Ling 566
Oct 16, 2012
Review
Overview

• Reading questions
• Homework tips
• SPR and COMPS
• Common mistakes
• Analogies to other systems you might know
• Problems 4.7, 4.9
Reading Questions

• In what way does the actual meaning of the two structures assigned to this sentence differ?

• *We sent two letters to Lee.*

• Are they really both grammatical?
We send two letters to Lee.
We send two letters to Lee.
Reading Questions

• How do we know what features to put into a predication?

• Would letters as in letters of the alphabet have the same lexical entry as letters like what’s usually sent in the mail?

• How do we represent the difference in meaning between send and sent?
Reading Questions

• How do we get enough different INDEX values for a whole dictionary?

• Why sometimes $s$ and sometimes $s_n$, and not $t, u, v$?

• How can *to* be semantically empty and still have a meaningful INDEX value?

• How can the head of a phrase be semantically empty?

• Why does *letter* share its INDEX with its SPR?
word

SYN

⟨letter ,

VAL

[head

[head

[head

[noun

[3sing

[gend neut]

[agr

[3sing

[gend neut]

[spr

[count +]

[index k]

[comps

[(pp m)]

[mod

[ ]

[mode ref

[index k]

[sem

[reln

[letter]

[restr

[inst k]

[addressee m]⟩

⟩

⟩

⟩

⟩

⟩

⟩

⟩

⟩
Reading Questions

• Does set of well-formed structures correspond exactly to the set of well-formed English sentences?

• Do we have to understand the squiggly bits?

• Why bother formalizing?

• Don’t these feature structures get ridiculously large?
Reading Questions

• Does English have dative case?

• Is it redundant to have a feature CASE for English given that we mostly use prepositions to mark 'case'?

• English nouns (other than pronouns) are underspecified for CASE. How do we figure out their particular CASE values when they are used in a tree?
Reading Questions

• Is position alone enough to tell whether something is SPR or COMPS?

• Will this approach work for morphologically complex languages as well?

• What ever happened to NOM?

• Is it worth memorizing the rules now?

• Why aren’t we using NumP?
Reading Questions

• Is top-down or bottom-up more efficient in actual processing?

• How can we possibly do "simultaneous satisfaction" of all constraints?

• What are the best practices for writing trees going bottom-up (order of things to put in)?
Reading Questions

• Does not having to realize semantic roles mean we can license semantically weird sentences?

• Can we build a grammar that works with more than one sentence at a time? (I.e., paragraphs)
Homework tips/requests

• Type whenever possible
• Answer each part of each question separately
• Be sure to answer each part of each question, and follow the directions!
• Look over the problems early and ask questions
• Check your work
• Monitor GoPost
• WORK TOGETHER
SPR value on AP/PP?

- Kim grew fond of baseball.
- Kim and Sandy ate lunch in the park.
- Kim and Sandy are in the park.
Which grammar does this tree go with?

```
NP
  D   NOM
    the   N
        cat
```
What’s wrong with this?

\[ \langle \text{out}, \begin{bmatrix} \text{word} \\ \text{HEAD} \quad \text{prep} \\ \text{VAL} \quad \text{SPR} \\ \text{COMPS} \end{bmatrix} \rangle \]
What’s wrong with this?

\[
\langle \text{out,} \quad \left[ \begin{array}{c}
\text{word} \\
\text{HEAD} \\
\text{VAL}
\end{array} \right]
\begin{array}{c}
\text{prep} \\
\text{\[ \text{SPR} \quad \langle \rangle \quad \text{COMPS} \quad \langle (NP) (PP) \rangle \]} \end{array}
\rangle
\]
What’s wrong with this?

\[
\langle \text{out,} \rangle \begin{bmatrix}
\text{word} \\
\text{HEAD}
\end{bmatrix}
\begin{bmatrix}
\text{prep} \\
\text{VAL}
\end{bmatrix}
\begin{bmatrix}
\text{SPR} \\
\text{COMPS} \\
(\text{NP} \mid \text{PP})
\end{bmatrix}
\]
What’s wrong with this?

\[
\langle \text{grew,} \vert \begin{array}{c}
\text{word} \\
\text{HEAD} \\
\text{VAL}
\end{array}
\vert 
\begin{array}{c}
\text{verb} \\
\text{AGR 3sing} \\
\text{SPR} \\
\text{COMPS}
\end{array}
\vert 
\begin{array}{c}
\langle \text{NP} \rangle \\
\langle \text{AP} \rangle
\end{array}
\rangle
\]
What’s wrong with this?

\[
\langle \text{out,} \quad \begin{bmatrix}
\text{word} \\
\text{HEAD} \\
\text{preposition} \\
\text{VAL} \\
\text{COMPS}
\end{bmatrix}
\quad \begin{bmatrix}
\text{SPR} \\
\langle \rangle \\
\text{COMPS} \\
\langle (\text{NP} | \text{PP}) \rangle
\end{bmatrix}\rangle
\]
What’s wrong with this?

\[
\left< \text{there,} \begin{array}{c}
\text{phrase} \\
\text{HEAD} \\
\text{VAL}
\end{array} \begin{array}{c}
\text{prep} \\
\text{SPR} \\
\text{COMPS}
\end{array} \right>
\]
Tags & lists

• What’s the difference between these two?

\[
\begin{array}{c}
\text{SPR} \left\langle \text{1} \langle \text{NP} \rangle \rightangle \\
\text{SPR} \left\langle \text{1} \text{NP} \right\rangle \\
\end{array}
\]

• When does it matter?
What’s wrong with this tree?

```
NP
  D
    the
  NOM
    N
      COMPS ⟨ (�PP) ⟩
      [photos]
      [of the suspect]
  ⟨�PP⟩
```
What’s wrong with this tree?

[HEAD noun
  SPR ⟨⟩
  COMPS ⟨⟩
]

[HEAD noun
  SPR ⟨⟩
  COMPS ⟨⟩
]

[HEAD noun
  SPR ⟨⟩
  COMPS ⟨⟩
]

[HEAD verb
  SPR ⟨⟩
  COMPS ⟨⟩
]

[HEAD verb
  SPR ⟨⟩
  COMPS ⟨⟩
]

[HEAD verb
  SPR ⟨⟩
  COMPS ⟨⟩
]

[HEAD prep
  SPR ⟨⟩
  COMPS ⟨⟩
]

[HEAD prep
  SPR ⟨⟩
  COMPS ⟨⟩
]

[HEAD prep
  SPR ⟨⟩
  COMPS ⟨⟩
]

[HEAD noun
  SPR ⟨⟩
  COMPS ⟨⟩
]

[HEAD noun
  SPR ⟨⟩
  COMPS ⟨⟩
]

[HEAD noun
  SPR ⟨⟩
  COMPS ⟨⟩
]

I

rely

on

Kim

What’s wrong with this tree?

What’s wrong with this tree?
What’s wrong with this tree?

I rely on Kim.

What’s wrong with this tree?
What’s wrong with this tree?

I rely on Kim.
What’s wrong with this tree?

What’s wrong with this tree?
What’s wrong with this tree?

What's wrong with this tree?
What’s wrong with this?

\[ \langle \text{hundred} , \langle \text{head} \ number \rangle \langle \text{index} \ j \rangle \langle \text{index} \ k \rangle \langle \text{restr} \ hund\text{-}number \rangle \langle \text{multiplier} \ j \rangle \langle \text{addend} \ k \rangle \langle \text{hund\text{-}value} \ m \rangle \rangle \]
And this?

SYN

VAL

COMPS

INDEX

MODE

SEM

RESTR

\[ \langle \text{hundred} , \text{,} \rangle \]
How about this?

\[
\begin{align*}
\langle \text{hundred} , \\
\text{SYN} & \langle \\
\text{VAL} & \langle \\
\text{COMPS} & \langle \\
\text{SEM} & \langle \\
\text{RESTR} & \langle \\
\end{align*}
\]

\[
\begin{align*}
\langle \text{hundred} , \\
\text{SYN} & \langle \\
\text{VAL} & \langle \\
\text{COMPS} & \langle \\
\text{INDEX} & m \\
\text{MODE} & \text{ref} \\
\text{SEM} & \langle \\
\text{RESTR} & \langle \\
\end{align*}
\]

\[
\begin{align*}
\langle \text{hundred} , \\
\text{SYN} & \langle \\
\text{VAL} & \langle \\
\text{COMPS} & \langle \\
\text{INDEX} & m \\
\text{MODE} & \text{ref} \\
\text{SEM} & \langle \\
\text{RESTR} & \langle \\
\end{align*}
\]

\[
\begin{align*}
\langle \text{hundred} , \\
\text{SYN} & \langle \\
\text{VAL} & \langle \\
\text{COMPS} & \langle \\
\text{INDEX} & m \\
\text{MODE} & \text{ref} \\
\text{SEM} & \langle \\
\text{RESTR} & \langle \\
\end{align*}
\]

\[
\begin{align*}
\langle \text{hundred} , \\
\text{SYN} & \langle \\
\text{VAL} & \langle \\
\text{COMPS} & \langle \\
\text{INDEX} & m \\
\text{MODE} & \text{ref} \\
\text{SEM} & \langle \\
\text{RESTR} & \langle \\
\end{align*}
\]
Better version

\[
\begin{align*}
\text{SYN} & \quad \text{VAL} \\
\langle \text{hundred} , \rangle & \\
\text{SEM} & \\
\text{RESTR} & \\
\langle [\text{RELN} \, \text{times} \, k] \rangle, & \langle [\text{RELN} \, \text{plus} \, \text{ Stunden} , \rangle \\
\langle [\text{RESULT} \, \text{inst} \, m] \rangle & \\
\langle [\text{FACTOR1} \, \text{inst} \, l] \rangle, & \langle [\text{FACTOR2} \, \text{inst} \, m] \rangle \\
\langle [\text{RESULT} \, \text{inst} \, i] \rangle, & \langle [\text{TERM1} \, \text{inst} \, j] \rangle \\
\langle [\text{TERM2} \, \text{inst} \, k] \rangle, & \langle [\text{VALUE} \, \text{inst} \, 100] \rangle
\end{align*}
\]
Type hierarchy analogies

• How is this formalism like OOP?
• How is it different?

• How is the type hierarchy like an ontology?
• How is it different?

• How is this formalism like the MP’s formalism?
• How is it different?
Overview

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4.7 Icelandic Case

• How do the following support the analysis of case marking as a lexical phenomenon?

(i) Drengurinn kyssti stúlkuna.
the-boy.NOM kissed the-girl.ACC
‘The boy kissed the girl.’

(ii) Drengina vantar mat.
the-boys.ACC lacks food.ACC
‘The boys lack food.’

(iii) Verkjanna gaetir ekki.
the-pains.GEN is-noticeable not
‘The pains are not noticeable.’

(iv) Barninu batnathi veikin.
the-child.DAT recovered-from the-disease.NOM
‘The child recovered from the disease.’
4.9 Agreement in NP coord

- What is the NUM value of NPs coordinated with *and*

- How does the PER value of coordinated NPs get computed from the PER value of the coordinands? Use examples like the following:

  *You and she distinguished yourselves/*themselves/*ourselves.*