

# Homework 2

## Due September 25, 2013

11-721: Grammars and Lexicons

# Purpose of homework

- Practice using context free phrase structure rules: generating all and only grammatical sentences, (and learning that it may not be possible)
- Learn about DP and internal structure of noun phrases
- Practice with recursion
- Practice with ambiguity: one tree per meaning
- Learn that the point is not to learn the correct grammar rules, but to learn to evaluate different grammar rules in different situations.

# Talk to Lori or Matt....

- If you have never used context free grammars before.
- We will give you a quick tutorial.

# Some Phrase Structure Rules

$S \rightarrow DP \quad VP$

- DP is Determiner Phrase

$VP \rightarrow V \quad (DP)$

- This rule introduces an argument and is not recursive.
- Parentheses mean optional.

$VP \rightarrow VP \quad PP$

- This rule introduces adjuncts and is recursive.

$PP \rightarrow P \quad DP$

# More Phrase Structure Rules

$DP \rightarrow (DP) \text{ D-bar}$

$\text{D-bar} \rightarrow (D) \text{ NP}$

- D is determiner

$NP \rightarrow AP \text{ NP}$

- This rule is recursive and introduces adjuncts.

$NP \rightarrow NP \text{ PP}$

- This rule is recursive and introduces adjuncts.

$NP \rightarrow N \text{ (PP)}$

- This rule is not recursive. It introduces an argument.

# Task 1

- Assume that 's is a D.
- Also assume that “the”, “a”, “this”, “that”, etc. are D's.
- Look at Cullicover, Chapter 4 (on Piazza), top of page 127. It's about D's that have obligatory specifiers and D's that can't have specifiers.
- What he's talking about is that the grammar on the previous slide generates ungrammatical DPs. What are the ungrammatical DPs that Cullicover is talking about? Write two such ungrammatical DPs, one with 's and one with another determiner. You don't need to write anything else, unless you want to.

# Use these DP rules instead

I think I got them from a book by Tom Payne (not the one that we used for reading in this class)

$DP \rightarrow GP \ NP$

$GP \rightarrow DP \ G$

- 's is a G (genitive)

$DP \rightarrow (D) \ NP$

$NP \rightarrow AP \ NP$

- This rule is recursive and introduces adjuncts.

$NP \rightarrow NP \ PP$

- This rule is recursive and introduces adjuncts.

$NP \rightarrow N \ (PP)$

- This rule is not recursive. It introduces an argument

# Task 2

- Using the rules on the previous slide....
  - Don't use your intuition. Follow the rules. Pretend you are a machine.
- Draw a tree for “Sam's friend's brother”



# Task 3

- Using the same rules as for Task 2, draw two trees for “a friend of Sam’s brother”.
  - The sentence is ambiguous in a way that can be represented in two phrase structure trees.
- Which meaning is associated with each tree.

# Task 4

- Draw two trees for “I saw a man with a telescope” using the grammar rules on these slides.
- The sentence is ambiguous. Which meaning goes with which tree?

# Task 5

Based on an exercise from Radford, *Transformational Grammar*, page 225

- Two additional Phrase structure rules:
- $DP \rightarrow DP \text{ conj } DP$
- $NP \rightarrow NP \text{ conj } NP$
- “and” and “or” are conj
- The phrase “the workers and the managers in this factory” is ambiguous. What are the two meanings?
- Draw a phrase structure tree for “the workers and the managers in this factory” using the phrase structure rules on these slides so far. Which meaning does it represent?
- Why can’t the other meaning be represented using the rules we have so far?

# Task 6

- Ideally, for ambiguous sentences and phrases, there should be one tree for each meaning.
- Unambiguous sentences should have only one tree.
- Draw two trees for “these smart students with long hair”. Assume that “with long hair” is an adjunct and use the recursive rule  $NP \rightarrow NP$  PP.
  - This phrase is not ambiguous, so in an ideal grammar it would not have two trees.

# Task 7

- The grammar so far assigns a structure like this for “this student of linguistics”
  - A. [DP [D this] [NP [N student] [PP of linguistics]]]
- But maybe you are wondering about these structures
  - B. [DP [D this] [N student] [PP of linguistics]]
  - C. [DP [DP this student] [PP of linguistics]]
- Assume that the word “one” as in “this one” is a pronoun that can substitute for a string of words only if that string of words is a constituent.
  - Example: “I met this smart student and you met that one”, where “one” substitutes for “smart student”
- Write a sentence using “one” that is not compatible with structures B and C.
- Write a coordinate structure (using “and”) that is not compatible with structures B and C (assuming that only constituents can be coordinated).