Where am I?

- HUL242: **Fundamentals of Language Sciences**
- **Syntax (Lecture-4)**
- Thursday, March 27

Review: Phrase structure rules in English

1. CP → (c) S or (c)TP
2. TP → {NP/CP} (T) VP
3. NP → (D) (AdjP+) N (PP+)
4. PP → P NP
5. AdjP → (AdvP) Adj
6. AdvP → (AdvP) Adv
7. VP → (AdvP+) V ({NP/CP}) ({NP/CP/PP}) (AdvP+) (PP+) (AdvP+)

Today

- Revise the NP rule
- Revise the PP rule
- Develop a rule for conjoining phrases and sentences
- Get familiar with parts of syntactic trees.
- How to build syntactic trees for sentences

Back to PP: The final rule

- The PP rule so far : PP → P NP

Set -1

1. I threw the garbage out the window.
2. I bought a book from India.
3. I saw a boy with a telescope.

Set-2

1. I threw the garbage out.
2. I blew it up.
3. I haven't seen him before.

- PP stands for prepositional phrases. A PP can have a preposition and optionally a NP. The **final PP rule** is:

PP → P (NP)

Back to NP: The final rule

- Our previous NP rule: NP → (D) (AdjP+) N (PP+)

- Some more data helps sharpen the picture:

[$_{SUB}$ The fact that you're not planning to vote] bothers me immensely.

- What's new? We have a CP inside the subject NP. Thus, our **final NP rule**:

  NP → (D) (AdjP+) N (PP+) (CP)

PS Rules: Conjunction

- Conjunction could be Lexical and phrasal

1. [Bill and Ethan] are reading the book.
2. The [blue and red] station wagon.
3. Bill [went and ate] a burger.
4. I am [drinking lemonade and eating a brownie].
5. [I've lost my wallet, or I've lost my mind].
6. We went [through the woods and over the bridge].

- $X \rightarrow X$ conj X *(to conjoin two words)*
- XP $\rightarrow X$P conj XP (to conjoin two phrases/sentences)

Here, the *X*'s can be instantiated as *any* category whatsoever.

Summing up: Phrase structure rules in English

1. CP → (c) TP
2. TP → {NP/CP} (T) VP
3. NP → (D) (AdjP+) N (PP+) (CP)
4. VP → (AdvP+) V ({NP/CP}) ({NP/CP/PP}) (AdvP+) (PP+) (AdvP+)
5. PP → P (NP)
6. AdjP → (AdvP) Adj
7. AdvP → (AdvP) Adv
8. *X* → *X* conj *X*
9. *X*P → *X*P conj *X*P

Other things into play: Subcategorization

- Our phrase structure rules are so powerful that they **over-generate**. They predict too many things are grammatical.

TP → {NP/CP} (T) VP

NP → (D) (AdjP+) N (PP+) (CP)

VP → (AdvP+) V ({NP/CP}) ({NP/CP/PP}) (AdvP+) (PP+) (AdvP+)

1. **John told*
2. **John ate that Mary left.*

- You cannot say things like (1) and (2). But our phrase structure rules predict both of these as grammatical TP's.

Other things into play: Subcategorization

- Solution: Not all verbs are the same kind.

  (we have seen these before. Remember “argument structure” ?).

- **Subcategorization**: different verbs have different properties.
  - There are V’s that require one argument (as ‘run’),
  - Some Vs require 2 arguments (as ‘read’) and
  - Some Vs require 3 arguments (as ‘tell’),
  - Some V’s combine with CPs (as ‘tell’) and some do not (as ‘eat’), and so on.

Subcategorization

Verbs are of different types:

- Intransitive *Verbs*: Verbs that take only one argument
  - John laughed
- Transitive Verbs: Verbs that take two arguments
  - John read the book.
- Ditransitive Verbs: Verbs that take three arguments
  - John gave Mary a book

Subcategorization

- Some verbs take CPs as an argument, but some do not. Verbs such as ‘hit’ do not take CP argument while verbs such as ‘ask’ do.

1. a. I hit [NP the ball].
   b. * I hit [CP that you knew the answer].

2. a. I asked [NP the question].
   b. I asked [CP if you knew the answer].

- (1b) is ungrammatical, even though the VP rule allows to generate it because ‘hit’ does not subcategorize for CP complement.

Returning to over-generalization

- How do you explain the ungrammaticality of the following sentences?
  1. **John told*
  2. **John ate that Mary left*.

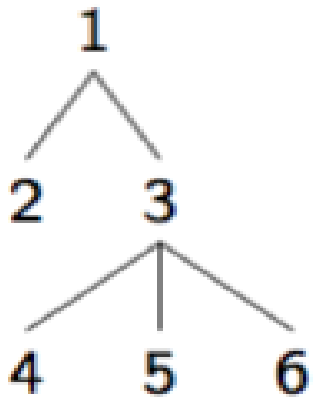
- (1) is ungrammatical because
  - ‘tell’ is a ditransitive verb. It needs three arguments. However, there is only one argument ‘John’ in (1).

- (2) is ungrammatical because
  - ‘eat’ cannot take a CP argument

How to build trees

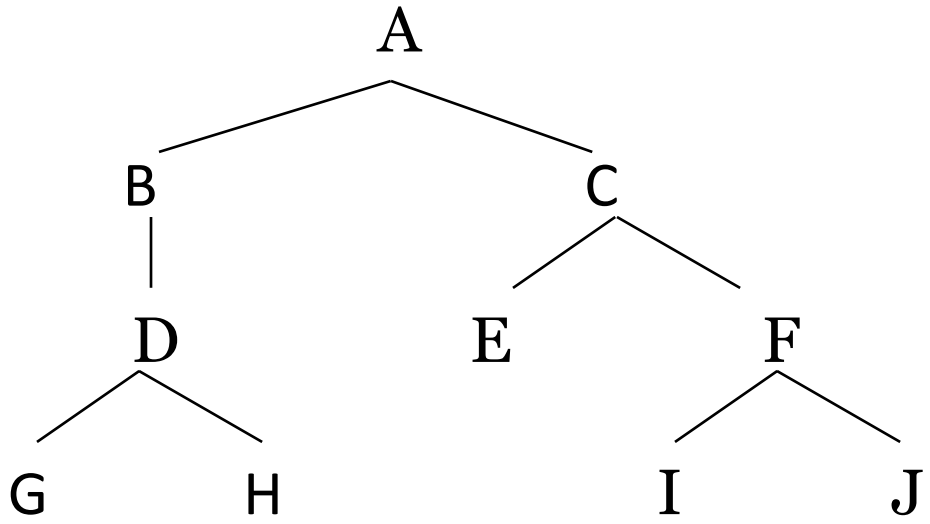
Parts of a tree

- Consider the following tree



- Some terminology that will be useful to know
  - 1,2,3,4,5, and 6 are all **nodes** in the tree
  - 1 and 3 are **branching/non-terminal** node
  - 2,4,5, and 6 are **terminal** node
  - 1, the highest branching node, is the **root** of the tree
  - 2 and 3 are **sisters;** so are 4, 5, and 6
  - 1 is the **mother** node for 2 and 3 and 3 is the **mother** node for 4, 5 and 6

Parts of a tree



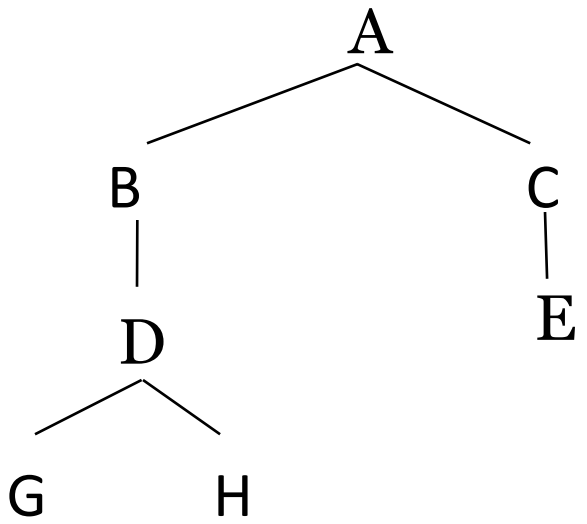
Some Practice:

- What is the **root note**? A
- What are the **nodes**? A-J
- What are the **terminal nodes**? G,H,E,I,J
- What are the **branching/non-terminal nodes**? A,B,D,C,F
- What are the **sisters/siblings**? B,C; G,H; E,F; I,J

Practice: From Phrase structure rules to trees

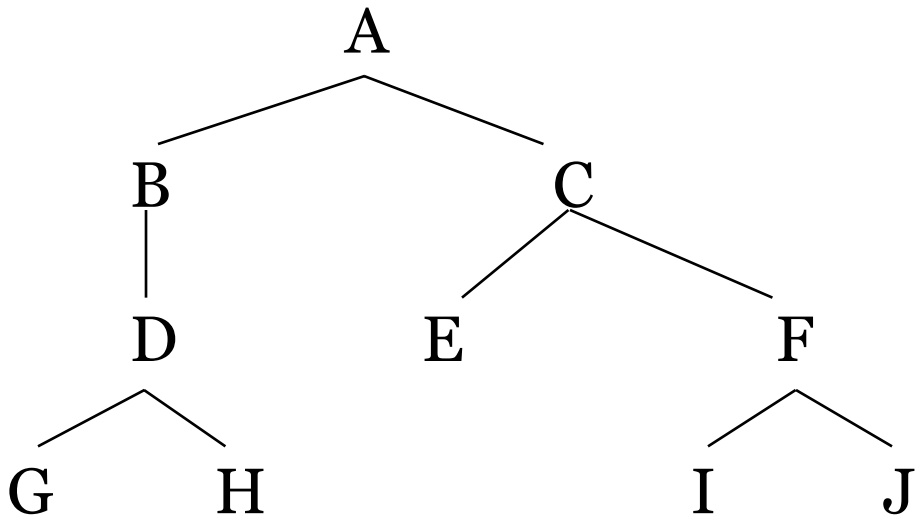
- Can you draw the tree that the following phrase structure rules generate?

A → B C
B → D
D → G H
C → E



Practice: From trees to Phrase structure rules

- Can you write the phrase structure rules that generate the following tree?

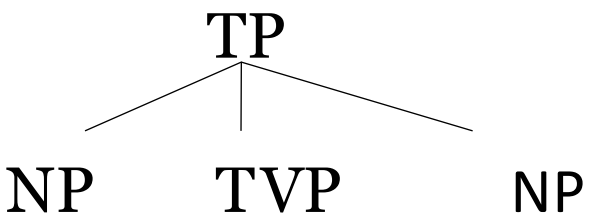


$A \rightarrow B\ C$
$B \rightarrow D$
$D \rightarrow G\ H$
$C \rightarrow E\ F$
$F \rightarrow I\ J$

PS rules and their relationship with Trees

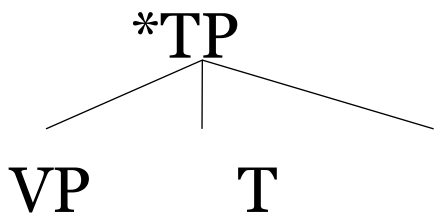
- Elements are ordered inside a phrase.
- Phrase structure rules describe how **trees** can be built.
- For example, based on TP → {NP/CP} (T) VP, we know that the tree in (1) is possible, and the tree in (2) and (3) are impossible:

1.



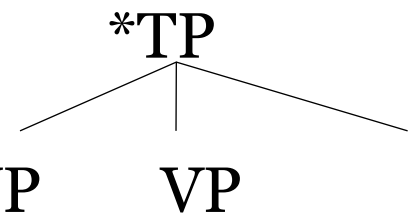
NP

2.



T

3.

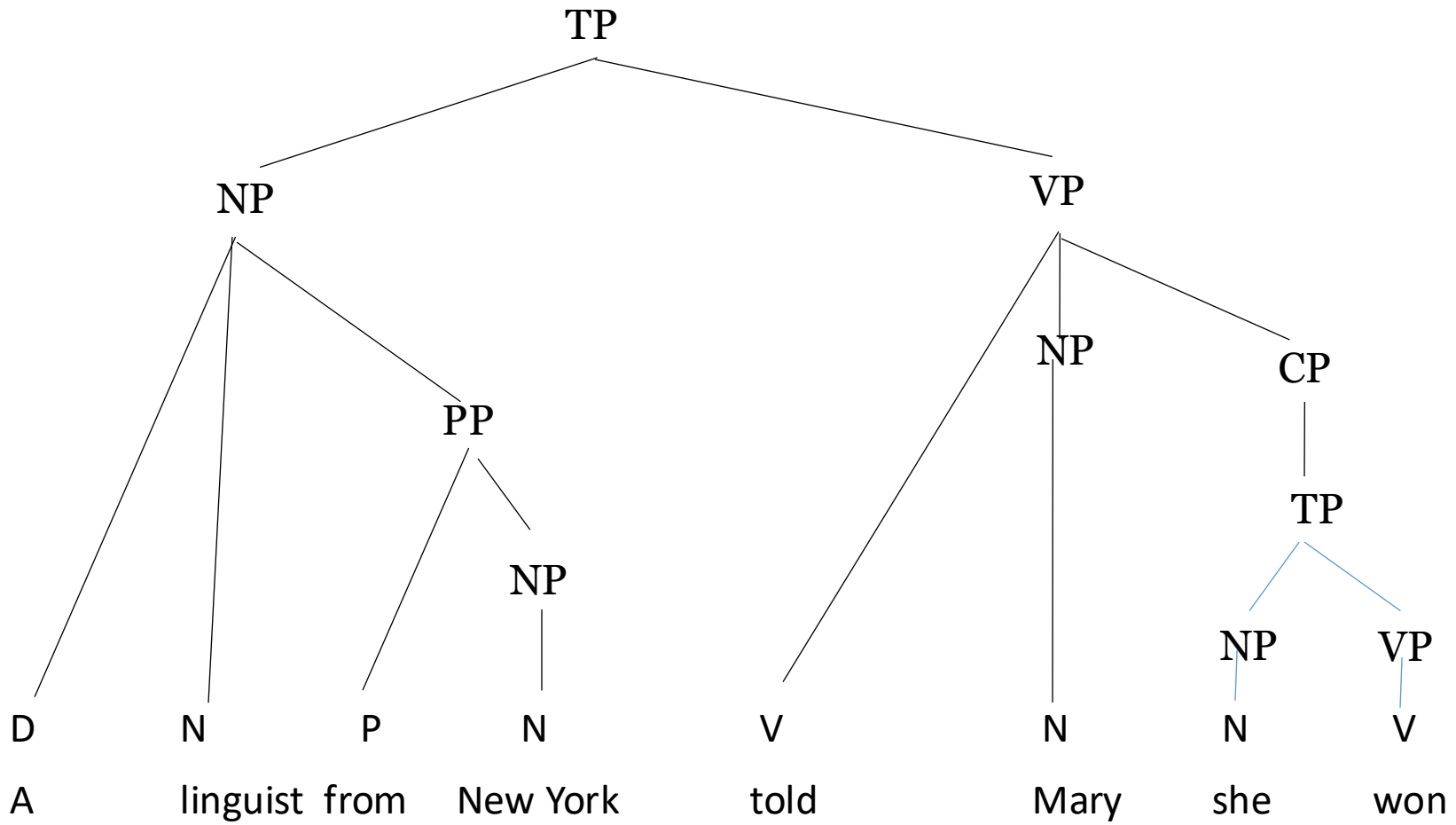


Note: Order matters

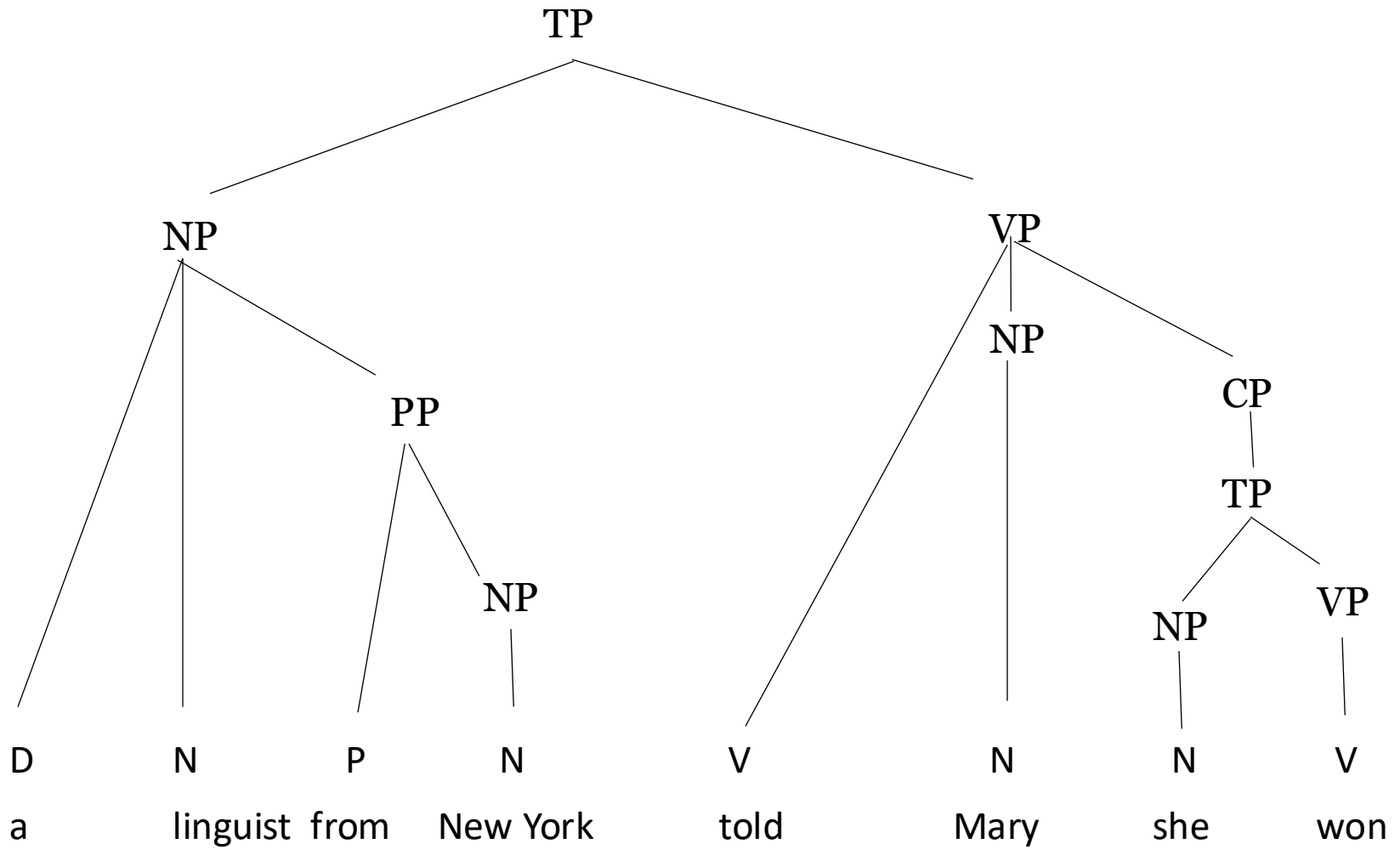
Building tree for sentences

- Draw tree structure for
  - A linguist from New York told Mary she won.
- Begin with lexical categories, then start putting them together, keep doing this in ways consistent with our Phrase structure rules

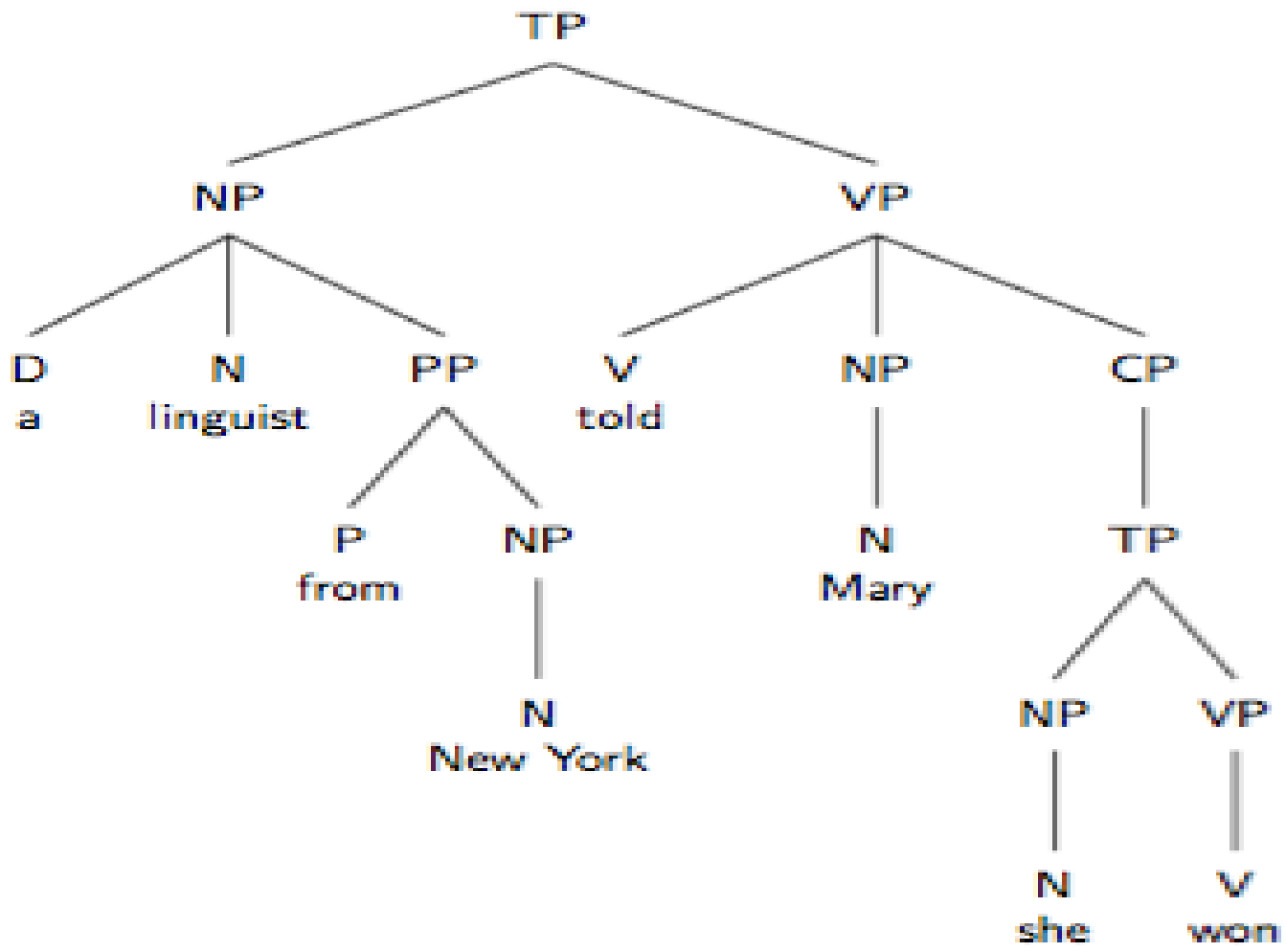
Bottom-up


TP
NP
VP
PP
NP
CP
NP
TP
NP
VP
D
N
P
N
V
N
N
V
A
linguist
from
New York
told
Mary
she
won

Top-down


TP
NP
VP
PP
NP
CP
TP
NP
VP
D
N
P
N
V
N
N
V
a
linguist
from
New York
told
Mary
she
won

Tree Representation



Phrase structure in other languages

Not all languages are like English: NPs

- In English, determiner and adjective appear before the noun they modify

  NP → D AdjP N

- But not all languages are like English. Consider an NP in French

  1. les gars beaux
     the.PL guys handsome.PL
     'The handsome guys'

- Generally, in French, adjectives typically follow the noun they modify.

  *NP → D AdjP N
  NP → D N AdjP

Not all languages are like English: PPs

- In English, a preposition appears before the noun: PP → P NP

- But not all languages are like English. Consider some PPs in Hindi

1. mez par
   table on
   'on the table'

2. dilli me
   Delhi in
   'in Delhi'

- In Hindi, prepositions appear after the noun phrase (called postpositions)

  *PP → P NP

  PP → NP P

-

- Adpositions
  - Before the noun- prepositions,
  - After the nouns - postpositions

Not all languages are like English: objects inside VP

- In English, object NPs follow the verb they are associated with (VP → V NP NP) but not in all languages. Consider a VP in Japanese and Hindi

1. John-ga [VP tegami-o yonda] (Japanese)
   John-SUB letter-OBJ read.PAST
   "John read the letter."

2. John-ne [VP chhithii parhii] (Hindi)
   John_{SUB} $\text{letter}_{\text{OBJ}}$ read.PAST.3S
   "John read the letter."

- The object comes before the verb
  *VP → V NP
  VP → NP V

Languages with free word orders: movement

- Possible word orders in Latin

a) Mīlitēs urbem dēlēbunt.
Soldiers city destroy.FUT.3PL
"The soldiers will destroy the city."

b) Mīlitēs dēlēbunt urbem.
c) Urbem mīlitēs dēlēbunt.
d) Urbem dēlēbunt mīlitēs.
e) Dēlēbunt mīlitēs urbem.
f) Dēlēbunt urbem mīlitēs.

- What is the PS rules for TP and VP in Latin?
  Idea: (a) shows the basic order: TP → NP VP, VP → NP V

- Others are derived by a "transformational rule" (movement).

- Transformational rules/movements do not have to respect PS rules.

Practice with syntactic trees

1. John ran.
2. John ate a mango.
3. The boy surprised John.
4. Mary might come.
5. Bill will read the book.
6. That Mary was coming surprised John.
7. I often bought ice cream at IIT happily.

Next class

- Movement
- Constituency
- Reading: **Carnie, Ch. 3 section-4-5**