Ling 566
Mar 1, 2006

Catch-up/review

Overview

- Big picture

- Untangle this...

- By request: *put*, *wh*-questions

Big picture: Our model

- Describes a set of strings

- Associates semantic representations (and trees) with well-formed strings

- Is stated in terms of declarative constraints

- ... which are order-independent

- Locates most constraints 'in the lexicon'

- Is stated in a precise fashion

Parts of our model

- Type hierarchy (lexical types, other types)

- Phrase structure rules

- Lexical rules

- Lexical entries

- Grammatical principles

- Initial symbol

Pause for reflection

- What have you learned about the nature of human language?

- What have you learned about how linguists think about language?

- How does this model/type of model differ from CFG?

- In what applications might CFG be sufficient?

- What applications might benefit from something linguistically more motivated?

Complicated example #1

- What phenomena are illustrated by this sentence?

- What rules or interesting lexical types are involved in our analysis of it?

- What tree structure does our grammar assign?

It was explained to me that Kim left.

```
                          S
                 _____/ _____
               NP                   VP
               |            _____/ _____
               It         V                    VP
               |          |        _____/ _____
               was    explained  V            PP                      CP
                              explained    __/ \__            _____/ _____
                                          P      NP          C              S
                                          |      |           |         ___/ \___
                                          to     me         that      NP       VP
                                                                      |        |
                                                                     Kim      left
```

S
- NP
  - It
- VP
  - V: was
  - VP
    - V: explained
    - PP
      - P: to
      - NP: me
    - CP
      - C: that
      - S
        - NP: Kim
        - VP: left
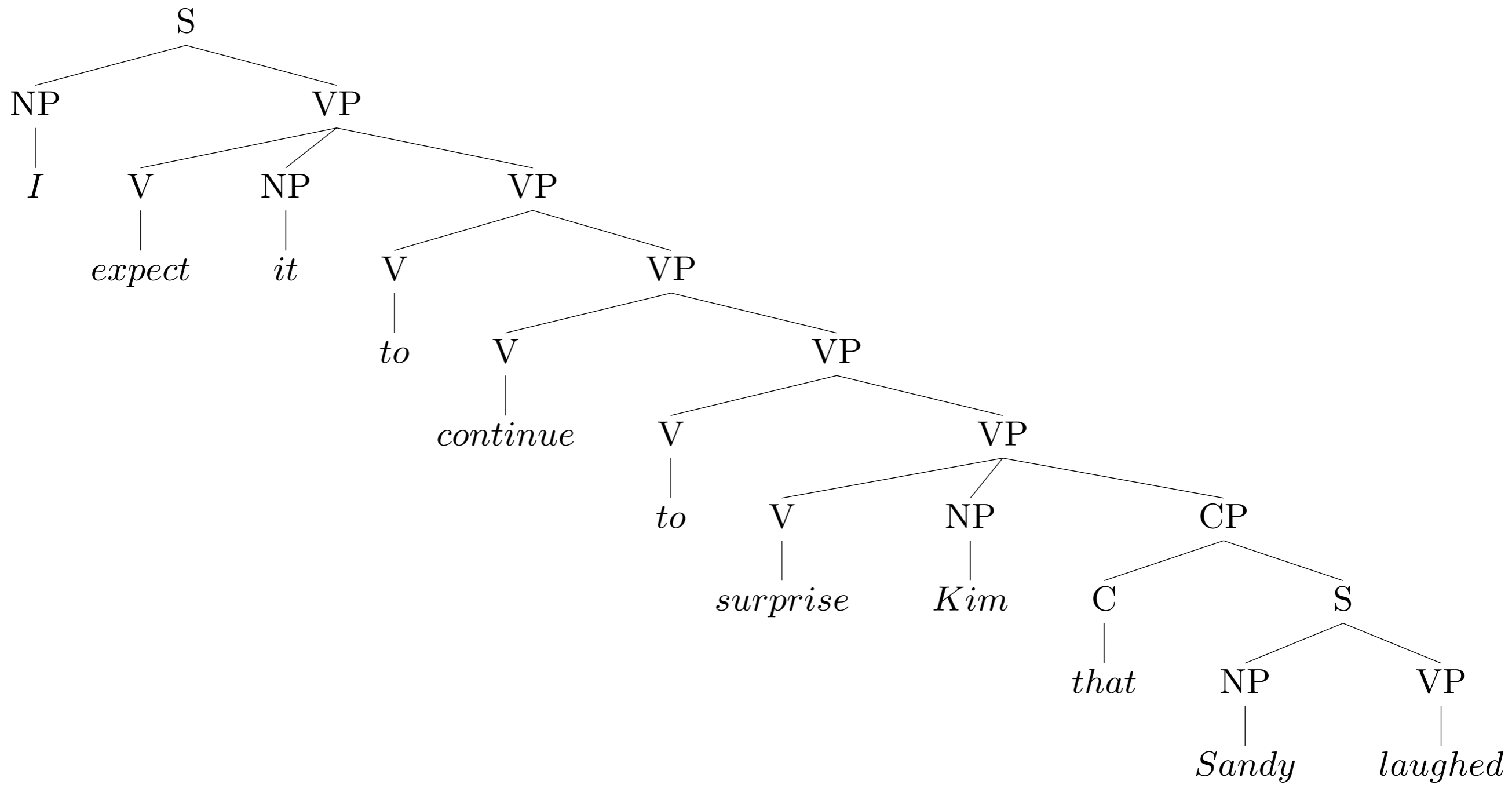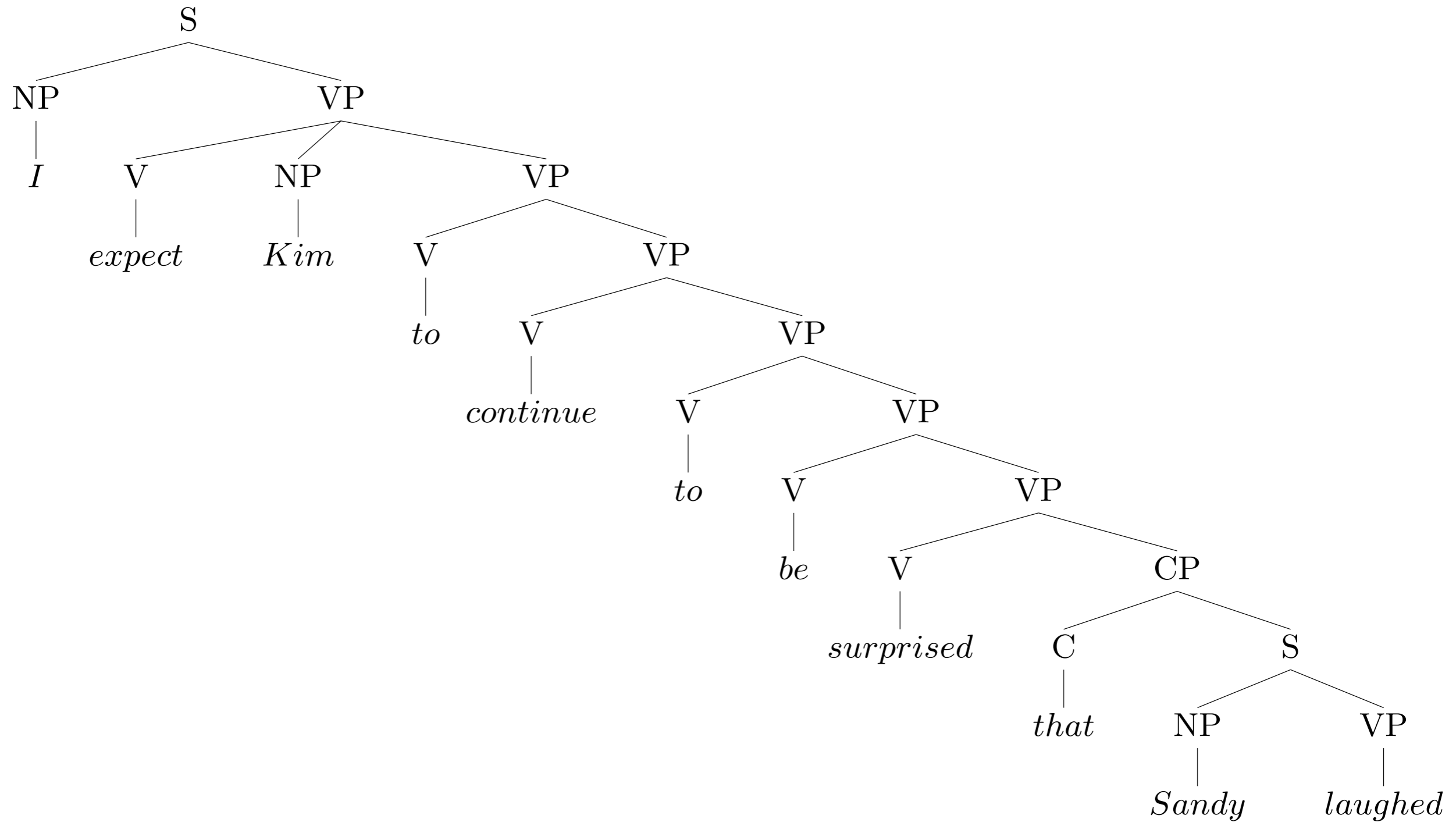
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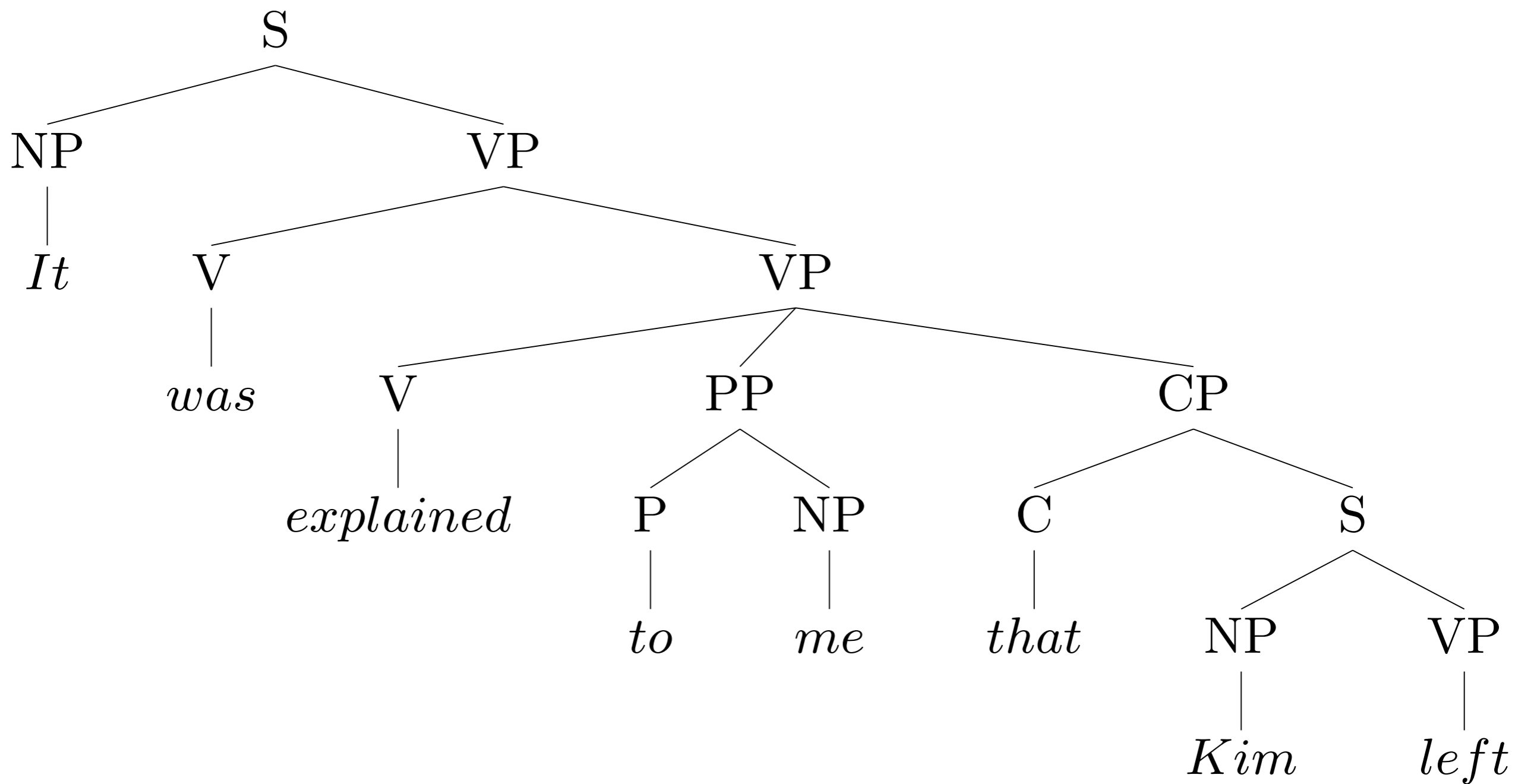
Complicated examples #2&3

I expect it to continue to surprise Kim that Sandy laughed.

I expect Kim to continue to be surprised that Sandy laughed.

```
                          S
           ┌──────────────┴──────────────┐
          NP                             VP
           │              ┌───────────────┼────────────────┐
           I              V              NP                VP
                          │               │        ┌────────┴────────┐
                       expect            it         V                VP
                                                    │         ┌───────┴────────┐
                                                    to        V                VP
                                                              │         ┌───────┴────────┐
                                                          continue      V                VP
                                                                        │      ┌──────────┼──────────────┐
                                                                        to     V         NP             CP
                                                                               │          │       ┌──────┴──────┐
                                                                           surprise       Kim      C            S
                                                                                          │        │       ┌─────┴─────┐
                                                                                        that      NP          VP
                                                                                                   │           │
                                                                                                 Sandy       laughed
```

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```
                              S
                 ┌────────────┴────────────┐
                NP                         VP
                 │          ┌──────────────┼──────────────┐
                 I          V             NP              VP
                 │          │              │      ┌────────┴────────┐
              expect       Kim             V                VP
                          expect                 to    ┌────┴────┐
                                                        V         VP
                                                        │    ┌────┴────┐
                                                   continue   V         VP
                                                              │    ┌────┴────┐
                                                              to   V         VP
                                                                   │    ┌────┴────┐
                                                                   be   V         VP
                                                                        │    ┌────┴────┐
                                                                  surprised  C        CP
```

S
├── NP
│   └── I
└── VP
    ├── V → *expect*
    ├── NP → *Kim*
    └── VP
        ├── V → *to*
        └── VP
            ├── V → *continue*
            └── VP
                ├── V → *to*
                └── VP
                    ├── V → *be*
                    └── VP
                        ├── V → *surprised*
                        └── CP
                            ├── C → *that*
                            └── S
                                ├── NP → *Sandy*
                                └── VP → *laughed*

Why not these?

*I expect it to continue to surprise Kim Sandy laughed.

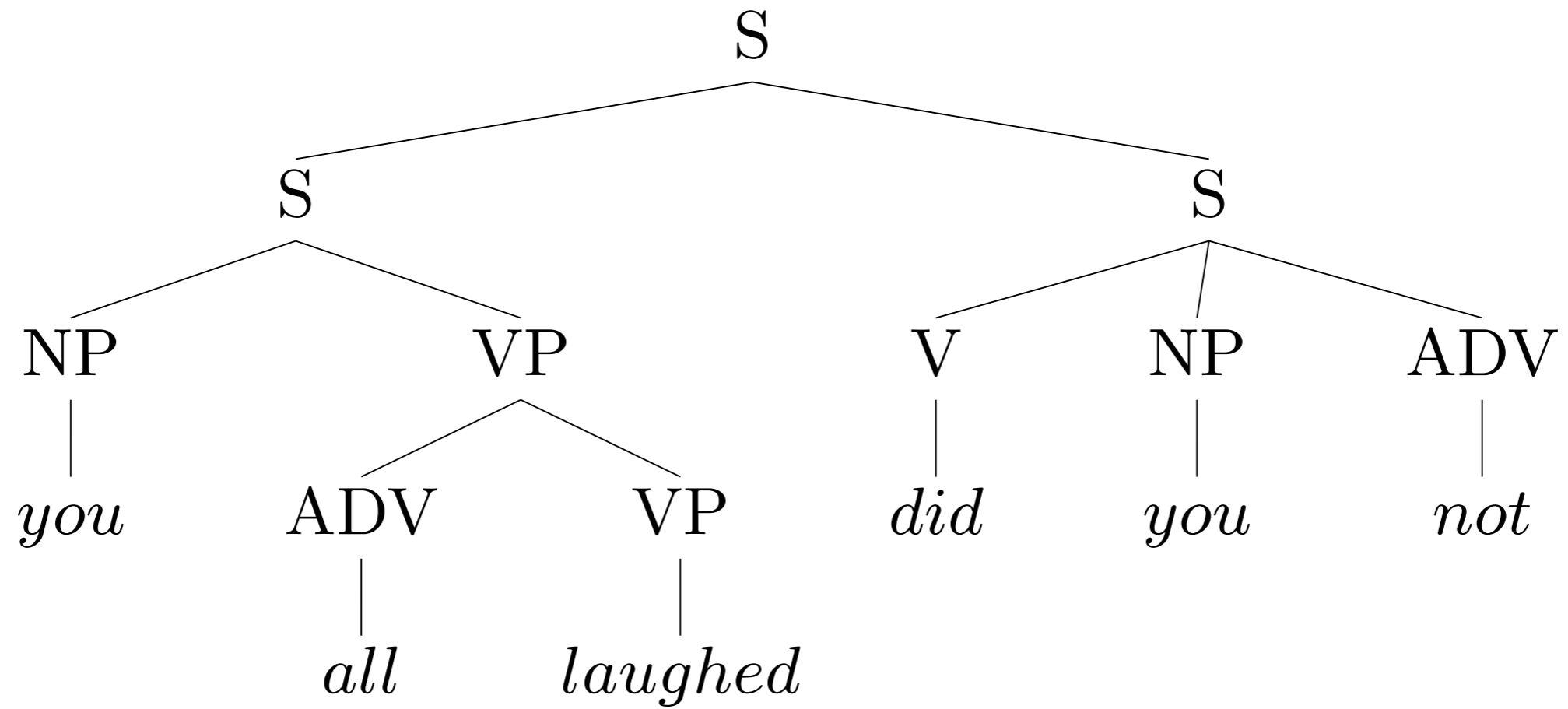*I expect there to continue to surprise Kim that Sandy laughed.
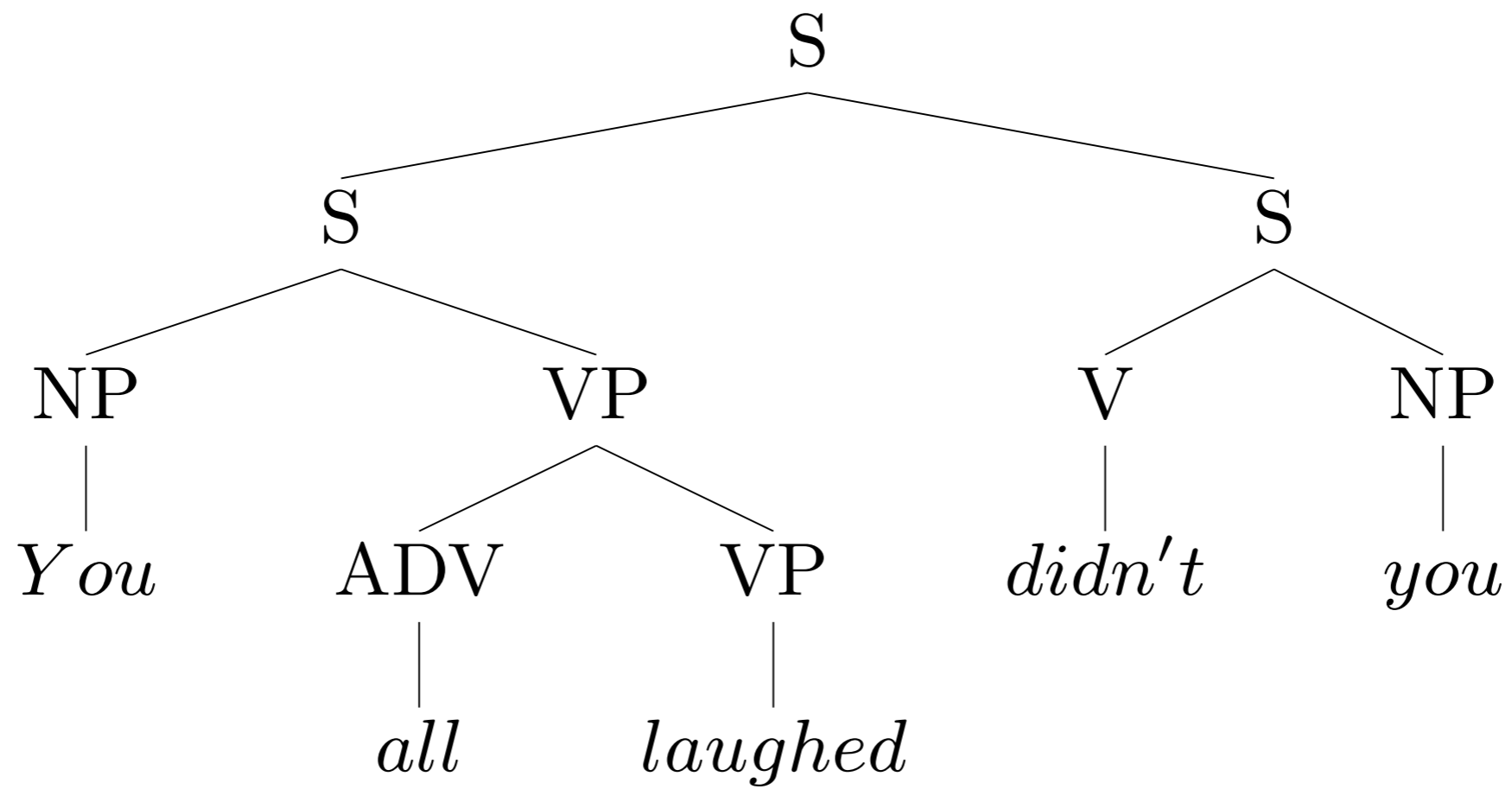
*I expect that Sandy laughed to Kim be surprised.

Complicated example #4

You all laughed, did you not?

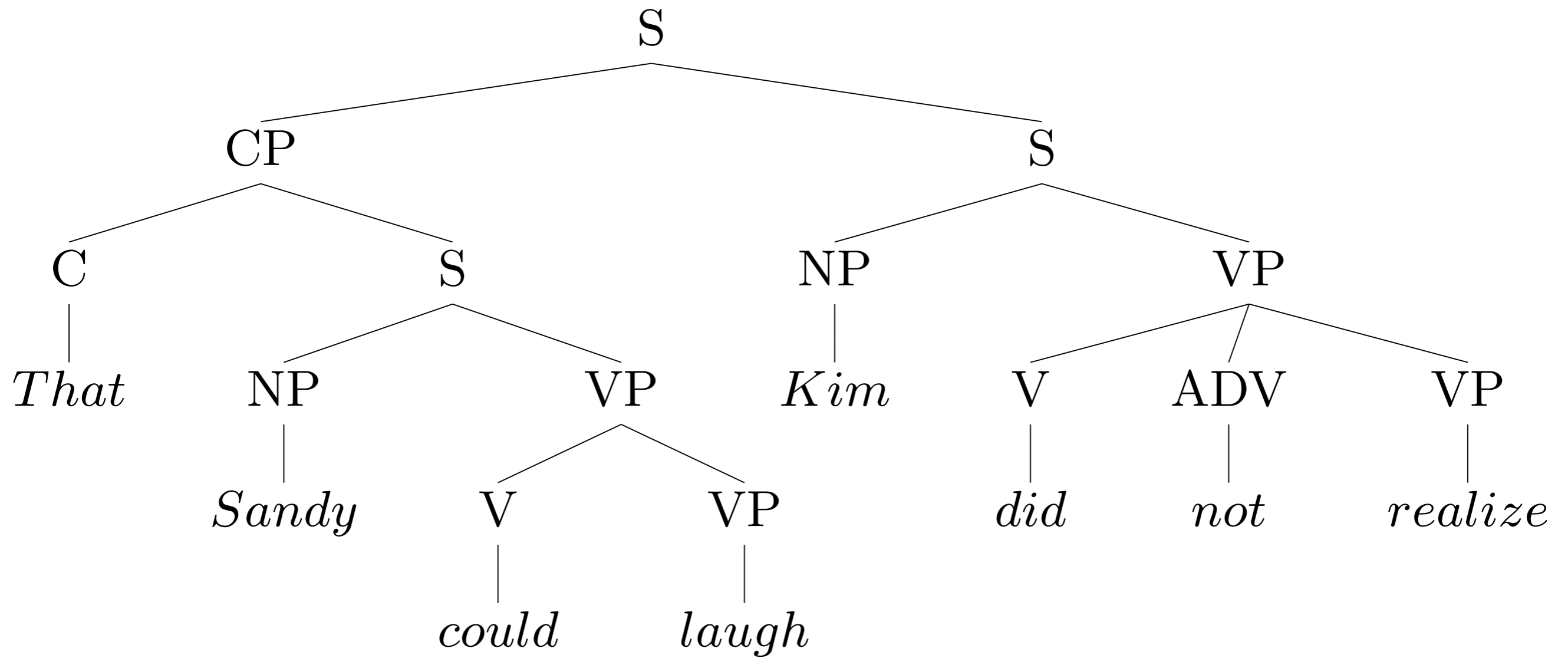**You all laughed, did not you?*

You all laughed, didn't you?

```
                              S
             ┌────────────────┴────────────────┐
             S                                  S
      ┌──────┴──────┐                   ┌───────┼───────┐
      NP            VP                  V       NP      ADV
      │        ┌────┴────┐              │       │       │
     you      ADV        VP            did     you     not
               │         │
              all      laughed
```

```
                        S
              _____/    _____
             S                       S
         ___/ \___              ___/ \___
       NP        VP            V        NP
        |       / \            |         |
       You    ADV  VP        didn't     you
              |     |
             all  laughed
```

Complicated example #5

That Sandy could laugh so hard, Kim did not realize.

*That Sandy could laugh so hard, Kim realized not.

*Sandy could laugh so hard, Kim did not realize.

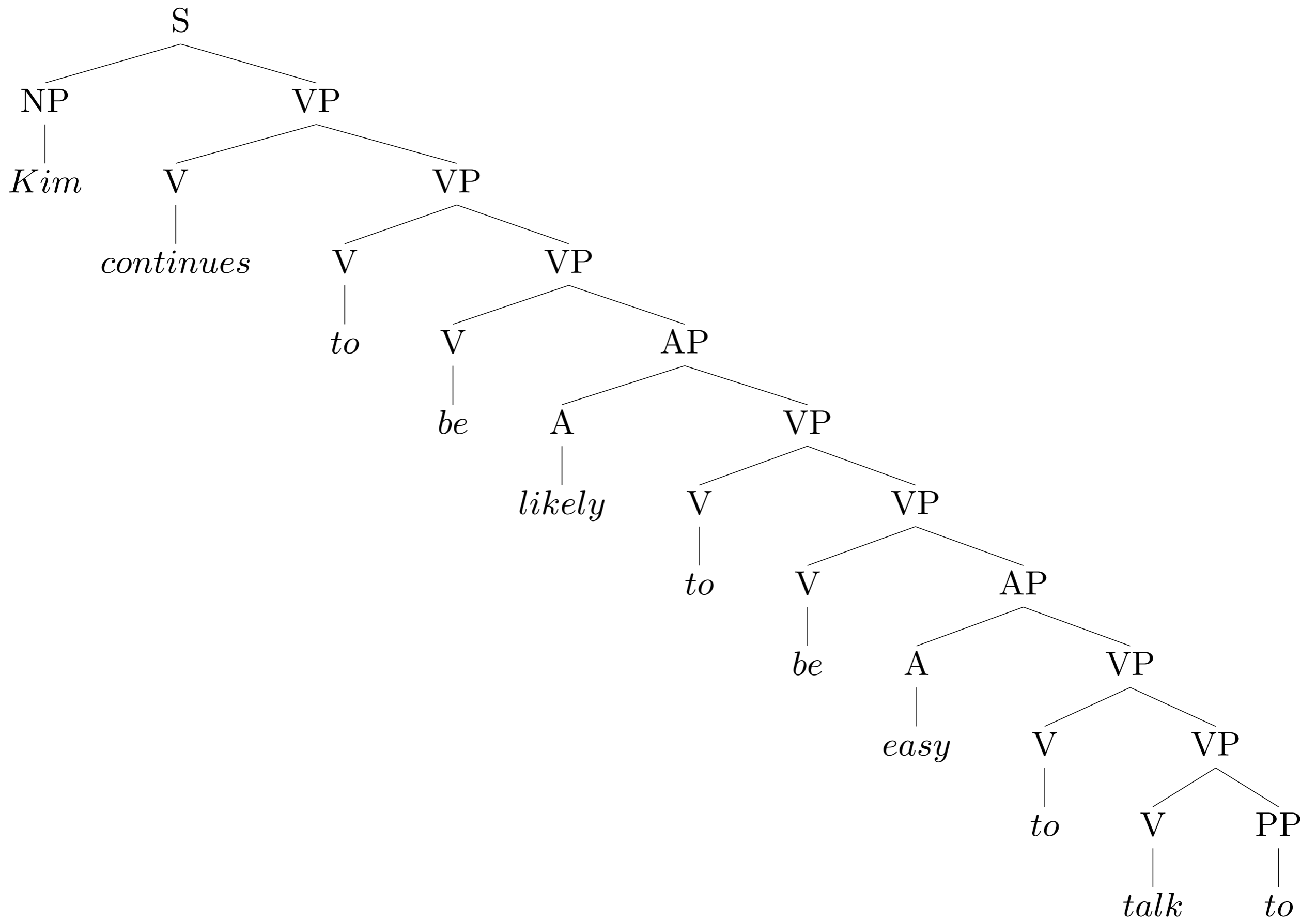**That Sandy could laugh so hard, Kim did not realize it.*

Complicated example #6

Kim continues to be likely to be easy to talk to.

*Kim continue to be likely to be easy to talk to.

*Kim continues to be likely to is easy to talk to.

*Kim continues to Kim be likely to be easy to talk to.

```
                              S
                ┌─────────────┴─────────────┐
               NP                           VP
                │              ┌─────────────┴─────────────┐
               Kim             V                           VP
                            continues          ┌───────────┴───────────┐
                                               V                       VP
                                               │           ┌───────────┴───────────┐
                                               to          V                       AP
                                                           │           ┌───────────┴───────────┐
                                                           be          A                       VP
                                                                       │           ┌───────────┴───────────┐
                                                                     likely        V                       VP
                                                                                   │           ┌───────────┴───────────┐
                                                                                   to          V                       AP
                                                                                               │           ┌───────────┴───────────┐
                                                                                               be          A                       VP
                                                                                                           │           ┌───────────┴───────────┐
                                                                                                         easy          V                       VP
                                                                                                                       │           ┌───────────┴───────────┐
                                                                                                                       to          V                       PP
                                                                                                                                   │                       │
                                                                                                                                  talk                     to
```

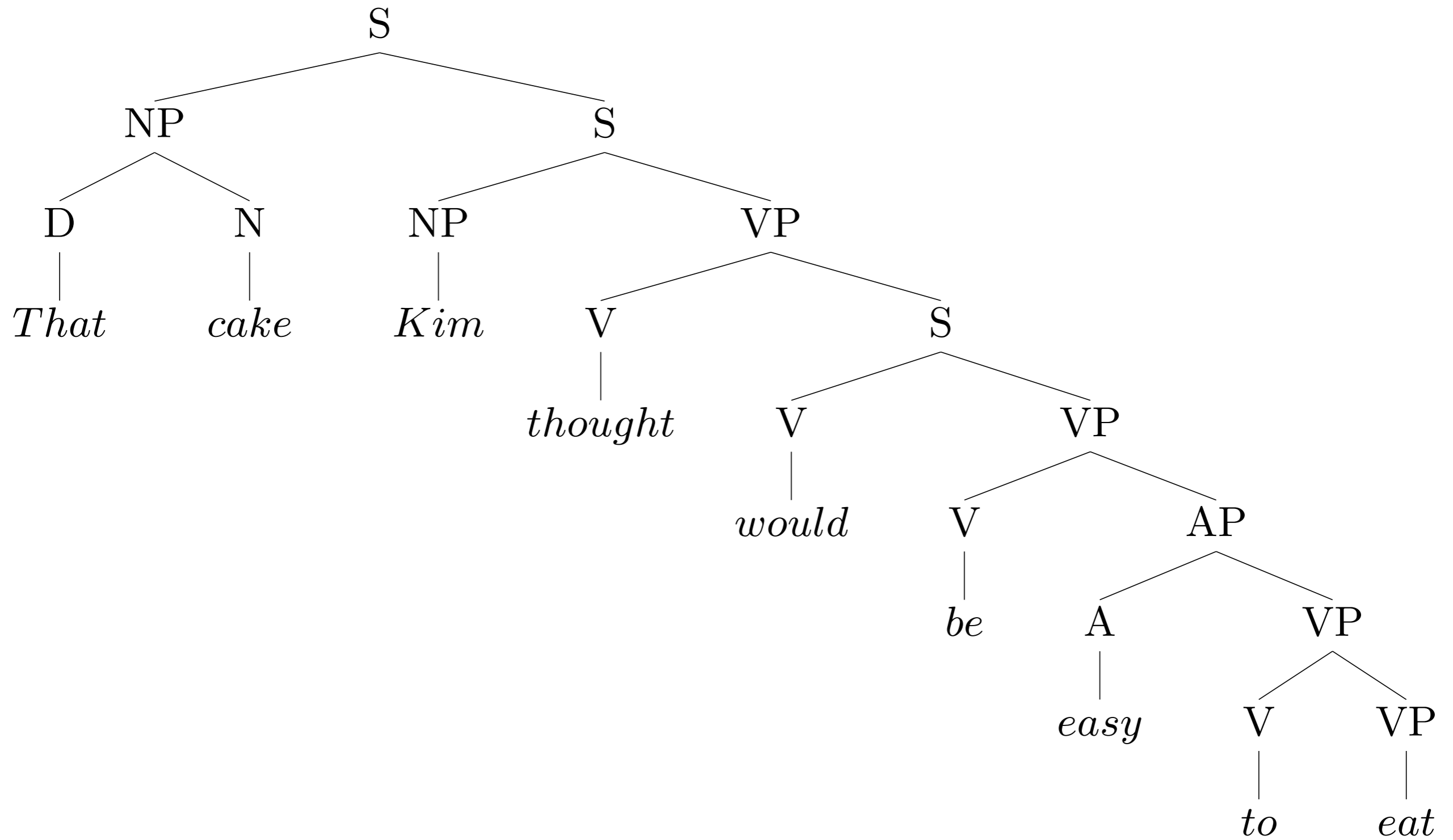18

Complicated example #7

That cake, Kim thought would be easy to eat.

*That cake, Kim thought would be easy to eat pie.

*That cake, Kim thought would be easy to eaten.

*Cupcake, Kim thought would be easy to eat.

*That cake, Kim thought that would be easy to eat.

```
                          S
              ┌───────────┴───────────┐
             NP                       S
          ┌───┴───┐            ┌───────┴───────┐
          D       N           NP               VP
          │       │           │          ┌─────┴─────┐
        That    cake         Kim         V           S
                              │          │     ┌──────┴──────┐
                             Kim      thought  V            VP
                                         │     │       ┌─────┴─────┐
                                      thought would    V          AP
                                                       │      ┌────┴────┐
                                                       be     A        VP
                                                              │    ┌────┴────┐
                                                            easy   V        VP
                                                                   │         │
                                                                   to       eat
```
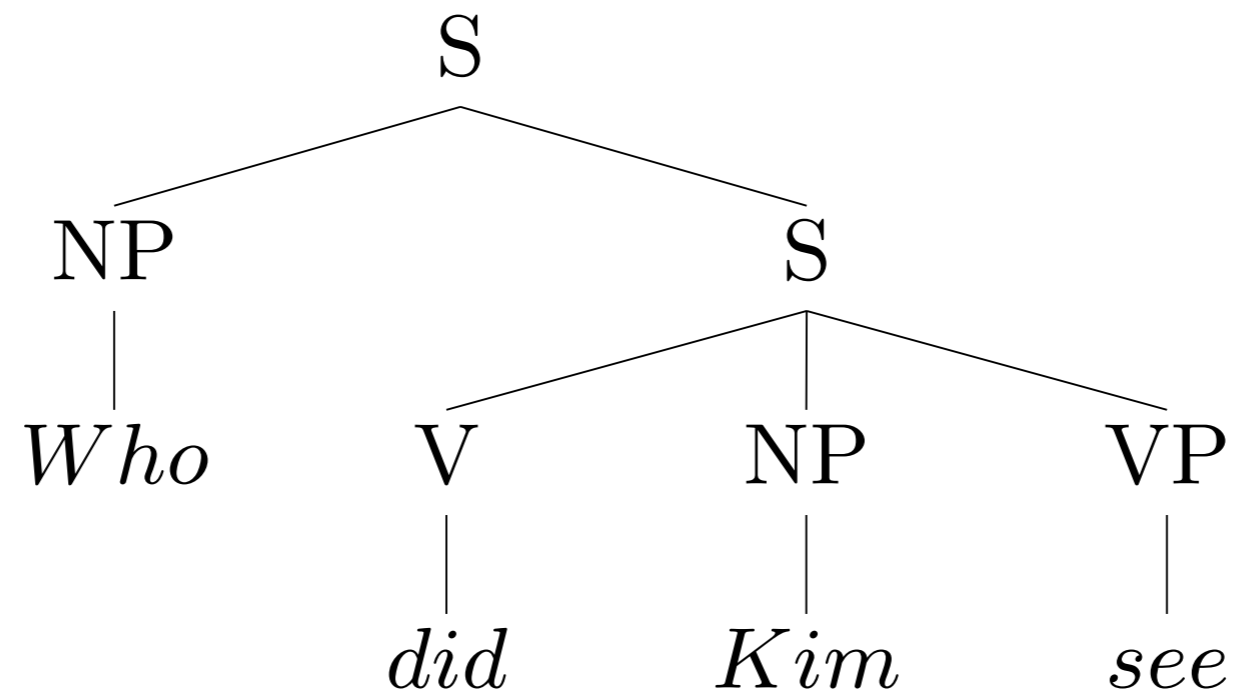
By request: *put*

- What is the status of the PP complement of *put*?

  Sara put the cushion beside her/herself.

  Simon put the cushion under him/himself.

- What is on its RESTR list?

- What is on its SPR list?

By request: *wh-* question

wh-questions again

S
- NP
  - *Who*
- S
  - V
    - *did*
  - NP
    - *Kim*
  - VP
    - V
      - *think*
    - S
      - NP
        - *Sandy*
      - VP
        - *saw*
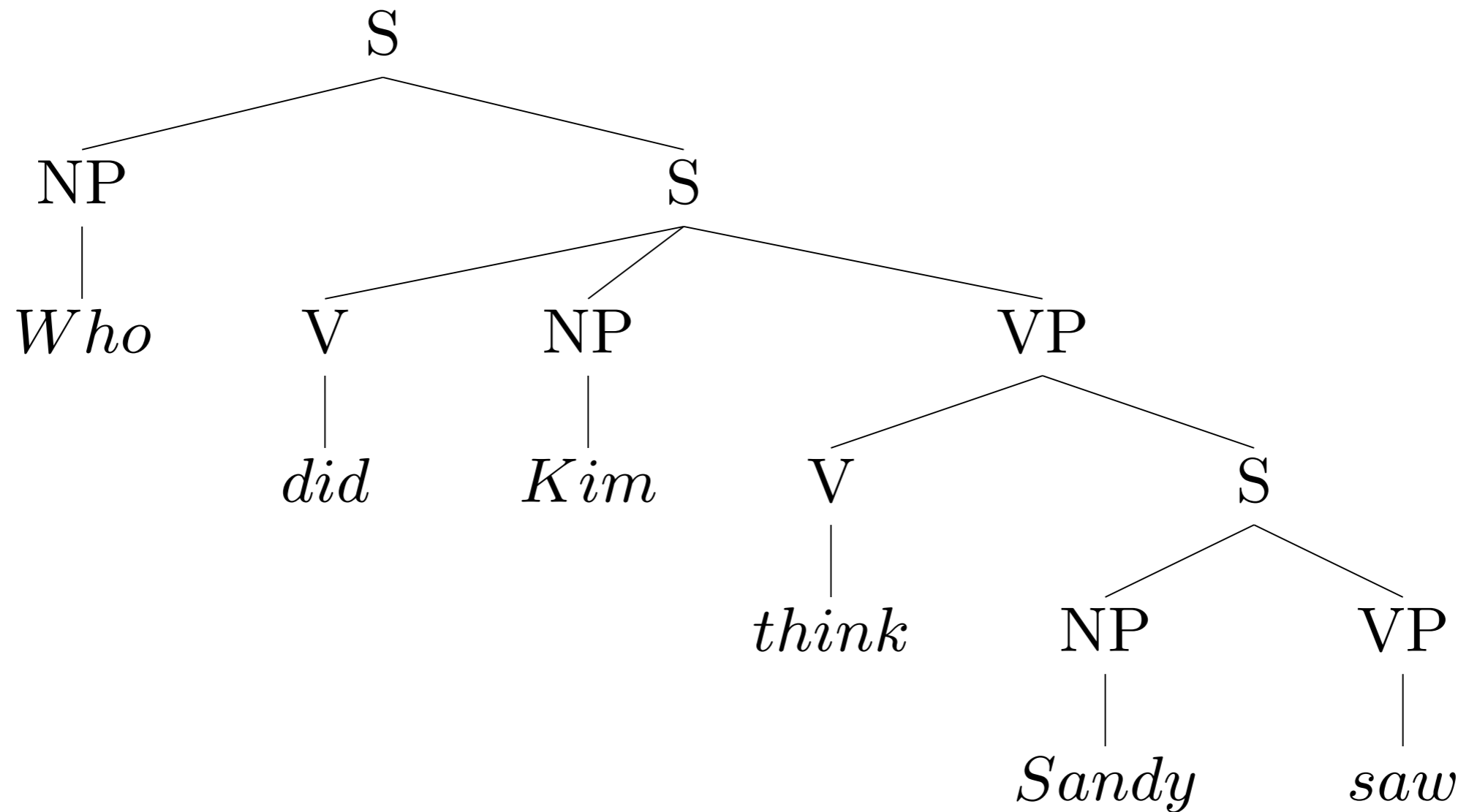
wh- complications

- Subject-aux inversion required

  - In matrix non-subject questions

  Who saw Kim? I wonder who Kim saw.

- Pied piping

  Who's brother's sister's kid did you meet?

- 'Subjacency'

  *Who read what? *What did who read?*

- *the hell: Who the hell reads what (*the hell)*

Relative clauses
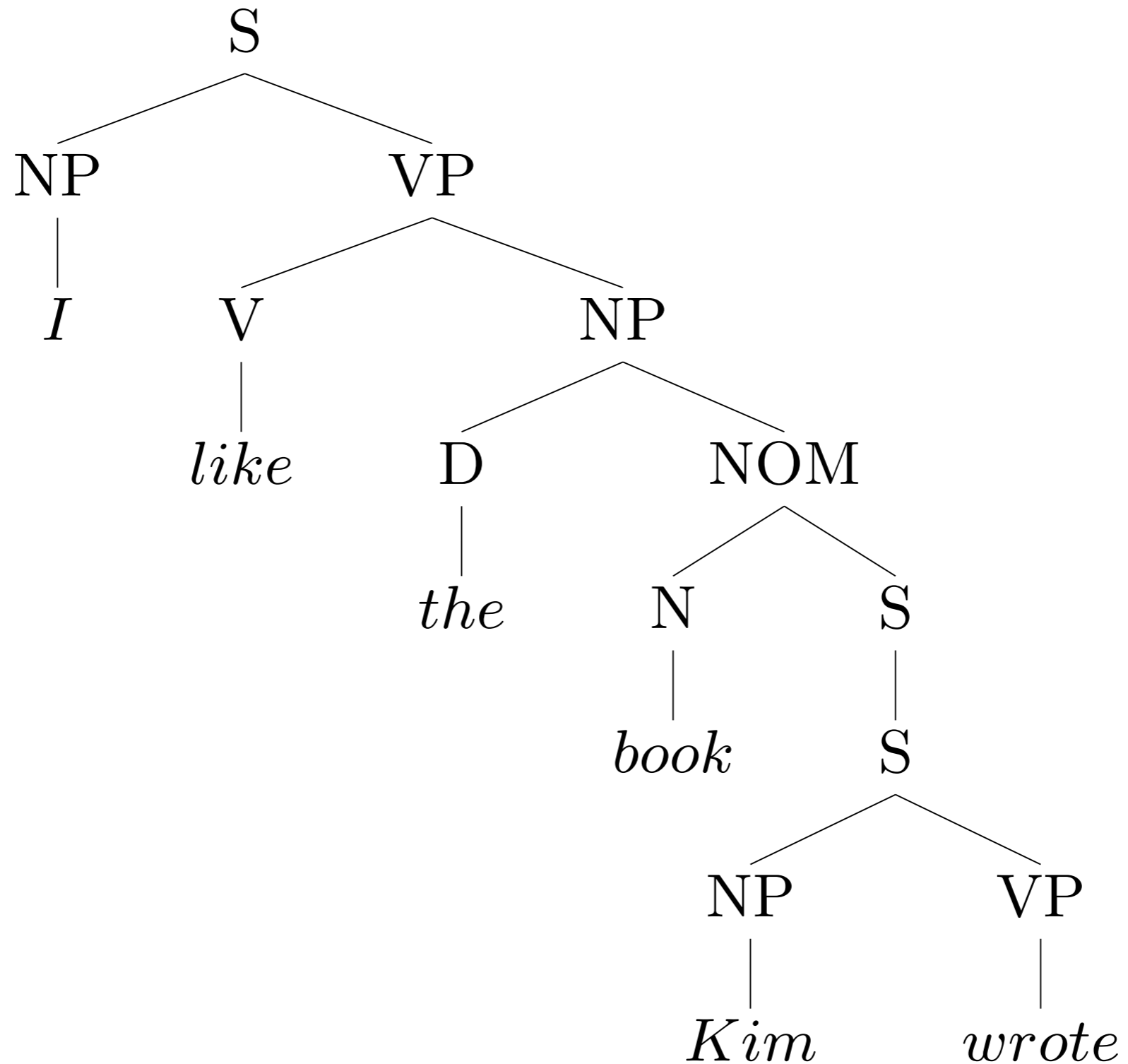
Relative clauses

Overview

- Big picture

- Untangle this...

- By request: *put*, *wh*-questions