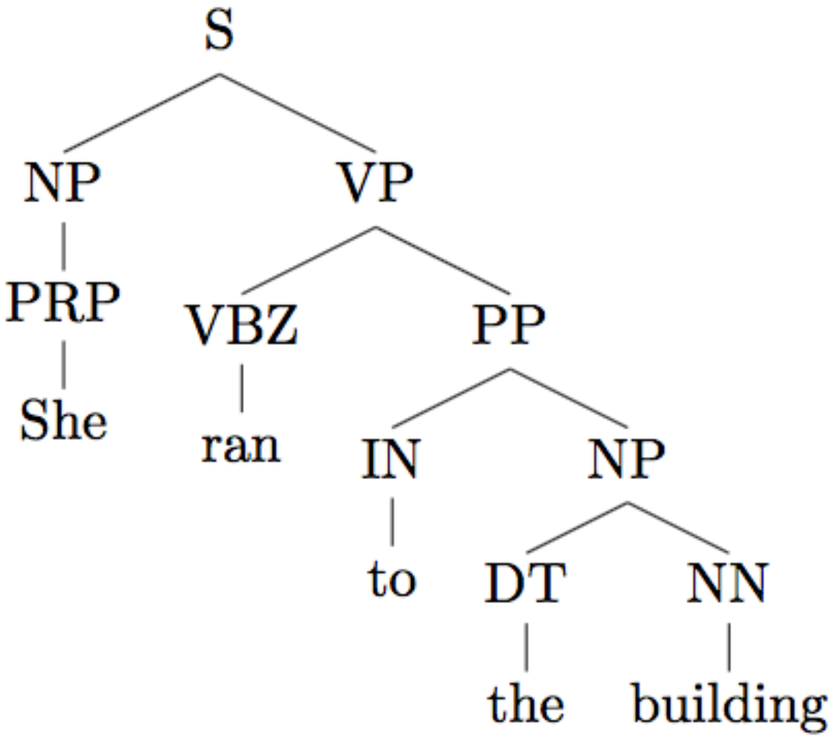
# Constituency Parsing

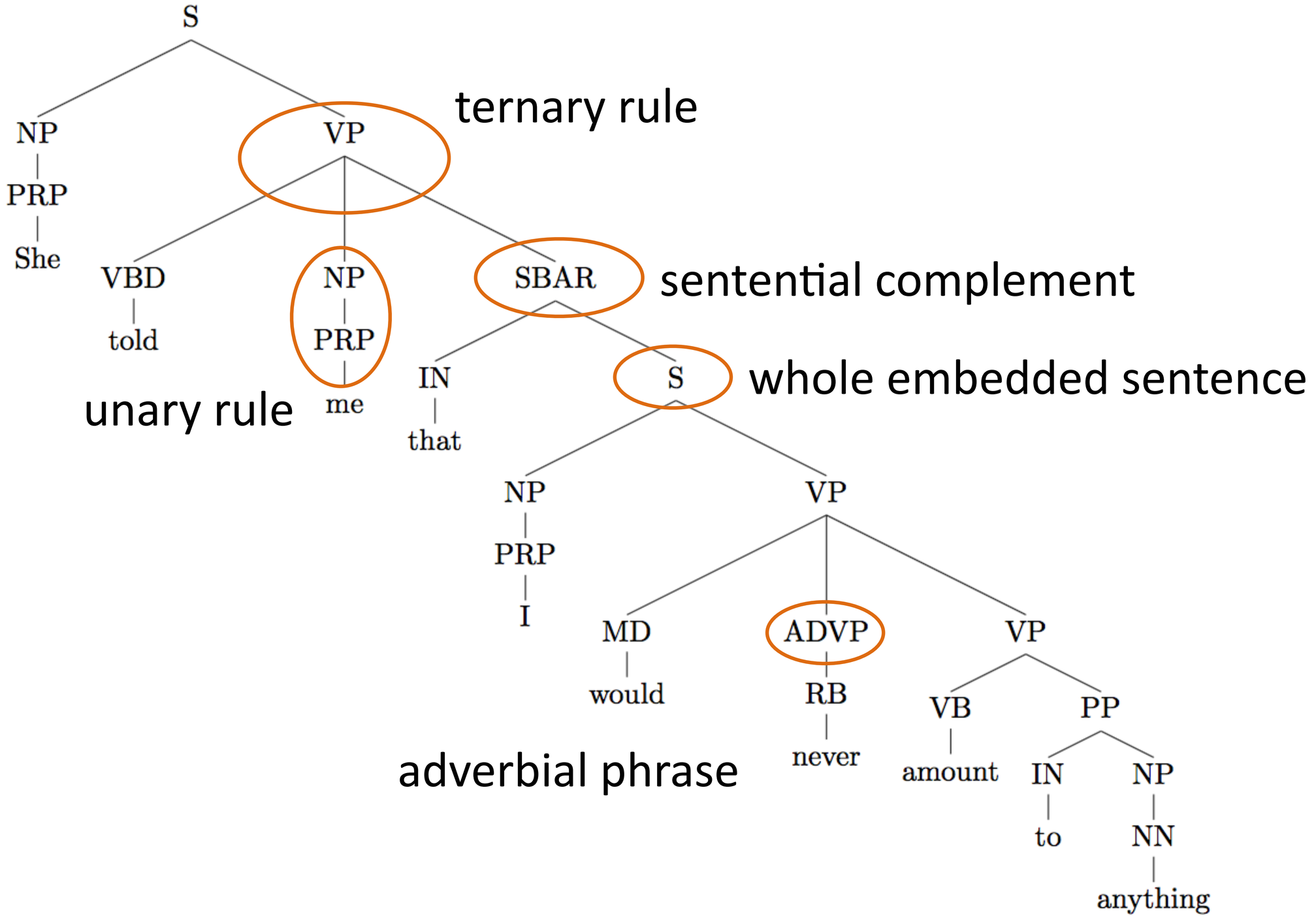
# Syntax

- 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




S
NP
PRP
She
VP
VBD
told
NP
PRP
me
SBAR
IN
that
S
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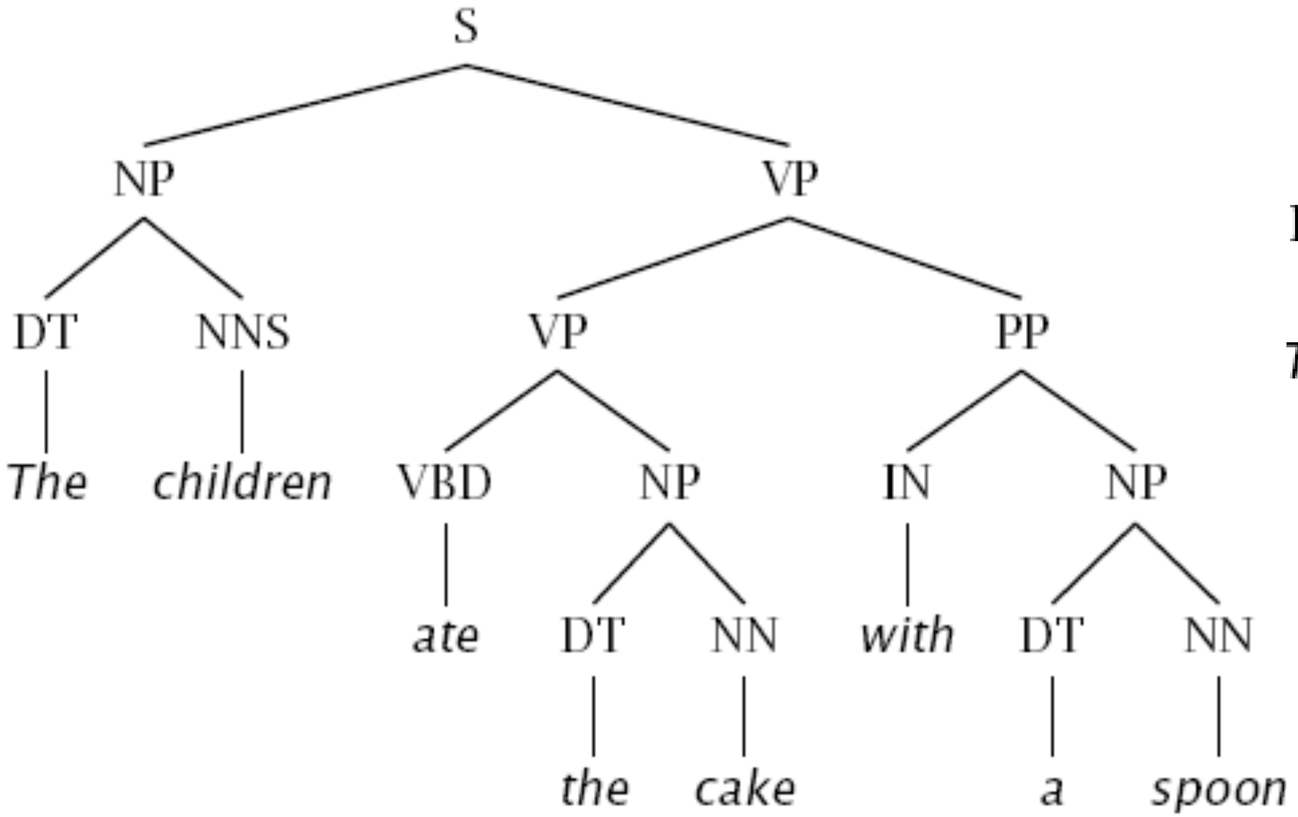
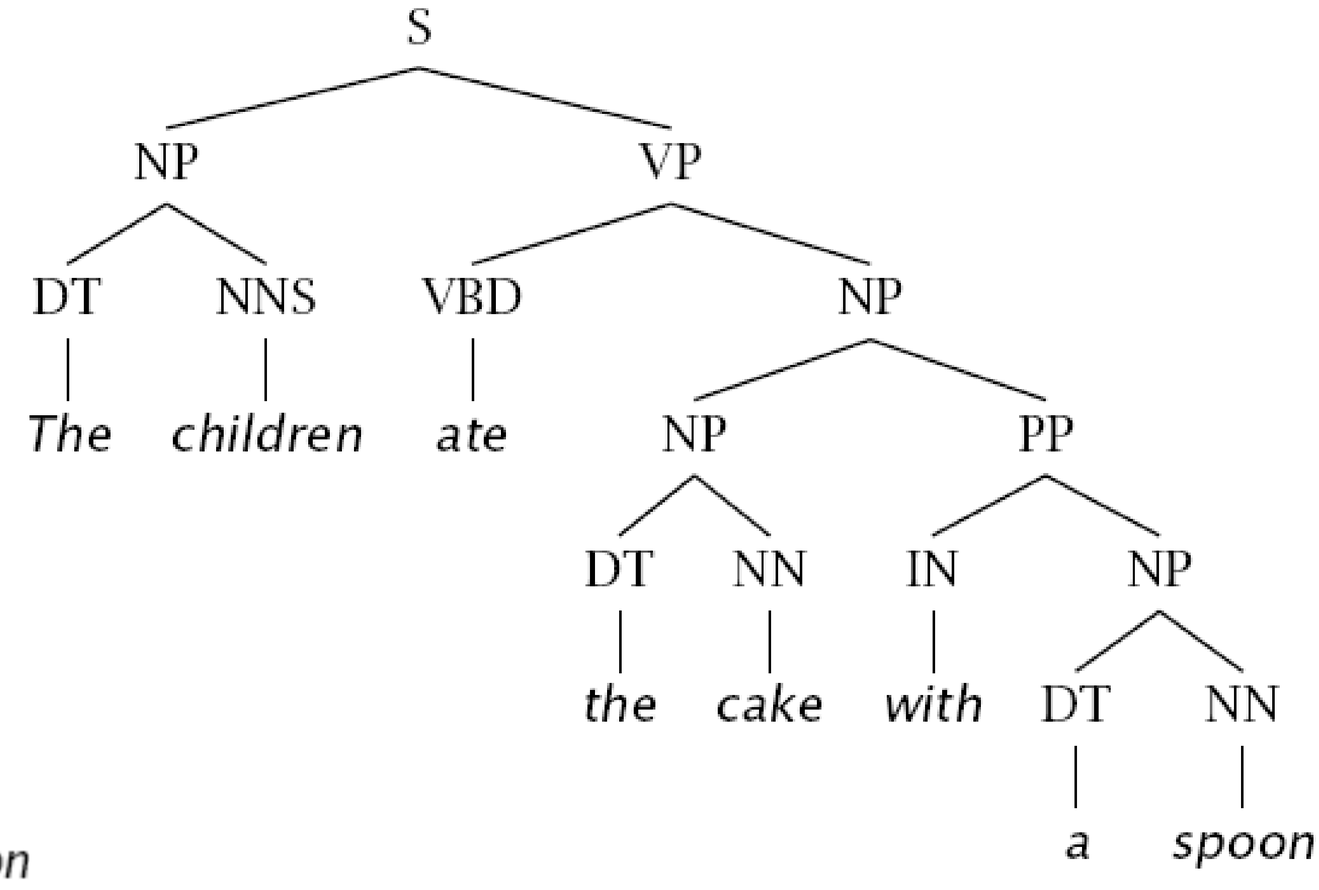
I
VP
MD
would
ADVP
RB
never
VP
VB
amount
PP
IN
to
NP
NN
anything
ternary rule
sentential complement
whole embedded sentence
unary rule
adverbial phrase

a refund that the court estimated *-1

# Challenges

PP attachment

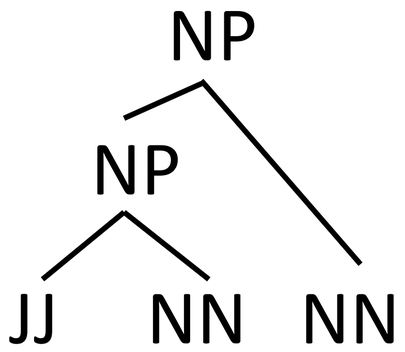


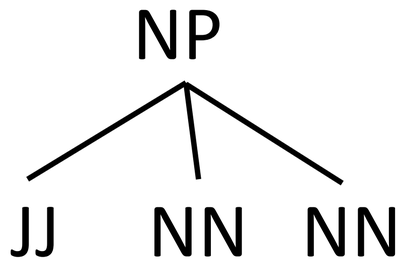

same parse as “the cake with some icing”

# Challenges

Modifier scope:




*plastic cup holder*




*plastic cup holder*

Complement structure:

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

Coordination scope:

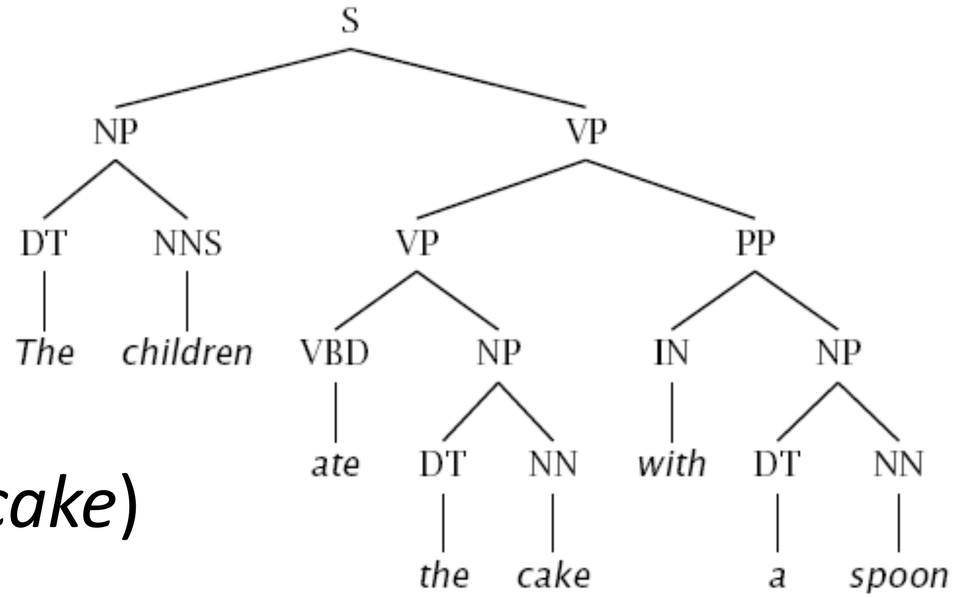
*The man picked up his hammer and saw*

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)
  - 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*