Phrase Structure Rules, trees

Constituents

Recursion

Conjunctions

Phrase Structure

1) Every word belongs to a *lexical category*

2) Lexical categories form heads of *phrases*

3) The way phrases are formed is governed by rules: *phrase structure rules*
Phrase Structure Rules

- Rules that determine...
  - what goes into a phrase (constituents)
  - how the constituents are ordered

- **Constituent**: a word or group of words that function as a unit and can make up larger grammatical units
Noun Phrase NP

- John  \( N \)
- the boy  \( \text{Det} \ N \)
- a little boy  \( \text{Det} \ \text{Adj} \ N \)
- a boy in a box  \( \text{Det} \ N \ PP \)

Phrase Structure Rule for NPs:

\[ \text{NP} \rightarrow (\text{Det}) \ (\text{Adj}) \ N \ (\text{PP}) \]

Where ( ) indicate optionality
Phrase Structure Trees

NP
  | N
  | John

NP
  | Det
  | the
  | N
  | boy

NP
  | Det
  | a
  | Adj
  | little
  | N
  | boy

NP
  | Det
  | a
  | N
  | boy
  | P
  | in

NP
  | Det
  | a
  | N
  | box
Prepositional Phrase (PP)

- in  P
- from a boy in a box  P NP

Phrase Structure Rule for PPs

PP ➔ P (NP)
in from a boy in a box
✓ Some phrasal categories may appear to the left or right of the arrow

NP  (Det) N  (PP)

PP  P  (NP)

✓ **Recursion**: the property of language that allows for the embedding of categories (which can yield infinitely long phrases)
The cat on the mat in the house on the street
VERB PHRASE (VP)

- sang V
- ate the cake V NP
- ate the cake hungrily V NP Adv
- sang a song in the shower V NP PP
- fell into the pond slowly V PP Adv

Phrase structure rule for VPs:

VP → V (NP) (PP) (Adv)
sang the cake a song badly in the shower
A sentence must contain an NP and a VP e.g.

S

NP

Det

the

N

dog

VP

aux

was

V

barking

Adv

loudly
A sentence must contain an NP and a VP e.g.

The dog was barking loudly.