

Ling 566
Nov 21, 2011
Auxiliaries

Overview

- What are auxiliaries?
- General properties of auxiliaries
- Lexical type/lexical entries for auxiliaries
- Reading questions
- Next time: NICE properties (lexical rules)

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*
- 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, treating 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.

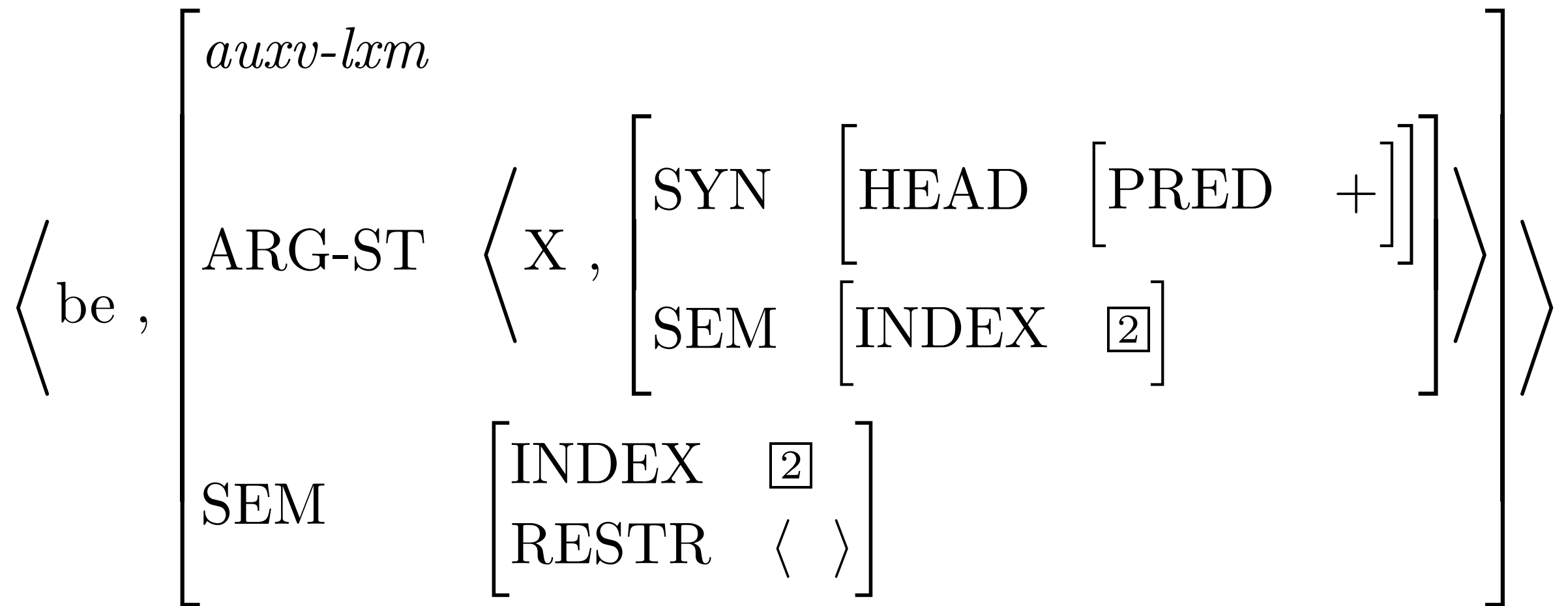
What's special about auxiliaries?

- 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.

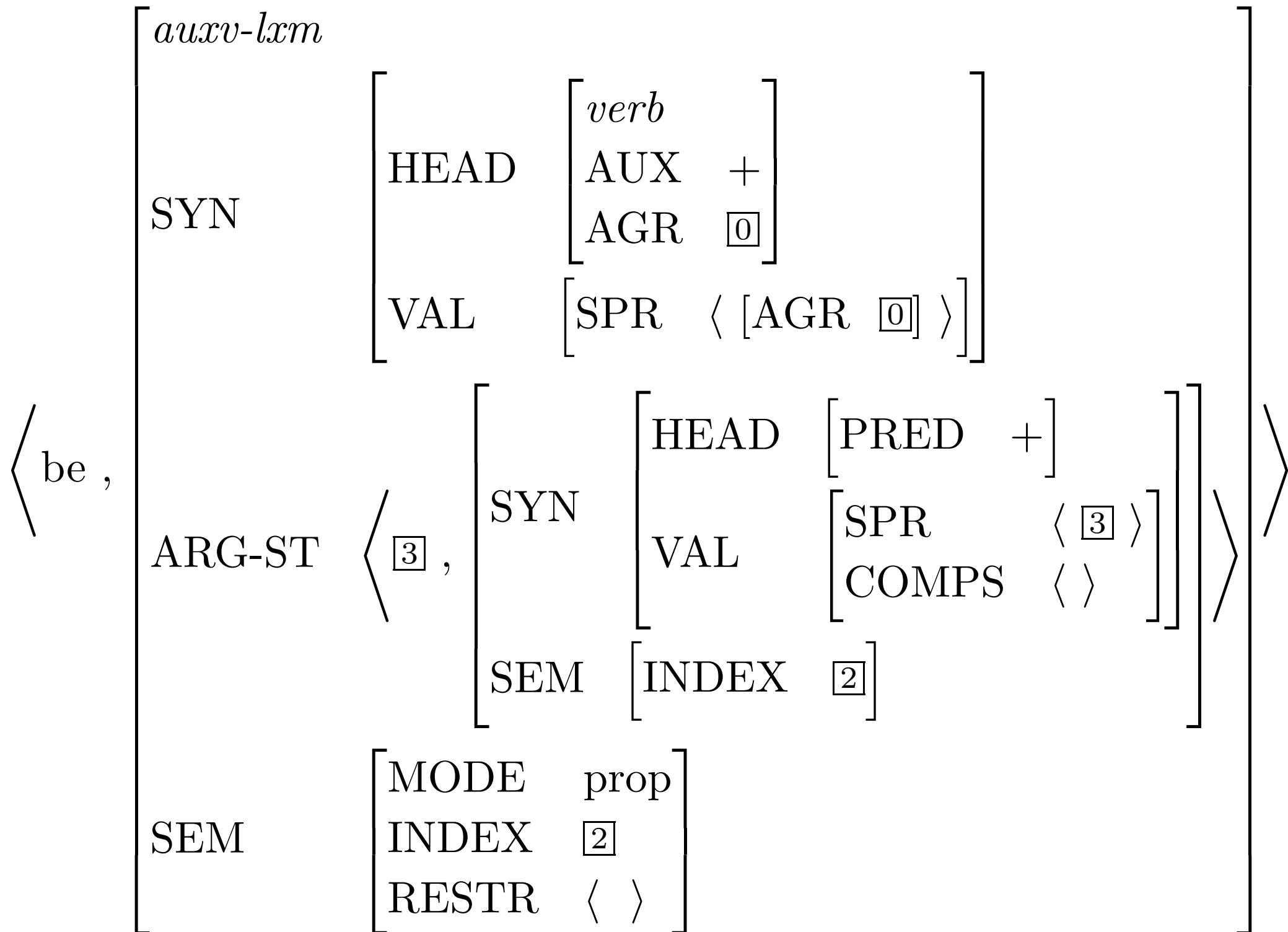
Some Type Constraints

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>

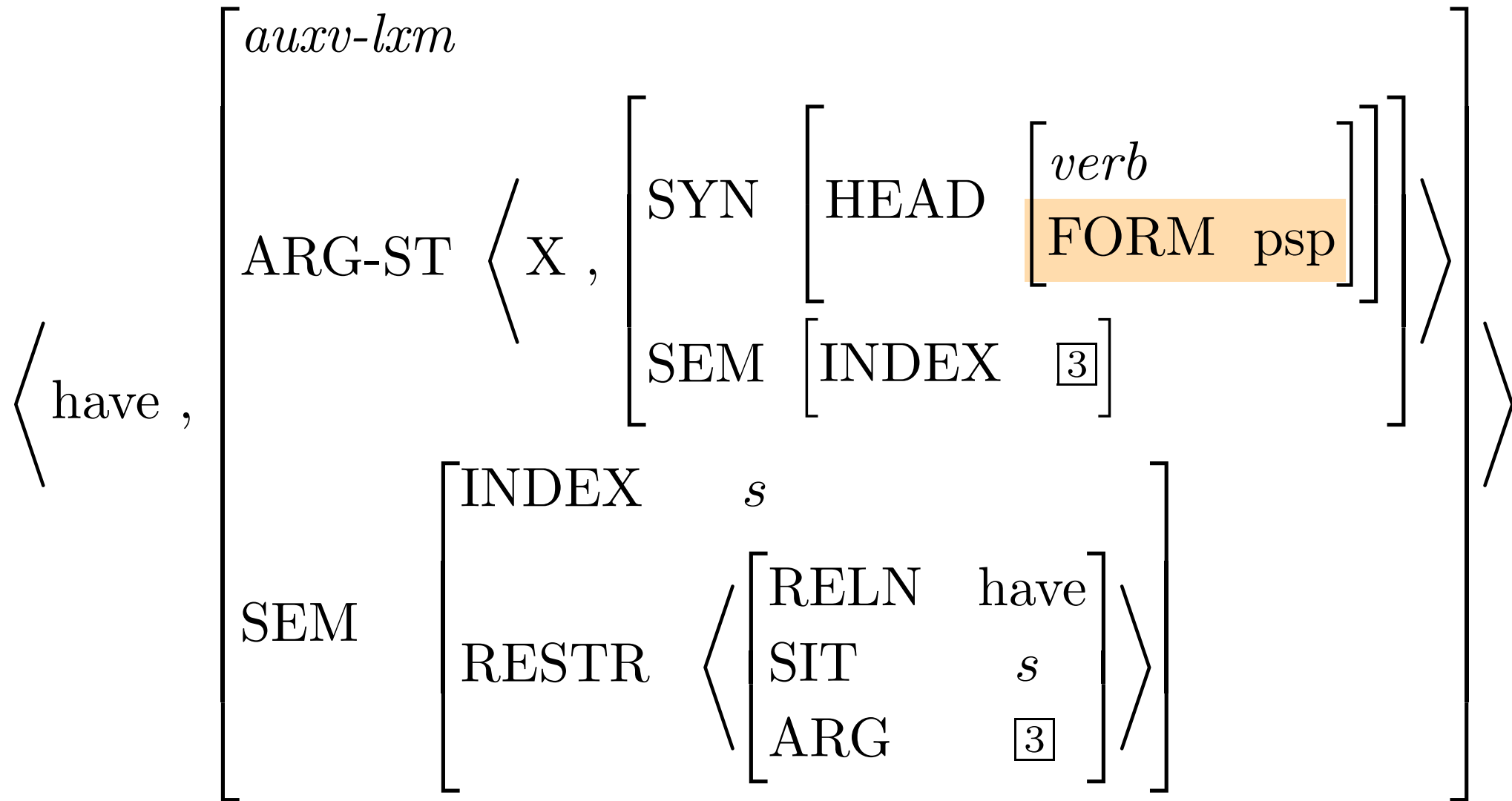
A Lexical Entry for *be*



The Entry for *be*, with Inherited Information

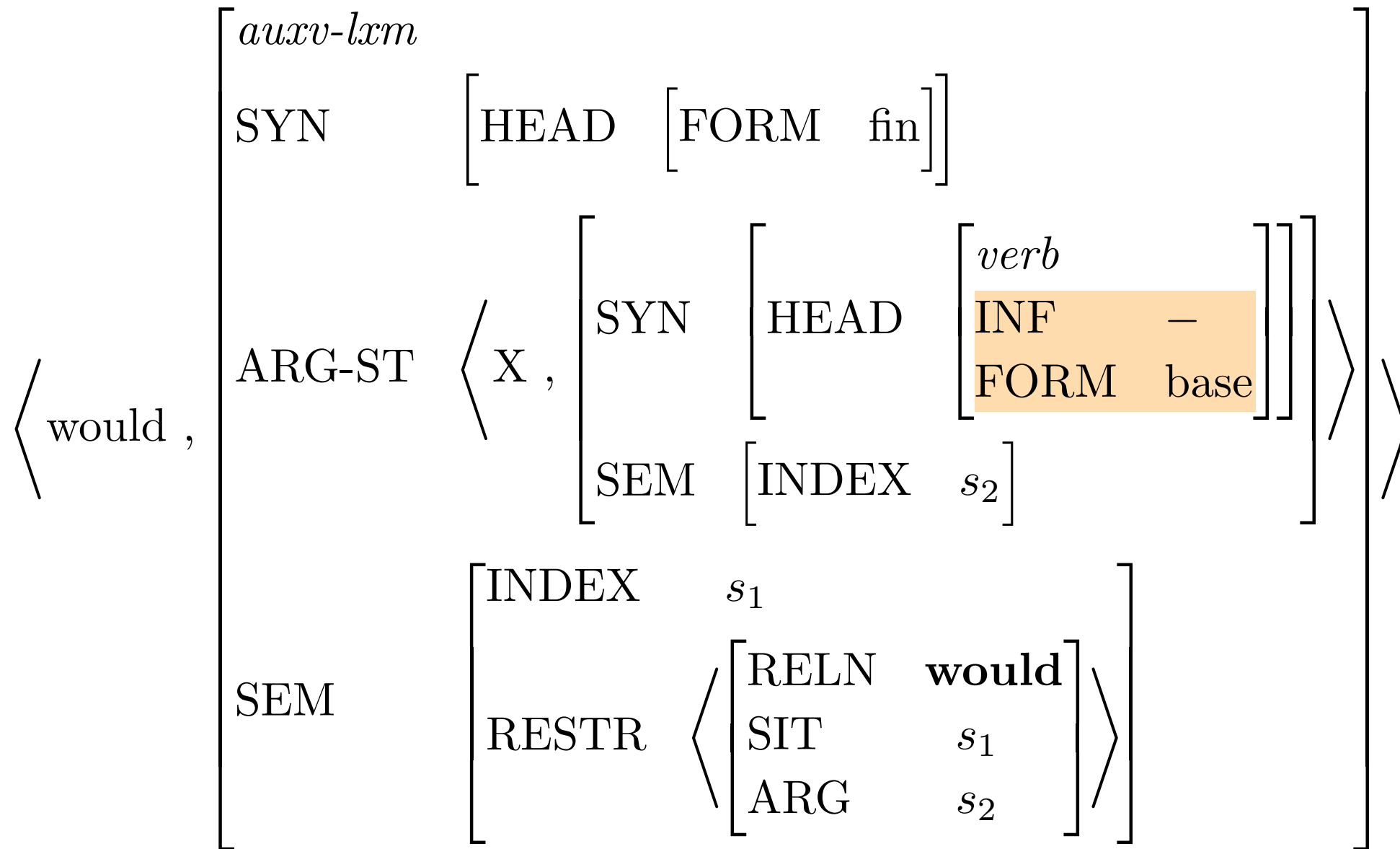


Entry for *have*



- 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 and complements go together.
- **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**

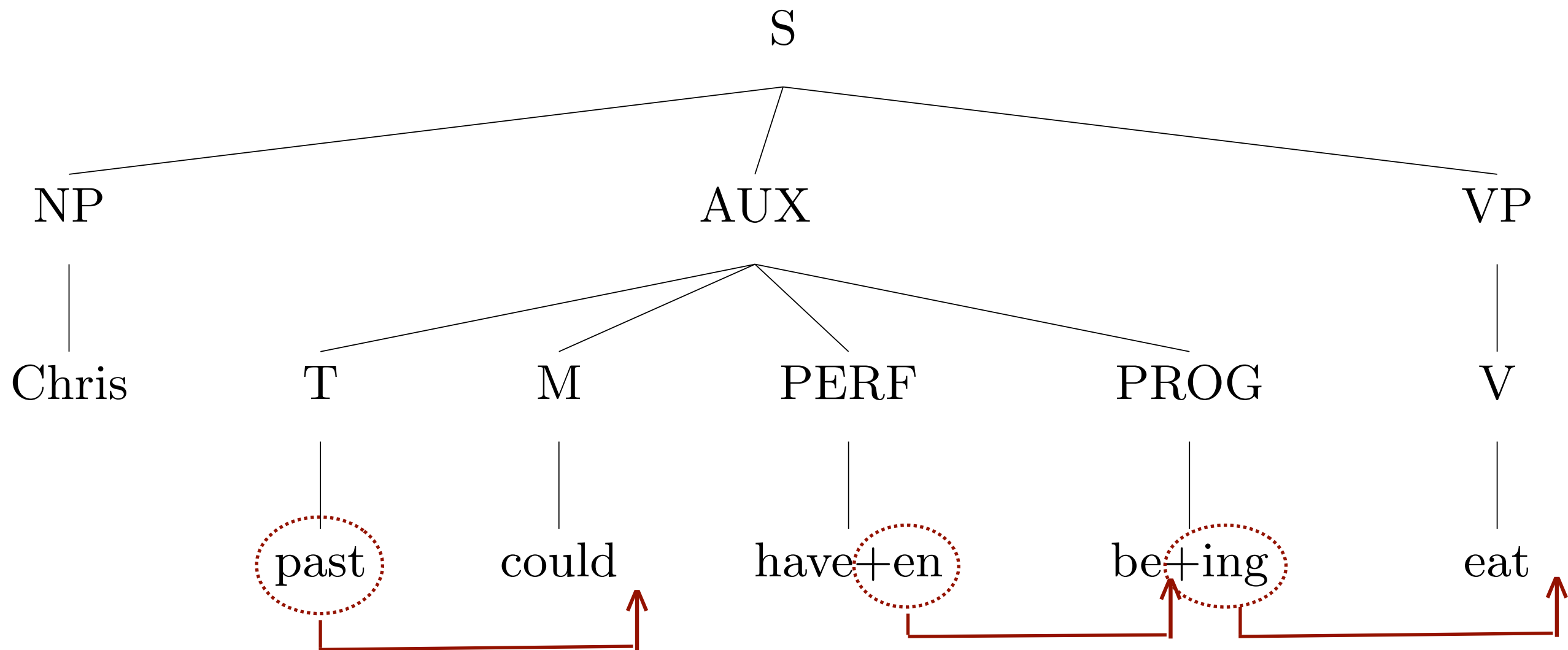
- Modals are finite, and all auxiliaries take non-finite complements. Hence, modals must come first.
- Stative verbs (like *own*) don't have present participles, and auxiliary *have* is stative. Hence, **Pat is having tapdanced*.

- **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

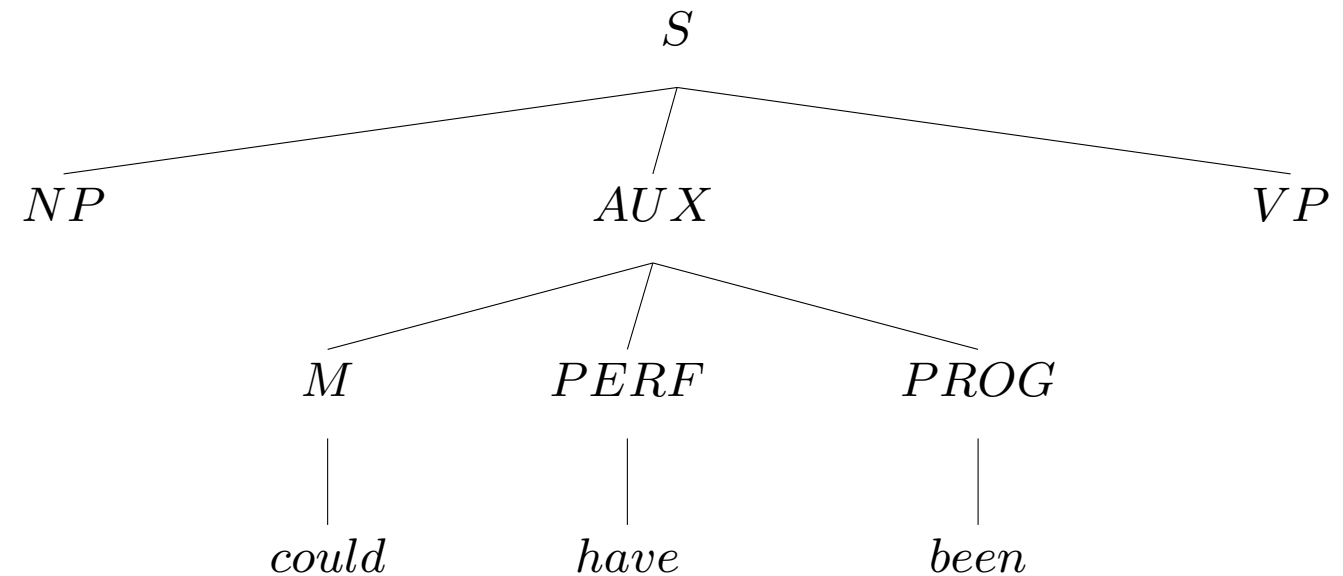
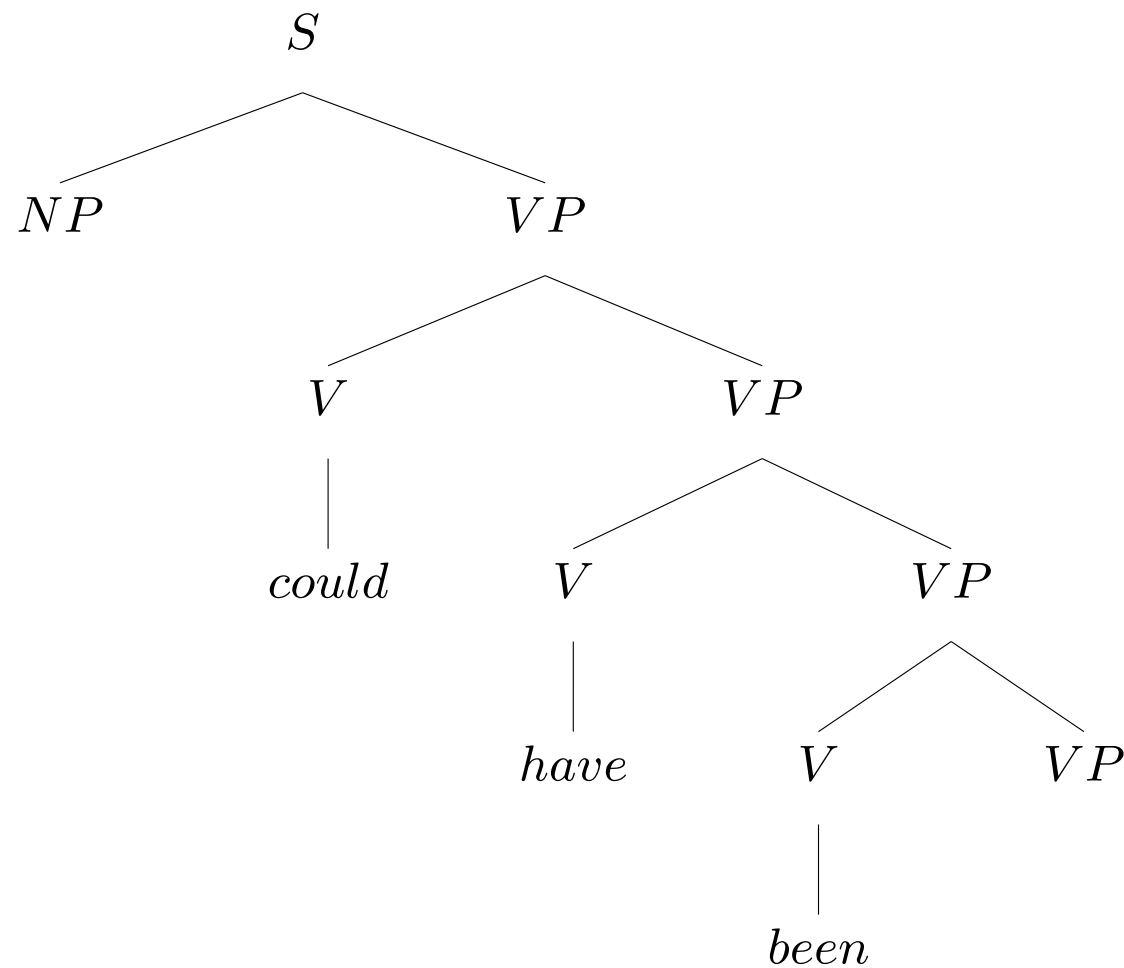
$S \rightarrow NP \text{ AUX } VP$
 $AUX \rightarrow T(M)(PERF)(PROG)$



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 Analysis of Auxiliaries So Far

- Auxiliaries are subject-raising verbs
- Most basic distributional facts about them can be handled through selectional restrictions between auxiliaries and their complements (that is, as ARG-ST constraints)
- Auxiliaries are identified via a HEAD feature AUX, which we have not yet put to use

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Reading Questions

- Doesn't the fact that modals seem to have the semantics of control verbs call into question our analysis of the semantics of control and raising verbs? Do we have to invent a separate category for them to capture this irregularity?
- It should rain tomorrow.
- Kim should be seen by a doctor./A doctor should be seen by Kim.

Reading Questions

- Could you clarify the comment in Footnote 5?
- We should mention that, historically, *would* evolved from the past tense form of *will*, *should* from the past tense form of *shall*, etc. We are assuming that such pairs of forms are unrelated in the grammar of Modern English.

Reading Questions

- If perfective *have* doesn't have a progressive form, how do we account for a sentence like *Pat, having slept late, was tired all day.?*
- The book handles the fact that modal verbs do not take the *-s* by simply mapping them back on to their input form. This seems a bit arbitrary. Are there any constraints on what can be mapped to what? Why would we not want to have a different version of the lex rule for *aux-lxms*?

Reading Questions

- It's stated that other languages have very different verbal systems with auxiliary verbs, but also that across languages the verbs called auxiliaries share many characteristics (and lists several characteristics). How different are these verbs across languages, versus what is presented as their model here?

Reading Questions

- So in a sentence like:
 - *Gene can do many things.*
- How does *many things* get licensed? Don't both *can* and *do* take only verb complements?