Ling 566
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Non-referential NPs, Expletives, and Extraposition

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Overview

- Existentials
- Extraposition
- Idioms

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Where We Are, and Where We're Going

- Last time, we met the passive *be*.
- Passive *be* is just a special case -- that *be* generally introduces [PRED **+**] constituents (next slide).
- Today, we'll start with another *be*, which occurs in existential sentences starting with *there*, e.g. *There is a monster in Loch Ness*.
- Then we'll look at this use of *there*.
- Which will lead us to a more general examination of NPs that don't refer, including some uses of *it* and certain idiomatic uses of NPs.

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Chapter 10 entry for *be*

$$\left\langle \text{be} \;,\; \begin{bmatrix} \textit{be-lxm} & \\ \text{ARG-ST} & \left\langle \boxed{1} \;,\; \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} & \\ \text{FORM} & \text{pass} \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \boxed{1} \rangle \\ \text{COMPS} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \\ \text{RESTR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

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Copula (generalized)

$$\left\langle \text{be}, \begin{bmatrix} \textit{be-lxm} \\ \text{ARG-ST} & \left\langle \boxed{1}, \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{PRED} & + \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \boxed{1} \rangle \\ \text{COMPS} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \\ \text{RESTR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

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Existentials

- The *be* in *There is a page missing* cannot be the same *be* that occurs in sentences like *Pat is tall* or *A cat was chased by a dog*. Why not?
- So we need a separate lexical entry for this *be*, stipulating:
  - Its SPR must be *there*
  - It takes two complements, the first an NP and the second an AP, PP, or (certain kind of) VP.
  - The semantics should capture the relation between, e.g. *There is a page missing* and *A page is missing*.

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Lexical Entry for the Existential *be*

$$\left\langle \text{be}, \begin{bmatrix} \textit{exist-be-lxm} \\ \text{ARG-ST} & \left\langle \begin{bmatrix} \text{NP} \\ \text{FORM} & \text{there} \end{bmatrix}, \boxed{2}, \begin{bmatrix} \text{PRED} & + \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \boxed{2} \rangle \\ \text{COMPS} & \langle\ \rangle \end{bmatrix} \\ \text{SEM} & [\text{INDEX}\ s\ ] \end{bmatrix} \right\rangle \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \\ \text{RESTR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

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Questions About the Existential *be*

- What type of constituent is the third argument?
- Why is the third argument [PRED **+**]?
- Why is the second argument tagged as identical to the SPR of the third argument?
- What is the contribution of this *be* to the semantics of the sentences it occurs in?
- Can all [PRED **+**] predicates appear as the third argument in existentials?
- How do we rule out **There was a greyhound a good runner*?

$$\left\langle \text{be}\ , \begin{bmatrix} \textit{exist-be-lxm} & \\ \text{ARG-ST} & \left\langle \begin{bmatrix} \text{NP} \\ \text{FORM} \quad \text{there} \end{bmatrix}, \boxed{2}, \begin{bmatrix} \text{PRED} & + \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle \boxed{2} \rangle \\ \text{COMPS} & \langle\ \rangle \end{bmatrix} \\ \text{SEM} & [\text{INDEX}\ \ s\ ] \end{bmatrix} \right\rangle \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \\ \text{RESTR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

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The Entry for Existential *there*

$$\left\langle \text{there}\ ,\ \begin{bmatrix} \textit{pron-lxm} & \\ \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{FORM} & \text{there} \\ \text{AGR} & \begin{bmatrix} \text{PER} & \text{3rd} \end{bmatrix} \end{bmatrix} \\ & \\ \text{SEM} & \begin{bmatrix} \text{MODE} & \text{none} \\ \text{INDEX} & \text{none} \\ \text{RESTR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix} \right\rangle$$

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Questions About Existential *there*

- Why do we call it a pronoun?
- Why don't we give it a value for NUM?
- What does this entry claim is *there*'s contribution to the semantics of the sentences it appears in?
  Is this a correct claim?

$$\left\langle \text{there}\ ,\ \begin{bmatrix} \textit{pron-lxm} & & & \\ \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{FORM} & \text{there} \\ \text{AGR} & \begin{bmatrix} \text{PER} & \text{3rd} \end{bmatrix} \end{bmatrix} \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{MODE} & \text{none} \\ \text{INDEX} & \text{none} \\ \text{RESTR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

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Other NPs that don't seem to refer

- *It sucks that the Rockies lost the series.*
- *It is raining.*
- *Andy took advantage of the opportunity.*
- *Lou kicked the bucket.*

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What we need to deal with examples like *It follows that you are wrong*

- A lexical entry for this dummy *it*
- An analysis of this use of *that*
- Entries for verbs that take clausal subjects (as in *That you are wrong follows*)
- A rule to account for the relationship between pairs like *That you are wrong follows* and *It follows that you are wrong*

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The Entry for Dummy *it*

$$\left\langle \text{it}, \begin{bmatrix} \textit{pron-lxm} & \\ \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{FORM} & \text{it} \\ \text{AGR} & \textit{3sing} \end{bmatrix} \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{MODE} & \text{none} \\ \text{INDEX} & \text{none} \\ \text{RESTR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

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Questions About Dummy *it*

- How does it differ from the entry for dummy *there*? Why do they differ in this way?
- Is this the only entry for *it*?

$$\left\langle \text{it}, \begin{bmatrix} \textit{pron-lxm} & & \\ \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{FORM} & \text{it} \\ \text{AGR} & \textit{3sing} \end{bmatrix} \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{MODE} & \text{none} \\ \text{INDEX} & \text{none} \\ \text{RESTR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

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A New Type of Lexeme: Complementizers

$$comp\text{-}lxm : \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} comp & \\ \text{AGR} & 3sing \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \left\langle \begin{bmatrix} \text{S} \\ \text{INDEX} \quad s \end{bmatrix} \right\rangle \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \\ \text{RESTR} & \langle\ \rangle \end{bmatrix} \end{bmatrix}$$

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Questions About the Type *comp-lxm*

- Why does it stipulate values for both SPR and ARG-ST?
- Why is its INDEX value the same as its argument's?
- What is its semantic contribution?

$$\textit{comp-lxm}: \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{comp} & \\ \text{AGR} & \textit{3sing} \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \left\langle \begin{bmatrix} \text{S} \\ \text{INDEX} & s \end{bmatrix} \right\rangle \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \\ \text{RESTR} & \langle\ \rangle \end{bmatrix} \end{bmatrix}$$

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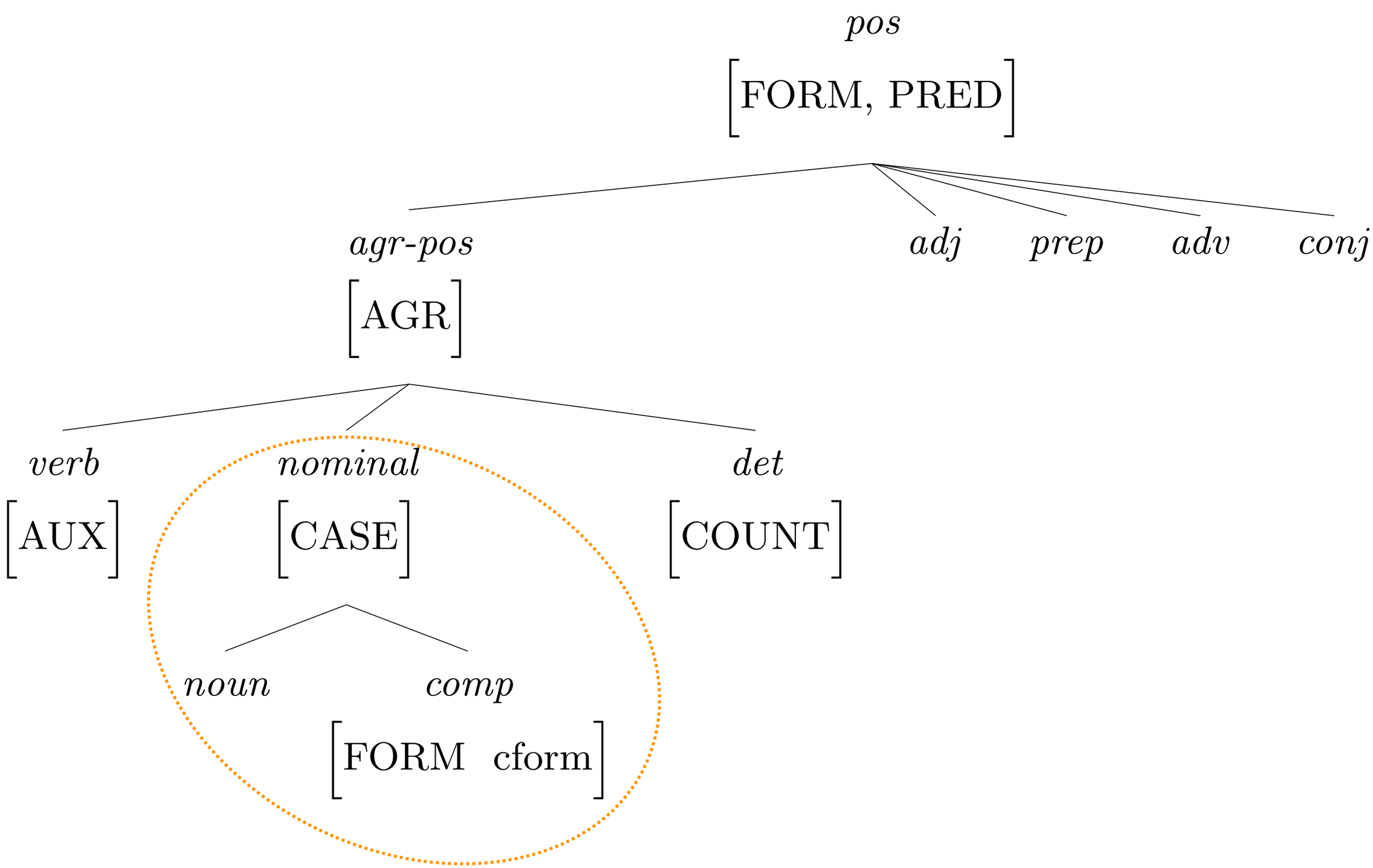
The Type *comp*



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The Lexical Entry for Complementizer *that*

$$\left\langle \text{that}\ ,\ \begin{bmatrix} \textit{comp-lxm} & \\ \text{ARG-ST} & \left\langle \begin{bmatrix} \text{FORM fin} \end{bmatrix} \right\rangle \\ \text{SEM} & \begin{bmatrix} \text{MODE prop} \end{bmatrix} \end{bmatrix} \right\rangle$$

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…and with inherited information filled in

$$\left\langle \text{that}\ ,\ \begin{bmatrix} \textit{comp-lxm} & \\ \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{comp} & \\ \text{FORM} & \text{cform} \\ \text{AGR} & \textit{3sing} \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \left\langle \overset{\text{S}}{\begin{bmatrix} \text{FORM} & \text{fin} \\ \text{INDEX} & s \end{bmatrix}} \right\rangle \\ \text{SEM} & \begin{bmatrix} \text{MODE} & \text{prop} \\ \text{INDEX} & s \\ \text{RESTR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

Question: Where did [FORM cform] come from?

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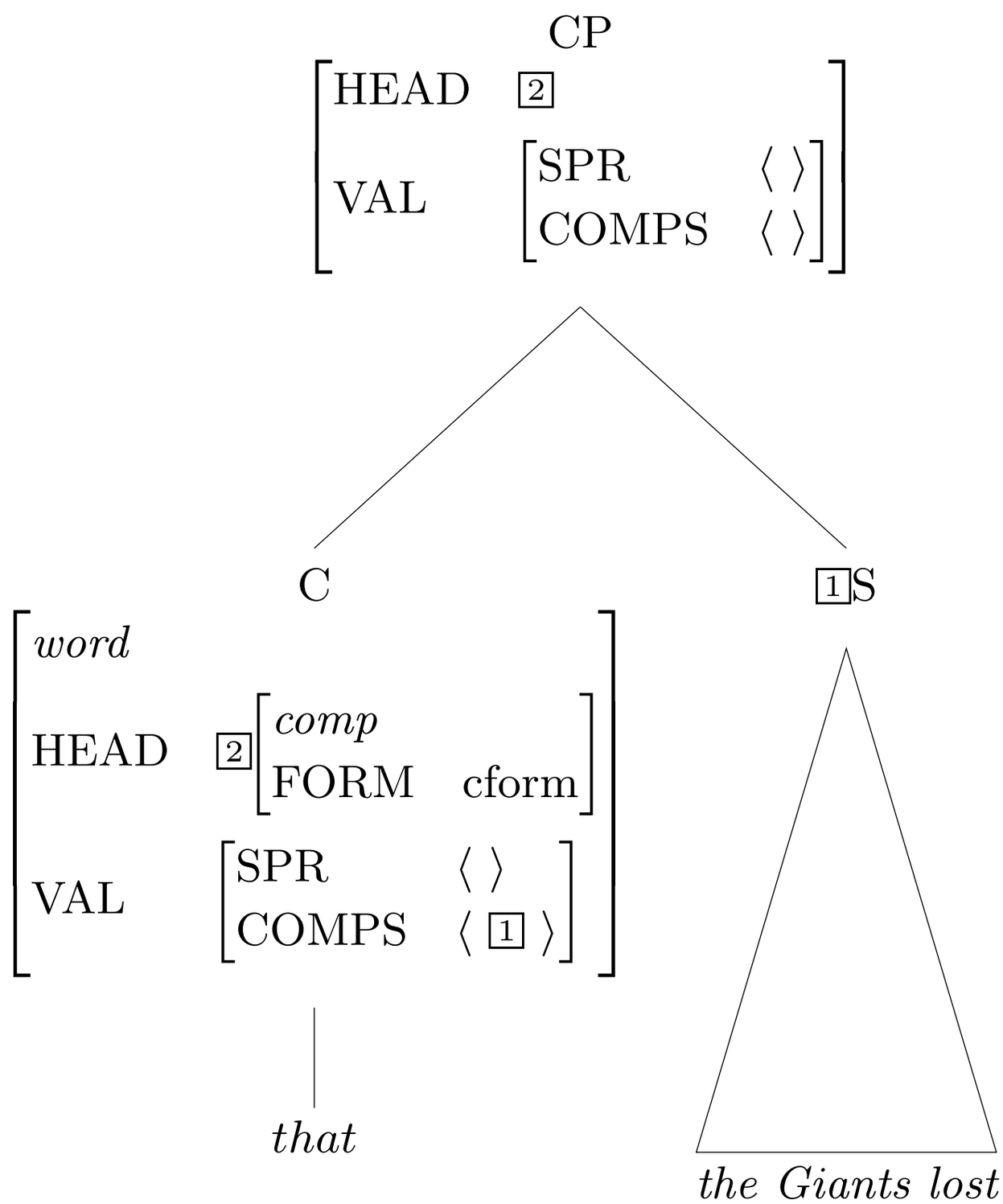
Structure of a Complementizer Phrase



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Sample Verb with a CP Subject

$$\left\langle \text{matter}, \begin{bmatrix} \textit{siv-lxm} & \\ \text{ARG-ST} & \left\langle \left[\text{SEM}\ [\text{INDEX}\ \boxed{1}]\right] \right\rangle \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{RELN} & \textbf{matter} \\ \text{SIT} & s \\ \text{MATTERING} & \boxed{1} \end{bmatrix} \right\rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

Note: the only constraint on the first argument is semantic

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A Problem

- We constrained the subject of *matter* only semantically. However...
  - CP and S are semantically identical, but we get:
    That Bush won matters vs. **Bush won matters*
  - Argument-marking PPs are semantically identical to their object NPs, but we get:
    The election mattered vs. **Of the election mattered*
- So we need to add a syntactic constraint.

$$\left\langle \text{matter}\ ,\ \begin{bmatrix} \textit{siv-lxm} & \\ \text{ARG-ST} & \left\langle \begin{bmatrix} \text{SYN} & [\text{HEAD}\ \textit{nominal}] \\ \text{SEM} & [\text{INDEX}\ \boxed{1}] \end{bmatrix} \right\rangle \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{RELN} & \textbf{matter} \\ \text{SIT} & s \\ \text{MATTERING} & \boxed{1} \end{bmatrix} \right\rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

  - S and PP subjects are generally impossible, so this constraint should probably be on *verb-lxm*.

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The Extraposition Lexical Rule

$$\begin{bmatrix} \textit{pi-rule} & \\ \text{INPUT} & \left\langle \text{X} , \begin{bmatrix} \text{SYN} \begin{bmatrix} \text{VAL} \begin{bmatrix} \text{SPR} & \langle\ \boxed{2}\text{CP}\ \rangle \\ \text{COMPS} & \boxed{\text{A}} \end{bmatrix} \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{OUTPUT} & \left\langle \text{Y} , \begin{bmatrix} \text{SYN} \begin{bmatrix} \text{VAL} \begin{bmatrix} \text{SPR} & \langle\ \text{NP[FORM it]}\ \rangle \\ \text{COMPS} & \boxed{\text{A}} \oplus \langle \boxed{2} \rangle \end{bmatrix} \end{bmatrix} \end{bmatrix} \right\rangle \end{bmatrix}$$

- Why is the type *pi-rule*?
- Why doesn't it say anything about the semantics?
- Why is the COMPS value $\boxed{\text{A}}$, not < >?

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Extraposition with Verbs whose COMPS Lists are Nonempty

- *It worries <u>me</u> that war is imminent.*
- *It occurred <u>to Pat</u> that Chris knew the answer.*
- *It endeared <u>you</u> <u>to Andy</u> that you wore a funny hat.*

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Another Nonreferential Noun

$$\left\langle \text{advantage}\ ,\ \begin{bmatrix} \textit{massn-lxm} & \\ \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{FORM} & \text{advantage} \\ \text{AGR} & \textit{3sing} \end{bmatrix} \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{MODE} & \text{none} \\ \text{INDEX} & \text{none} \\ \text{RESTR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

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The Verb that Selects *advantage*

$$\left\langle \text{take} \;,\; \begin{bmatrix} \textit{ptv-lxm} & \\ \text{ARG-ST} & \left\langle \text{NP}_i \;,\; \begin{bmatrix} \text{FORM} & \text{advantage} \end{bmatrix}, \begin{bmatrix} \text{FORM} & \text{of} \\ \text{INDEX} & j \end{bmatrix} \right\rangle \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \\ \text{RESTR} & \left\langle \begin{bmatrix} \text{RELN} & \textbf{exploit} \\ \text{SIT} & s \\ \text{EXPLOITER} & i \\ \text{EXPLOITED} & j \end{bmatrix} \right\rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

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Our analyses of idioms and passives interact...

- We generate

  Advantage was taken of the situation by many people.

  Tabs are kept on foreign students.

- But not:

  Many people were taken advantage of.

- Why not?

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Overview

- Existentials (*there*, *be*)
- Extraposition (*that*, *it*, *LR*)
- Idioms

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Reading Questions

- We added the type *pi-rule* and it is allowed to "muck around with argument structure". That seems to break the nice clean cut distinction between i-rules and d-rules. does it add the NP[form it] to the SPR or does it simply take it out of the [A] and put it on the SPR list and add the constraint [FORM it]? Also how do we tell the differences between *pi-rules* and *d-rules*?

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Reading Questions

- Why is *advantage* shown as being 3rd person, while *tabs* is not?

(47) a.

$$\left\langle \text{tabs}\ ,\ \begin{bmatrix} \textit{cntn-lxm} & \\ \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{FORM} & \text{tabs} \\ \text{AGR} & \begin{bmatrix} \text{NUM} & \text{pl} \end{bmatrix} \end{bmatrix} \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{MODE} & \text{none} \\ \text{INDEX} & \text{none} \\ \text{RESTR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

b.

$$\left\langle \text{advantage}\ ,\ \begin{bmatrix} \textit{massn-lxm} & \\ \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{FORM} & \text{advantage} \\ \text{AGR} & \textit{3sing} \end{bmatrix} \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{MODE} & \text{none} \\ \text{INDEX} & \text{none} \\ \text{RESTR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \right\rangle$$

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cn-lxm	$\begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{noun} & \\ \text{AGR} & \begin{bmatrix} \text{PER 3rd} \end{bmatrix} \end{bmatrix} \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{MODE} & / \text{ ref} \\ \text{INDEX} & i \end{bmatrix} \\ \text{ARG-ST} & \begin{bmatrix} \text{FIRST} & \text{DP}_i \\ \text{REST} & / \langle \ \rangle \end{bmatrix} \end{bmatrix}$	*infl-lxm*
cntn-lxm	$\begin{bmatrix} \text{ARG-ST} & \langle \ [\text{COUNT} +] \ , \ldots \ \rangle \end{bmatrix}$	*cn-lxm*
massn-lxm	$\begin{bmatrix} \text{ARG-ST} & \langle \ [\text{COUNT} -] \ , \ldots \ \rangle \end{bmatrix}$	*cn-lxm*

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Reading Questions

- I'm not sure I quite understand which words are valued PRED + and which are valued PRED -. Specifically, why is *be* PRED +?
- How does the Extraposition Lexical Rule plural verbs from taking dummy *it* as a SPR?
- What are some of the other ways idioms are treated in grammars? As far as allowing the semantic meanings under the covers, etc.

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Reading Questions

- What about *Well, there's the cat*...?
- Does *exist* have the same lexical entry as existential *be*?
- I'm confused about the finite S that is the part after *that* as defined on page 340. What is the S? The definition says is a phrase headed by a finite verb so why isn't it just a VP?

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Reading Questions

- It seems like we're getting a lot of new features that aren't always relevant. How does the person building the grammar trade off accuracy versus intelligibility and generalization? Is the goal always to find a way to ensure accuracy, and if so how about the trade-off between lexical entry complexity, more rules, etc.? Is this a case by case basis and somewhat intuitive, or is there an actual metric to quantify the entropy (or something like that) of the grammar?

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