Overview

- Bonus 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?
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?
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?
What’s wrong with this?

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

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

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

⟨out, [word
   HEAD   preposition
   VAL    [SPR  ⟨⟩
   COMPS  ⟨(NP | PP)⟩]⟩}
What’s wrong with this?

\[
\langle \text{there,} \quad \begin{bmatrix}
\text{phrase} \\
\text{HEAD} \\
\text{VAL}
\end{bmatrix}
\begin{bmatrix}
\text{prep} \\
\text{SPR} \\
\text{COMPS}
\end{bmatrix}
\rangle
\]
Tags & lists

• What’s the difference between these two?

\[
\begin{align*}
&\text{[SPR } \underline{1}\langle \text{NP } \rangle \text{]} \\
&\text{[SPR } \langle \underline{1}\text{NP } \rangle \text{]}
\end{align*}
\]

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

[Diagram showing a tree structure with nodes labeled D, NP, NOM, N, PP, COMPS, and the words 'the', 'photos', 'of the suspect'.]
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 tree?

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

\[
\begin{align*}
&\langle \text{hundred ,} \\
&\langle \text{VAL} \ 
\begin{array}{c}
\text{HEAD} \\
\text{number}
\end{array} \\
&\langle \text{COMPS} \\
&\langle \text{INDEX} \ 
\begin{array}{c}
\text{head}
\end{array} \\
\langle \text{MODE} \\
\langle \text{RELN} \\
\langle \text{MULTIPLIER} \ 
\begin{array}{c}
j
\end{array} \\
\langle \text{ADDEND} \ 
\begin{array}{c}
k
\end{array} \\
\langle \text{HUND-VALUE} \ 
\begin{array}{c}
m
\end{array}
\end{align*}
\]
And this?

\[
\begin{align*}
\text{SYN} & \quad \text{VAL} \\
\langle \text{hundred} , \rangle & \quad \left[ \text{HEAD} \ number \right] \\
\text{VAL} & \quad \langle \text{SPR} \left[ \text{HEAD} \ number \right] \rangle \\
\text{VAL} & \quad \langle \text{COMPS} \left[ \text{HEAD} \ number \right] \rangle \\
\text{INDEX} & \quad i \\
\text{MODE} & \quad \text{ref} \\
\text{SEM} & \quad \left[ \text{RELN} \ times \right] \\
\text{SEM} & \quad \left[ \text{RESULT} \ k \right] \\
\text{SEM} & \quad \left[ \text{FACTOR1} \ l \right] \\
\text{SEM} & \quad \left[ \text{FACTOR2} \ m \right] \\
\text{SEM} & \quad \langle \text{RELN} \ plus \rangle \\
\text{SEM} & \quad \langle \text{RESULT} \ i \rangle \\
\text{SEM} & \quad \langle \text{TERM1} \ j \rangle \\
\text{SEM} & \quad \langle \text{TERM2} \ k \rangle \\
\end{align*}
\]
How about this?

\[ \langle \text{hundred}, \langle \text{head} \ number \rangle \langle \text{spr} \langle \text{index} \ l \rangle \rangle \langle \text{comps} \langle \text{head} \ number \rangle \langle \text{index} \ j \rangle \rangle \rangle \langle \text{index} \ m \rangle \langle \text{mode} \ ref \rangle \langle \text{sem} \langle \text{restr} \langle \text{reln} \ times \ k \rangle \langle \text{result} \ i \rangle \langle \text{factor1} \ l \rangle \langle \text{factor2} \ m \rangle \rangle, \langle \text{reln} \ constant \rangle \langle \text{inst} \ m \rangle \langle \text{value} \ 100 \rangle \rangle \]
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?
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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.