How Do We Identify Constituents?

Tallerman: Chapter 5

Discovering the Structure of Sentences

- **Evidence of structure in sentences**
  - Structural ambiguity
    - Black cab drivers went on strike yesterday
      - **Black [cab drivers]** went on strike.
      - **[Black cab] drivers** went on strike.
    - The boy and the girl's uncle stayed to dinner.
      - **[The boy and the girl]'s** uncle stayed.
      - The boy and **[the girl]'s** uncle stayed.
    - Sometimes intonation distinguishes the two readings.

- Constituent
  - A group of words that forms a phrase in a sentence
- Constituent Structure
  - A particular grouping of words
- A sequence of words which form a constituent in one environment, need not in another
  - The students wondered how simple textbooks could be obtained.
  - The students wondered how simple textbooks could be.
- We need to manipulate the sentence to discover constituency, using formal constituency tests.
  - The students wondered how **they** could be obtained.
  - The students wondered how simple **they** could be.

- **Some syntactic tests for constituent structure**
  - <u>Sentence fragment test</u>
    - A string of words that can be a sentence fragment must be a constituent.
      - But <u>whose uncle</u> stayed to dinner?
        - » **The boy and the girl's**.   (one person stayed)
        - » **The girl's**.   (two people stayed)
      - The boy and <u>who</u> stayed to dinner?
        - » **The girl's uncle.**
      - <u>Who</u> stayed to dinner?
        - » **The boy and the girl's uncle.**
    - [[The boy and the girl's] uncle]
    - [[The boy] and [[the girl's] uncle]]

- Using constituency tests we can discover if two apparently similar sentences have the same structure.
  - Sue lost that book with the   blue cover.
    Sue left that book with her best   friend.
    N   V   D   N   P   D   A   N
  - What did she lose?
    - **[That book with the blue cover.]**
  - What did she leave?
    - **[That book]**
      *That book with her best friend
- To claim a difference in syntactic structure, we must show contrast in syntactic behavior; we must show a grammaticality clash.

- Cleft test
  - The string of words in the "focus position" of a cleft sentence must be a constituent.
    - It was [that book with the blue cover] that Sue lost.
    - *It was that book with her best friend that Sue left.

  - It + COPULA + FOCUS + RELATIVE CLAUSE

  - M: I want to ask this question: Why is this agreement so bad? I ask you.
    G: Because our whole intention was to bring some form of democracy there; our intention was to make the Sandinistas cry uncle. *It is the CONTRAS who have cried uncle.*   [McLaughlin Group: 3/25/88].

- It was [that book] that Sue left with her best friend.
- It was [with her best friend] that Sue left the book.

- Sue lost [that book with the blue cover]
- Sue left [that book] [with her best friend]

- Irish
  - Bhí an fear ag péinteáil cathaoir.
    Was the man PROG paint chair
    'The man was painting a chair.'
  - Is é **[an fear]**   a   bhí   ag   péieáil cathaoir.
    Is he the man who was PROG paint   chair
    'It's the man who was painting a chair.'

- **Basque**
  - Premizúa orreri   mutillarî   emon-dótze.
    Prize   that:DATIVE boy:DATIVE give-AUX
    'They have given the prize to that boy.
  - **[orreri   mutillarî]**   dâ premizúa emón dotzé-na
    that:DATIVE boy:DATIVE is prize   give AUX-that
    'It's to that boy that they have given the prize.'

– Coordination test

- Sequences of words which are constituents can be coordinated (or 'conjoined') with one another, provided that they are of the same syntactic category.

  - Sue lost [that book with the blue cover] and [that notebook with the pink cover]
  - *Sue left that book with her best friend and that notebook with her mother.

- XP and XP

  - Sue left [that book] and [that notebook] with her best friend.
  - Sue left that book [with her best friend] and [with her mother]

- Sue lost [that book with the blue cover]
- Sue left [that book] [with her best friend].

– Grammaticality judgments
  - Intuitions about which sentences are possible and which aren't.
  - The fact that speakers share these judgments shows that we have unconscious knowledge of constituent structure.

- **Constituent Structure Trees**

– (Sue) left   that book with the blue cover

– (Sue) left that book with her best friend
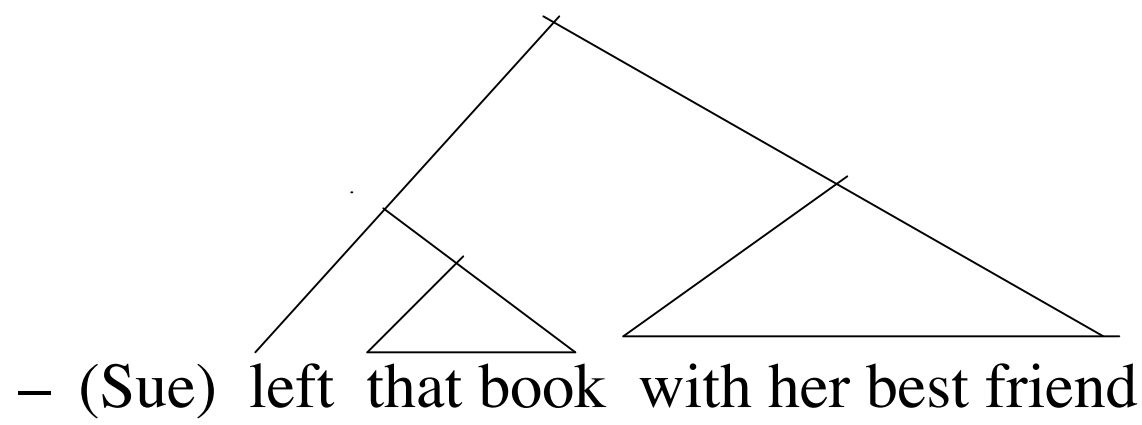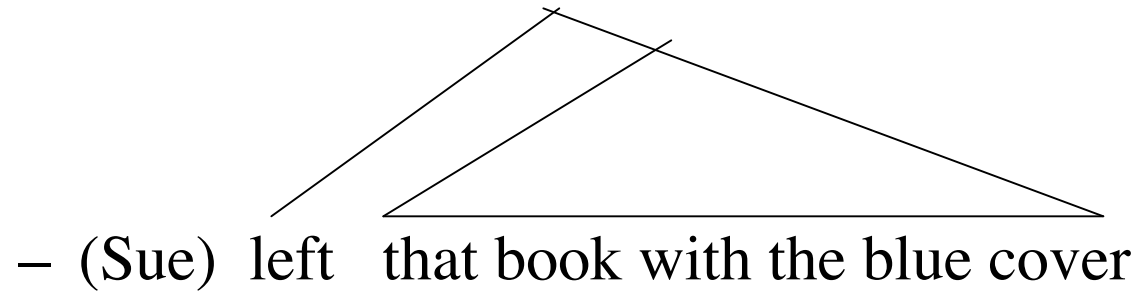
- We represent the structure of sentences with tree diagrams
  - Upside down trees, with root at the top
  - Branches descend from the root.
- Adjuncts are attached to the tree at a different level than complements
  - Adjuncts are not required to make the sentence meaningful.
- Both trees are drawn as constituents: VP
  - Sue did what?
    - Lost that book with the blue cover.
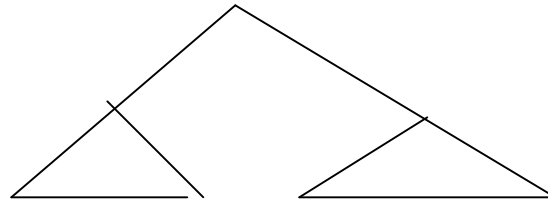   - Left that book with her best friend.

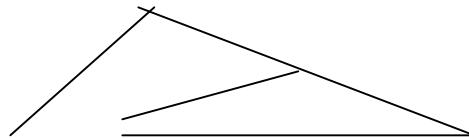– My sister wrote down her address.
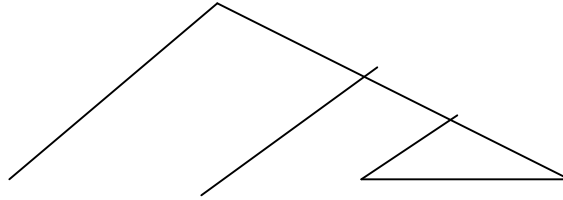My sister lived down this road.
D   N   V   P   D   N

– Cleft test:

- *It was **down her address** that my sister wrote.
- It was **[down this road]** that my sister lived.

– (My sister) wrote down her address
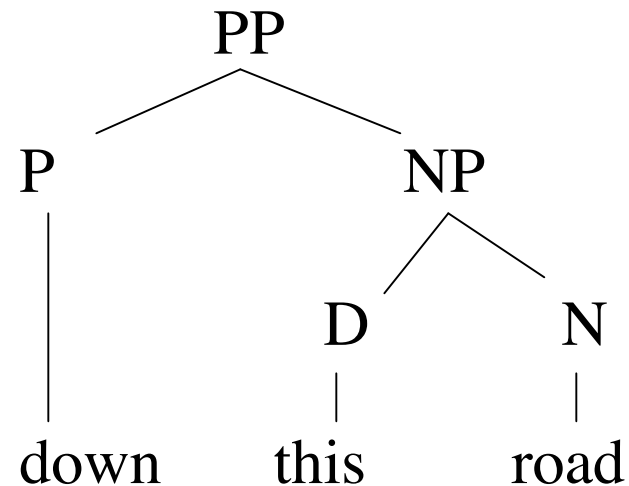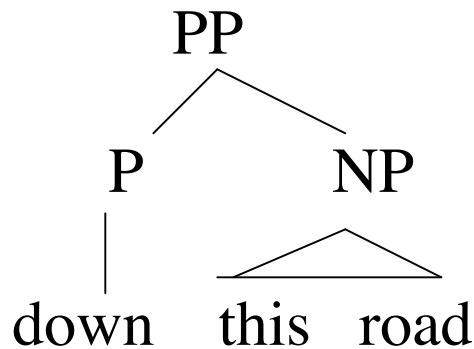
– (My sister) lived down this road

– (My sister) lived down this road

– We include the amount of detail that we need for a given purpose.

– Nested brackets can also give this detail:

- [down [this road]]

Labeled Tree Diagrams and Relationships Within the Tree

- It is more common to use labeled brackets or labeled tree diagrams.

- [$_{PP}$ [$_P$ down] [$_{NP}$ this road]]

```
        PP                              PP
       /  \                            /  \
      P    NP                         P    NP
      |    /\                         |    /  \
    down this road                    |   D    N
                                      |   |    |
                                    down this  road
```

- Branches

- Category labels

- Node

  - Phrasal nodes

  - Lexical nodes

  - Words

- Immediately dominates

- Mother

- Daughters

- Dominates

- A set of elements forms a <u>constituent</u> in a tree diagram if and only if there is a single node that dominates just these elements, and no other items.
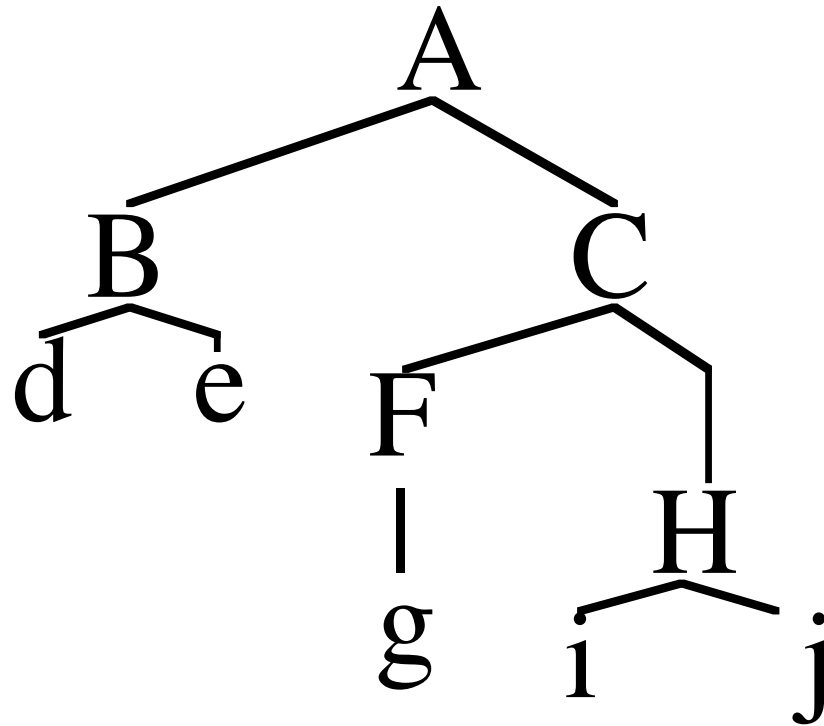
Developing Detailed Tree Diagrams

- **Applying some constituent structure tests**
  - These fishermen switched on the shipping forecasts.
  - These fishermen relied on the shipping forecast.

  - *switched on* is a <u>phrasal verb</u>:
    - [$_V$ switch on]
  - *relied on* is a <u>prepositional verb</u> :
    - [$_V$ rely] [$_{PP}$ on…]

- The preposition of a transitive phrasal verb can alternatively follow the direct object NP:
  - These fishermen switched the shipping forecast on.

- Other transitive phrasal verbs:
  - *Turn over, tear down, pick up, put out, break up*
    - I'd pick that snake up.
    - They tore that old place down.

- The PP modifier *right* can only co-occur with the preposition after the NP, indicating that the one immediately after the verb is a bare P. .
    - I'll pick that snake right up.
    - *I'll pick right up that snake.
    - They tore that old place right down.
    - *They tore right down that old place.

– Prepositional verbs take an obligatory PP complement headed by a particular preposition

  • *rely for, *rely over, *rely under*

– The preposition cannot be placed after the NP:

  • *The fishermen relied the shipping forecasts on.

– Other prepositional verbs

  • *talk about, glance at, depend on, look after*

Tree 1:

```
                          S
               ┌──────────┴──────────┐
              NP                     VP
           ┌───┴───┐          ┌──────┴──────┐
           D       N          V             NP
           │       │       ┌──┴──┐          │
         these  fishermen  V     P      the shipping forecast
                           │     │
                        switched on
```

Tree 2:

```
                       S
              ┌────────┴────────┐
             NP                 VP
          ┌───┴───┐        ┌────┴────┐
          D       N        V         PP
          │       │        │      ┌──┴──┐
        these  fishermen  relied  P     NP
                                  │     │
                                  on  the shipping forecast
```
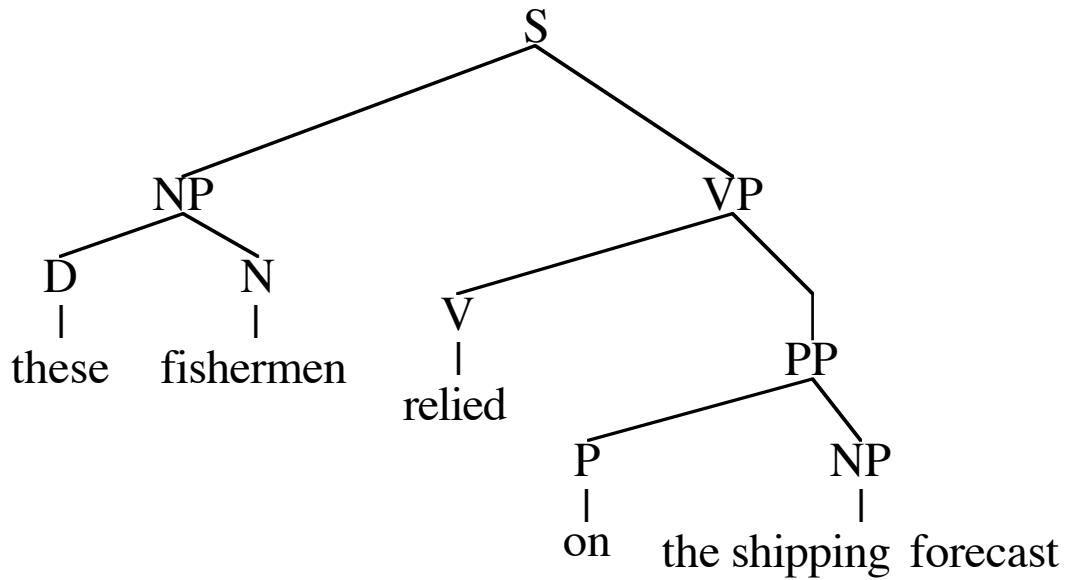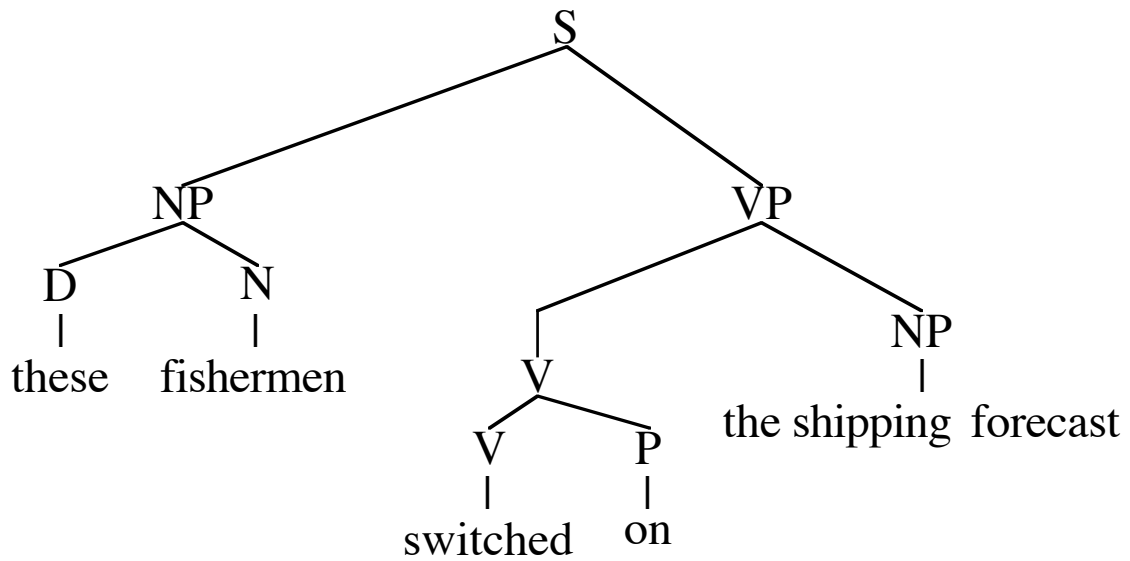
- The NP VP split of S reflects the split between subject and predicate of a sentence.
  - Here 'predicate' refers to a constituent consisting of the verb and all its modifier--complements and adjuncts.
  - In another usage, 'predicate' just refers to the verb (or to the predicate adjective or noun in languages without copulas).
- We need to use constituency tests to prove the existence of each constituent in the tree.
  - <u>Sentence Fragment Test</u>
    - Who switched on the shipping forecasts?
      - » [$_{NP}$ These fishermen]
    - Who relied on the shipping forecasts?
      - » [$_{NP}$ These fishermen]
    - What did the fishermen do?
      - » [$_{VP}$ switched on the fishing forecast]
    - What did the fishermen do?
      - » [$_{VP}$ relied on the shipping forecast]

- Coordination test
  - [NP These fishermen] and [NP those yachtsmen] switched on the shipping forecast.
  - [NP These fishermen] and [NP those yachtsmen] relied on the shipping forecast.
  - The fishermen [VP switched on the shipping forecast] and [VP answered their cell phones].
  - The fishermen [VP relied on the shipping forecast] and [VP answered their cell phones]

- Cleft test
  - It was [NP these fishermen] who switched on the shipping forecast.
  - It was [NP these fishermen] who relied on the shipping forecast.

- Most dialects of English don't allow clefting of the VP:
  - *it's **switch on the shipping forecast** that these fishermen did.
  - *it's **rely on the shipping forecast** that these fishermen did.

- However other languages do allow it, e.g. <u>Irish</u> (and Irish English)
  - Bhí an fear ag péinteáil cathaoir
    was the man PROG paint   chair
    'The man was painting a chair.'
  - Is [_{VP} **ag   péinteáil   cathaoir**] a bhí an fear.
    Is   PROG paint   chair   that was the man
    '*It's painting a chair that the man was.

- Sometimes a test won't work for some language-specific or construction-specific reason. We must then rely on other tests.

- **Pro-form test**
  - Any string of words that can be replaced by an appropriate pro-form must be a constituent.

  - Pro-NP *they*
    » [$_{NP}$ **They**] switched on the shipping forecast.
    » [$_{NP}$ **They**] relied on the shipping forecast.

  - Pro-VP *do so*
    » These fishermen [$_{VP}$ switched on the shipping forecast], and those yachtsmen [$_{VP}$ **did so**] too.
    » These fishermen [$_{VP}$ relied on the shipping forecast], and those yachtsmen [$_{VP}$ **did so**] too.

- **Ellipsis test**
  - The omitted part of the sentence must be a constituent.

  - VP ellipsis
    » These fishermen should [$_{VP}$ switch on the shipping forecast], and those yachtsmen should **[$_{VP}$]** too.
    » These fishermen didn't [$_{VP}$ rely on the shipping forecast], but those yachtsmen did **[$_{VP}$]** for sure

  - Not all constituents can be omitted
    » *These fishermen didn't rely on [$_{NP}$ the shipping forecasts], but those yachtsmen did rely on [$_{NP}$] for sure.
    » *These fishermen didn't rely [$_{PP}$ on the shipping forecasts], but those yachtsmen did rely [$_{PP}$] for sure.
    » The complement of V or P in these cases is obligatory.

- **Movement test**
  - A sequence of words must be a constituent in order to be moved.:
  - NP preposing (topicalization):
    - » A: I know the fishermen switched off their personal stereos, but what did they do with regard to the shipping forecast?
    - » B: **The shipping forecast**, the fishermen switched on.
  - VP preposing:
    - » I said the fishermen would switch on the shipping forecast, and **switch on the shipping forecast** they did.

– We need to show ungrammatical as well as grammatical sentences to prove that two sentences have different structure:

- Sentence Fragment test
  - What did the fishermen rely on?
    » [PP **On the shipping forecast**]
  - What did the fishermen switch on?
   » ***On the shipping forecast**.

- Cleft test
  - It was [PP **on the shipping forecast**] that the fishermen usually relied.
 - *It was **on the shipping forecast** that the fishermen switched

- Coordination test
  - The fishermen relied [$_{PP}$ **on the shipping forecast**] and [$_{PP}$ **on their years of experience**].
  - *The fishermen switched **on the shipping forecast** and **on their personal stereos.**

- Ellipsis test: Gapping
  - These fishermen [$_V$ **switched on**] the shipping forecast and those yachtsmen [$_V$] their personal stereos.
  - These fishermen [$_V$ **relied**] on the shipping forecast and those yachtsmen [$_V$] on their personal stereos.
  - *These fishermen relied on the shipping forecast and those yachtsmen their personal stereos.

- P-Movement test
  - The fishermen **switched** the shipping forecast **on**.
 - *The fishermen **relied** the shipping forecast **on**.
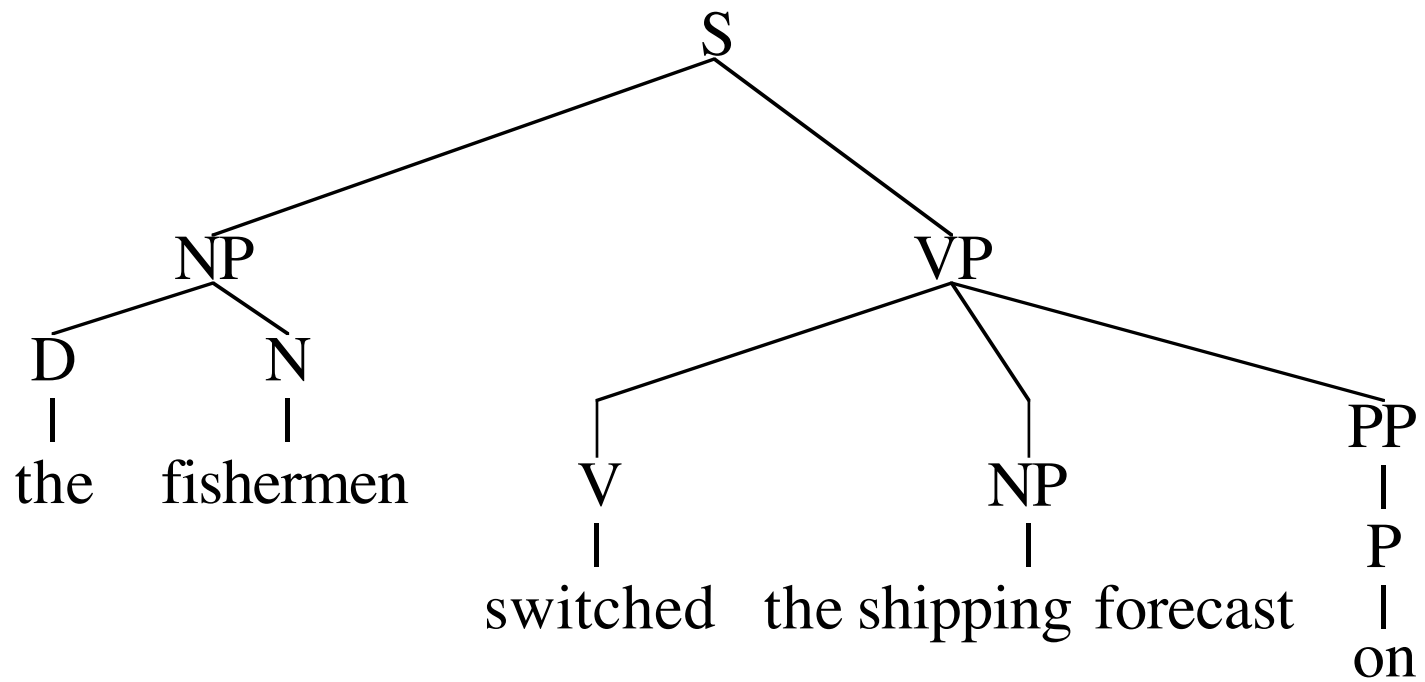
- **Coordinate structures in the tree**
  - Sequences of words which are constituents can be coordinated with one another, provided they are of the same syntactic category.
  - Coordinating conjunctions: *and, but, or, nor*
  - The coordinated conjuncts form a constituent of the same type.
 - Schema for coordination: α can stand for any category.:

$$\alpha$$
$$\alpha \quad \text{CONJ} \quad \alpha$$
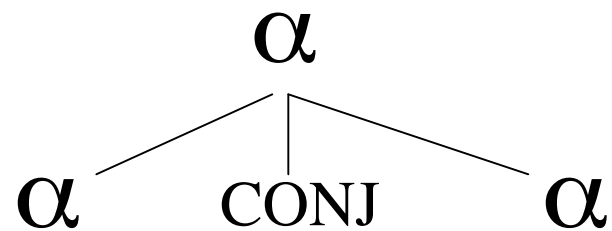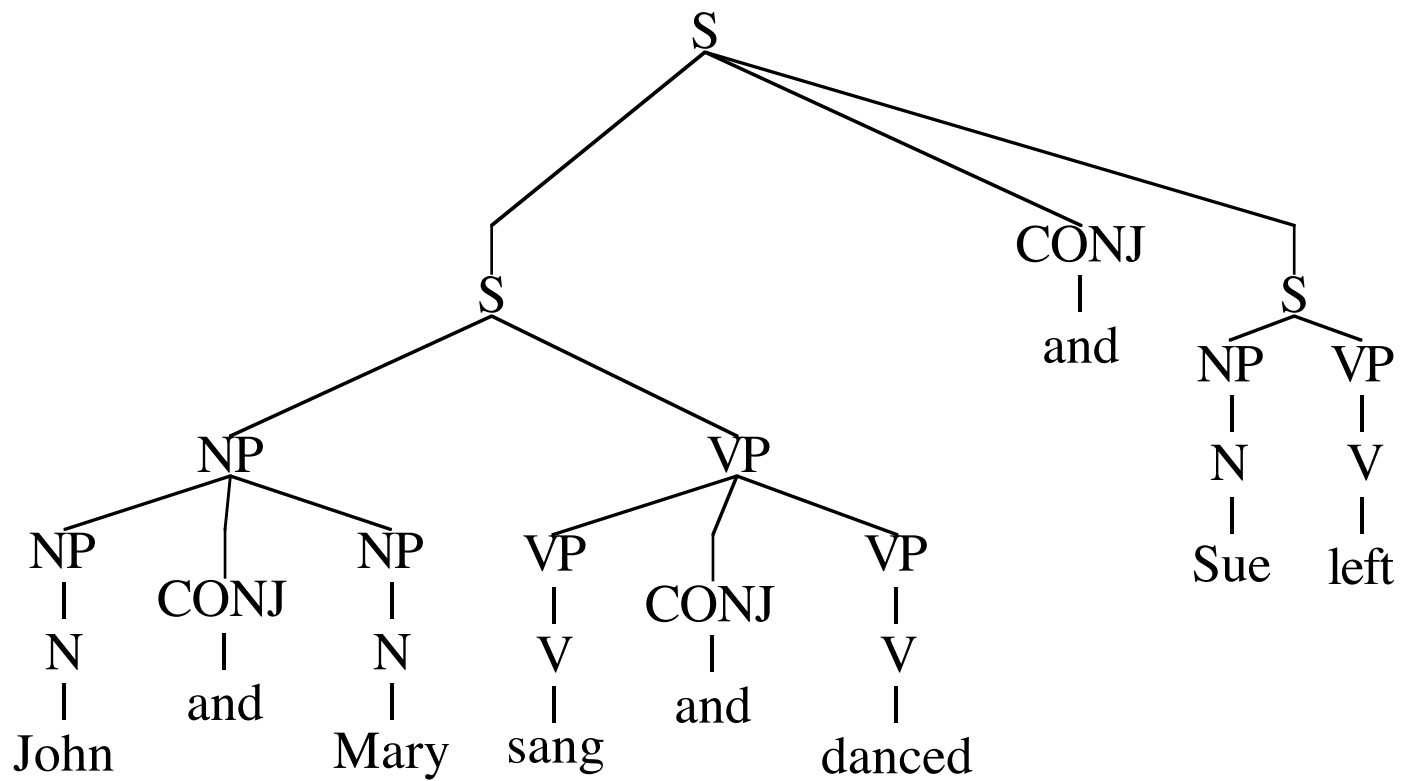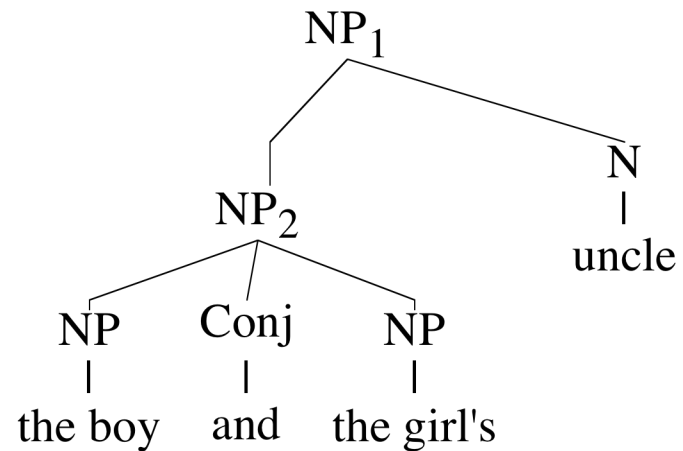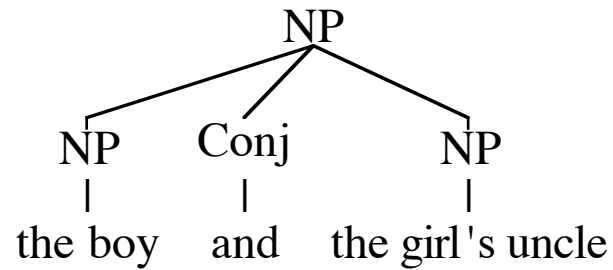
Note: Kim is [NP a brilliant lawyer] and [AP very proud of it]

- **An introduction to the bar notation**
  - The head noun together with its complement forms a constituent smaller than an NP.
    - I admired [$_{NP}$ the director's treatment of the issues]
    - I admired [$_{NP}$ the director's treatment of the issues] and [$_{NP}$ her sensitivity to the problems]
    - I admired [$_{NP}$ the director's treatment of the issues and sensitivity to the problems]
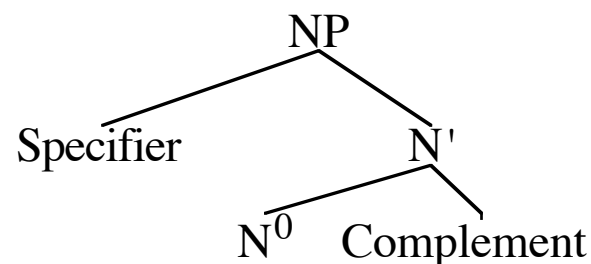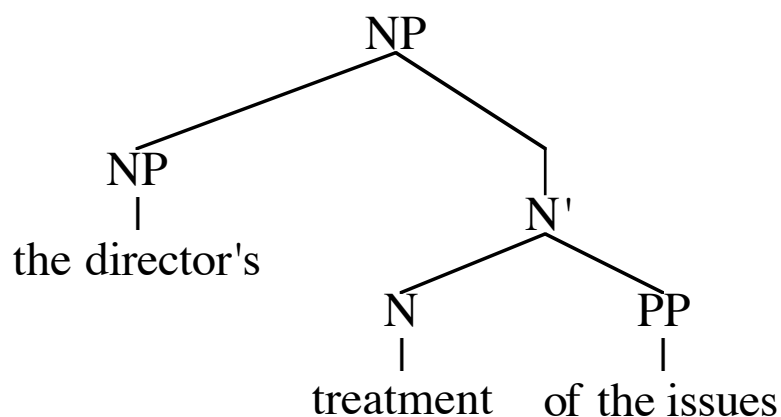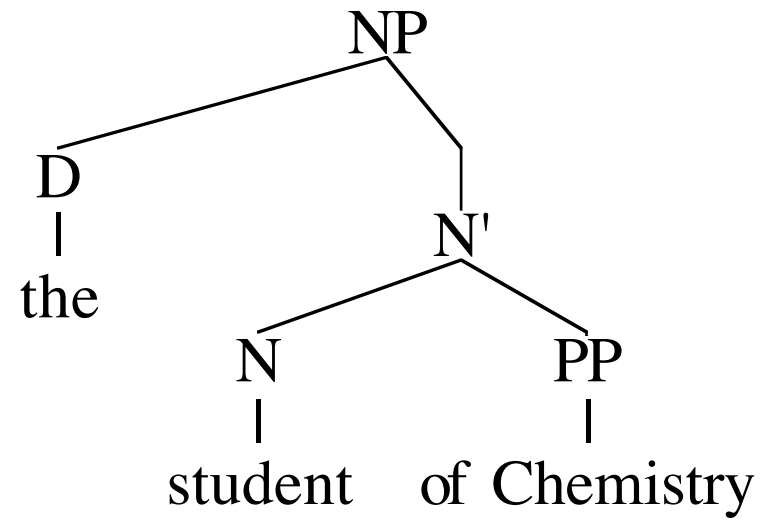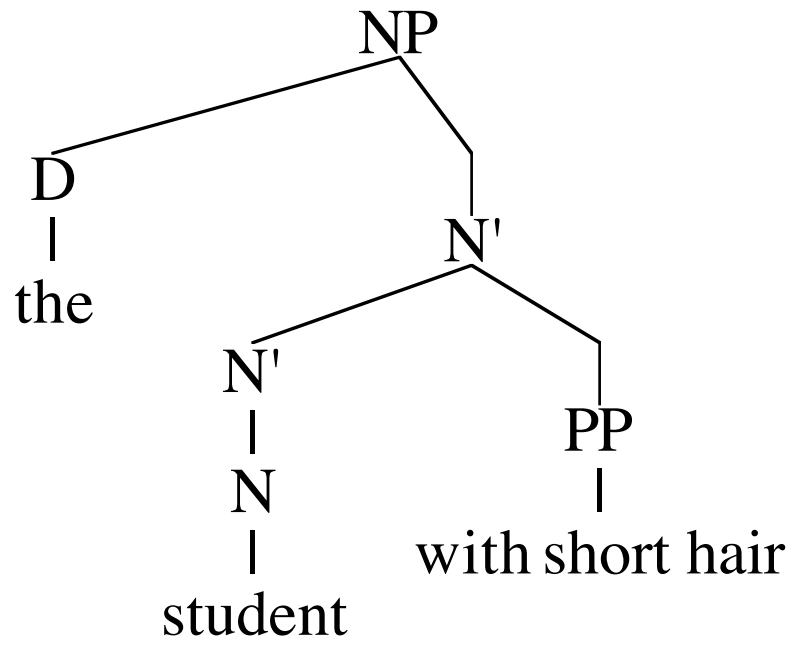
- I admired [the director's [$_{N'}$ [$_{N'}$ **treatment of the issues**] and [$_{N'}$ **sensitivity to the problems**]]]

  – Lexical head noun: N^0, 'N-zero'
  – Intermediate nominal phrase: N','N-bar'

  – N' Pro-form *one*:
    - [$_{NP}$ This [$_{N'}$ **treatment of the issues**]] is better than [$_{NP}$ that [$_{N'}$ **one**]]

- **Tests for complement versus adjunct**
  - Pro-N' *one* test
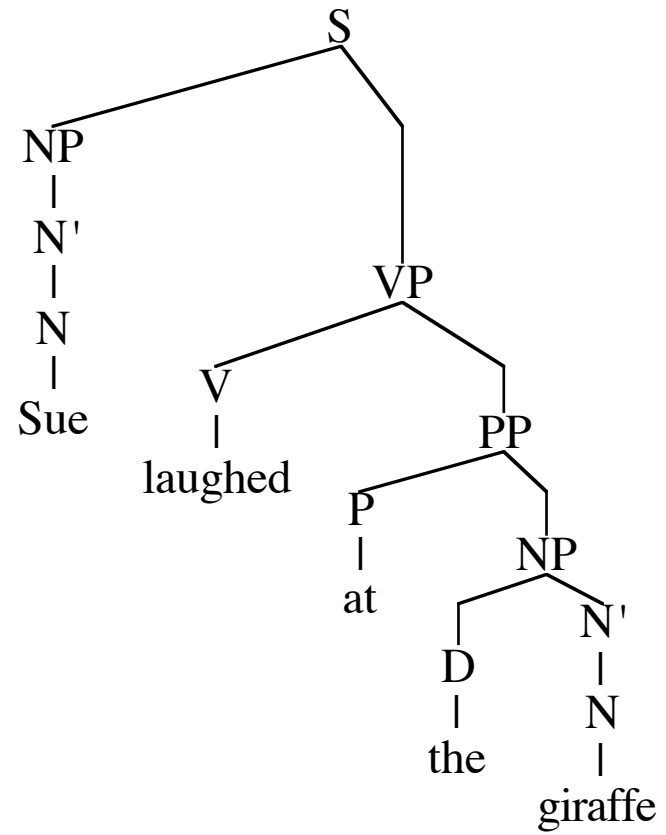   - I like the student <u>with short hair</u>.   Adjunct
    - I like the student <u>of chemistry</u>.   Complement

    - [$_{NP}$ The [$_{N'}$ [$_N$ **student**]] with long hair] is smarter than the **one** with short hair.

    - *[$_{NP}$ The [$_{N'}$ [$_N$ **student**] of physics]] is smarter than the **one** of chemistry.

    - The pro-N' *one* must replace a whole N', not just the head noun.

Tree 1:

```
              NP
           /      \
         D          N'
         |        /    \
        the     N'      PP
                |        |
                N    with short hair
                |
             student
```

Tree 2:

```
              NP
           /      \
         D          N'
         |        /    \
        the     N       PP
                |        |
             student  of Chemistry
```

– Pro-VP *do so* test

- John worked <u>at the office</u>.   Adjunct
- John laughed <u>at the clown</u>.   Complement

- John **worked** at the office, and Sue **did so** at her house.
- *John **laughed** at the clown, and Sue **did so** at the giraffe.

- *Do so* must replace a whole VP, not just a part of one.

Tree 1 (left)

S
- NP
  - N'
    - N
      - Sue
- VP
  - VP
    - V
      - worked
  - PP
    - P
      - at
    - NP
      - D
        - her
      - N'
        - N
          - house

Tree 2 (right)

S
- NP
  - N'
    - N
      - Sue
- VP
  - V
    - laughed
  - PP
    - P
      - at
    - NP
      - D
        - the
      - N'
        - N
          - giraffe
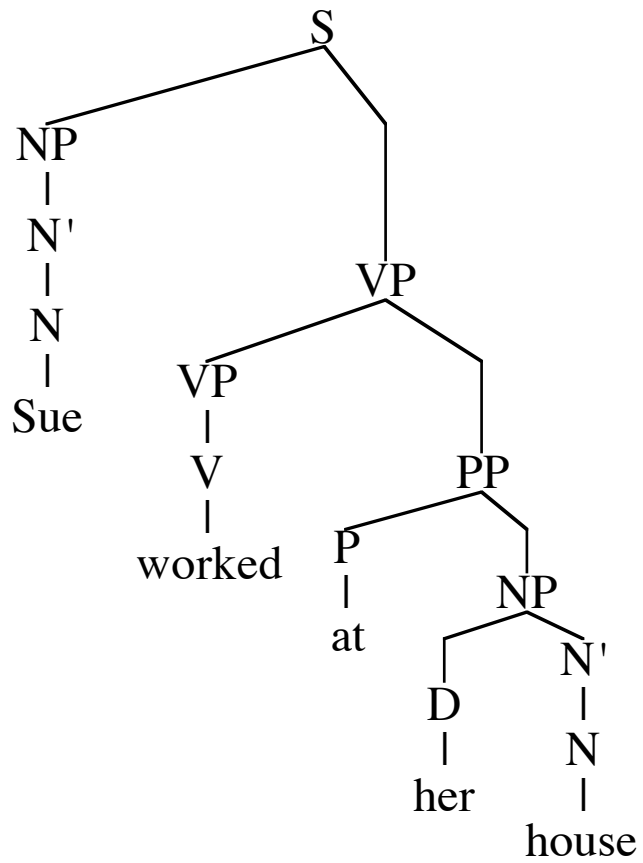
– VP Pseudocleft test

- What Sue **did** <u>at her house </u>was **work**.
- *What Sue **did** <u>at the giraffe</u> was **laugh.**

- Only a whole VP, not just part of one, can move to the focus position of a pseudocleft and be replaced by *do*.
- Only an adjunct can be "left behind" in a VP pseudocleft.

– Schema for adjunction:

- α is a head or a projection of a head, β is the adjunct:

$$
\begin{array}{c}
\alpha \\
\diagup \diagdown \\
\alpha \quad \beta
\end{array}
$$

$$
\begin{array}{c}
N' \\
\diagup \diagdown \\
N' \quad PP
\end{array}
\qquad
\begin{array}{c}
VP \\
\diagup \diagdown \\
VP \quad PP
\end{array}
$$