

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/>

Semantics of words and phrases

- **Logical form**
- Most semantic content is supplied by the lexicon
one relation per lexeme
- Most syntactic rules simply append the REFS of their daughters
- Some rules supply additional content

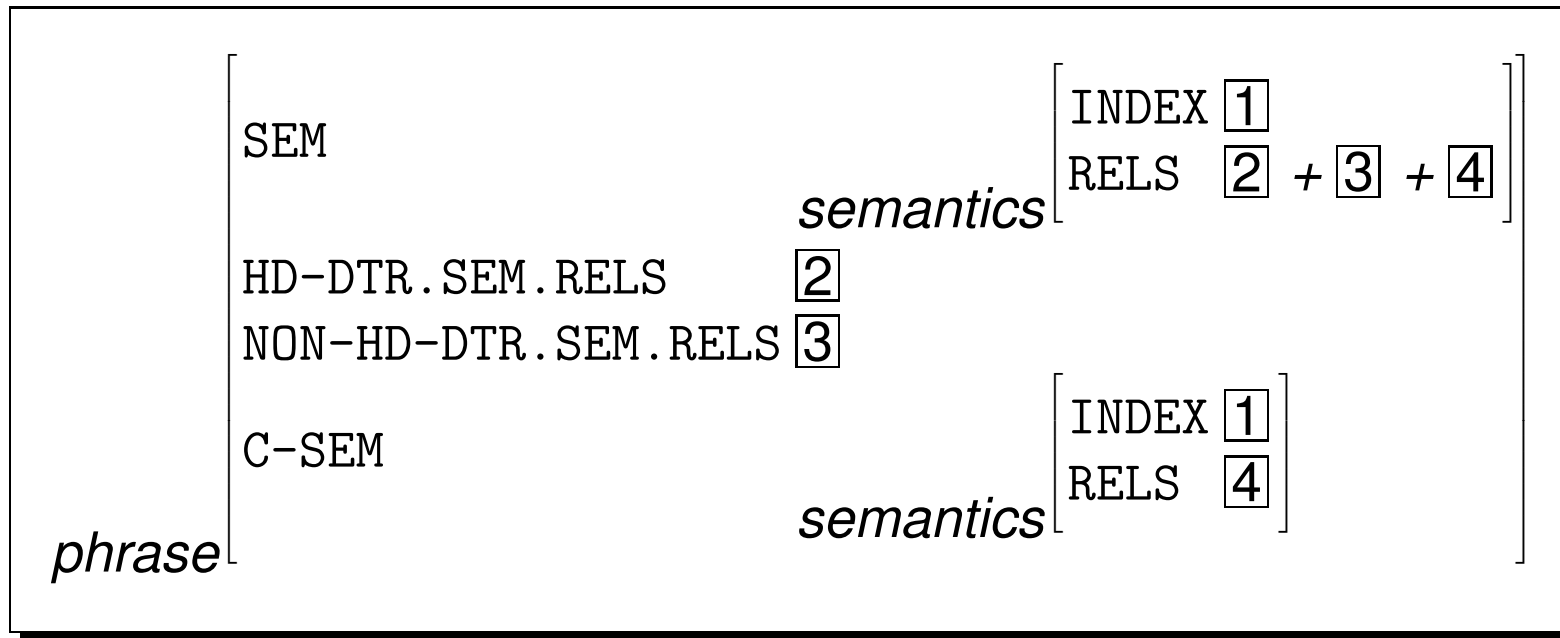


Construction-specific semantics

- Motivation: Some part of the semantics of a phrase cannot be drawn from any of its daughters
- Approach: Allow the rule admitting that phrase to introduce directly one or more semantic relations
- Mechanism: Introduce an additional attribute on *phrase* called C-SEM (construction or rule semantics)

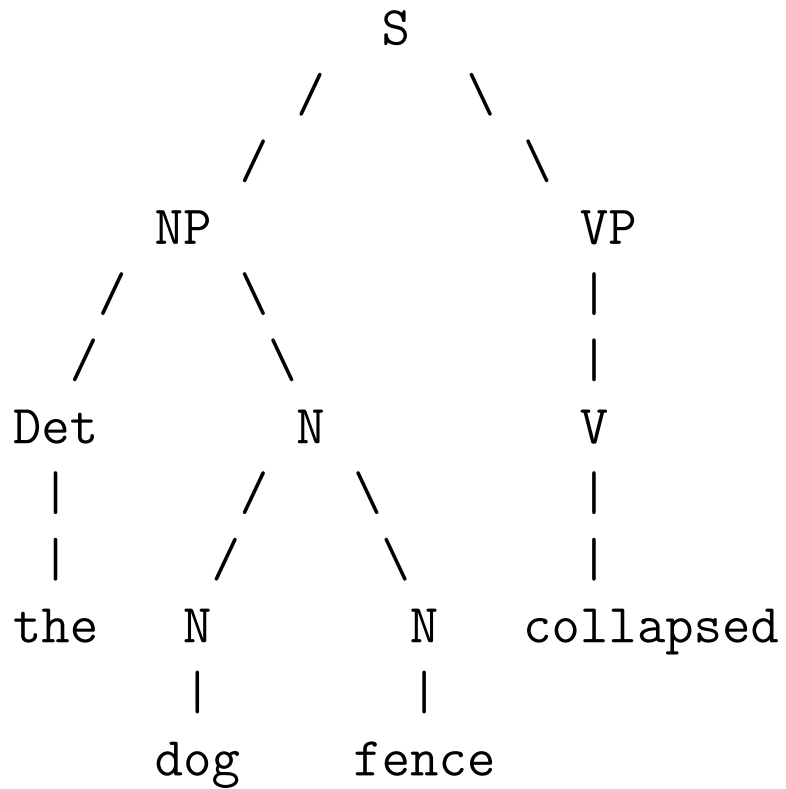


The C-SEM attribute on phrases



Example 1: Noun-noun compounds

The dog fence collapsed

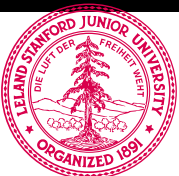


MRS for noun-noun compounds

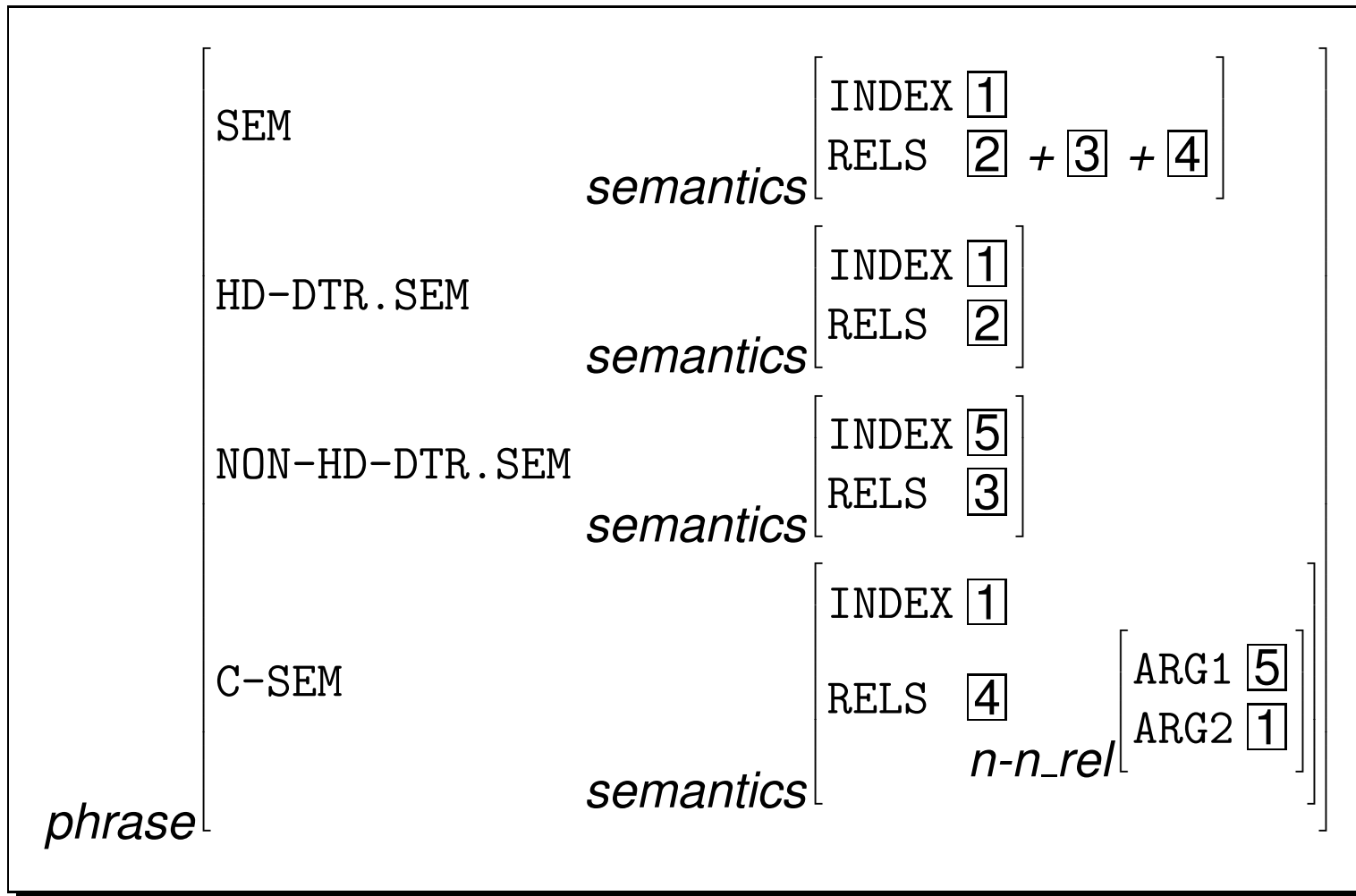
The dog fence collapsed

(collapse(e1, (n-n-compnd(dog(x), fence(y))))))

```
[ INDEX 0
  RELS <! [ PRED ‘‘the_q_rel’’
            ARG0 2 ]
          [ PRED ‘‘dog_n_rel’’
            ARG0 1 ]
          [ PRED ‘‘fence_n_rel’’
            ARG0 2 ]
          [ PRED ‘‘n-n-compnd_rel’’
            ARG1 1
            ARG2 2 ]
          [ PRED ‘‘collapse_v_rel’’
            ARG0 0
            ARG1 2 ] !> ]
```

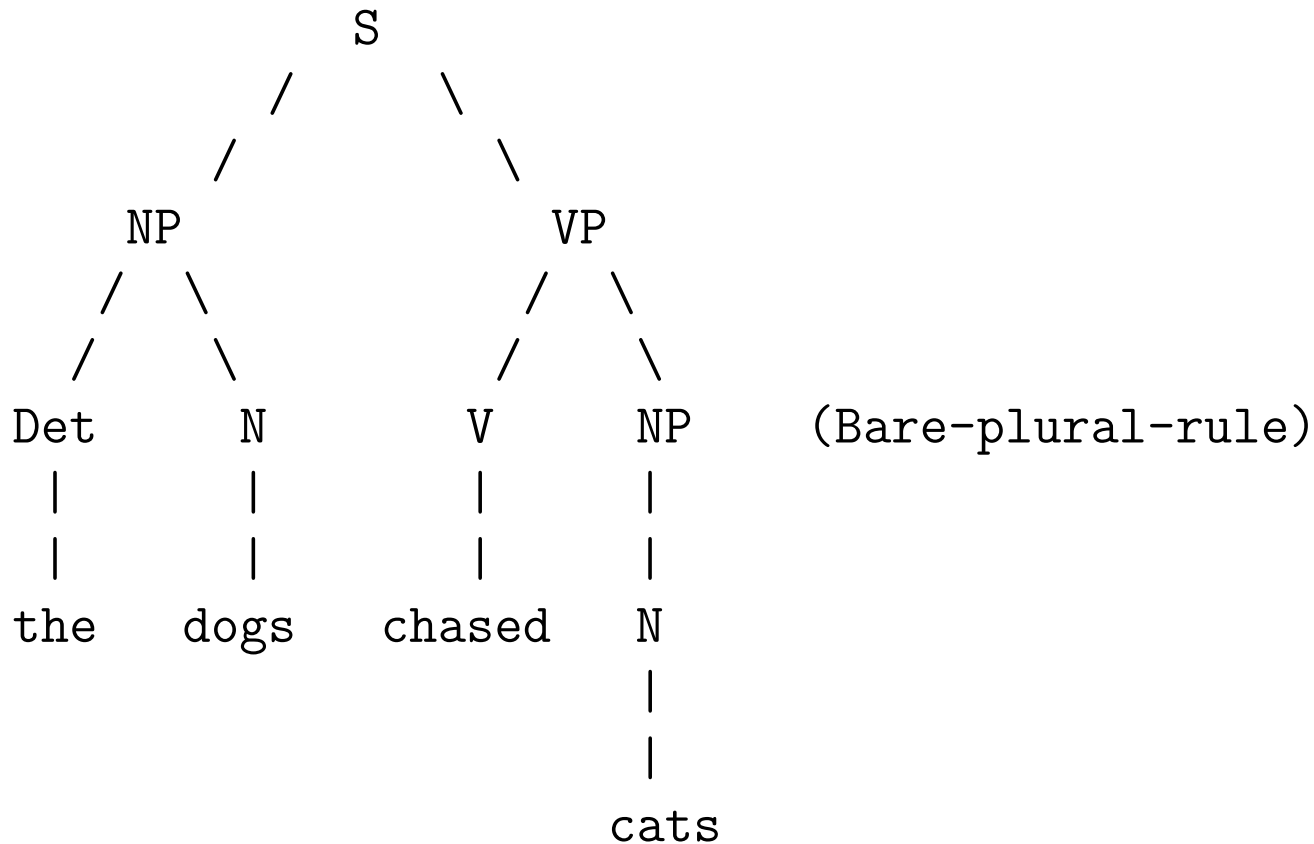


Example 1: Noun-noun compounds



Example 2: Bare plural noun phrases

The dogs chased cats



MRS for bare plurals

The dogs chased cats

(chased((the(x) dog(x)), ((generic_q(y) cat(y))))))

[INDEX 0

RELS <! [PRED ‘‘the_q_rel’’

ARG0 1]

[PRED ‘‘dog_n_rel’’

ARG0 1]

[PRED ‘‘chase_v_rel’’

ARG0 0

ARG1 1

ARG2 2]

[PRED ‘‘generic_q_rel’’

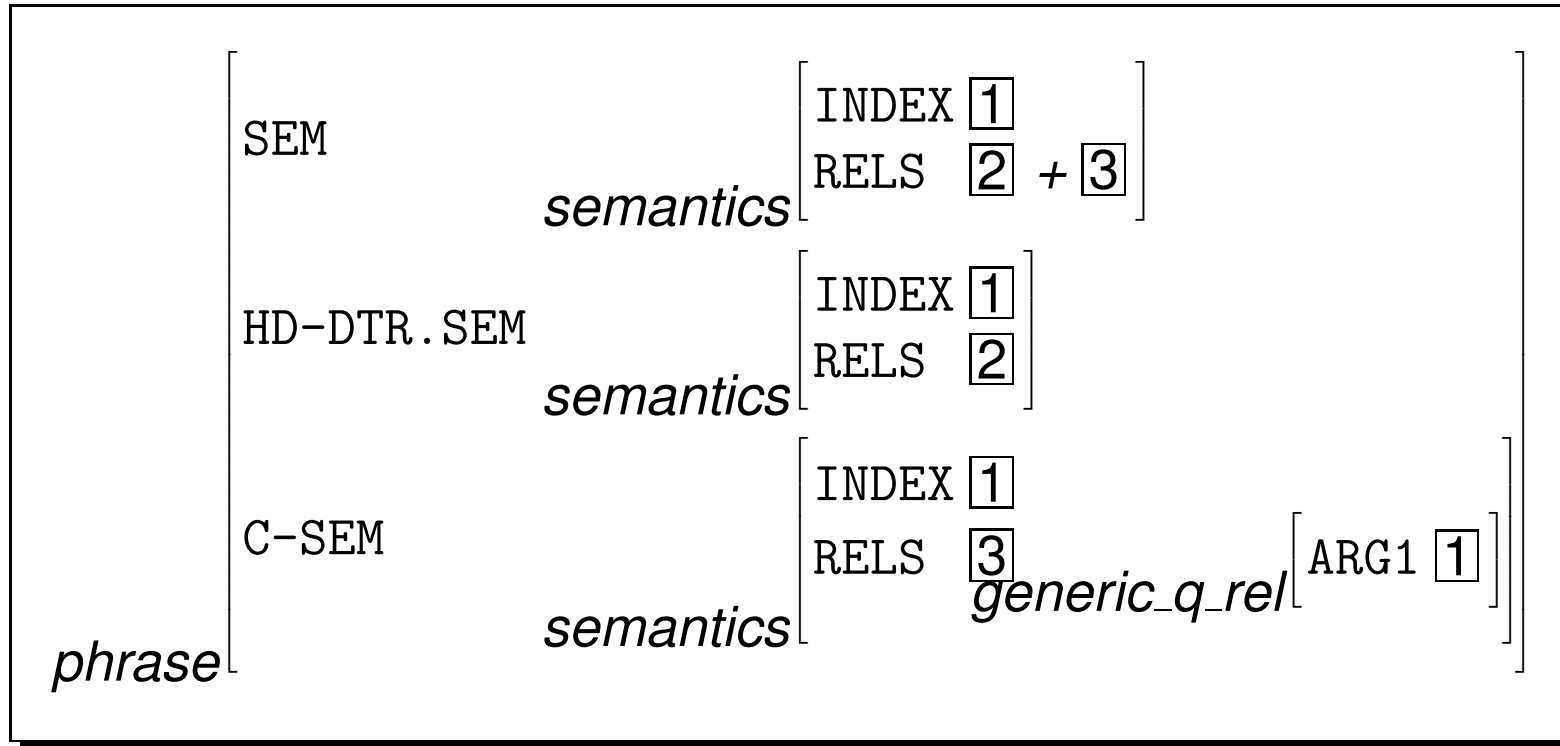
ARG0 2]

[PRED ‘‘cat_n_rel’’

ARG0 2] !>]



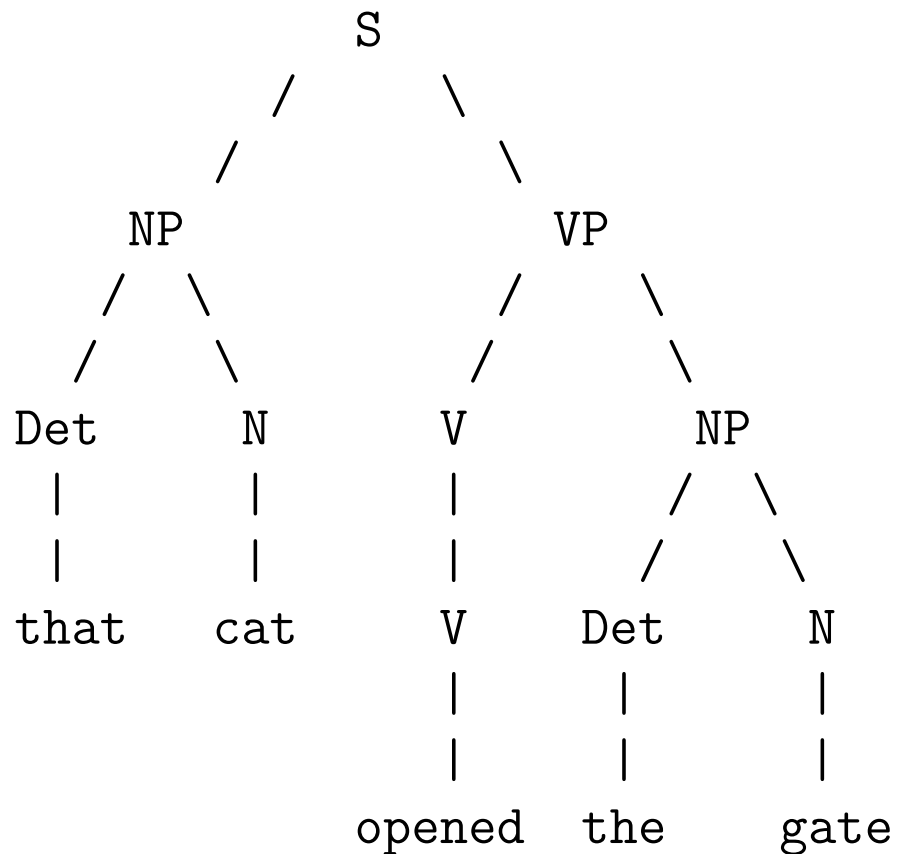
Bare plural rule



Example 3: Lexical rule for causative verbs

The gate opened.

That cat opened the gate.



MRS for derived causatives

That cat opened the gate
(*cause(e1, cat(x), (open(e2, gate(y))))*)

```
[ INDEX 0
  RELS <! [ PRED ‘‘that_q_rel’’      [ PRED ‘‘cat_n_rel’’
            ARG0 1 ],                ARG0 1 ],
            [ PRED ‘‘cause_v_rel’’   [ PRED ‘‘open_v_rel’’
            ARG0 0                    ARG0 2
            ARG1 1                    ARG1 3 ],
            ARG2 2 ],
            [ PRED ‘‘the_q_rel’’     [ PRED ‘‘gate_n_rel’’
            ARG0 3 ],                ARG0 3 ]                !> ]
```

