

Categorial Grammar

- Basic Categorial Grammar:
 - core “5” rules
- Semantics in Categorial Grammar
- Categorial Unification Grammar
 - and how it can be used in other formalisms

Categorial Grammar

- Simplify the rules
- Move complexity from rules to lexical entries
- More tightly coupled with semantics:
 - particularly lambda calculus
- One to one relationship from
 - syntactic and semantic constituents

5 rules

- application:
 - Forward: $A/B + B = A$
 - Backward: $B + A \setminus B = A$
- composition:
 - $A/B + B/C = A/C$
- coordination:
 - $A \text{ CONJ } A' = A''$
- type raising:
 - $A = X/(X \setminus A)$

a, the np/n
old n/n
in (np\np)/np
man, ball, park n
kicked (s\np)/np

the old man kicked a ball in the park
np/n n/n n (s\np)/np np/n n (np\np)/np np/n n

n

np

np

np

np\np

np

s\np

s

Coordination

- Constituent Coordination – John and Mary like books
 - (NP and NP) VP
 - John likes fishing and dislikes baseball.
 - NP (VP and VP)
- Non-constituent coordination
 - John likes and Mary dislikes sport.
 - ????

Type raising

$X \Rightarrow Y / (Y \backslash X)$

John likes and Mary dislikes Bob
np (s\np)/np conj np (s\np)/np np

----T

----T

s/(s\np)

s/(s\np)

-----FC

-----FC

s/np

s/np

CONJ

s/np

s

Type Raising

- Computationally unbounded:
 - could happen for any category
 - Makes parsing intractable

- Controlled type raising – needs to be guarded
 - only (some) lexical items