Ling 566
Nov 25, 2025

Catch-up/review

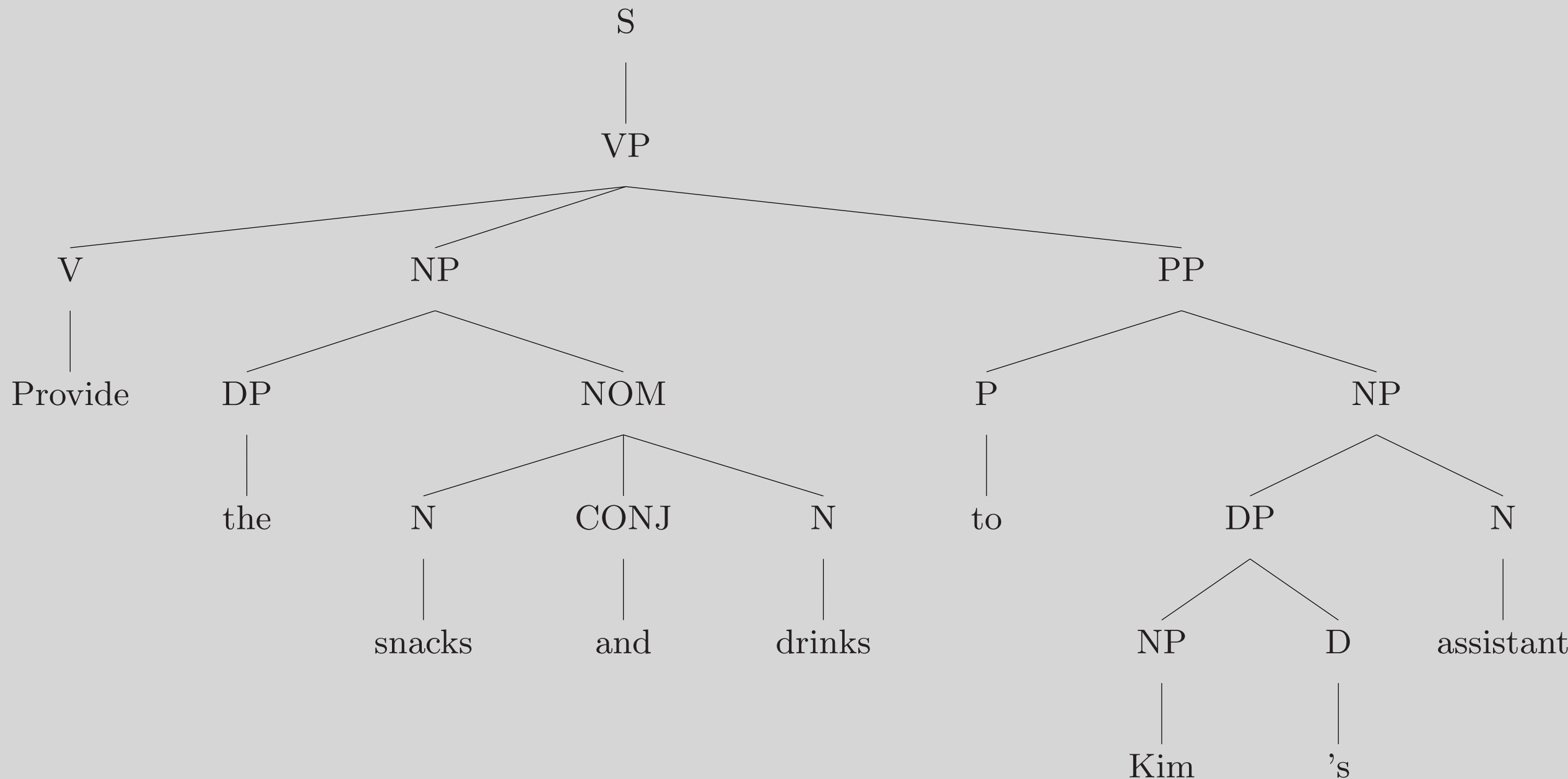# Overview

- Midterm Q3

- Big picture

- Untangle this…
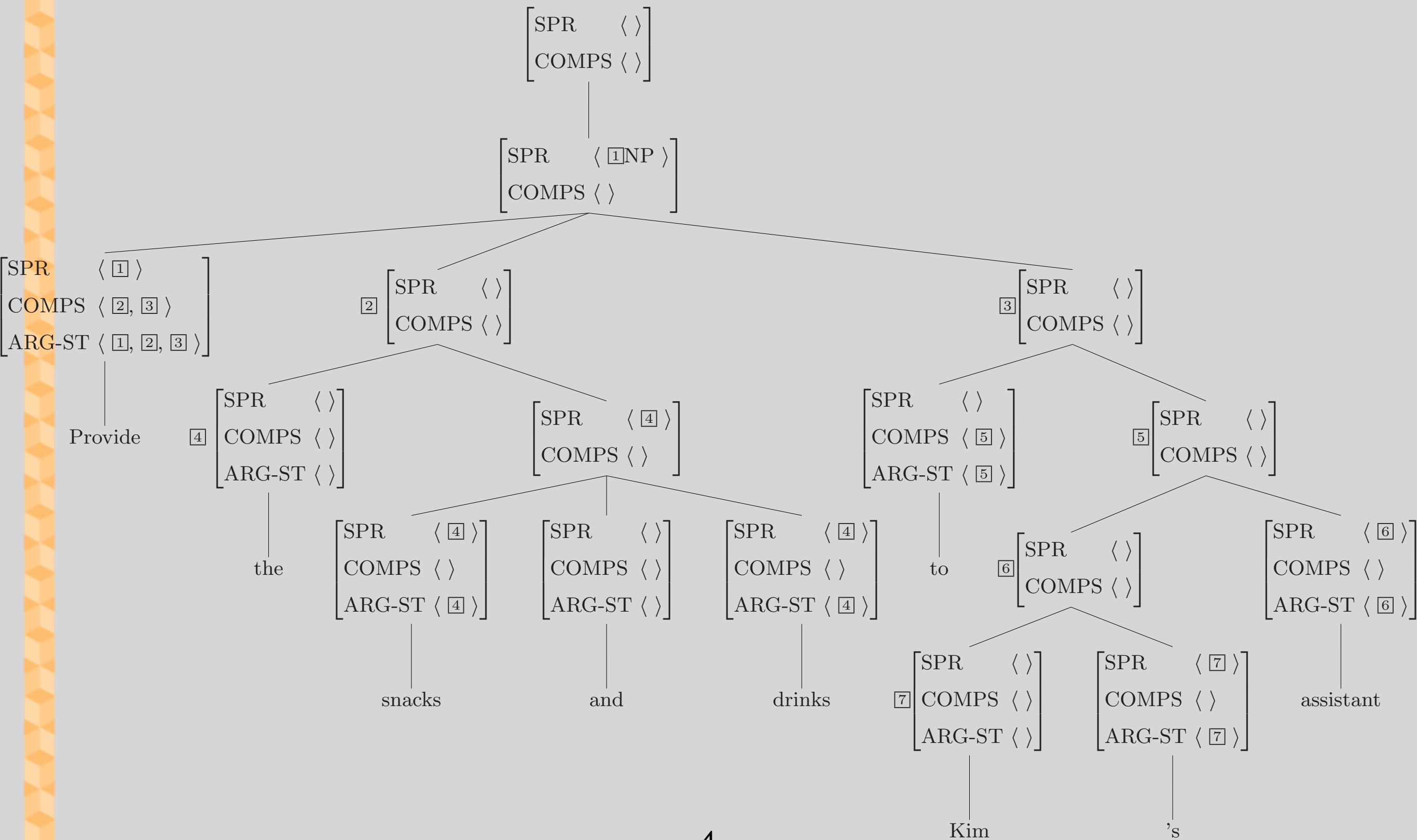
Midterm Q3 tree

Which rule licenses each node?   How many nodes have ARG-ST?

```
                                  S
                                  |
                                  VP
              _____/|_____
             V                   NP                    PP
             |            _____/  _____        _____/  \_____
          Provide        DP              NOM      P              NP
                         |          ____/ | \____  |        ____/  \____
                        the        N    CONJ   N   to      DP           N
                                   |     |     |          /  \          |
                                 snacks and  drinks      NP    D     assistant
                                                         |     |
                                                        Kim    's
```

NO EXTRA FEATURES

$$\begin{bmatrix} \text{SPR} & \langle\,\rangle \\ \text{COMPS} & \langle\,\rangle \end{bmatrix}$$

$$\begin{bmatrix} \text{SPR} & \langle\,\boxed{1}\text{NP}\,\rangle \\ \text{COMPS} & \langle\,\rangle \end{bmatrix}$$

$$\begin{bmatrix} \text{SPR} & \langle\,\boxed{1}\,\rangle \\ \text{COMPS} & \langle\,\boxed{2},\boxed{3}\,\rangle \\ \text{ARG-ST} & \langle\,\boxed{1},\boxed{2},\boxed{3}\,\rangle \end{bmatrix}$$

$$\boxed{2}\begin{bmatrix} \text{SPR} & \langle\,\rangle \\ \text{COMPS} & \langle\,\rangle \end{bmatrix}$$

$$\boxed{3}\begin{bmatrix} \text{SPR} & \langle\,\rangle \\ \text{COMPS} & \langle\,\rangle \end{bmatrix}$$

Provide

$$\boxed{4}\begin{bmatrix} \text{SPR} & \langle\,\rangle \\ \text{COMPS} & \langle\,\rangle \\ \text{ARG-ST} & \langle\,\rangle \end{bmatrix}$$

$$\begin{bmatrix} \text{SPR} & \langle\,\boxed{4}\,\rangle \\ \text{COMPS} & \langle\,\rangle \end{bmatrix}$$

$$\begin{bmatrix} \text{SPR} & \langle\,\rangle \\ \text{COMPS} & \langle\,\boxed{5}\,\rangle \\ \text{ARG-ST} & \langle\,\boxed{5}\,\rangle \end{bmatrix}$$

$$\boxed{5}\begin{bmatrix} \text{SPR} & \langle\,\rangle \\ \text{COMPS} & \langle\,\rangle \end{bmatrix}$$

the

$$\begin{bmatrix} \text{SPR} & \langle\,\boxed{4}\,\rangle \\ \text{COMPS} & \langle\,\rangle \\ \text{ARG-ST} & \langle\,\boxed{4}\,\rangle \end{bmatrix}$$

$$\begin{bmatrix} \text{SPR} & \langle\,\rangle \\ \text{COMPS} & \langle\,\rangle \\ \text{ARG-ST} & \langle\,\rangle \end{bmatrix}$$

$$\begin{bmatrix} \text{SPR} & \langle\,\boxed{4}\,\rangle \\ \text{COMPS} & \langle\,\rangle \\ \text{ARG-ST} & \langle\,\boxed{4}\,\rangle \end{bmatrix}$$

to

$$\boxed{6}\begin{bmatrix} \text{SPR} & \langle\,\rangle \\ \text{COMPS} & \langle\,\rangle \end{bmatrix}$$

$$\begin{bmatrix} \text{SPR} & \langle\,\boxed{6}\,\rangle \\ \text{COMPS} & \langle\,\rangle \\ \text{ARG-ST} & \langle\,\boxed{6}\,\rangle \end{bmatrix}$$

snacks

and

drinks

$$\boxed{7}\begin{bmatrix} \text{SPR} & \langle\,\rangle \\ \text{COMPS} & \langle\,\rangle \\ \text{ARG-ST} & \langle\,\rangle \end{bmatrix}$$

$$\begin{bmatrix} \text{SPR} & \langle\,\boxed{7}\,\rangle \\ \text{COMPS} & \langle\,\rangle \\ \text{ARG-ST} & \langle\,\boxed{7}\,\rangle \end{bmatrix}$$

assistant

Kim

's

4

Chain of identities

	Grammar entity	1st member of identity	2nd member of identity
1.	lexical entry for *provide*	RECIPIENT role of the **provide** predication	INDEX value of the third element (PP) on its ARG-ST list.
2.	ARP (w/the SHAC)	third element of the ARG-ST list of *provide*	2nd element of its COMPS list
3.	Head Complement Rule	2nd element of the COMPS list	the 3rd daughter of the VP constituent (the PP ③)
4.	Semantic Inheritance Principle	INDEX of the PP *to Kim's assistant*	INDEX of the P *to*
5.	lexical entry for *to* /the type *argmkp-lxm*	INDEX of *to*	INDEX of the sole element of its ARG-ST
6.	ARP	sole argument of *to*'s COMPS list	sole argument of its ARG-ST
7.	Head Complement Rule	the sole element of the COMPS list of the P *to*	the NP *Kim's assistant* (⑥)
8.	Semantic Inheritance Principle	INDEX of the NP *Kim's assistant*	INDEX of the N *assistant*
9.	lexical entry for *assistant*	INST value of the **assistant** predication	its INDEX value

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 (with atomic categories)?

- In what applications might (atomic category) CFG be sufficient?

- What applications might benefit from something linguistically more motivated?

Reality v. expectations: Now that you're almost done with 566, how does it compare to what you expected?

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Syntax is cool and I always knew that

0

Way more nitty gritty details than expected

0

Way more work than expected

0

Less work than feared

0

Actually, I'm more interested in the P side

0

Syntax (so far) helps me:

○○ 0

understand other classes

0

understand what I'm getting the computer to do

0

understand how to evaluate NLP systems

0

not very much/not at all

0

by being interesting

0

0

understand other classes

0

understand what I'm getting the computer to do

0

understand how to evaluate NLP systems

0

not very much/not at all

0

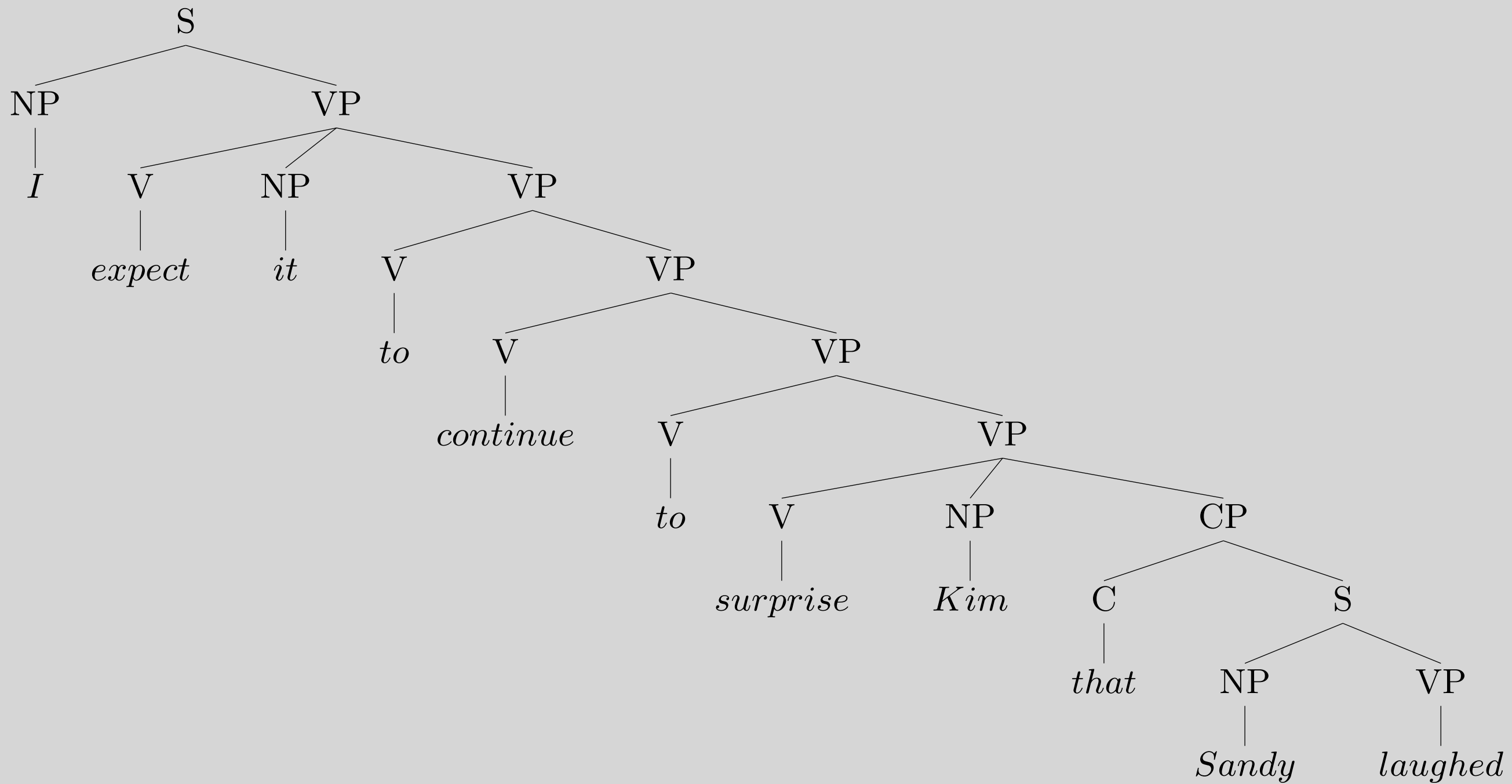by being interesting

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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.
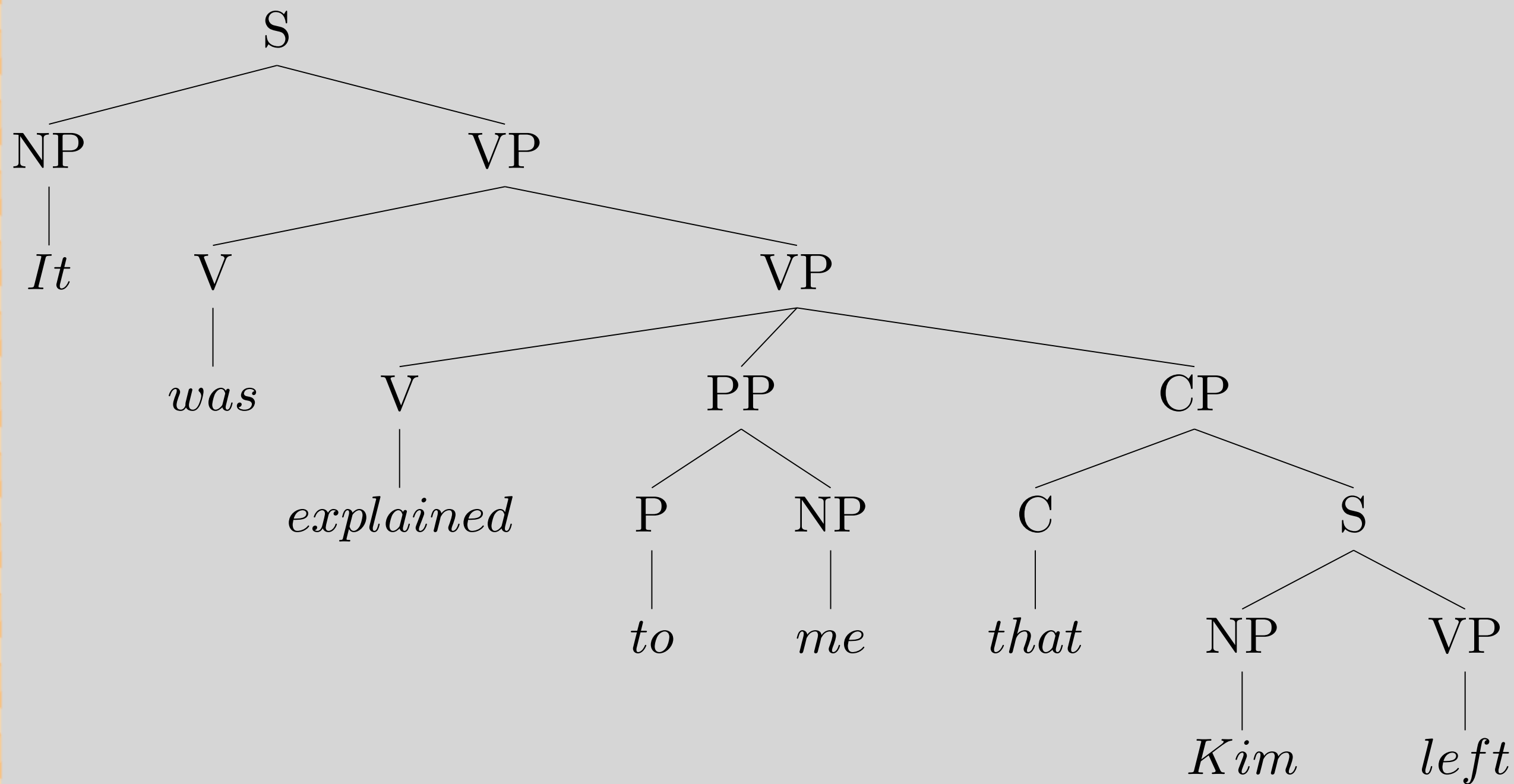
Complicated example #2

I expect it to continue to surprise Kim 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
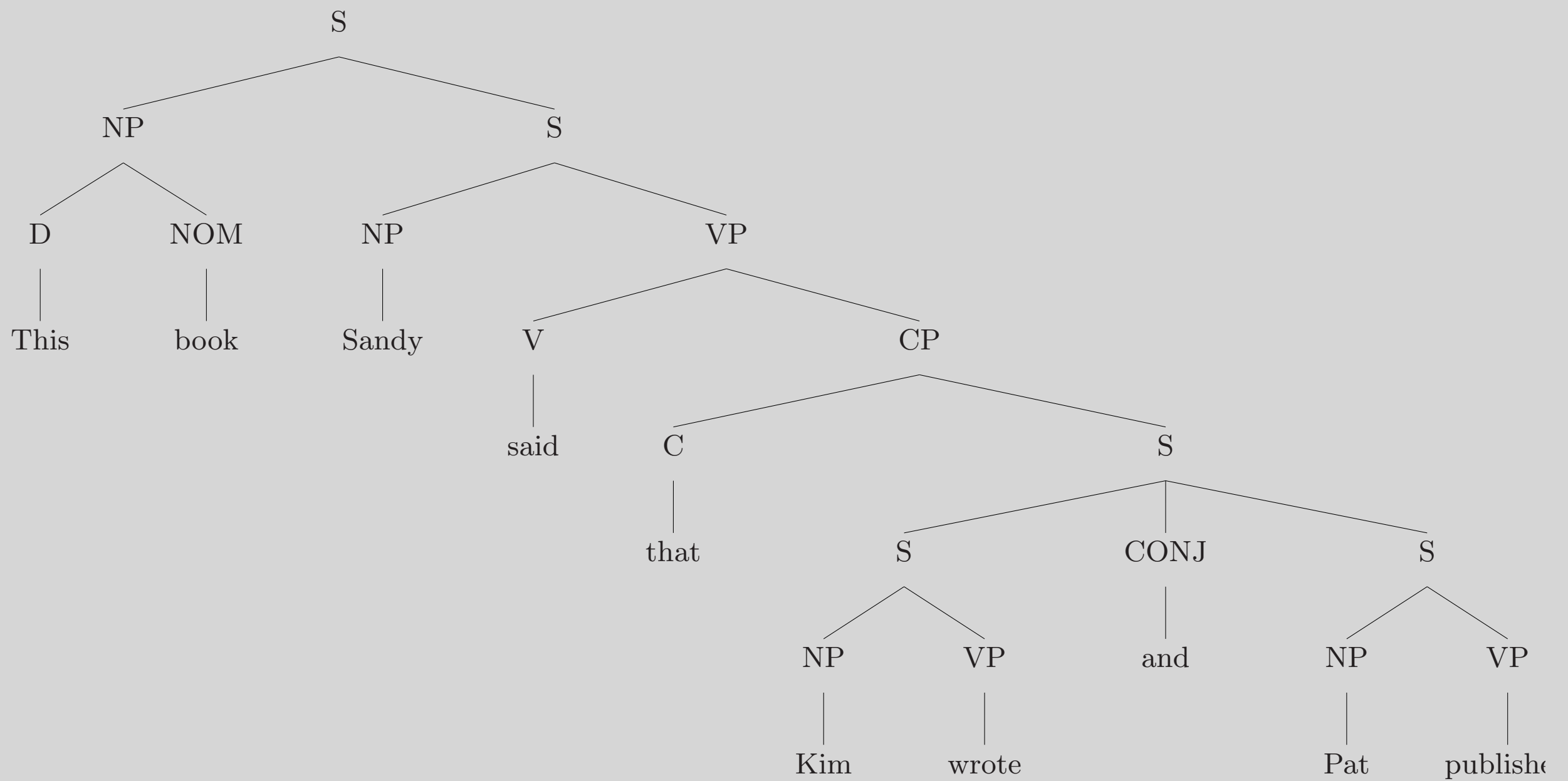
that NP VP

Sandy *laughed*

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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

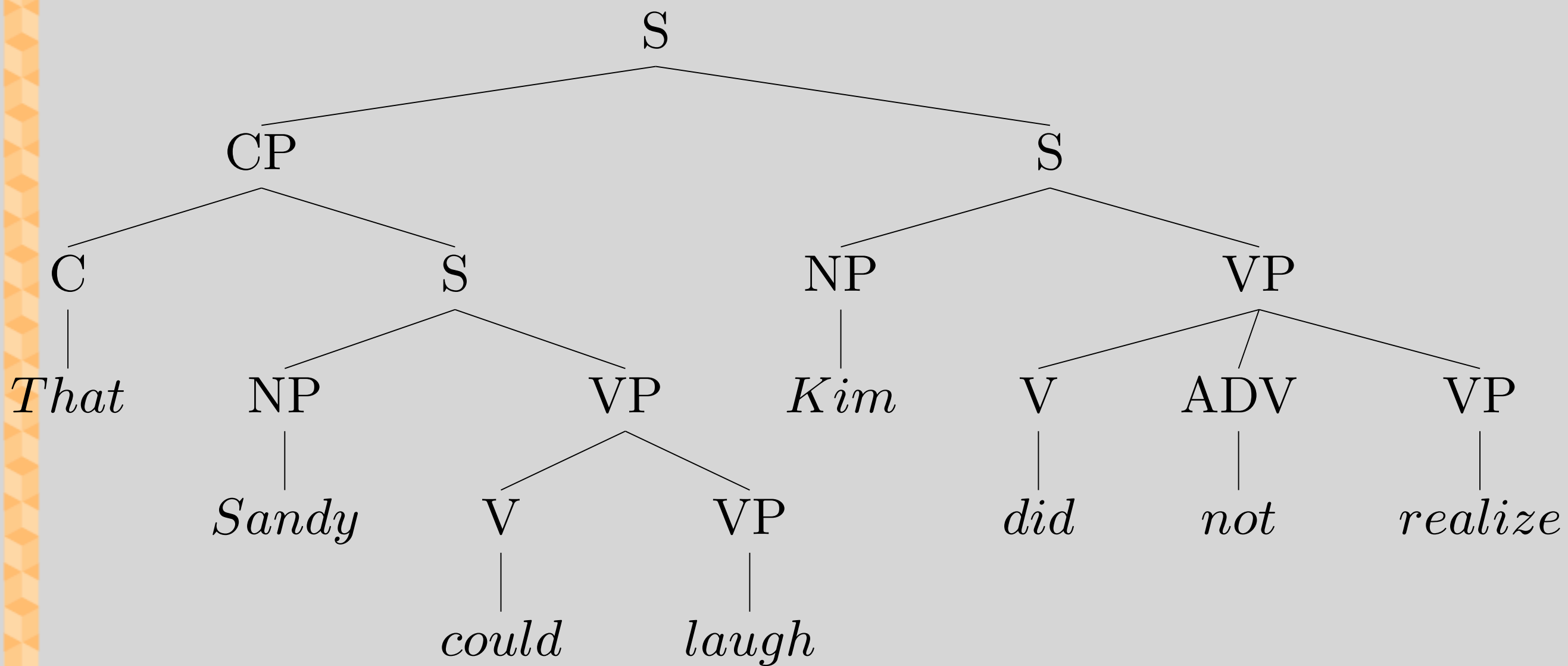*This book, Sandy said that Kim wrote and Pat read.*

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.
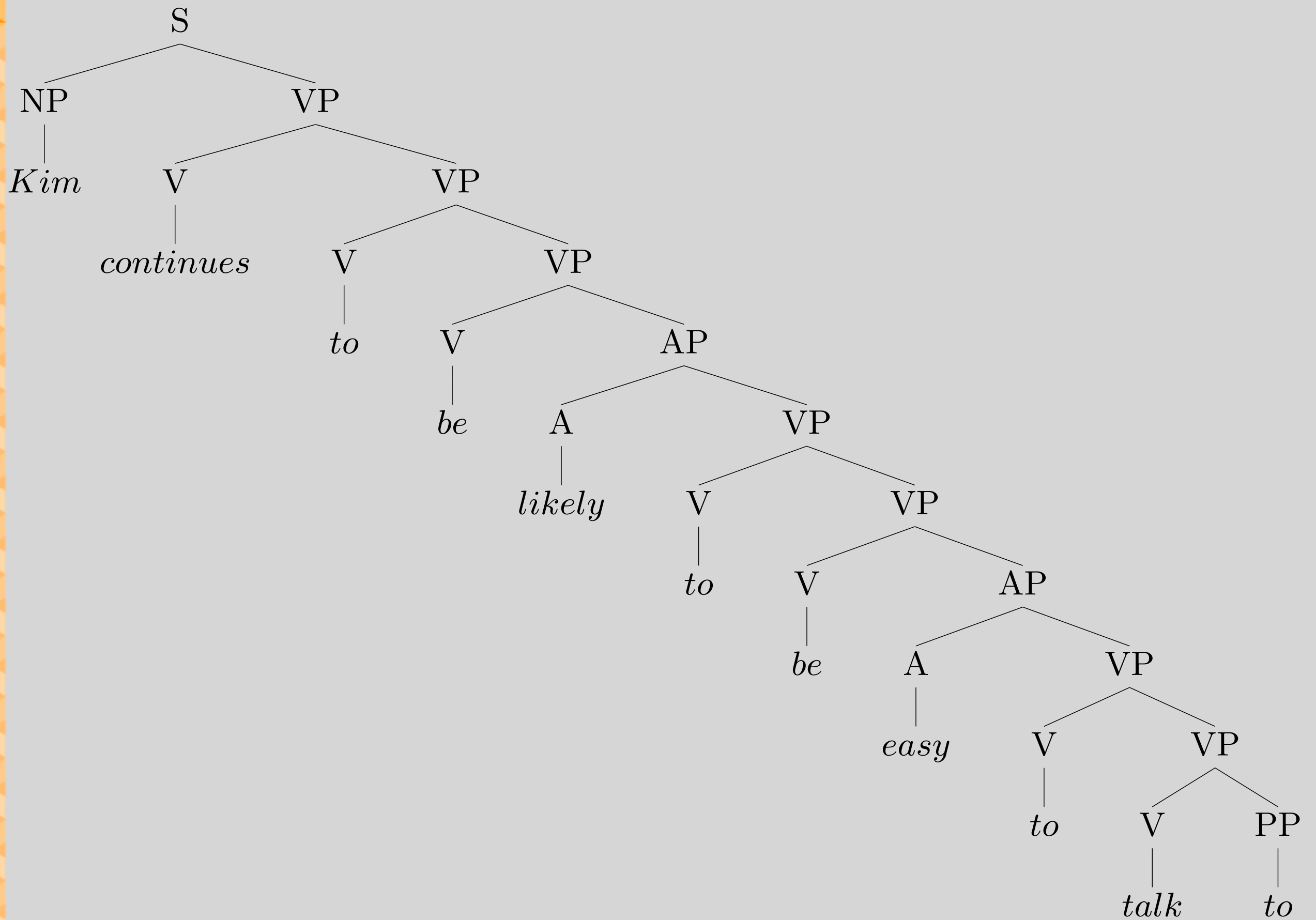
Complicated example #6

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
```
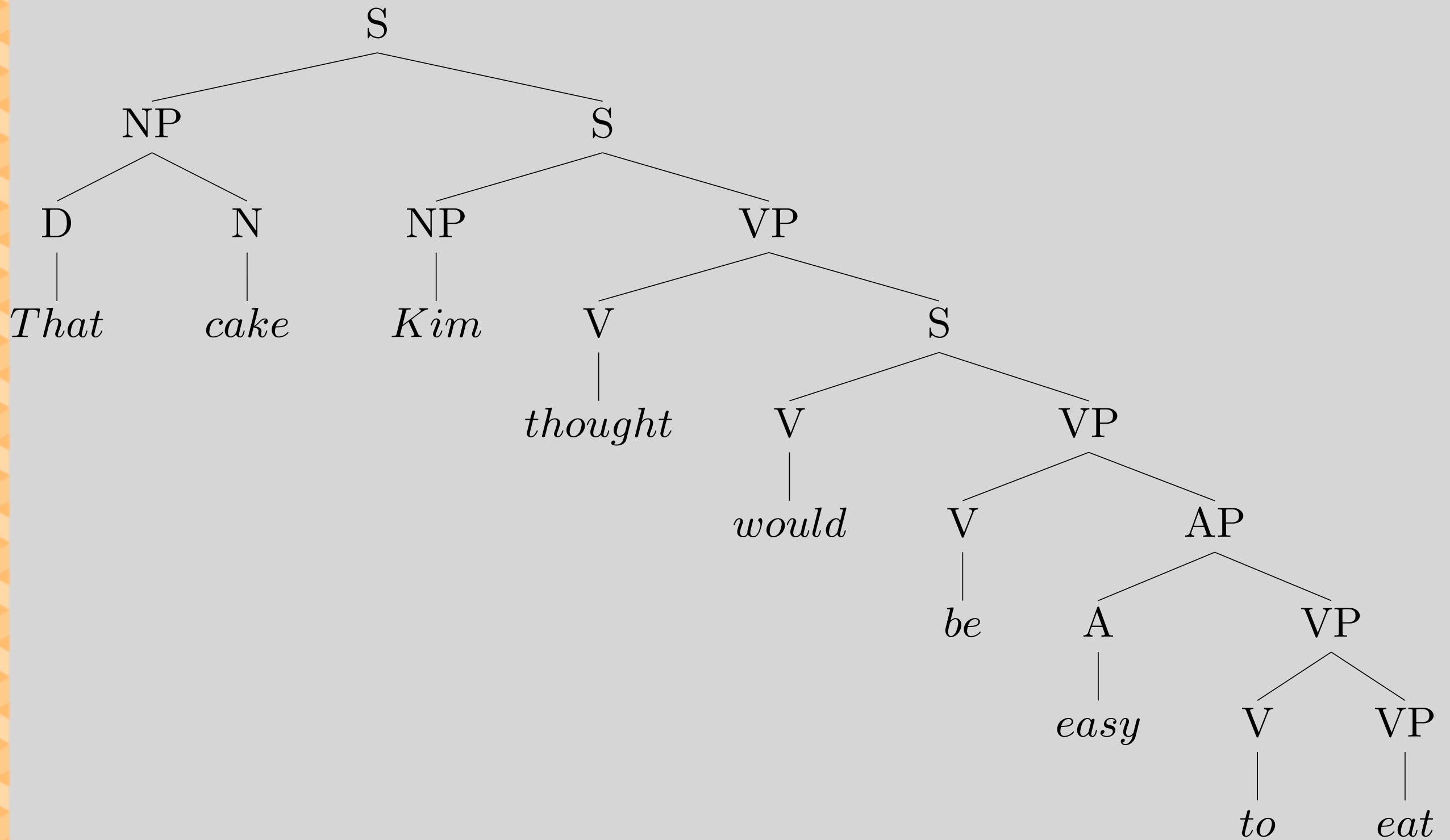
Complicated example #7

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.

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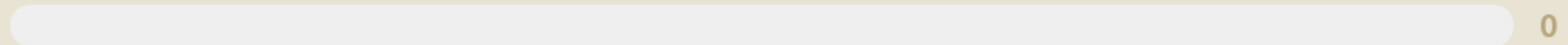How many more analyses of interacting phenomena do you think we'd need to get to broad coverage of English?
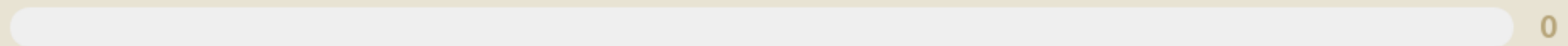
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10s

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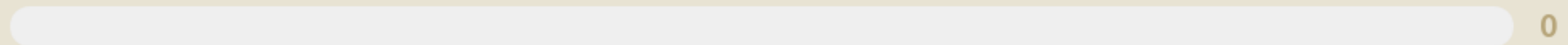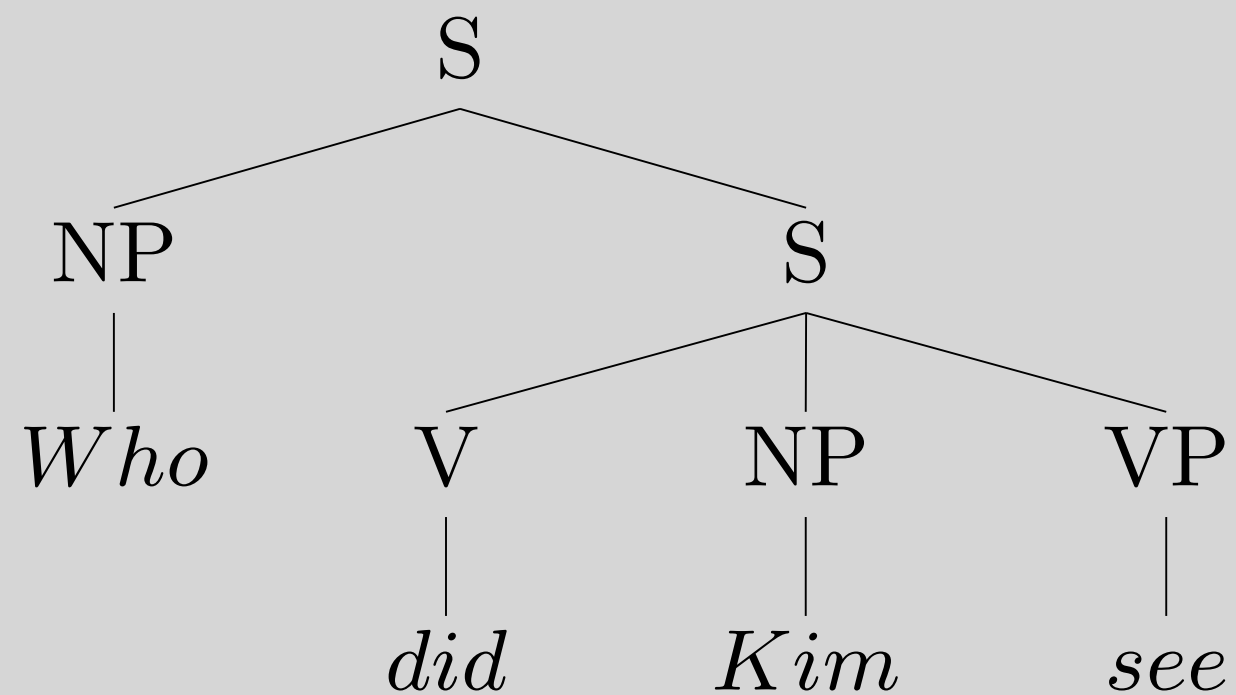100s

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1000s

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10000s

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More?!

0

wh- question

```
                    S
           _____/ _____
          NP                  S
          |              ____/|\____
         Who            V    NP     VP
                        |     |      |
                       did   Kim    see
```

wh-questions again
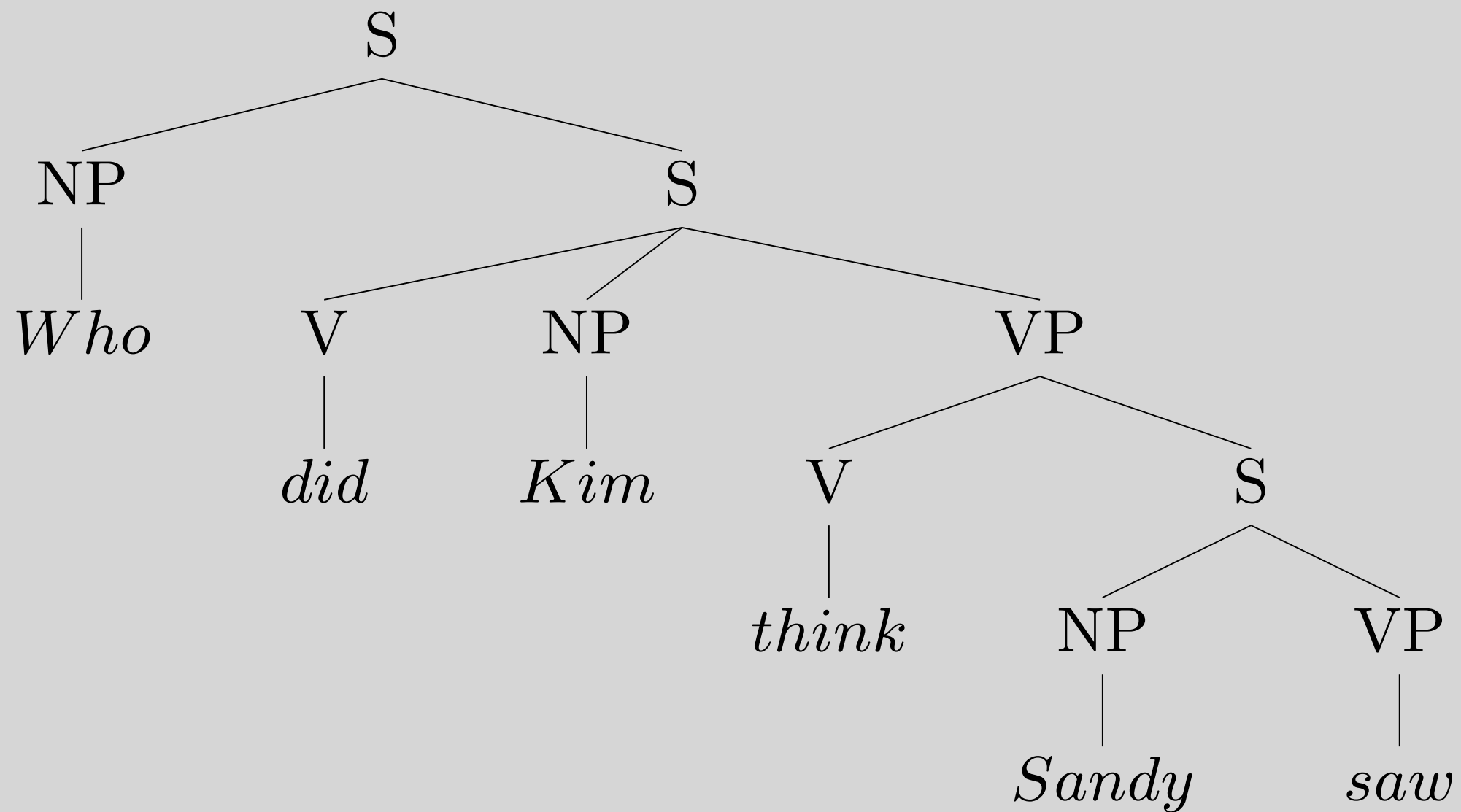
wh- complications

- 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)*

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