

Topics in Computational Linguistics — Grammar Engineering —

Dan Flickinger

CSLI Stanford & Saarland University

`danf@csli.stanford.edu`

Stephan Oepen

Universitetet i Oslo & CSLI Stanford

`oe@csli.stanford.edu`

<http://lingo.stanford.edu/courses/05/ge/>

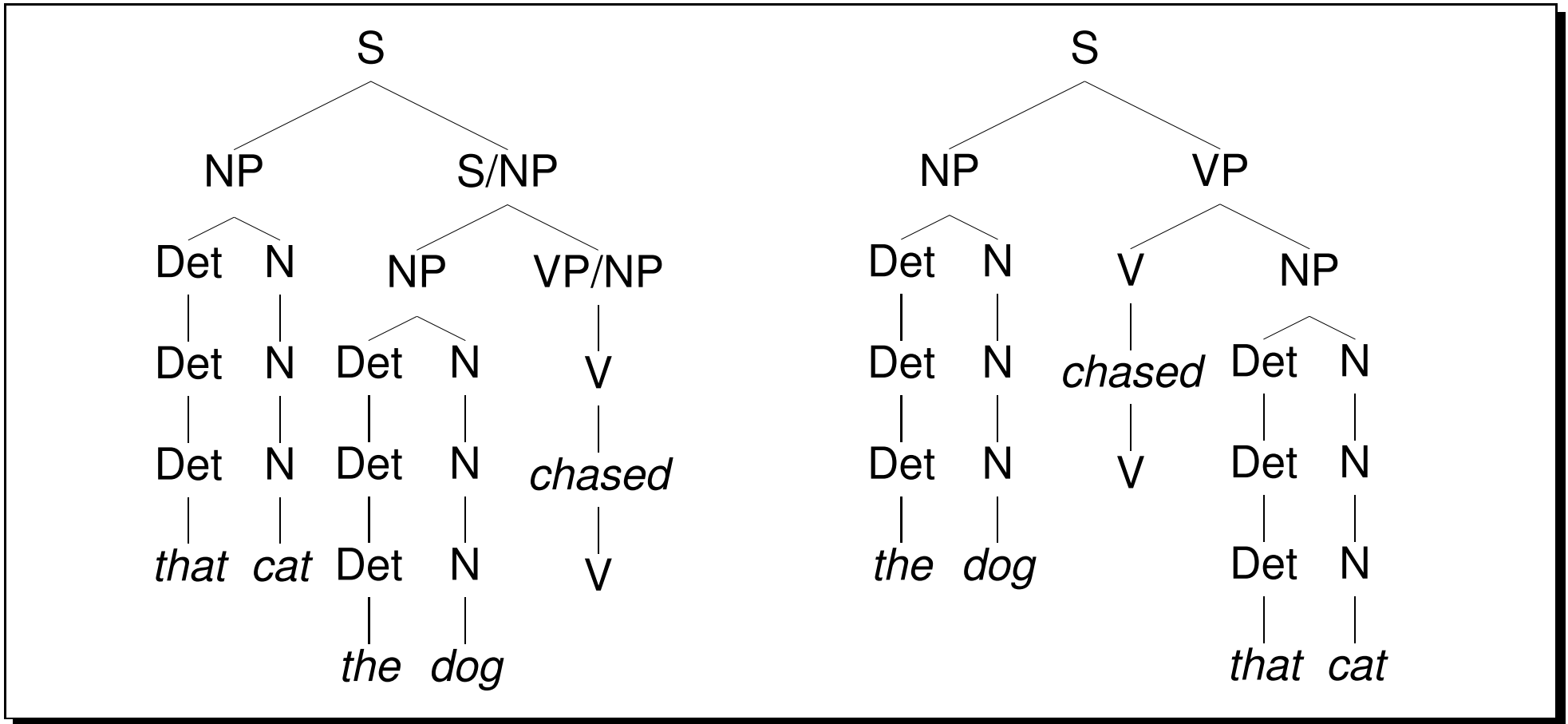
Non-Local (aka Unbounded) Dependencies

- (1) *That cat, the dog chased* _.
- (2) *That cat, the aardvark believes the dog chased* _.
- (3) *That cat, I know the aardvark believes the dog chased* _.
- (4) *On that aardvark, you can rely* _.
- (5) *That aardvark, you can rely on* _.
- (6) **On that aardvark, you can rely on* _.

- Account for relation between *gap* and *filler* by unification of *sign*;
- use GAP feature to percolate *sign* through derivation tree;
- gap introduction: put *sign* of dislocated element into GAP list;
- gap percolation: most phrases accumulate GAP values of daughters;
- gap termination: realize and discharge non-empty GAP value.



Topicalization—Comparison of Tree Topologies



Gap Introduction (Simplified Version)

| | |
|-------|-----|
| HEAD | 1 |
| SPR | 2 |
| COMPS | <> |
| GAP | <3> |

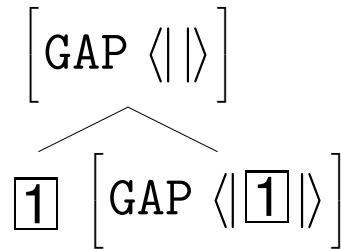
| | |
|-------|--------------|
| HEAD | 1 |
| SPR | 2 |
| COMPS | <3 sign []> |
| GAP | < > |

Engineering Issues to Consider

- Where should gap introduction take place?
- lexical rules: one per complement position;
- syntactic rule: interleaved with regular applications of head – complement schema;
- moderate extraction out of modifiers:
(7) ? *That cat, the dog barked near.*
- how to deal with adjunct extraction:
(8) *Near the cat, the dog barked.*
- various constraints on subject extraction:
(9) *Who do you think barked?*



Gap Termination—The Filler–Head Construction



Engineering Issues to Consider

- Terminate gap percolation path at top;
- unification ensures constraint satisfaction from gap introduction to gap termination;
- order appropriately with specifier saturation:
(10) **The dog, that cat, chased.*
- prevent ‘leakage’ of gaps:
(11) **To, the dog gave the cat.*
- make sure gaps are saturated eventually:
(12) **the dog gave the cat.*

