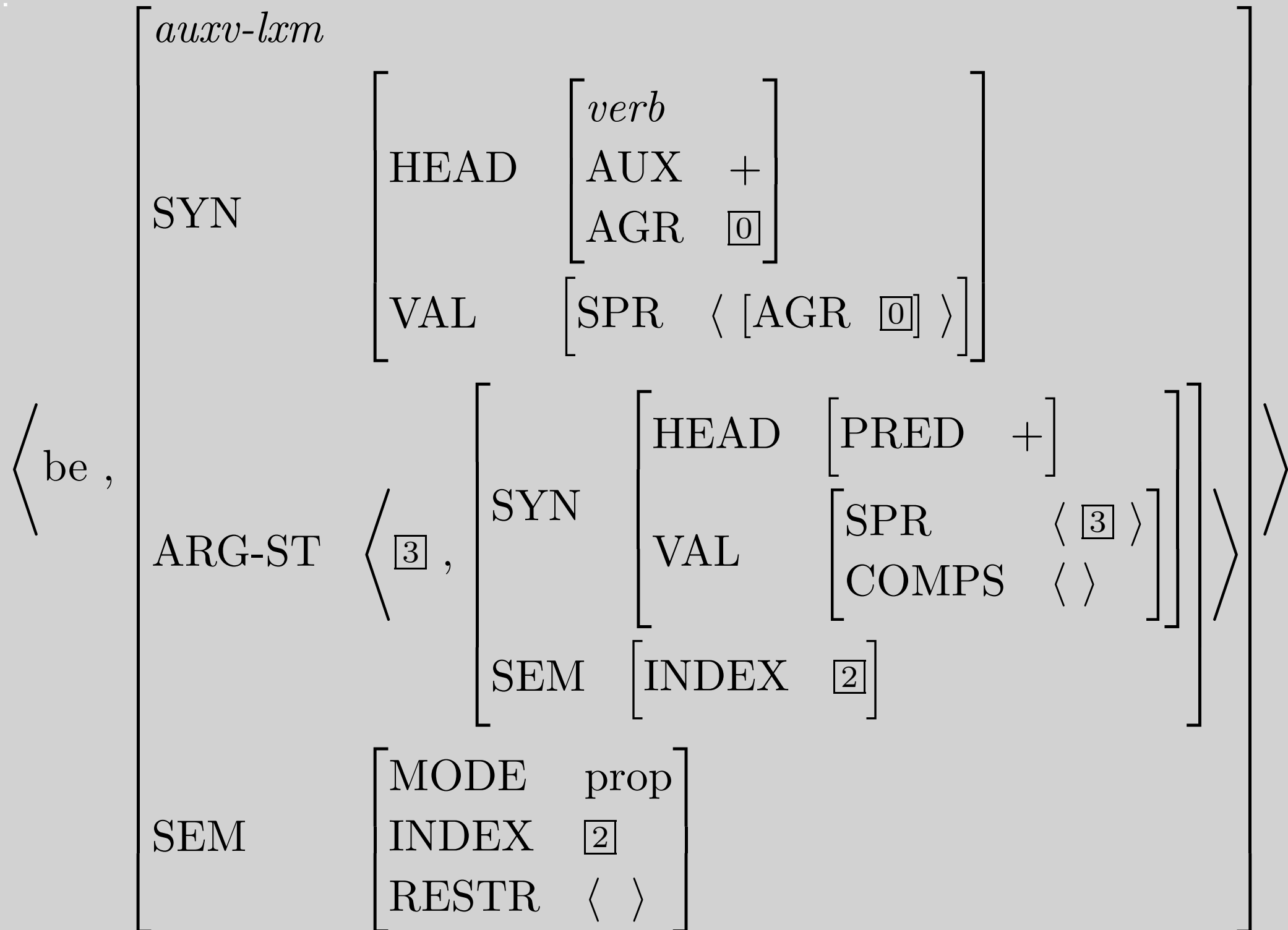
Some Type Constraints

TYPE	FEATURES/CONSTRAINTS	IST
<i>verb-lxm</i>	$\left[\begin{array}{l} \text{SYN} \quad \left[\text{HEAD} \quad \left[\begin{array}{l} \textit{verb} \\ \text{AUX} \quad / \quad - \end{array} \right] \right] \\ \text{ARG-ST} \quad \langle [\text{HEAD} \textit{nominal}] , \dots \rangle \\ \text{SEM} \quad \left[\text{MODE} \quad \textit{prop} \right] \end{array} \right]$	<i>infl-lxm</i>
<i>srv-lxm</i>	$\left[\text{ARG-ST} \quad \left\langle \boxed{1} , \left[\begin{array}{l} \text{SPR} \quad \langle \boxed{1} \rangle \\ \text{COMPS} \quad \langle \rangle \end{array} \right] \right\rangle \right]$	<i>verb-lxm</i>
<i>ic-srv-lxm</i>	$\left[\begin{array}{l} \text{ARG-ST} \quad \left\langle \text{X} , \left[\begin{array}{l} \text{VP} \\ \text{INF} \quad + \\ \text{INDEX} \quad s \end{array} \right] \right\rangle \\ \text{SEM} \quad \left[\text{RESTR} \quad \left\langle [\text{ARG} \quad s] \right\rangle \right] \end{array} \right]$	<i>srv-lxm</i>
<i>auxv-lxm</i>	$\left[\text{SYN} \quad \left[\text{HEAD} \quad \left[\text{AUX} \quad + \right] \right] \right]$	<i>srv-lxm</i>

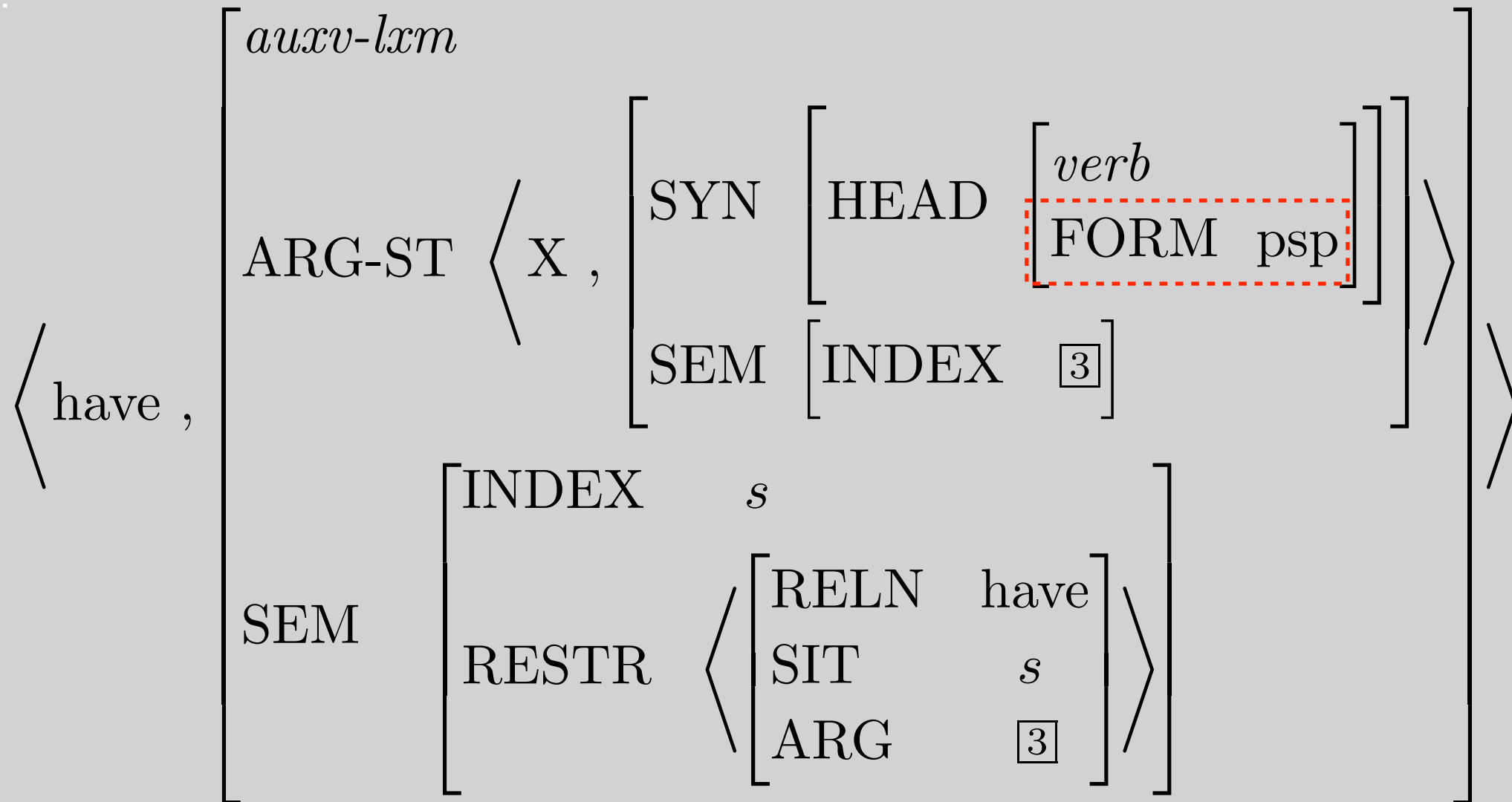
A Lexical Entry for *be*



The Entry for *be*, with Inherited Information

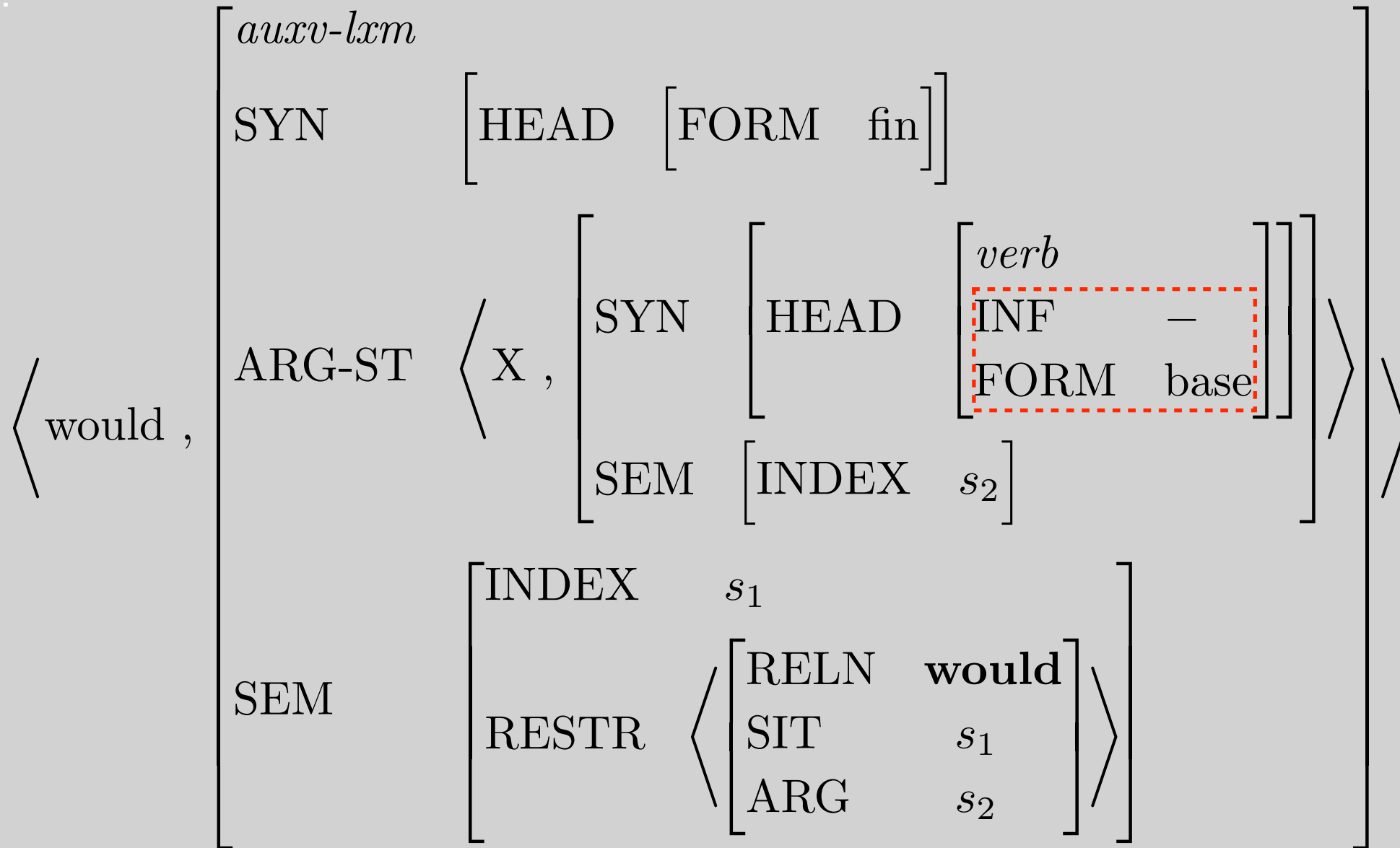


Entry for *have*



- Note the *FORM* restriction on the complement VP
- What accounts for the analogous *FORM* restriction on verbs following *be*?

Lexical Entry for a Modal



- Note the restriction on the form of the complement VP
- What inflectional lexical rules apply to this lexeme?

Accounting for the Basic Facts Cited Earlier

- **Optionality of auxiliaries:**
As raising verbs, their subjects are also their complements' subjects, so their subjects and complements must be compatible.
- **Auxiliaries precede non-auxiliary verbs:**
Auxiliaries are heads, and complements follow heads in English.
- **Auxiliaries determine the form of the following verb:**
This is built into their lexical entries.
- **When auxiliaries co-occur, their order is fixed:**
Different explanations for different combinations; see next slide.
- **Non-iterability of auxiliaries:**
Ditto.

Accounting for Restrictions on Order and Iterability

- **Order**

- Modals are finite, and all auxiliaries take non-finite complements. Hence, modals must come first.
- Stative verbs (like *own*) don't have present participles, and auxiliary *have* is stative. Hence, **Pat is having tapdanced*.

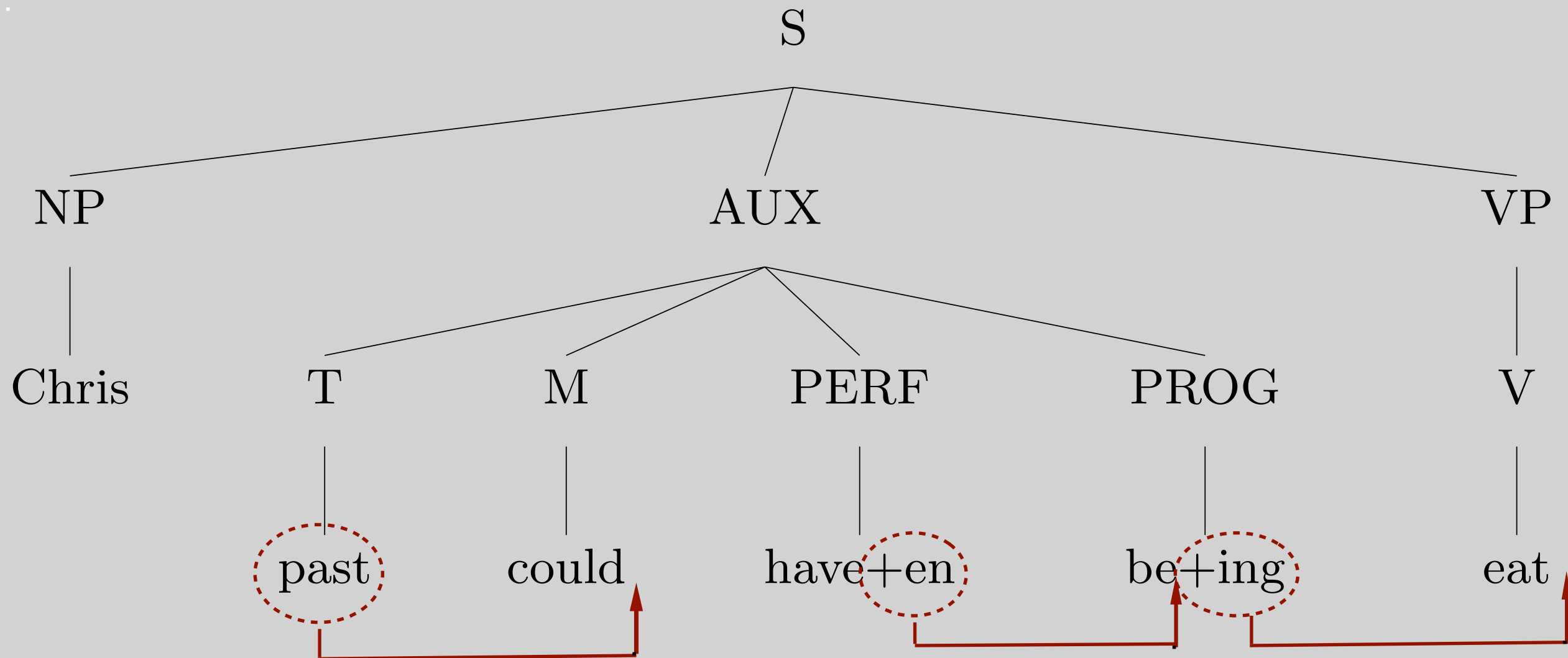
- **Iterability**

- Auxiliary *be* is also stative, so **Pat is being tapdancing*.
- Modals must be finite, and their complements must be base, so **Pat can should tapdance*.
- **Pat has had tapdanced* can be ruled out in various ways, e.g. stipulating that auxiliary *have* has no past participle.

Sketch of Chomsky's Old Analysis

$S \rightarrow NP \text{ AUX } VP$

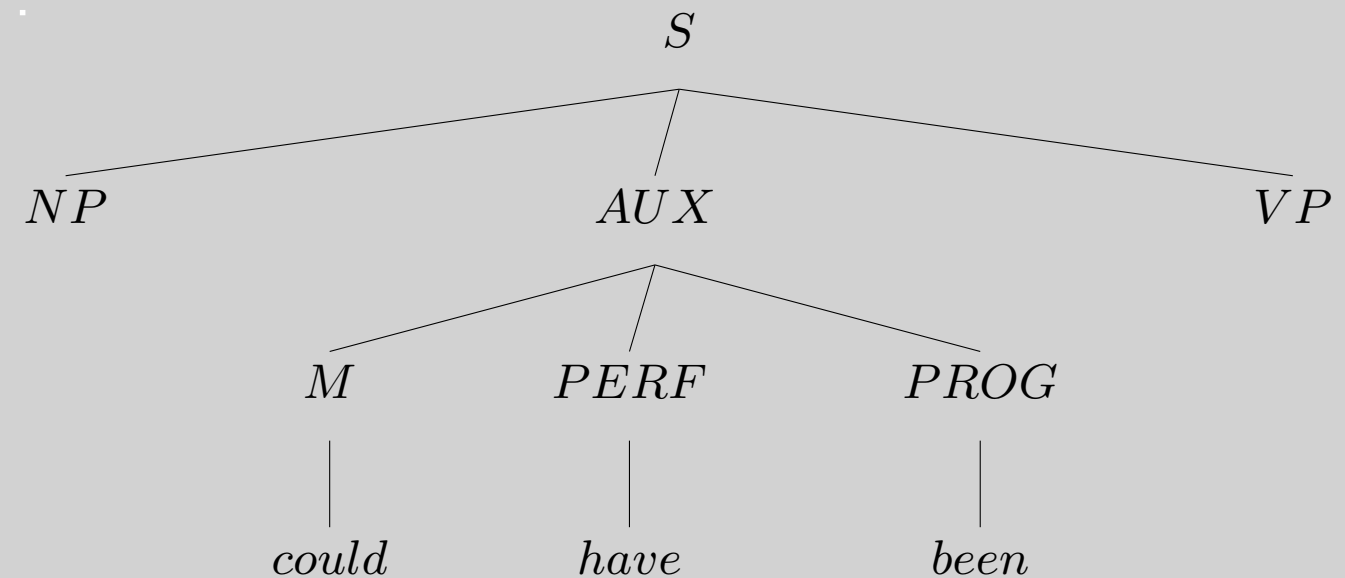
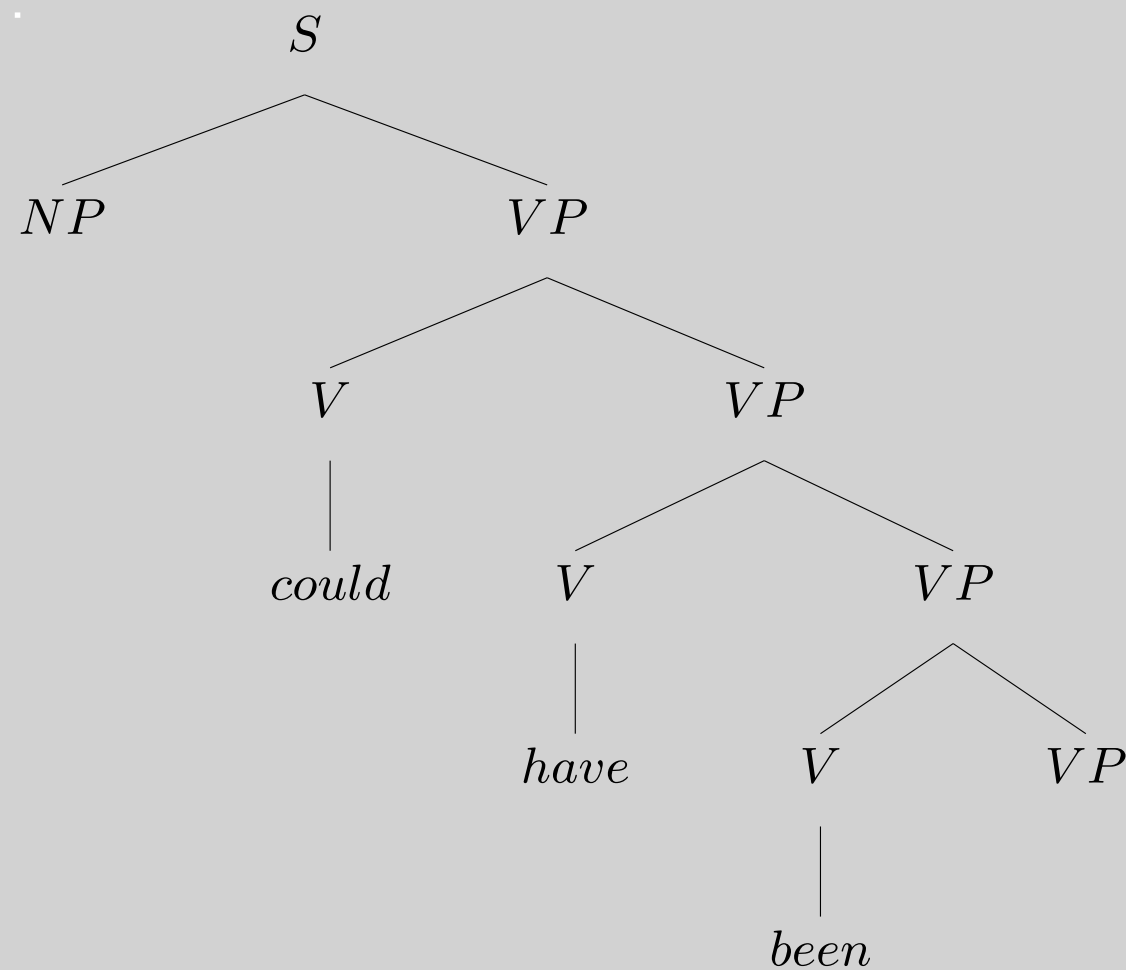
$AUX \rightarrow T(M)(PERF)(PROG)$



How this Analysis Handles the Basic Facts

- **Optionality of auxiliaries:**
Stipulated in the phrase structure rule (with parentheses)
- **Auxiliaries precede non-auxiliary verbs:**
Built into the phrase structure rule, with AUX before VP
- **Auxiliaries determine the form of the following verb:**
Inflections are inserted with the auxiliaries and moved onto the following verb transformationally.
- **When auxiliaries co-occur, their order is fixed:**
Stipulated in the phrase structure rule for AUX
- **Non-iterability of auxiliaries:**
Ditto.

The two analyses assign very different trees



- *could have been* VP, *have been* VP, and *been* VP are all constituents
- *could have been* is not a constituent

- *could have been* VP, *have been* VP, and *been* VP are not constituents
- *could have been* is a constituent

Ellipsis and Constituency

- Consider:

Pat couldn't have been eating garlic, but Chris could have been

Pat couldn't have been eating garlic, but Chris could have

Pat couldn't have been eating garlic, but Chris could

- On the nested analysis, the missing material is a (VP) constituent in each case
- On the flat analysis, the missing material is never a constituent
- This argues for our analysis over the old transformational one. Our treatment of ellipsis is presented in the next class