Non-referential NPs, Expletives, and Extraposition
Overview

• Existentials
• Extraposition
• Idioms
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.
Chapter 10 entry for *be*

\[
\left\langle \text{be} , \begin{bmatrix}
\text{ARG-ST} \\
\text{SEM}
\end{bmatrix}ightangle \\
\left\langle \begin{bmatrix}
\text{be-lxm} \\
\text{be}
\end{bmatrix} , \\
\begin{bmatrix}
\text{ARG-ST} \\
\text{SEM}
\end{bmatrix}ightangle \\
\left\langle \begin{bmatrix}
\text{SYN} \\
\text{SEM}
\end{bmatrix} , \\
\begin{bmatrix}
\text{HEAD} \\
\text{SEM}
\end{bmatrix}ightangle \\
\left\langle \begin{bmatrix}
\text{VAL} \\
\text{SEM}
\end{bmatrix} , \\
\begin{bmatrix}
\text{INDEX} \\
\text{SEM}
\end{bmatrix}ightangle \\
\left\langle \begin{bmatrix}
\text{SPR} \\
\text{COMPS}
\end{bmatrix} , \\
\begin{bmatrix}
\text{FORM} \\
\text{SEM}
\end{bmatrix}ightangle \\
\left\langle \begin{bmatrix}
\text{verb} \\
\text{SEM}
\end{bmatrix} , \\
\begin{bmatrix}
\text{INDEX} \\
\text{SEM}
\end{bmatrix}ightangle \\
\left\langle \begin{bmatrix}
\text{PASS} \\
\text{SEM}
\end{bmatrix} , \\
\begin{bmatrix}
\text{INDEX} \\
\text{SEM}
\end{bmatrix}ightangle \\
\left\langle \begin{bmatrix}
\text{INDEX} \\
\text{SEM}
\end{bmatrix} , \\
\begin{bmatrix}
\text{RESTR} \\
\text{SEM}
\end{bmatrix}ightangle
\]
Copula (generalized)
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*. 
Lexical Entry for the Existential *be*

\[
\left\langle \textit{be}, \ \begin{array}{c}
\text{ARG-ST} \\
\text{SEM}
\end{array} \left\langle \begin{array}{c}
\text{NP} \\
\text{VAL}
\end{array} \right\rangle \right\rangle
\]
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?*
The Entry for Existential *there*
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?

\[
\begin{pmatrix}
\text{pron-lxm} \\
\text{SYN} \quad \text{HEAD} \quad \text{FORM} \quad \text{there} \\
\text{SEM} \quad \text{AGR} \quad \text{PER} \quad 3\text{rd} \\
\text{MODE} \quad \text{none} \\
\text{INDEX} \quad \text{none} \\
\text{RESTR} \quad \langle \rangle \\
\end{pmatrix}
\]
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.*
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*
The Entry for Dummy \textit{it}

\[ \langle \text{it,} \rangle \]

\[
\begin{bmatrix}
\text{pron-lxm} \\
\text{SYN} \\
\text{SEM}
\end{bmatrix}
\]

\[
\begin{bmatrix}
\text{HEAD} \\
\text{MODE} \\
\text{INDEX} \\
\text{RESTR}
\end{bmatrix}
\]

\[
\begin{bmatrix}
\text{FORM} \quad \text{it} \\
\text{AGR} \quad 3\text{sing} \\
\text{none} \\
\langle \rangle
\end{bmatrix}
\]

\[
\begin{bmatrix}
\text{none} \\
\text{none}
\end{bmatrix}
\]
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*?

\[
\langle \text{it}, \begin{bmatrix}
\text{pron-lxm} \\
\text{SYN} \\
\text{SEM}
\end{bmatrix}
\begin{bmatrix}
\text{HEAD} \\
\text{MODE} \\
\text{INDEX} \\
\text{RESTR}
\end{bmatrix}
\begin{bmatrix}
\text{FORM} \\
\text{AGR} \\
\text{none} \\
\langle \rangle
\end{bmatrix}
\rangle
\]
A New Type of Lexeme: Complementizers

\[
\text{comp-lxm : } \begin{cases}
\text{SYN} & \begin{bmatrix}
\text{HEAD} \\
\text{VAL}
\end{bmatrix}
= \begin{bmatrix}
\text{comp} \\
\text{AGR} \ 3\text{sing}
\end{bmatrix} \\
\text{ARG-ST} & \begin{cases}
\langle 
\begin{bmatrix}
\text{S} \\
\text{INDEX} \ s
\end{bmatrix}
\rangle \\
\text{SEM} & \begin{bmatrix}
\text{INDEX} \ s \\
\text{RESTR} \ 〈 〉
\end{bmatrix}
\end{cases}
\end{cases}
\]
Questions About the Type \textit{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?
The Type \textit{comp}
The Lexical Entry for Complementizer *that*
…and with inherited information filled in

```plaintext
⟨that, \\
\begin{bmatrix}
\text{comp-lxm} \\
\text{SYN} \\
\text{ARG-ST} \\
\text{SEM}
\end{bmatrix}
\begin{bmatrix}
\text{HEAD} \\
\text{VAL} \\
\text{S} \\
\text{INDEX}
\end{bmatrix}
\begin{bmatrix}
\text{comp} \\
\text{AGR} \\
\text{FORM} \\
\text{FORM}
\end{bmatrix}
\begin{bmatrix}
\text{cform} \\
3\text{sing} \\
\text{SPR} \\
\text{fin}
\end{bmatrix}
\begin{bmatrix}
\text{prop} \\
\text{INDEX}
\end{bmatrix}
\begin{bmatrix}
\text{INDEX} \\
\text{RESTR}
\end{bmatrix}
\langle \rangle
```

Question: Where did [FORM cform] come from?
Structure of a Complementizer Phrase

\[
\begin{align*}
\text{CP} & \quad \begin{cases}
\text{HEAD 2} \\
\text{VAL} & \begin{cases}
\text{SPR} & \langle \rangle \\
\text{COMPS} & \langle \rangle
\end{cases}
\end{cases} \\
\text{C} & \quad \begin{cases}
\text{word} \\
\text{HEAD 2} & \begin{cases}
\text{comp} & \text{FORM cform} \\
\text{SPR} & \langle \rangle \\
\text{COMPS} & \langle 1 \rangle
\end{cases}
\end{cases}
\end{align*}
\]

that
the Giants lost
Sample Verb with a CP Subject

Note: the only constraint on the first argument is semantic
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.

```
 ⟨matter, ⟨siv-lxm
 ARG-ST ⟨ SYN [HEAD nominal ]
 SEM ⟨ INDEX [ [RELN matter ⟩ ⟩ ] ⟩ ⟩

 RESTR ⟨ SIT [MATTERING [ ] ] ⟩ ⟩
```

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

\[ \text{pi-rule} \]

\[
\begin{aligned}
\text{INPUT} &\left\langle X, \left[\begin{array}{c}
\text{SYN} \\
\text{VAL} \\
\text{SPR} \\
\text{COMPS} \\
\end{array}\right]\left[\begin{array}{c}
\left\langle 2\text{CP} \right\rangle \\
\end{array}\right] \right\rangle \\
\text{OUTPUT} &\left\langle Y, \left[\begin{array}{c}
\text{SYN} \\
\text{VAL} \\
\text{SPR} \\
\text{COMPS} \\
\end{array}\right]\left[\begin{array}{c}
\left\langle \text{NP[FORM it]} \right\rangle \\
\end{array}\right] \oplus \left\langle 2 \right\rangle \right\rangle 
\end{aligned}
\]

- Why is the type \textit{pi-rule}?
- Why doesn’t it say anything about the semantics?
- Why is the COMPS value \([A]\), not \(< \ >\)?
Extraposition with Verbs whose COMPS Lists are Nonempty

• *It worries me* that war is imminent.

• *It occurred to Pat* that Chris knew the answer.

• *It endeared you to Andy* that you wore a funny hat.
Another Nonreferential Noun

\[
\langle \text{advantage} , \begin{bmatrix}
\text{massn-lxm} \\
\text{SYN} & \text{HEAD} & \text{FORM} & \text{advantage} \\
\text{SEM} & \text{MODE} & \text{AGR} & 3\text{sing} \\
\text{INDEX} & \text{none} \\
\text{RESTR} & \langle \rangle 
\end{bmatrix}\rangle
\]
The Verb that Selects *advantage*
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.

• That would require another lexical entry, in which
  take advantage of is a transitive verb (with spaces in its written form).
Overview

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