- **Structural ambiguity**
- **Modifier phrases**

Background reading and preparation:

- *CL* Ch 5, §5.1
- *CL* Ch 6, §3.2
- Recommended: Video "Structural Ambiguity" (by Ling Vids)

1. Review and context for this discussion

- Syntax is **creative**: The mental grammar has a way of **building sentences** (and understanding them)
- Linguists want to know: How does this work?
- Goal is to build a syntax **model** that can:
  - Produce only sentences that native speakers find **grammatical**
  - Make the right predictions about which words in a sentence form **constituents** (units, subgroups)
- Building an effective model helps us understand the properties of the actual human mental grammar

1. Review and context for this discussion

- A big piece of our model of the syntax component of human mental grammar is the **X' schema**
  - Word combinations that **don't fit** into the X' schema are predicted to be **ungrammatical**
  - Anything that is an **XP** in the X' schema is predicted to be a **constituent**

- If human speakers differ from our model in terms of what is grammatical or what is a constituent, we need to **adjust** our model!

1. Review and context for this discussion

Some useful constituency tests (*CL* Ch 5, sec 1.4)

- Which words do **native speakers** group as **constituents**?
- Our **trees** should treat any **constituent** as an **XP**

- **Substitution test:** Can the group of words be **substituted by a single word** (or *do so*)?
- **Movement test:** Can the group of words be **moved** as a unit (often to the front of the sentence)?
- **Coordination test:** Can the group of words be **linked by a conjunction** to another group of words already known to be a constituent?

2. Structural ambiguity

- How many meanings does this sentence have?

Ingrid saw the Martian with a telescope

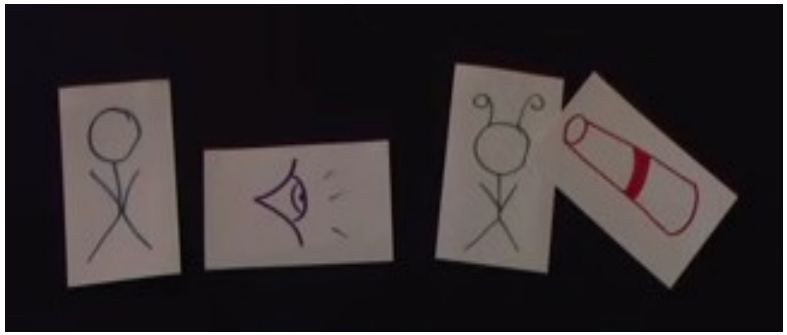
(this sentence is from the Ling Vids video)

2. Structural ambiguity

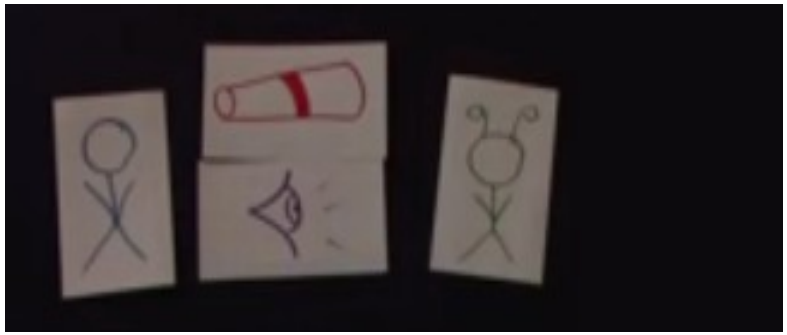
- This sentence has **two possible meanings**

Ingrid saw the Martian with a telescope

#1: **the Martian has**
a telescope



#2: **the seeing happened by means of**
a telescope



(graphics from the Ling Vids video)

2. Structural ambiguity

- This sentence has **two possible meanings**

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→ How can the mental grammar give two different meanings to the same set of words?

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  → How can the mental grammar give two different meanings to the same set of words?

- Remember *unlockable*? How did we account for the fact that this **word** had **two meanings**?
  - 'able to be unlocked' / 'not able to be locked'

2. Structural ambiguity

- This sentence has **two possible meanings**

  Ingrid saw the Martian with a telescope

  → How can the mental grammar give two different meanings to the same set of words?

- Remember *unlockable*? How did we account for the fact that this **word** had **two meanings**?
  - Two word trees: [*un-lock*]+*able*, *un*+[*lock-able*]
  - We can take a similar approach in syntax: if a sequence of words can have **more than one structure**, it can have more than one meaning

2. Structural ambiguity

- This sentence has **two possible meanings**

Ingrid saw the Martian with a telescope

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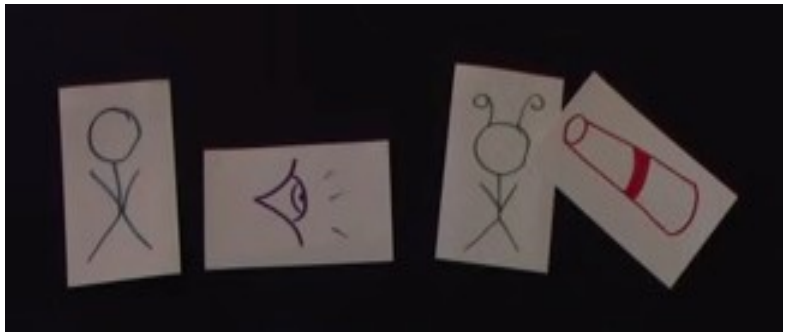

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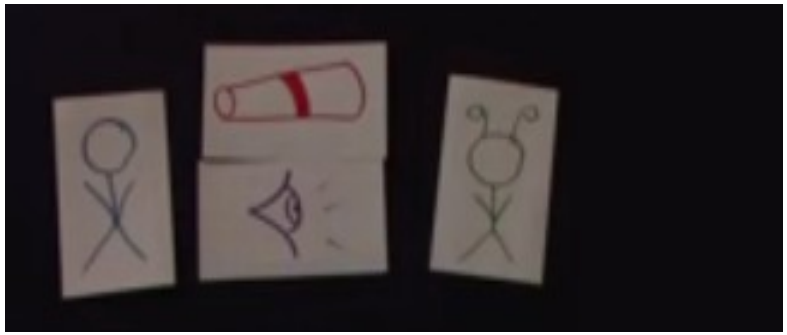

- So we need our mental grammar to be able to give it **two different structures**

2. Structural ambiguity

- **Which group of words** is a **constituent** in the mental grammar of a native speaker?

Ingrid saw *the Martian with a telescope*.

Ingrid saw *it*.

Ingrid saw *the Martian* *with a telescope.*

Ingrid saw *it* *with a telescope.*

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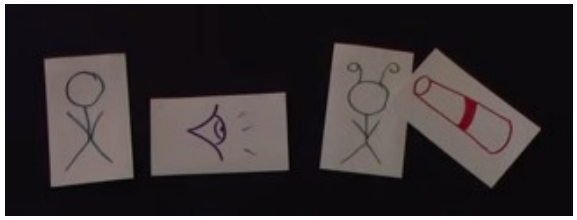

Ingrid saw *the Martian* *with a telescope.*

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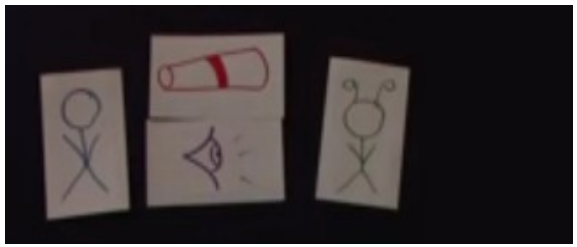


→ It depends on **which meaning** we consider!

2. Structural ambiguity

- **Which group of words** is a **constituent**?

#1: **the Martian has** a telescope

*Ingrid saw **[the Martian with a telescope]**.*

✔ *Ingrid saw **it**.*

✘ *Ingrid saw it with a telescope.*

#2: **the seeing happened by means of** a telescope

*Ingrid saw **[the Martian]** with a telescope.*

✘ *Ingrid saw it.*

✔ *Ingrid saw **it** with a telescope.*

2. Structural ambiguity

- As things now stand…

  If we apply our X' schema to this sentence, there is **only one tree** that we can construct

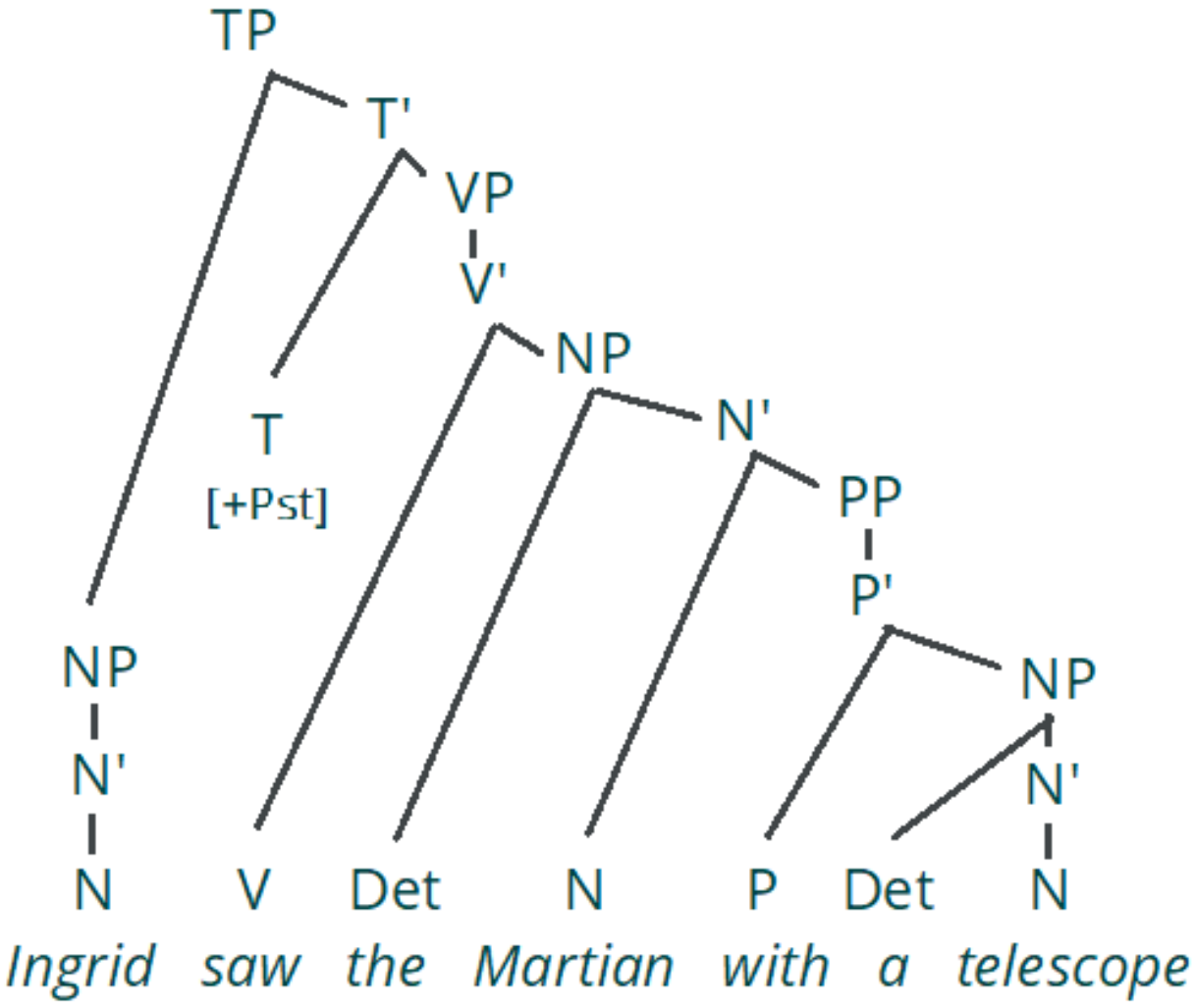
  - Try it: What does your tree look like?

Ingrid saw the Martian with a telescope

- Reminders for sentence trees
  - Start by labeling word categories
  - Find subject and predicate
  - Heads (N V A P T) project phrases
  - Specifiers are “special”—each XP category has particular kinds

2. Structural ambiguity

- Were you able to draw this tree?



2. Structural ambiguity

- **Which meaning** goes with this tree? How can we tell?

#1: **the Martian has** a telescope

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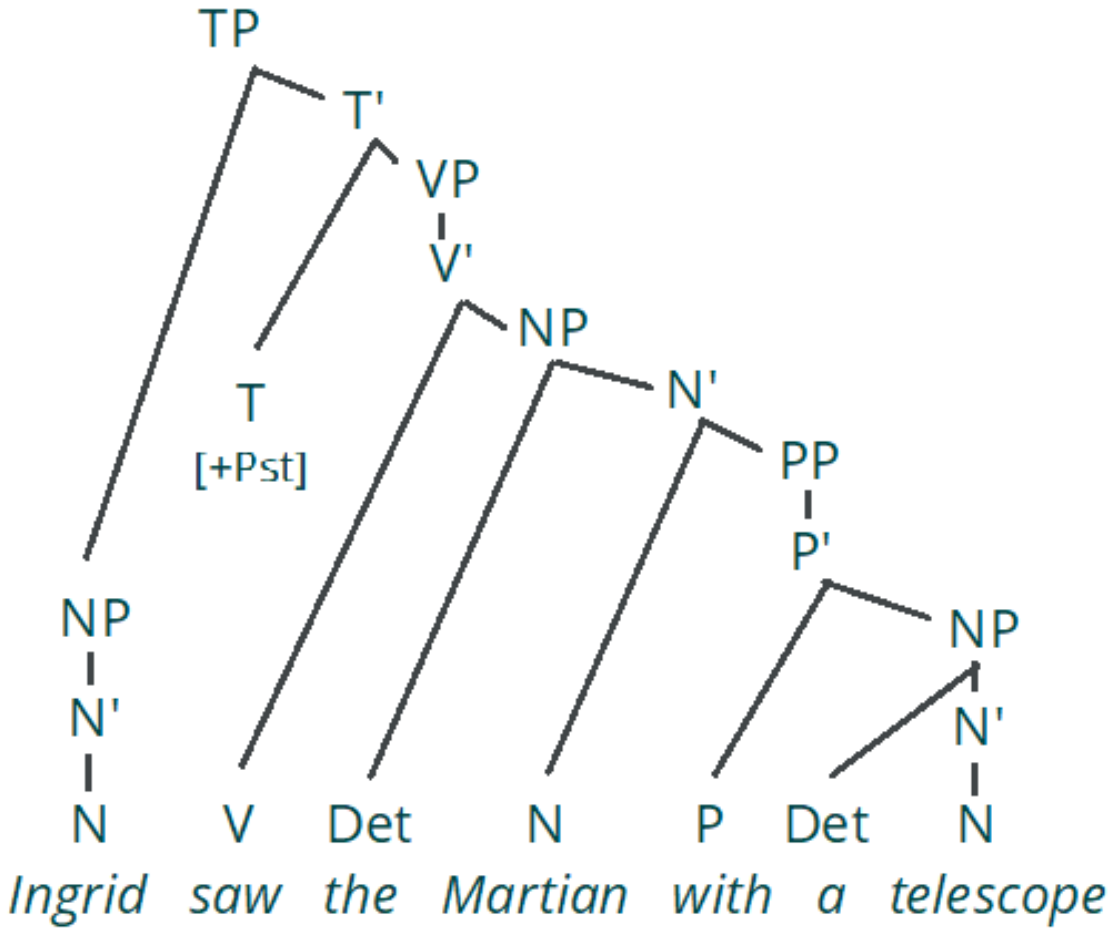

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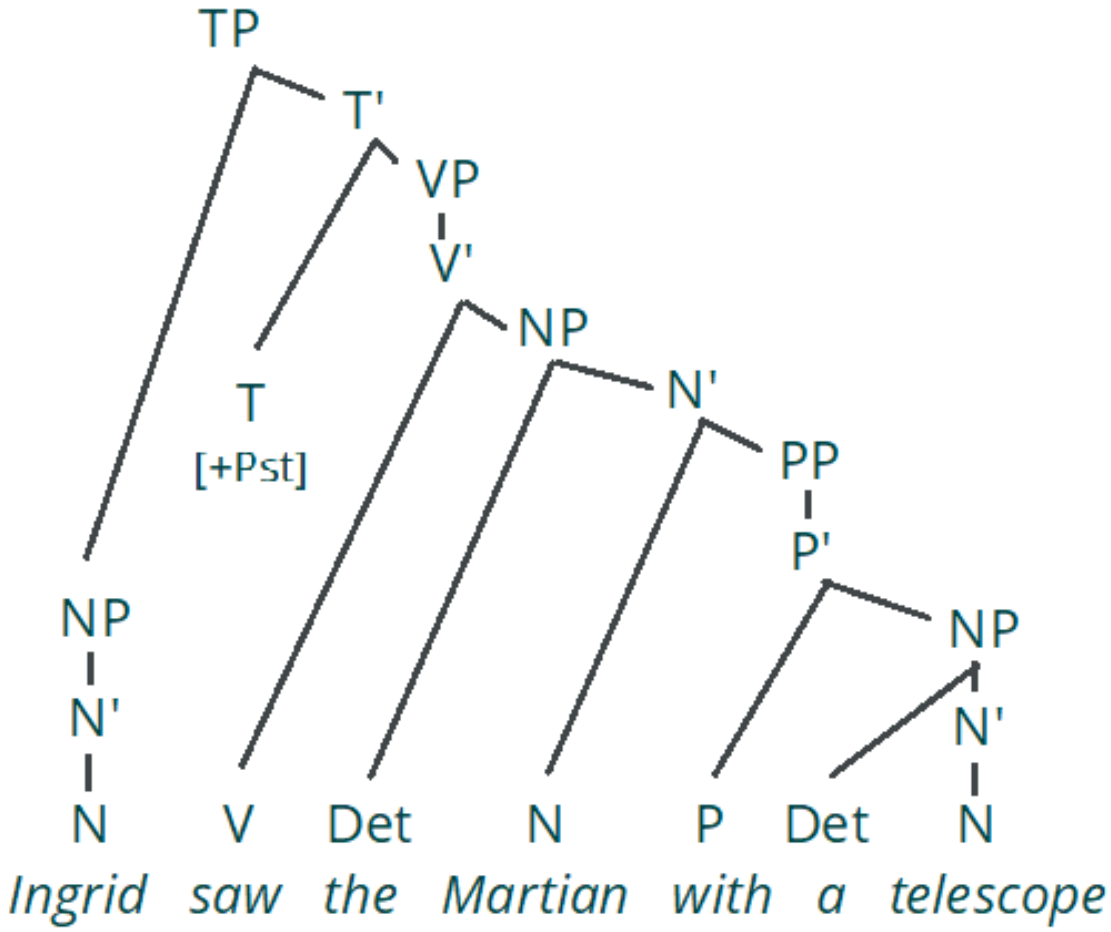


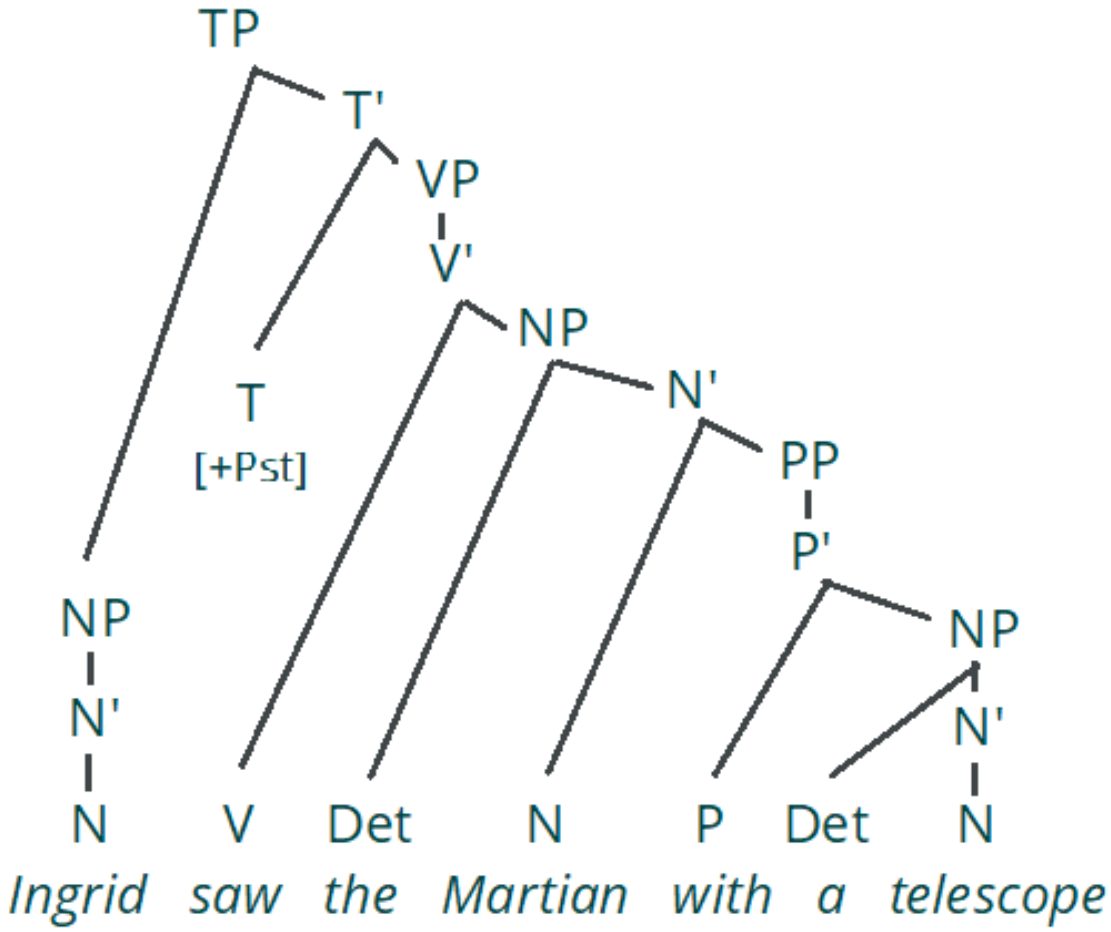
→ **Check for constituency!**

2. Structural ambiguity

- **Which meaning** goes with this tree? How can we tell?

#1: **the Martian has** a telescope

[the Martian with a telescope] *is a constituent* (NP)



2. Structural ambiguity

- How do we get the other meaning?

- Reminder…
  If human speakers differ from our model in terms of what is grammatical or what is a constituent, we need to **adjust** our model!

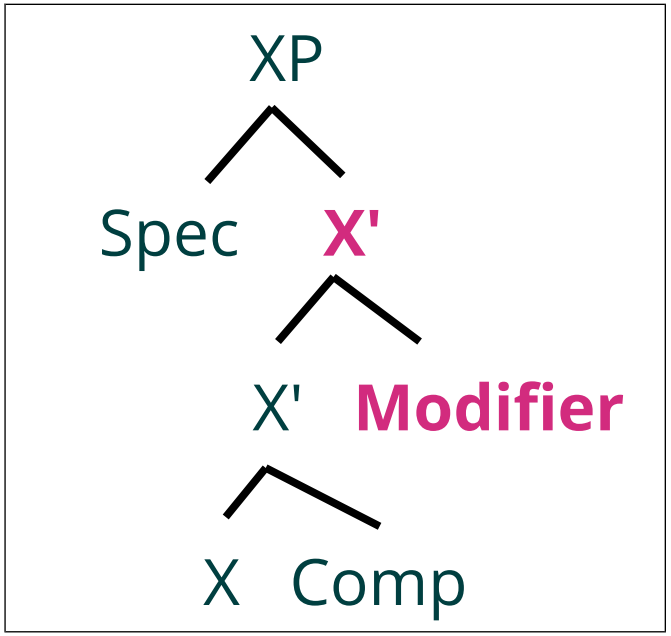
3. Modifiers

- This example shows us that we need **more options** for syntactic structure than the basic X' schema allows

  → One further development: **modifiers**

3. Modifiers

- One further development: **modifiers**
  - Modifiers are optional, extra information about the head of a phrase
  - They are included in the X' schema by **repeating the X' level** — modifiers combine with X' and the new node formed is also X'



  - Which side of the X' a modifier appears on (left or right) depends on the type of modifier

3. Modifiers

- Example: What is the structure of this phrase?
  - What is always the first step?

those very expensive cars

3. Modifiers

- Example: What is the structure of this phrase?
  - What kind of XP is this? What is the **head**?

Det Deg A N

those very expensive cars

3. Modifiers

- Example: What is the structure of this phrase?
  - What other word here is a head that needs XP?

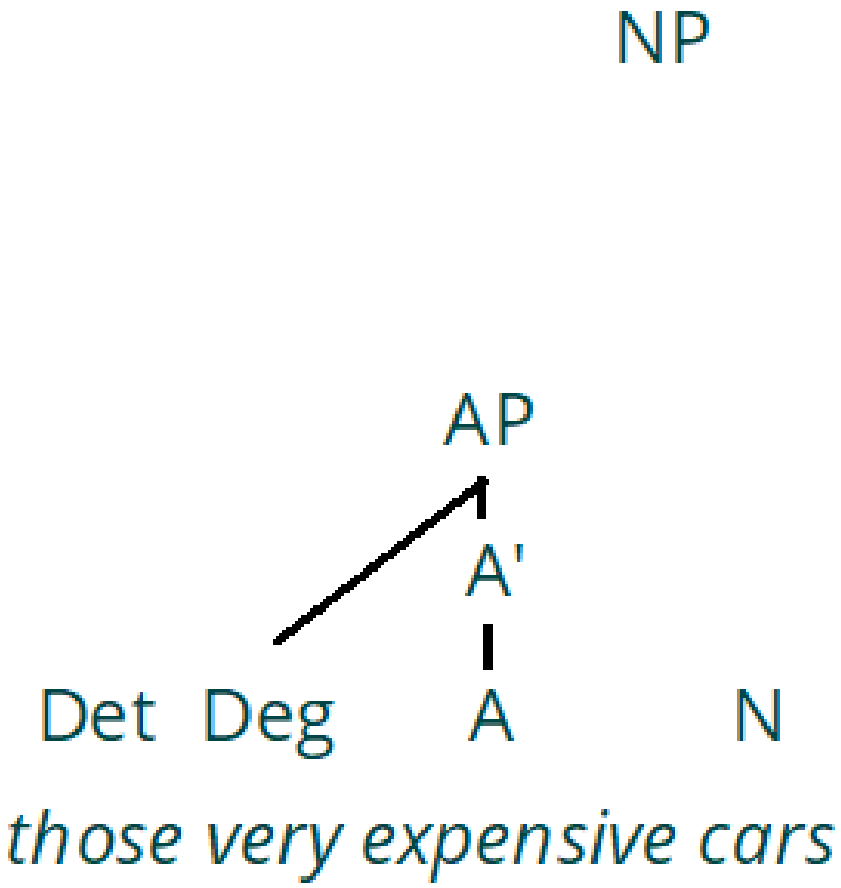
NP

Det Deg A N

those very expensive cars

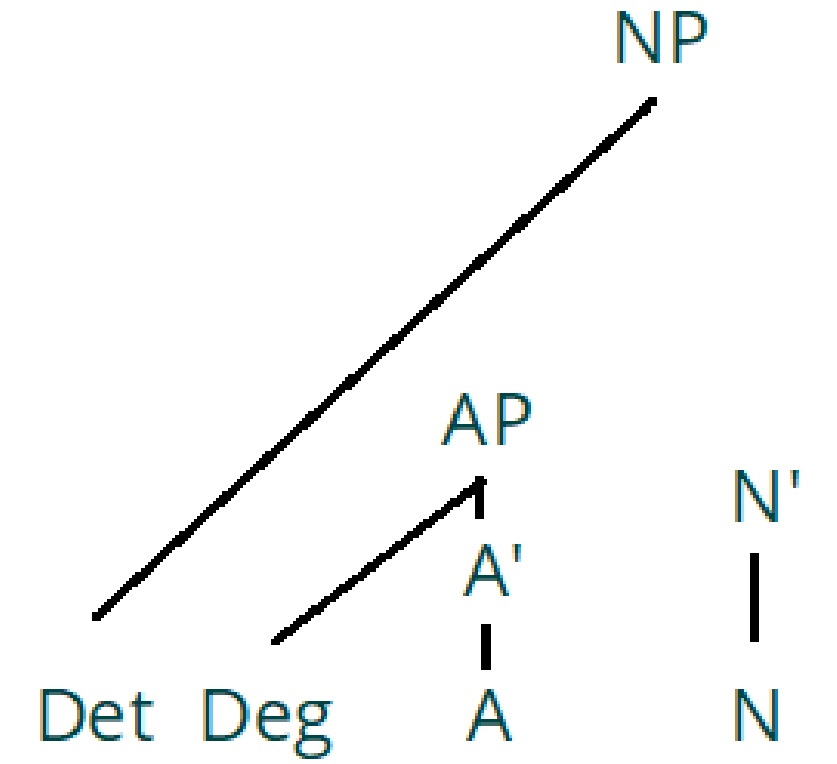
3. Modifiers

- Example: What is the structure of this phrase?
  - Can the AP be a **complement** of the N?



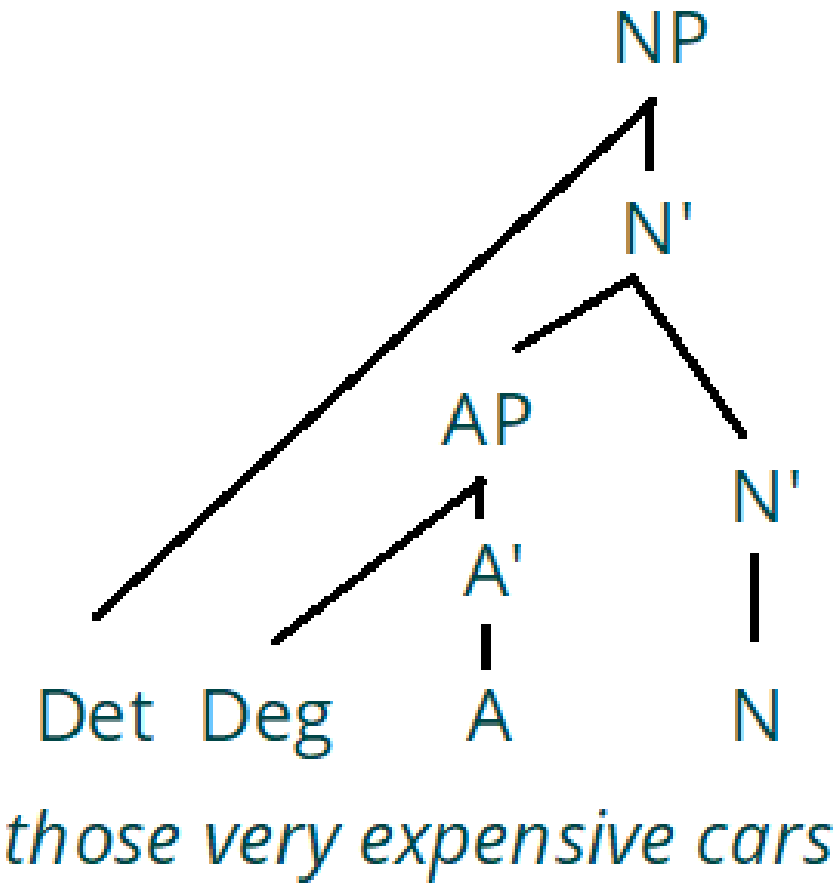
3. Modifiers

- Example: What is the structure of this phrase?
  - The AP is on the **wrong side** to be a complement



3. Modifiers

- Example: What is the structure of this phrase?
  - The AP must be a **modifier**: add another **N'**



3. Modifiers

- Since a modifier is an “add-in” to the X' schema, there can be **multiple** modifiers in an XP
  - There can be unlimited APs in an NP!

    those red cars

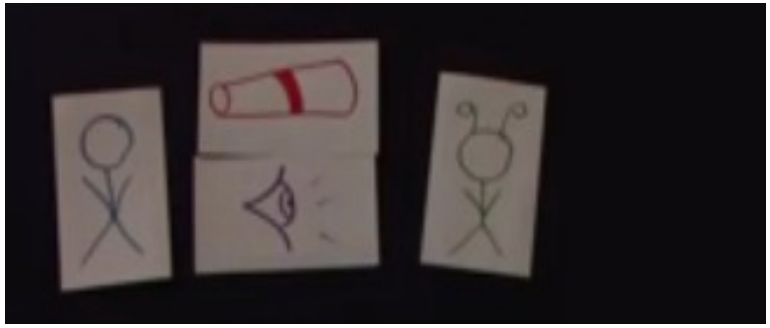
    those expensive red cars

    those big expensive red cars

    (etc.)

3. Modifiers

- Now that our X' model contains **modifiers**, we have a way to represent the structure of meaning #2:



#2: **the seeing happened by means of** a telescope

*Ingrid saw **[the Martian]** with a telescope.*

✘ *Ingrid saw it.*

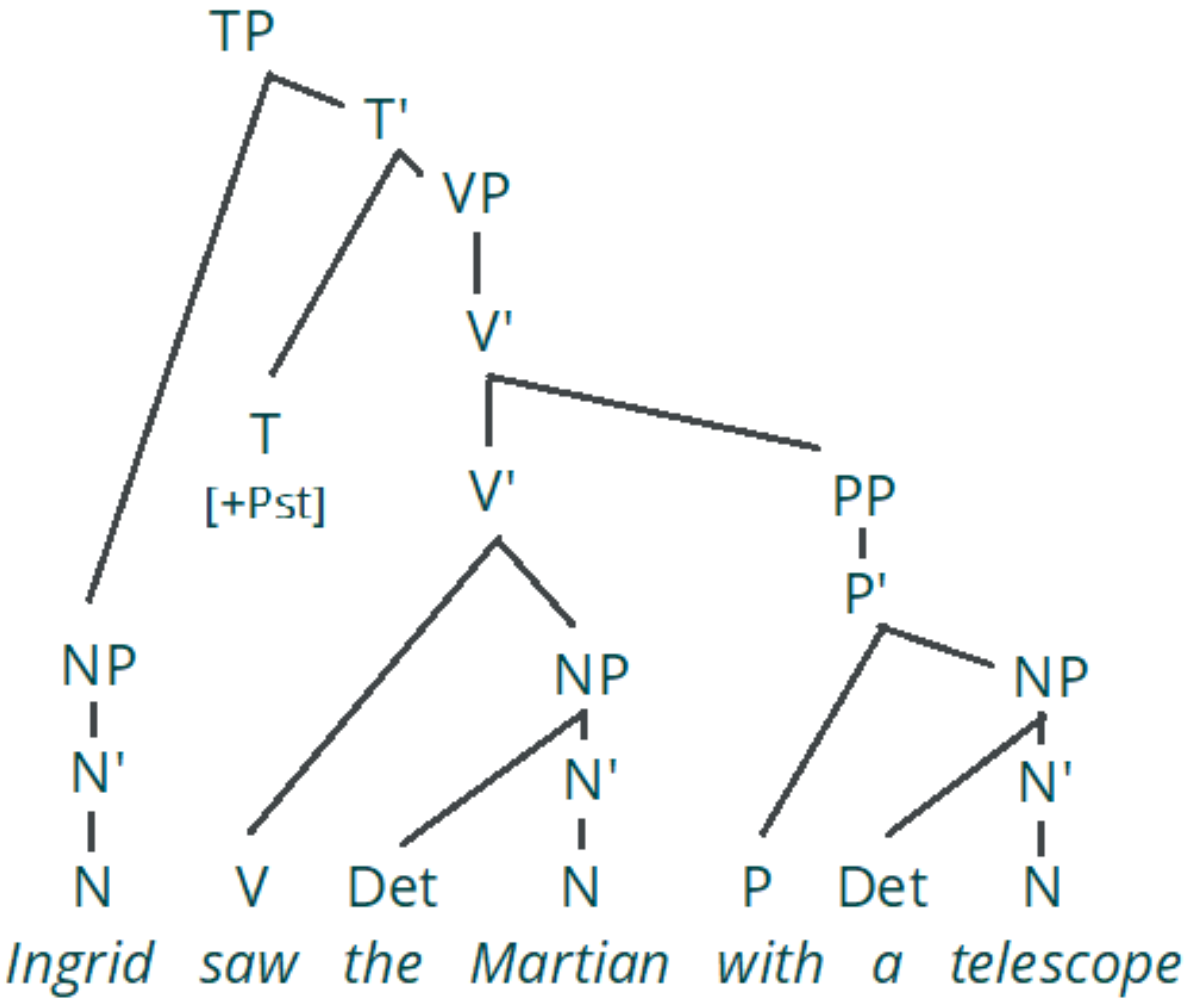
✔ *Ingrid saw **it** with a telescope.*

3. Modifiers

- In this meaning, the PP *with a telescope* is telling us something about the V *saw*
  - But it's **not** the complement of saw — that's *the Martian*
  - We also note that the V *see* **doesn't require** a PP (the way the V *put* requires one)
- So we conclude that this PP is a **modifier** in the VP whose head is *saw*

3. Modifiers

- We conclude that this PP is a **modifier** in the VP



3. Modifiers

- Now we have seen three different structures for a **V NP PP** sequence — which do we use when?
  - Consider **constituency**: Is the PP inside the NP, as in [*the Martian with a telescope*]?
  - If the PP is outside the NP and in the VP somewhere: Is it **required** by the V (as with *put*)?
    - If so, use the **double-complement** structure (3-way branching V')
    - Otherwise, treat it as a **modifier**

3. Modifiers

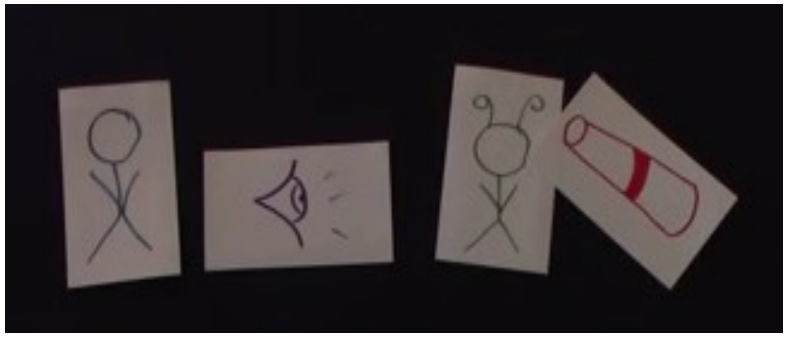
- More generally, when to use the modifier structure? Given [**X YP**], is YP a **complement** or a **modifier**?
- For this class, **use the basic X' schema whenever possible** — only treat a phrase as a modifier if:
  - there are phrases that wouldn't otherwise fit into the XP schema (like an AP before a N), or
  - **constituent structure** requires it: [*saw* [*the Martian*] [*with a telescope*]]
  - There are advanced syntactic theories about systematically distinguishing modifiers from complements, but we won’t pursue this

4. Two meanings — two structures

- Returning to the original problem:
  This sentence has **two possible meanings**

Ingrid saw the Martian with a telescope

#1: **the Martian has**
a telescope



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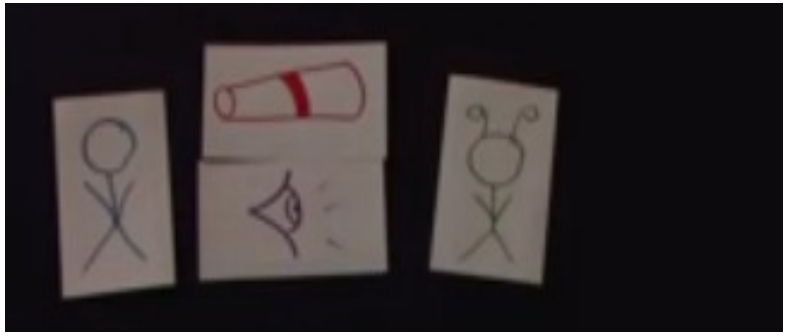
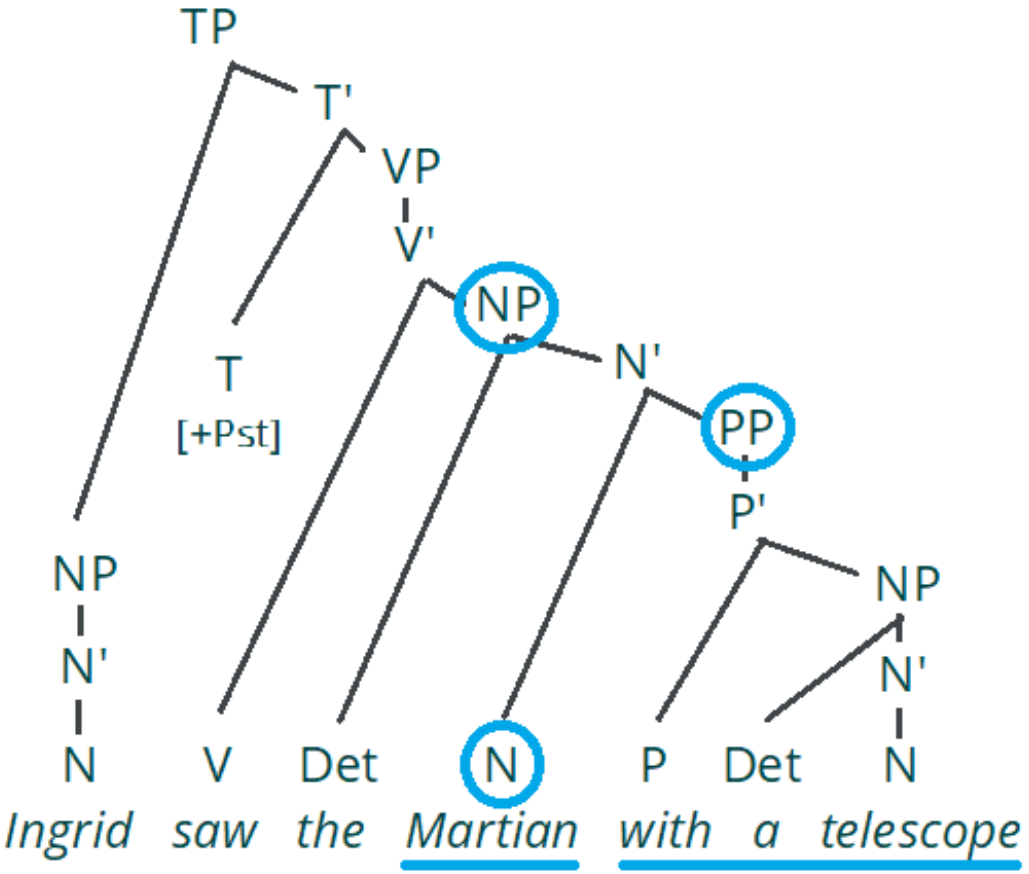


- These **two meanings** need **two structures**

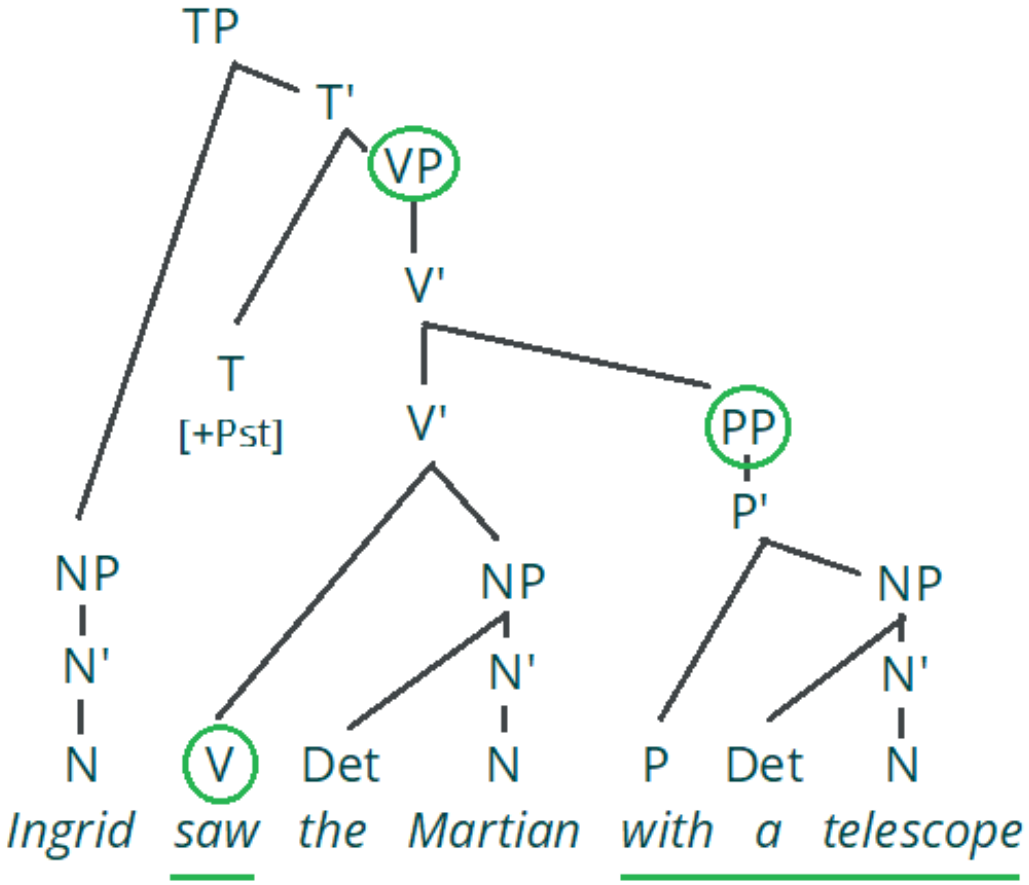
4. Two meanings — two structures

- ***Ingrid saw*** [***the Martian*** [***with a telescope***]]
  - the PP tells us something about *Martian*, so it is under the NP whose head is *Martian*



4. Two meanings — two structures

- ***Ingrid*** [***saw*** [***the Martian***] [***with a telescope***]]
  - the PP tells us something about *saw*, so it is under the VP whose head is *saw*



5. Some examples to practice

- Try it: Draw trees for these sentences, some of which need the modifier structure

  (1) Grover put the book on the table.

  (2) A very large green balloon floated by.

  (3) Susan will follow the man in my car.

  - Do any of these sentences have two meanings, corresponding to two different tree structures?
  - If so, how are the meanings related to the structures?

→ Answers will be posted later for you to check