

# Constituency Parsing



# Syntax

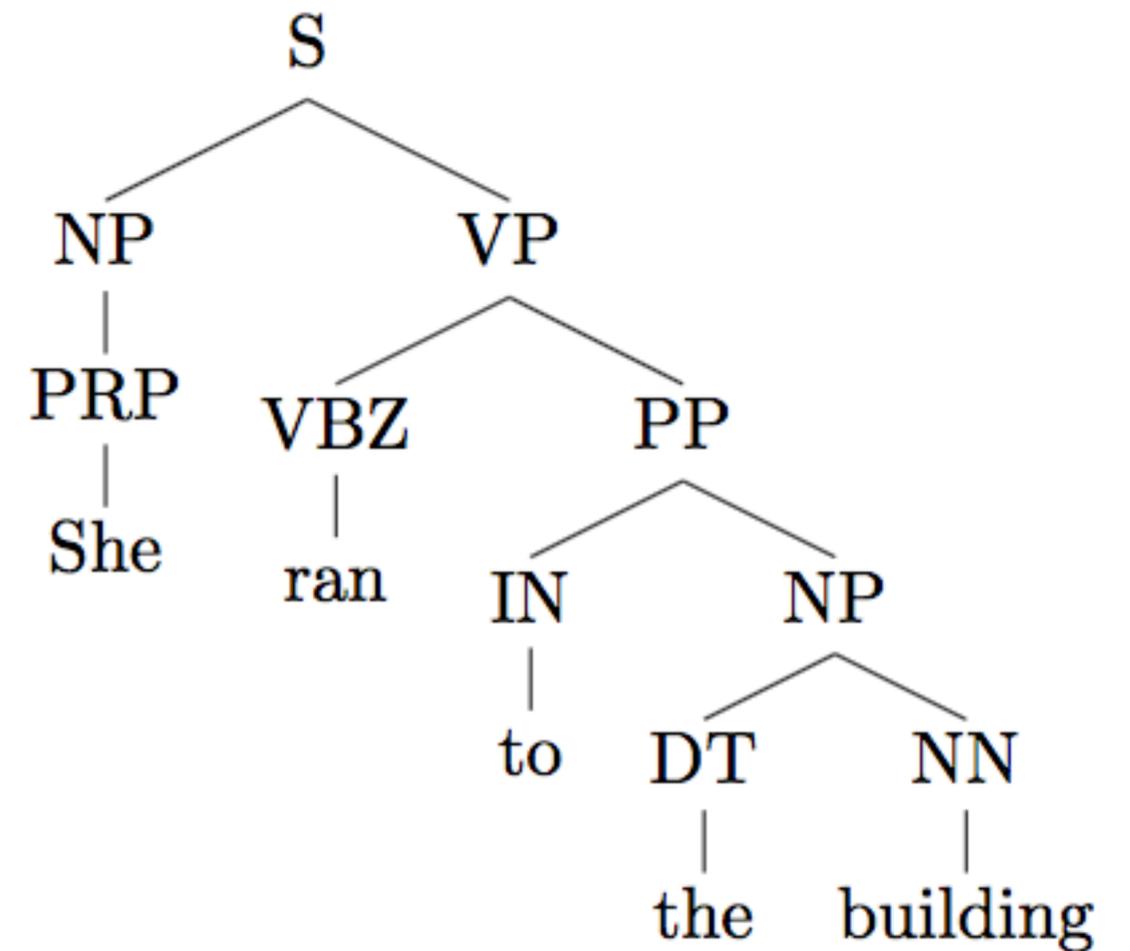
---

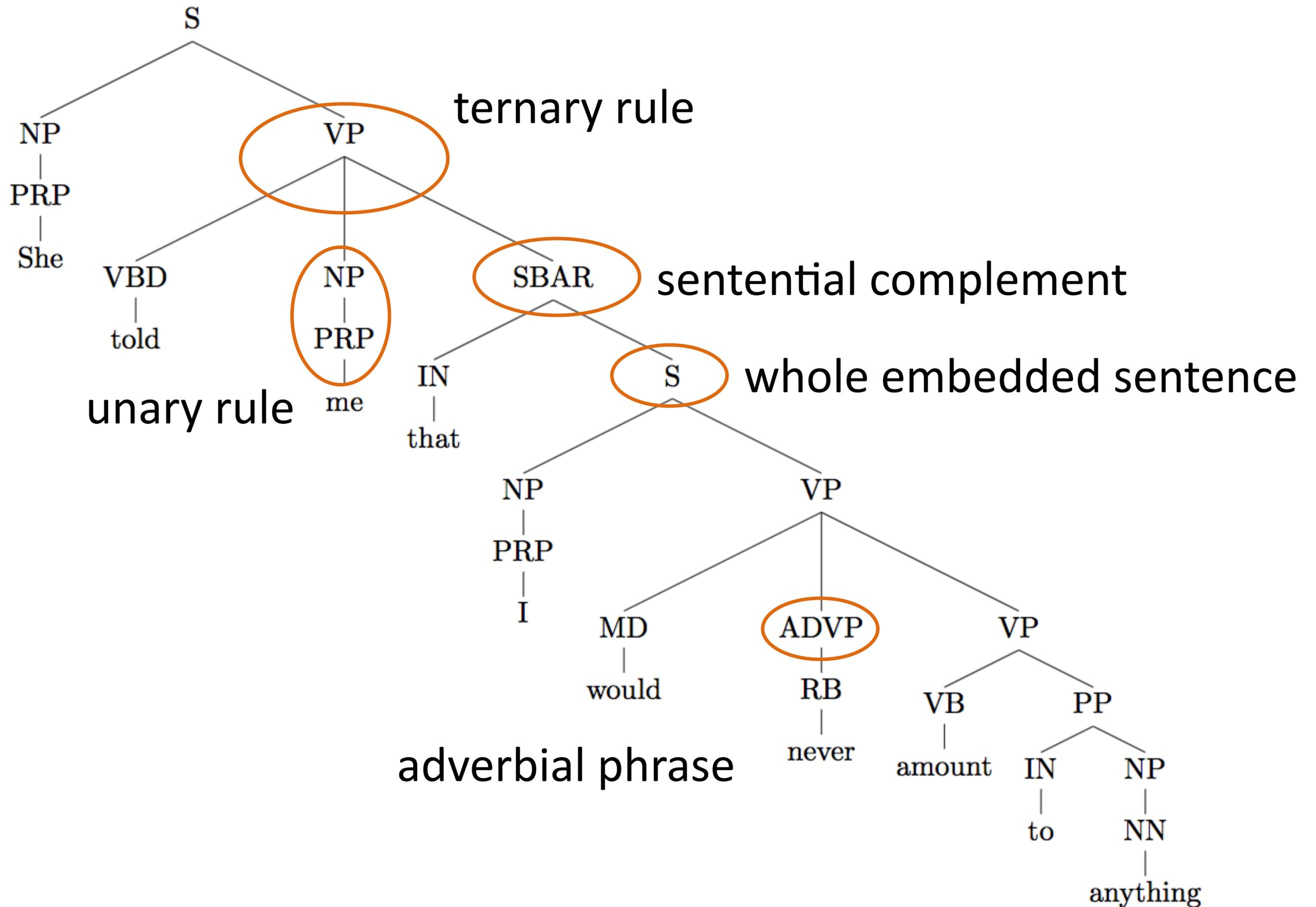
- ▶ Study of word order and how words form sentences
- ▶ Why do we care about syntax?
  - ▶ Multiple interpretations of words (noun or verb? *Fed raises...* example)
  - ▶ Recognize verb-argument structures (who is doing what to whom?)
  - ▶ Higher level of abstraction beyond words: some languages are SVO, some are VSO, some are SOV, parsing can canonicalize

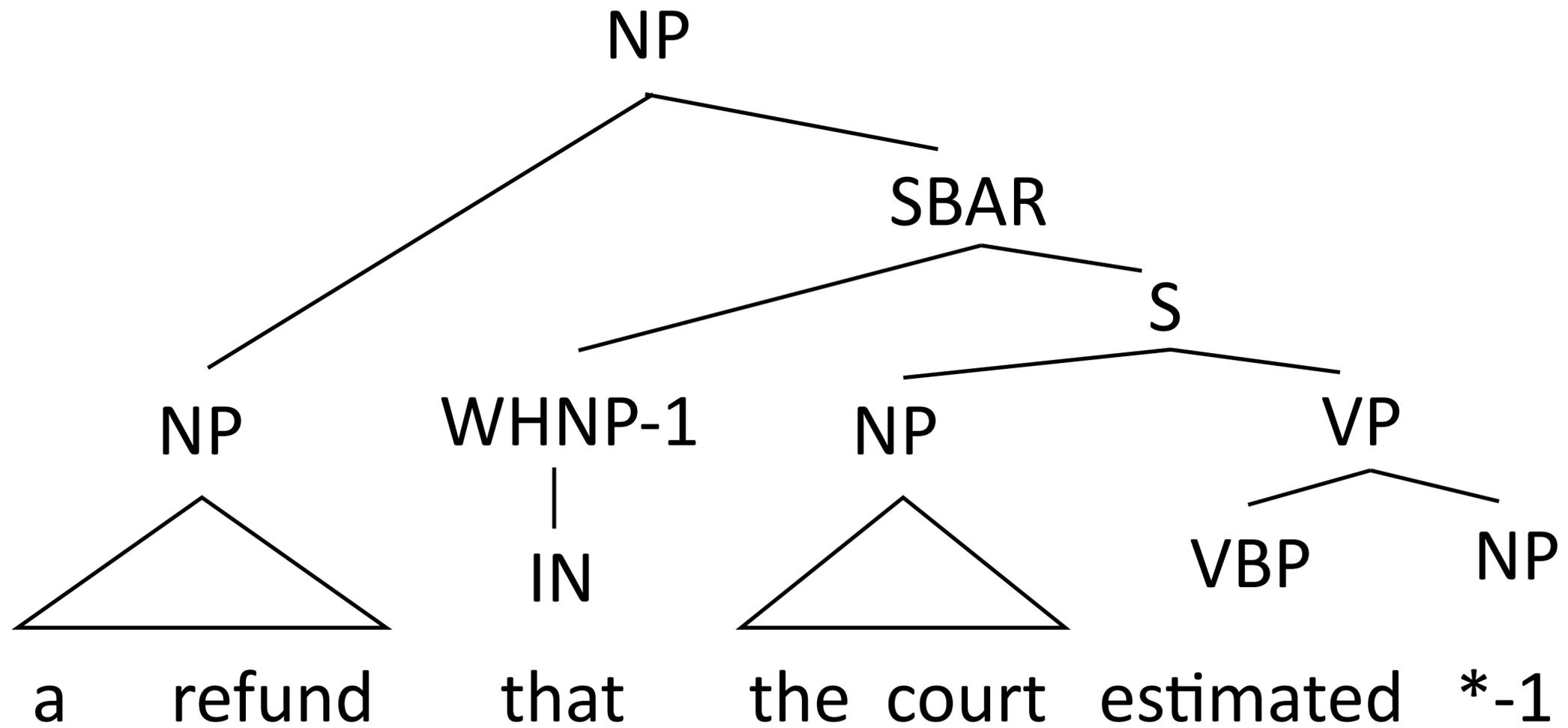


# Constituency Parsing

- ▶ Tree-structured syntactic analyses of sentences
- ▶ *Constituents*: (S)entence, (N)oun (P)hrases, (V)erb (P)hrases, (P)repositional (P)hrases, and more
- ▶ Bottom layer is POS tags
- ▶ Examples will be in English. Constituency makes sense for a lot of languages but not all



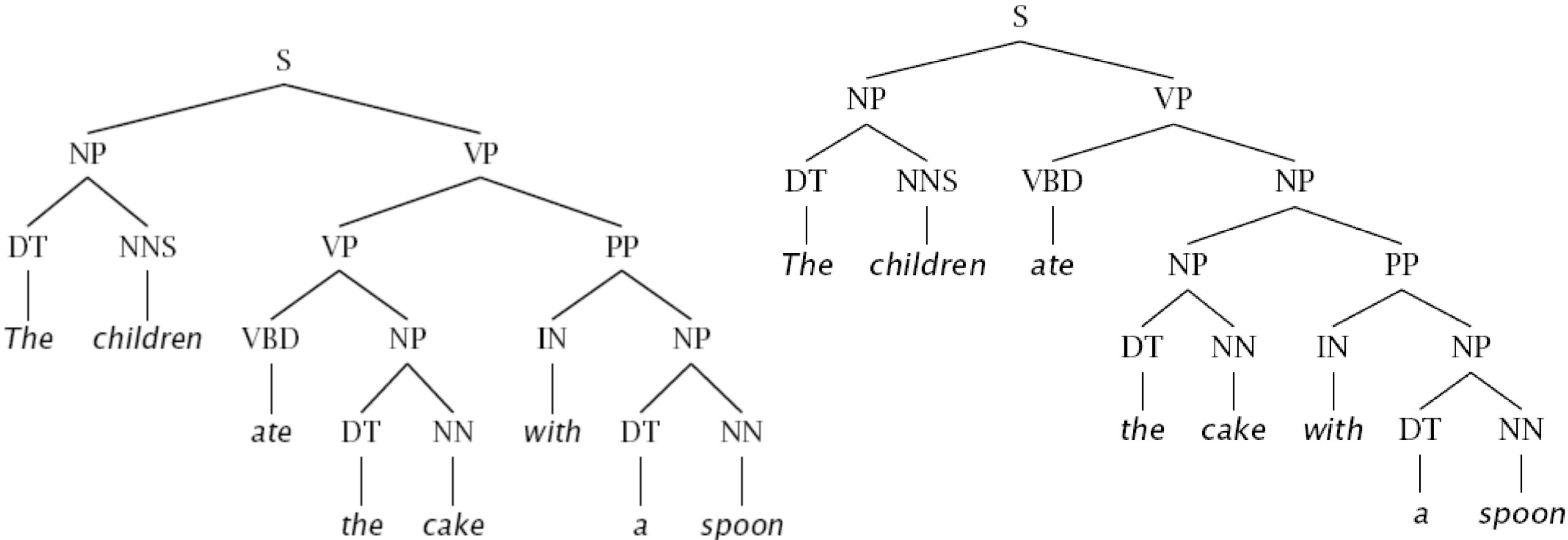






# Challenges

## PP attachment

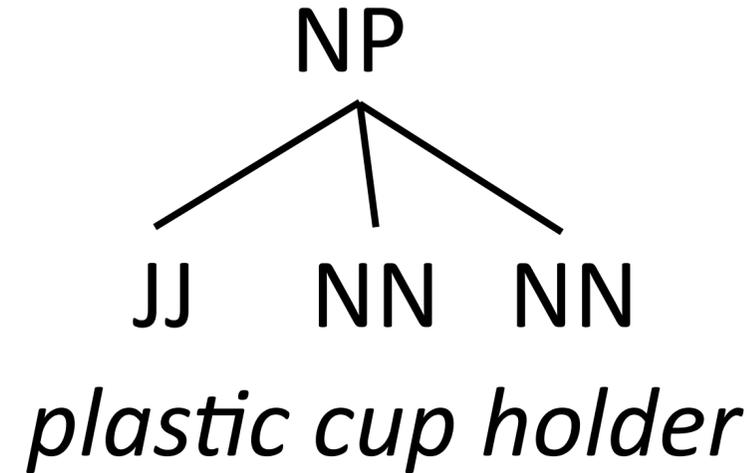
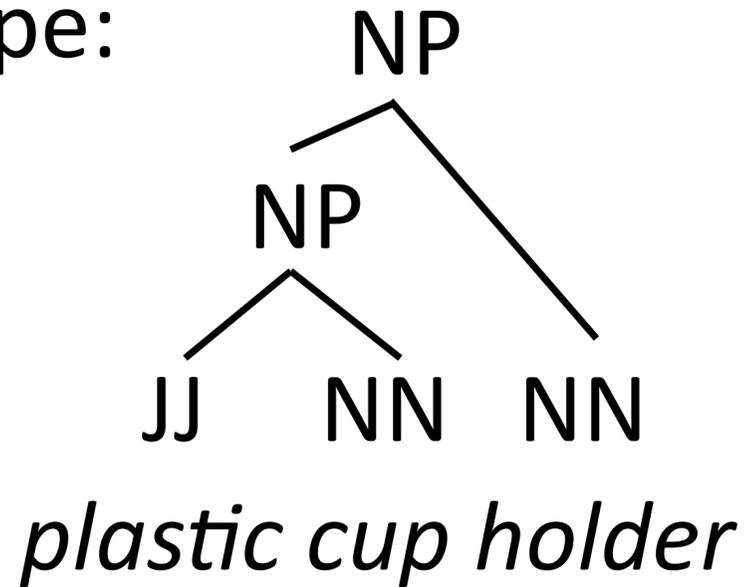


same parse as "the cake with some icing"



# Challenges

Modifier scope:



Complement structure:

*The students complained to the professor that they didn't understand*

Coordination scope:

*The man picked up his hammer and saw*

compare: *The man picked up his hammer and swung*

[Eisenstein book]

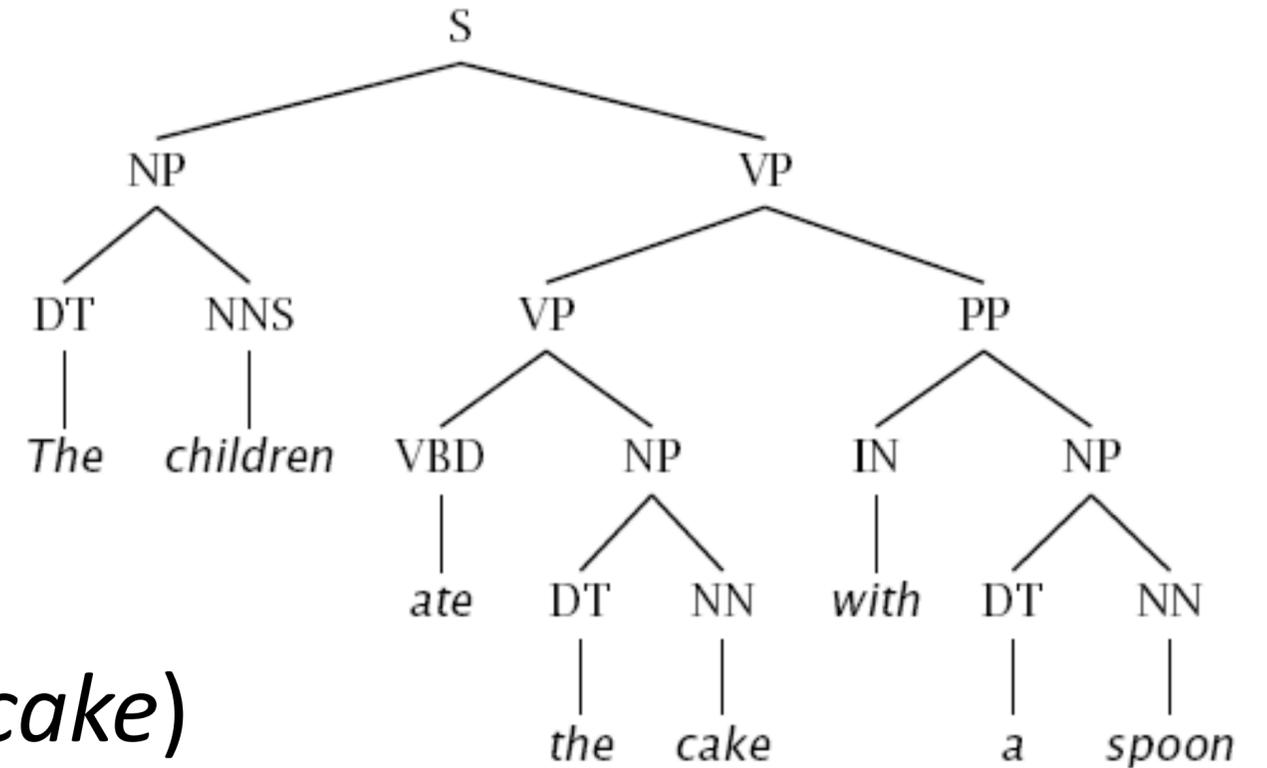


# Constituency

▶ How do we know what the constituents are?

▶ Constituency tests:

- ▶ Substitution by *proform* (e.g., pronoun, *did so*)
- ▶ Clefting (*It was with a spoon that...*)
- ▶ Answer ellipsis (What did they eat? *the cake*)  
(How? *with a spoon*)



▶ Sometimes constituency is not clear, e.g., coordination: *she went to and bought food at the store*