

- **Heads and phrases**
- **The X' schema**

Background reading:

- CL Ch 5, §1 through §1.2 (§1.1 is review)
- CL Ch 5, Appendix sections on Merge

0. Course information

- **HW #6 is due**

- Please put it in the pile on the table that is labeled with your TA's name & recitation number
- **Make sure your recitation number is visible on your homework paper!**

Yuhan (10:10) —601

Esther (10:10) —602

Esther (11:15) —603

Yuhan (11:15) —604

1. Syntax in our model of mental grammar

- Our goal for syntax is:

Develop a model of mental grammar that can...

- Produce sentences that native speakers find **grammatical**, and not produce sentences that native speakers find ungrammatical
- Make the right predictions about which words in a sentence form **constituents** (units, subgroups)

1. Syntax in our model of mental grammar

- Last time, we discussed **constituent structure**:
“Sentences are not formed by simply stringing words together like beads on a necklace.” (CL, p 172)
 - Native speakers have intuitions about how words in a sentence are grouped into **constituents**
 - *Review:* How did we collect **data** about this?
 - Our **model** of the mental grammar needs to create the same constituents that native speakers do
- Today, we will start building this model

2. Types of phrases

- Consider these sentences:

Books are great.

These books about travel are great.

The books about travel on a budget are great.

I read books.

I read these books about travel.

I read the books about travel on a budget.

- Are the underlined groups of words **constituents**?
(How can we check?)

2. Types of phrases

- Consider these sentences:

Books are great.

These books about travel are great.

The books about travel on a budget are great.

→ These pass Substitution, Coordination tests

I read books.

I read these books about travel.

I read the books about travel on a budget.

→ These pass Substitution, Movement, Coordination tests

- These are all constituents — of the same type

2. Types of phrases

- What do these phrases all have in common?

books

these books about travel

the books about travel on a budget

- They all include the word *books*
- They all indicate “some kind of books”
- They can all take the same position in the sentence, and can be replaced with the same kinds of words in the Substitution test

2. Types of phrases

- We conclude: these are all the **same type** of phrase
 - books
 - these books about travel
 - the books about travel on a budget
- Our **model** of syntax includes these proposals:
 - A phrase has a **head**, that is, a “core word”
 - The type of the phrase is determined by its head
- What is the word category of *books*? ____
 - These phrases are all ...

2. Types of phrases

- We conclude: these are all the **same type** of phrase
 - books
 - these books about travel
 - the books about travel on a budget
- Our **model** of syntax includes these proposals:
 - A phrase has a **head**, that is, a “core word”
 - The type of the phrase is determined by its head
- What is the word category of *books*? **N (noun)**
 - These phrases are all **NPs (noun phrases)**

2. Types of phrases

- Now consider these sentences:

I will read.

I will read books.

I will read books about travel.

I will always read those books.

- Are the underlined groups of words **constituents**?

2. Types of phrases

- Consider these sentences:

I will read.

I will read books.

I will read books about travel.

I will always read those books.

→ These pass Substitution, (Movement), Coordination tests

- These are all constituents — of the same type

2. Types of phrases

- What do these phrases all have in common?

read

read books

read books about travel

always read those books

- They all include the word *read*
- They all indicate “some kind of reading”
- They can all take the same position in the sentence, and can be replaced with the same kinds of words in the Substitution test

2. Types of phrases

- We conclude: these are all the **same type** of phrase
 - read
 - read books
 - read books about travel
 - always read those books
- Our **model** of syntax includes these proposals:
 - A phrase has a **head**, that is, a “core word”
 - The type of the phrase is determined by its head
- What is the word category of *read*? ____
 - These phrases are all ...

2. Types of phrases

- We conclude: these are all the **same type** of phrase
 - read
 - read books
 - read books about travel
 - always read those books
- Our **model** of syntax includes these proposals:
 - A phrase has a **head**, that is, a “core word”
 - The type of the phrase is determined by its head
- What is the word category of *read*? **V (verb)**
 - These phrases are all **VPs (verb phrases)**

2. Types of phrases

- One more set of sentences to consider:

They went across.

They went across the street.

They went right across this state.

- Are the underlined groups of words **constituents**?

2. Types of phrases

- Consider these sentences:

They went across.

They went across the street.

They went right across this state.

→ These pass Substitution, Movement, Coordination tests

- These are all constituents — of the same type

2. Types of phrases

- What do these phrases all have in common?

across

across the street

right across this state

- They all include the word *across*
- They all indicate “some kind of location/direction across”
- They can all take the same position in the sentence, and can be replaced with the same kinds of words in the Substitution test

2. Types of phrases

- We conclude: these are all the **same type** of phrase
across
across the street
right across this state
- Our **model** of syntax includes these proposals:
 - A phrase has a **head**, that is, a “core word”
 - The type of the phrase is determined by its head
- What is the word category of *across*? ____
 - These phrases are all ...

2. Types of phrases

- We conclude: these are all the **same type** of phrase
across
across the street
right across this state
- Our **model** of syntax includes these proposals:
 - A phrase has a **head**, that is, a “core word”
 - The type of the phrase is determined by its head
- What is the word category of *across*? **P (preposition)**
 - These phrases are all **PPs (prepositional phrases)**

2. Types of phrases

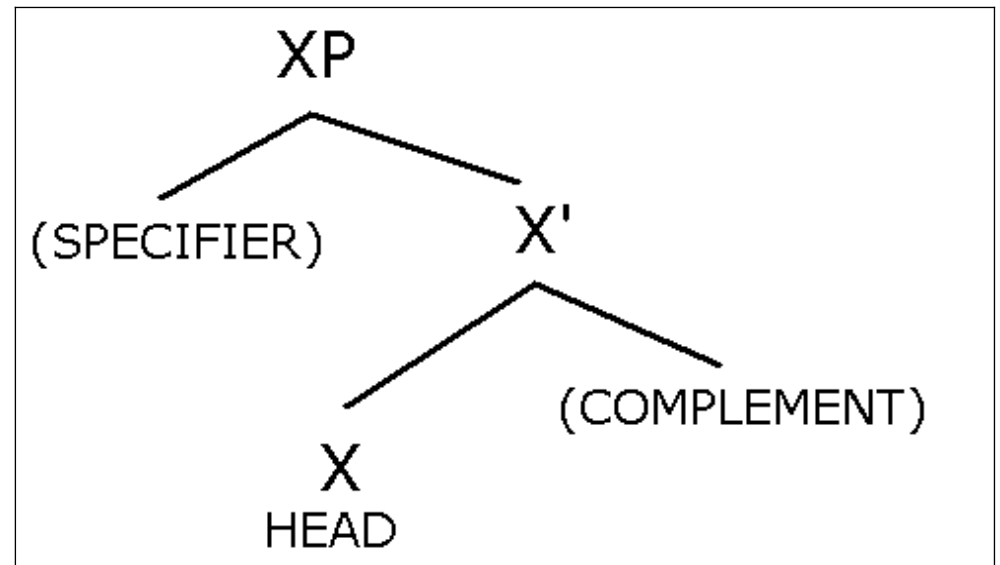
- A few further notes about **prepositions (P)**
 - They usually indicate location or relationship
 - Table 5.3 unfortunately doesn't include any **distributional tests** for P, but here is one:
 - P can (usually) occur after *right*, as in:
 - right across the state*
 - right along*
 - right with the crossing guard*
 - PPs inside NPs sometimes fail constituency tests; look for common Ps *of, with, about, from, for, by*

2. Types of phrases

- We can see some **common patterns** here!
NP: (these) books (about travel)
VP: (always) read (those books)
PP: (right) across (the state)
- Our **model** of phrase and sentence structure will need to capture the fact that different types of phrases have similar internal structures

3. The X' schema

- The **X'** (X bar) **schema** is a key piece of our model of the syntax component of human mental grammar



- Another key piece of our model is the **Merge** operation (*CL*, p 175), which fits words into the X' schema to make **phrases**

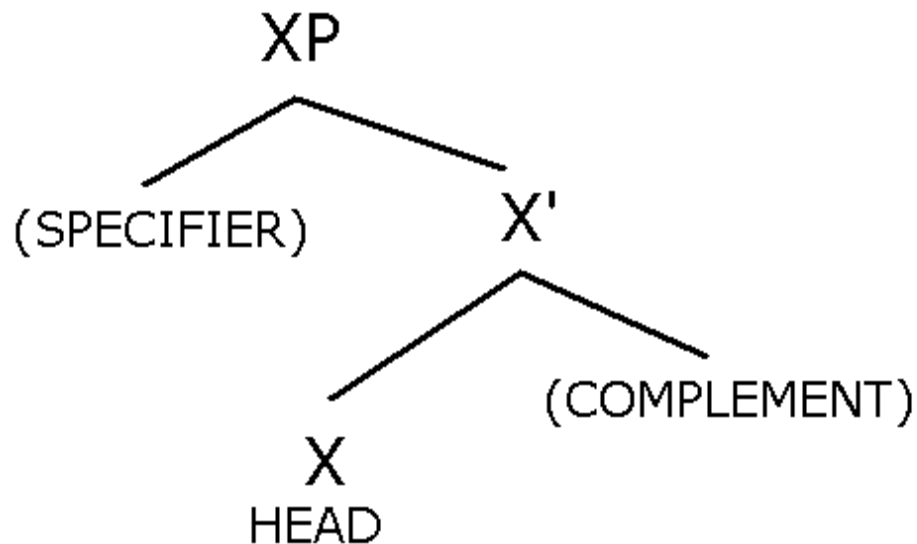
Merge: Combine words in a manner compatible with the X' schema.

3. The X' schema

- The **X' schema** is a key piece of our model of the syntax component of human mental grammar
 - 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**
- *Coming soon:* If we find that human speakers differ from our model in terms of what is grammatical or what is a constituent, we will need to **adjust** our model!

3. The X' schema

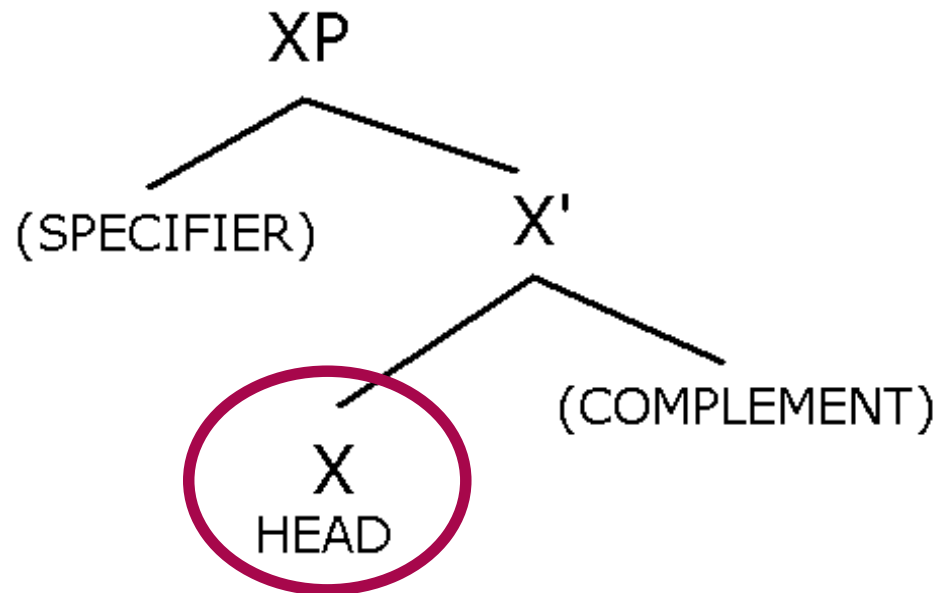
- **X' schema:** blueprint for phrases
 - Proposal: **All phrases** fit into this structure



- An element in parentheses (...) is **optional**
 - **All** phrases have **heads**
 - **Not all** phrases have complements or specifiers

3. The X' schema

X' schema:



- **head**—**word**-level category (N, V, A, P, T, and C); determines the **category** of the whole phrase
 - These category types always project (create) an XP — an N is always part of an NP, etc.

3. The X' schema

Categories we will use to label words in trees:

- Lexical categories and their phrases

N	→	NP
V	→	VP
A	→	AP
P	→	PP

- Functional categories
(see *CL* p 169, Table 5.1)

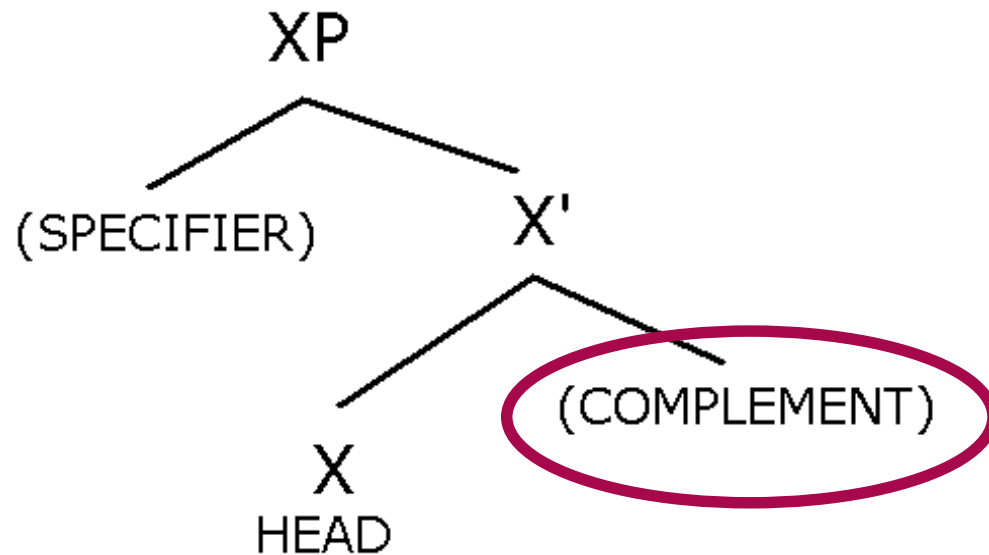
Det	determiner
Deg	degree word
Aux	auxiliary verb
Con	conjunction

T	→	TP
C	→	CP

(we will see T/C and TP/CP later)

3. The X' schema

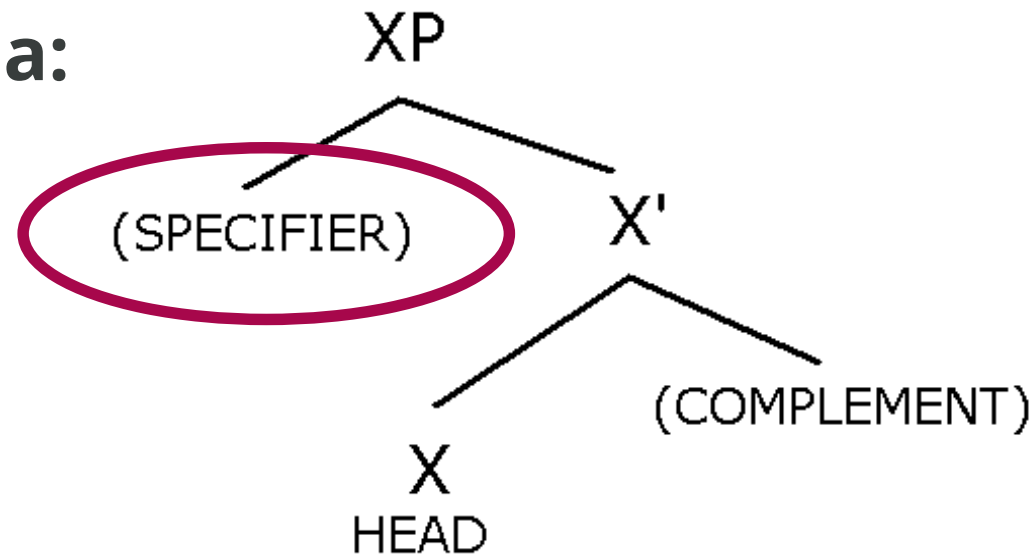
X' schema:



- **complement**—a **phrase**-level category that “provide[s] information about entities and locations implied by the meaning of the head” (CL, p 173)
 - **Low** in the phrase — sister to the head
 - Some heads, especially *V*, *require* complements

3. The X' schema

X' schema:



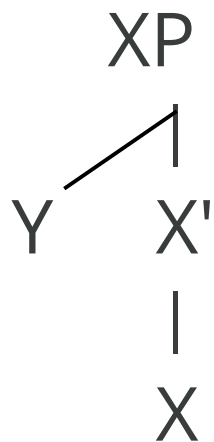
- **specifier** — “no single semantic function...they occur at the edge of a phrase” (CL, p 173)
 - (a) for **NP, VP, AP, PP** — can be a **word-level** category (Det, Adv, Deg)
 - (b) for **TP** — this is a special case; *covered next time*
 - **High** in the phrase — daughter of XP

3. The X' schema

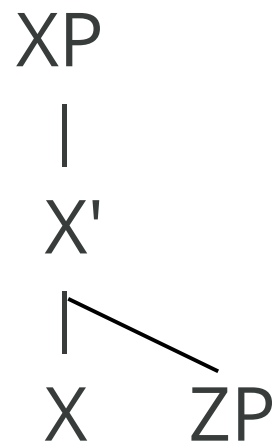
WARNING: CL says (p 174): “It is common (and practical!) to represent tree structures in an abbreviated way, without the intermediate X', when there is no specifier and/or complement...”

WE WILL NOT DO THIS in our course.

Always show the FULL X' structure in ALL trees!



no complement



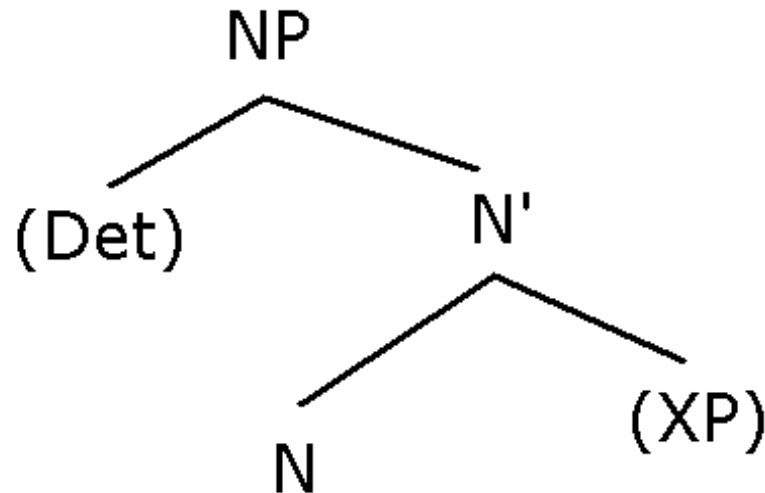
no specifier



head only

4. Examples of XPs

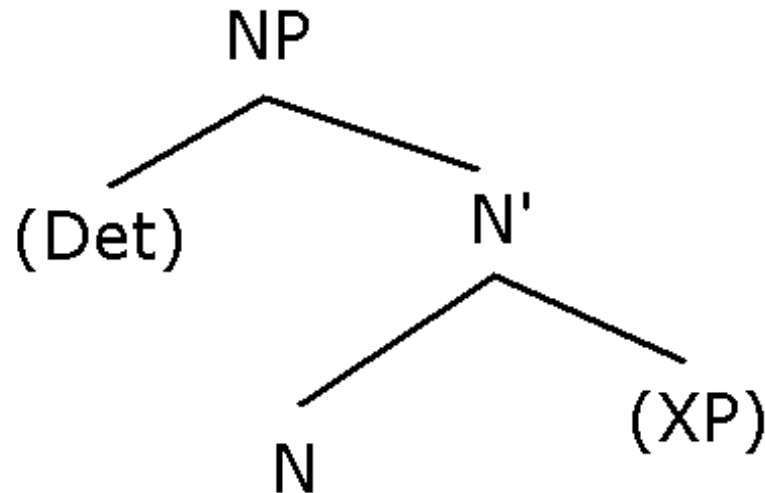
- **NP:**



- A **Det** is a word-level category that includes articles (*a, an, the*), demonstratives (*this, those...*)
 - Only **one** Det can occur per NP (unlike adjectives!)
 - Det must come **first** in the NP
- **Possessives** (*my, the child's, ...*) are NPs that go in the specifier position of another NP (in place of Det)

4. Examples of XPs

- **NP:**



- Some examples to try

rabbits

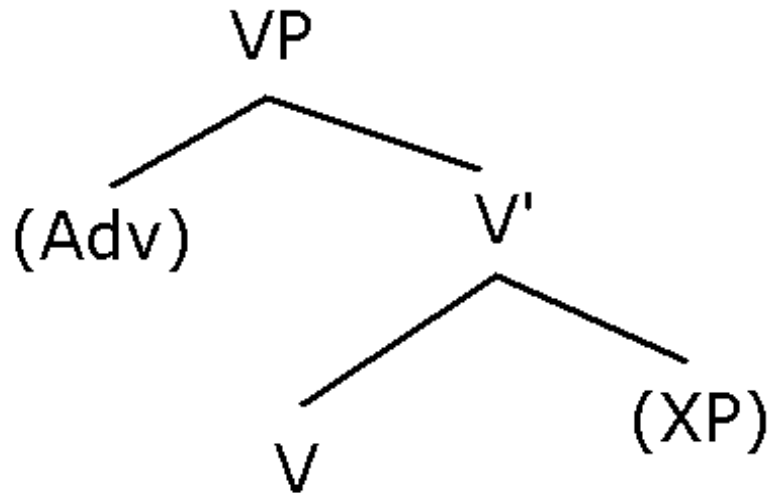
these rabbits

the child's rabbits

→ The **answers** to all of today's practice examples are posted as a separate document so that you can check your work

4. Examples of XPs

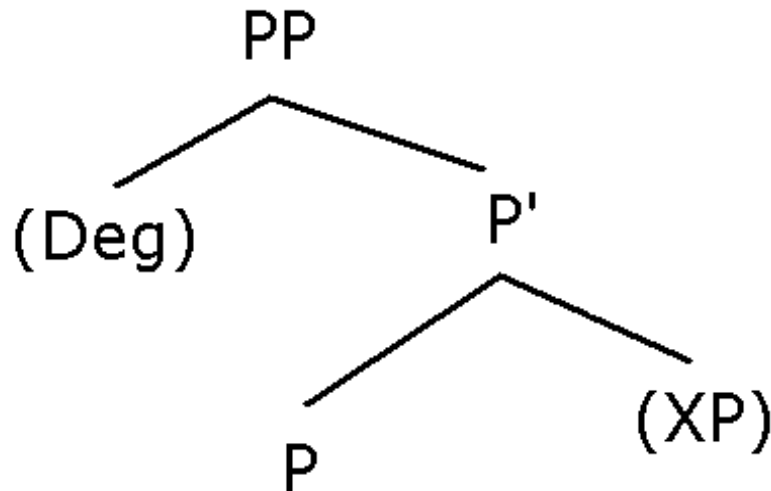
- **VP:**



- **Adv** = pre-V adverb (*always, never, happily, etc.*)
- Some examples to try
 - (Oscar) yawned*
 - (Grover) always smiles*
 - (Susan) read a book*
 - (Ernie) usually annoys Bert*

4. Examples of XPs

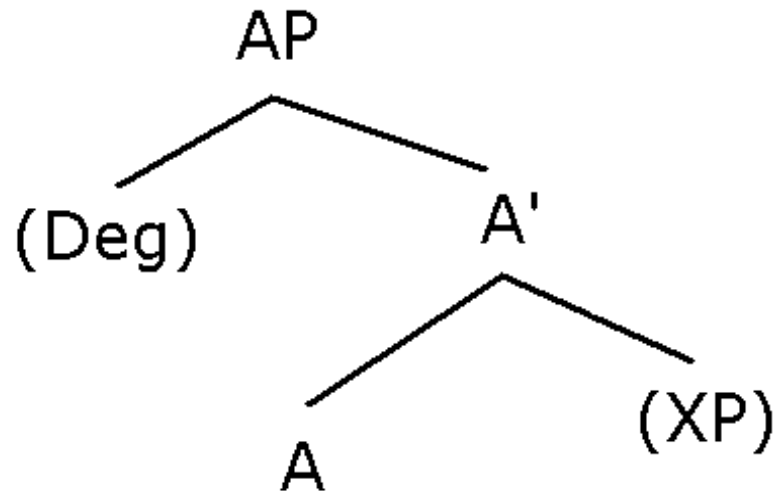
- **PP:**



- **Deg** = degree word (*right*, certain adverbs)
- Some examples to try
 - (Oscar went) out*
 - (Susan put the basketball) right in*
 - (a book) about rabbits*
 - (a liking) for truffles from France*

4. Examples of XPs

- **AP:**



- **Deg** = degree word (*very, too, quite, almost, ...*)
- Some examples to try
 - happy*
 - very angry*
 - pleased with the results*
 - fond of her dog*

5. The X' schema in our model of syntax

- For a phrase or sentence to be **grammatical**, all of its words must be able to **fit into the X' schema**
 - So, our model can already explain why these are not grammatical in English:
**book the* **ate quickly the cookie*
- What we will look at next time:
 - **Sentences** in the X' schema
 - The X' schema is not enough to *guarantee* that a phrase or sentence is grammatical — **other requirements** may need to be met
 - We must check predictions about **constituents**