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

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

\[ \begin{array}{c}
\text{ARG-ST} \\
\text{SEM}
\end{array} \]

\[ \begin{array}{c}
\text{be-lxm} \\
\text{sem}
\end{array} \]

\[ \begin{array}{c}
\text{SYN} \\
\text{VAL} \\
\text{HEAD} \\
\text{verb FORM pass} \\
\text{SPR} \langle 1 \rangle \\
\text{COMPS} \langle \rangle \\
\text{INDEX s}
\end{array} \]

\[ \begin{array}{c}
\text{INDEX s} \\
\text{RESTRICTION} \langle \rangle 
\end{array} \]
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 \textit{be}

\[
\langle \text{be}, \left[\begin{array}{c}
\text{ARG-ST} \\
\text{SEM}
\end{array}\right]
\left[\begin{array}{c}
\text{exist-be-lxm} \\
\text{NP} \\
\text{SEM}
\end{array}\right]
\left[\begin{array}{c}
\text{there} \\
\text{there} \\
\text{there}
\end{array}\right]
\left[\begin{array}{c}
\text{2} \\
\text{2} \\
\text{2}
\end{array}\right]
\left[\begin{array}{c}
PRED \\
VAL \\
SEM
\end{array}\right]
\left[\begin{array}{c}
\text{PRED +} \\
\text{SPR} \\
\text{COMPS}
\end{array}\right]
\left[\begin{array}{c}
\text{\langle 2 \rangle} \\
\text{\langle \rangle} \\
\text{\langle \rangle}
\end{array}\right]
\left[\begin{array}{c}
\text{INDEX} \\
\text{INDEX}
\end{array}\right]
\langle \rangle
\left[\begin{array}{c}
\text{s} \\
\text{s}
\end{array}\right]
\left[\begin{array}{c}
\text{RESTR} \\
\text{RESTR}
\end{array}\right]
\langle \rangle
\left[\begin{array}{c}
\langle \rangle \\
\langle \rangle
\end{array}\right]\rangle
\]

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?*

\[
\begin{align*}
\left\langle \text{be}, \begin{bmatrix}
\text{exist-be-lxm} \\
\text{ARG-ST} \begin{bmatrix}
\text{NP} \begin{bmatrix}
\text{FORM} \text{ there}, 2
\end{bmatrix}
\end{bmatrix}
\end{bmatrix}
\end{align*}
\]
The Entry for Existential *there*

\[ \langle \text{there}, \begin{bmatrix} \text{pron-lxm} \\ \text{SYN} \\ \text{SEM} \end{bmatrix} \begin{bmatrix} \text{HEAD} \\ \text{AGR} \\ \text{MODE} \\ \text{INDEX} \\ \text{RESTR} \end{bmatrix} \begin{bmatrix} \text{FORM} \text{ there} \\ \text{PER 3rd} \end{bmatrix} \rangle \]
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?

```
⟨there ,
  SYN
  HEAD
  [FORM there
     AGR [PER 3rd]]
  MODE none
  INDEX none
  RESTR ⟨⟩
⟩
```

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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.*
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 *it*

\[
\langle \text{it}, \begin{array}{l}
\text{pron-lxm} \\
\text{SYN} \\
\text{SEM} \\
\end{array}
\begin{array}{l}
\text{HEAD} \\
\text{MODE} \\
\text{INDEX} \\
\text{RESTR} \\
\end{array}
\begin{array}{l}
\text{FORM} \text{ it} \\
\text{AGR} \text{ 3sing} \\
\text{none} \\
\langle \rangle \\
\end{array}\rangle
\]
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*?

```
pron-lxm
 SYN [HEAD [FORM it 3sing]]
 SEM [MODE none]
 INDEX none
 RESTR ⟨⟩
```

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A New Type of Lexeme: Complementizers

comp-lxm:

\[
\begin{align*}
\text{SYN} & : & \text{HEAD} & : & \begin{bmatrix} \text{comp} \\ \text{AGR} & 3\text{sing} \end{bmatrix} \\
\text{VAL} & : & \begin{bmatrix} \text{SPR} \\ \langle \rangle \end{bmatrix} \\
\text{ARG-ST} & : & \begin{bmatrix} \text{S} \\ \langle \begin{bmatrix} \text{INDEX} & s \end{bmatrix} \rangle \end{bmatrix} \\
\text{SEM} & : & \begin{bmatrix} \text{INDEX} \\ \text{RESTR} & \langle \rangle \end{bmatrix}
\end{align*}
\]
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 `comp`
The Lexical Entry for Complementizer *that*

\[
\langle \text{that} , \begin{bmatrix}
\text{ARG-ST} & \langle [\text{FORM fin}] \rangle \\
\text{SEM} & [\text{MODE prop}]
\end{bmatrix}
\rangle
\]
...and with inherited information filled in

\[
\begin{array}{c}
\text{comp-lxm} \\
\text{SYN} \quad \text{HEAD} \quad \text{FORM} \quad \text{cform} \\
\text{VAL} \quad \text{SPR} \langle \rangle \\
\text{ARG-ST} \quad \langle \text{S} \rangle \quad \langle \text{fin} \rangle \\
\text{INDEX} \quad s \\
\text{SEM} \quad \text{MODE} \quad \text{prop} \\
\text{INDEX} \quad s \\
\text{RESTR} \langle \rangle \\
\end{array}
\]

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

The diagram shows the structure of a complementizer phrase (CP) in a sentence. CP consists of a head [HEAD 2] and a valency [VAL [SPR ⟨ ⟩ | COMPS ⟨ ⟩]].

The complementizer C [HEAD word [HEAD 2 comp [HEAD FORM cform | VAL [SPR ⟨ ⟩ | COMPS ⟨ 1 ⟩]]]] captures the syntactic characteristics of the complementizer.

The complementizer phrase is complemented by the sentence [HEAD 1 S [HEAD the Giants lost | VAL that]].
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:
    
    \textit{That Bush won matters} \textit{ vs. *Bush won matters}  
  
  • Argument-marking PPs are semantically identical to their object NPs, but we get:
    
    \textit{The election mattered} \textit{ vs. *Of the election mattered}  

• So we need to add a syntactic constraint.

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

\[
\begin{align*}
\text{INPUT} & : \langle X, [\text{SYN} [\text{VAL} [\text{SPR} [\text{COMPS} [A]])] \rangle \\
\text{OUTPUT} & : \langle Y, [\text{SYN} [\text{VAL} [\text{SPR} [\text{COMPS} [A] \oplus \langle 2 \rangle]]]] \rangle
\end{align*}
\]

- 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

\[\langle \text{advantage} \rangle, \begin{bmatrix} \text{massn-lxm} \\ \text{SYN} \begin{bmatrix} \text{HEAD} \\ \text{AGR} \end{bmatrix} \begin{bmatrix} \text{FORM} \\ \text{advantage} \end{bmatrix} \\ \text{SEM} \begin{bmatrix} \text{MOED} \\ \text{INDEX} \end{bmatrix} \begin{bmatrix} \text{none} \\ \text{none} \end{bmatrix} \\ \text{RESTR} \begin{bmatrix} \langle \rangle \end{bmatrix} \end{bmatrix} \]
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.

- Why not?
Overview

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