

X-bar Theory. Heads and Complements, Specifiers, Adjuncts

Exercise 1

(iv) Given the distribution of nominative and accusative forms in English, what problem is raised by the following examples?

- (1) a He being the owner, we were all given a free drink.
 b Who wants ice cream? Me.
 c Her cheat on him? Never.

Exercise 2

Identify the constituents in the following sentences:

- a. The postman lost his glasses at the party.
 b. The postman who lost his glasses looks crazy.
- a string of words that you can replace with “he/she” or “it” will be a DP (determiner phrase)
 - a string of words that you can replace with a single noun will be a NP (noun phrase)
 - a string of words that you can replace with a single verb will be a VP (verb phrase)
 - finite (= tensed) clauses (sentences) are CP-s (complementiser phrases); even subordinate ones
 - if you can replace something with “there”, that will be a PP (preposition phrase)
 - you can do a “*so*-replacement” for AP-s (adjective phrases),
 e.g. *Brian is trustworthy, and so is Robert*

Exercise 3

Account for why the following sentences are ungrammatical.

- a *Yesterday I met Paul and with Peter.
 b *Whose did you see favourite film?
 c *Mike invited the woman with long hair, Jamie invited the she with short hair.
 d *The student, I haven't seen of Physics lately.

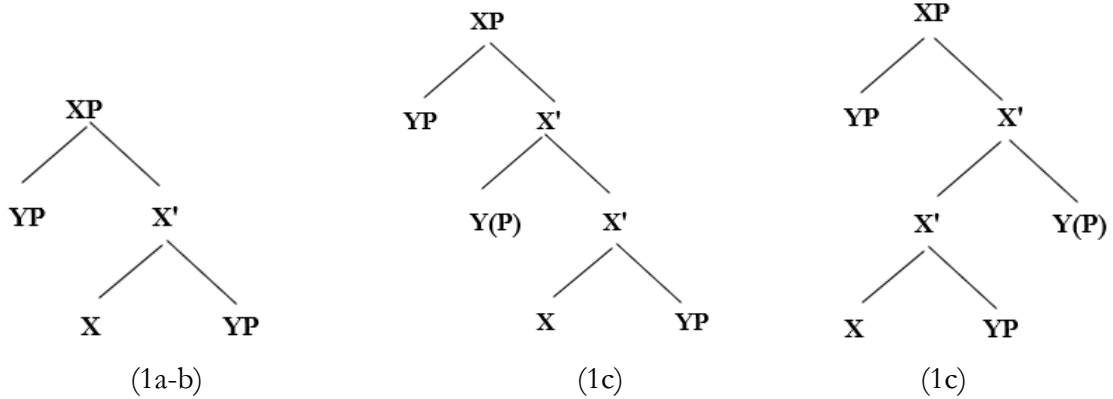
(For b) and c), think about the phenomenon of *movement*, discussed last week)

1 X-bar Theory

- The below three rewrite rules determine the nature of **all structures in a language**:

- (1) a. $X' \rightarrow X YP$ (complement rule)
 b. $XP \rightarrow YP X'$ (specifier rule)
 c. $X^n \rightarrow X^n, Y/YP$ (adjunct rule)

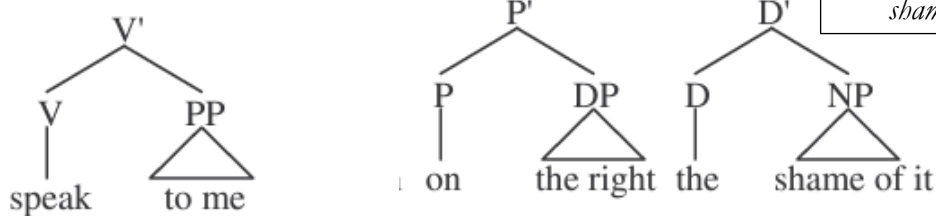
(1a-b) are obligatory rules; (1c) is an optional rule



- X and Y are category variables: they stand for any possible category (nouns (N), verbs (V), prepositions (P), determiners (D), etc.)
- XP, YP: variables that stand for phrases (NP / VP / PP / DP / CP etc.)

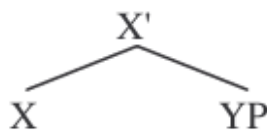
1.1 The complement rule. Heads and complements

(2)



- although these are constituents of different types (V', P', D'), they all have a very similar pattern: the **head** (X) is on the **left** and the **complement** (YP) is on the **right**:

(3)



$X' \rightarrow X YP$

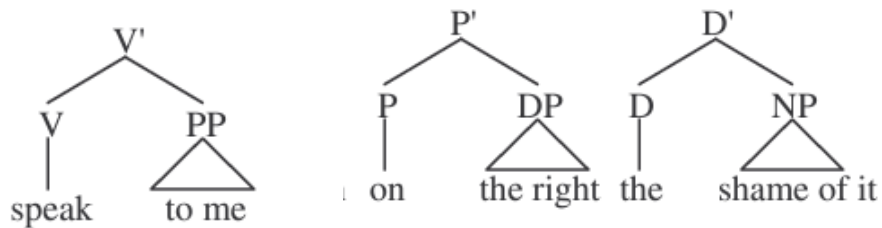
- X' (pronounced *X bar*) has two immediate constituents:
 - **X** = the **head**:
 - the central element of the phrase
 - it is a **word** of the same category as the X' (cf. the tree structures in (4)):
 - if the head is a verb, the X' will be a V'

if the head is an adjective, the X' will be an A' etc.

▪ **YP** = the **complement**:

- the **complement rule** ($X' \rightarrow X YP$) introduces the structural position for the complement (i.e., the complement position)
- in English complements follow their heads (in other languages they may precede the head)
- the symbol YP tells us that **only a phrasal** element can sit in the complement position (as **P** in YP stands for *phrase*), but it does not tell us the **category** of that phrase (noun phrase/preposition phrase etc.

(4)



However, we cannot insert a complement of just any category into the complement position. E.g., if the head (X) is the verb (V) 'fell':

- (5)
- a. fell [_{PP} off the shelf]
 - b. *fell [_{DP} the cliff]
 - c. *fell [_{VP} jumped over the cliff]

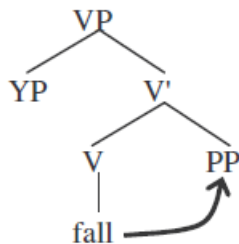
→ It is the properties of heads, namely, the subcategorisation frame of a lexical element which determine the category of their complements:

(6)

fall **category:** [-F, -N +V]
 Θ-grid: <theme, path>
 subcat: prepositional

→ the head (*fall* in this case) determines the category of the elements that can occupy the complement position – e.g., *fall* it requires a PP complement:

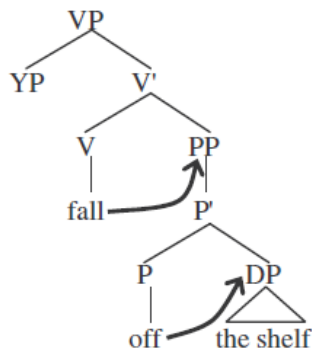
(7)



→ From the fact of being a PP (prepositional phrase), it follows that the head of the PP will be a P (preposition) → thus only a preposition can be inserted into the head position of the PP phrase (*off* in this case)

The lexical properties of this P head will, in turn, impose categorical restrictions on the complement position of this PP, i.e., they tell us that the complement of the PP will be a DP (determiner phrase; most of the prepositions select for a DP complement):

(8)



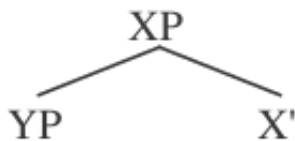
→ The determiner requires an NP complement → only a N (noun) (*shelf* in this case) can be inserted into the head of the determiner's complement

→ This could continue indefinitely, but in this case the process stops at this point as the noun subcategorises for no complement.

1.2 The specifier rule

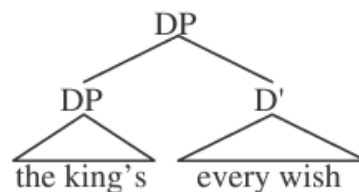
- (1b) ($XP \rightarrow YP X'$) is the **specifier rule**: it introduces the structural position of the **specifier** (the YP of this rule):

(9a)



$XP \rightarrow YP X'$

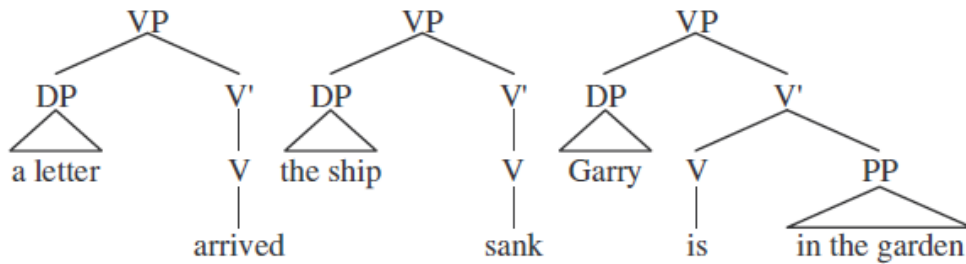
(9b)



- XP has two immediate constituents:
 - **X'**: the constituent containing the head and the complement
 - the **specifier (YP)**:
 - a **phrase**
 - in English it precedes the X' (in other languages it may however follow the X')
 - specifiers are typically **arguments**, e.g., subjects:

- (10) a. [a letter] arrived
 b. [the ship] sank
 c. [Garry] is in the garden

(11)

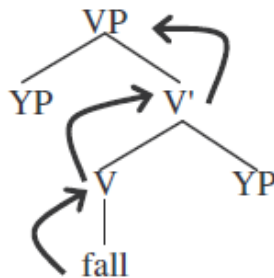


→ These arguments are nearly always DPs → specifiers, unlike complements, do not seem to be restricted differently by different heads in terms of their category.

1.3 Projection

- the property of sharing category (V/D/N/P/A/C etc.) between the head, the X' and the phrase XP:
The head projects its categorial status (whether it is a verb/a determiner/a noun/a preposition/an adjective/a complementiser etc.) from the lexicon to the syntax, i.e. to the X' and ultimately to the XP: if the head is V, then X' = V', and XP = VP. Thus, the whole phrase will be of the same category as the head:

(12)



- We can imagine a phrase as a three-floored building:
 - On the ground floor we have the **head**, which is not built on top of anything – it is an unprojected element – a “**zero level projection**” → this can be represented as **X⁰**
 - Above the head, we have the **X'**, the **1st projection** of the head
 - On the top floor: the **phrase, XP** (or X'', *X double bar* – the maximal projection)
! All phrases project to two levels, so no X''', or X'''' , etc.
- X-bar theory is a completely general theory applying to all constructions of a language

1.4 The adjunct rule

- (13) a. **smart** student
 b. **vicious** dog
 c. **serious** mistake

→ Main question: What are the adjectives in (31a-c): are they heads/complements/specifiers/something else?

→ What is the **head** of these constructions? Is it the adjective or the noun?

- The **noun**, because the constructions in (13) can act as the complement of a determiner (14a-c), and determiners take nominal complements, not adjectival ones. Thus, the **adjectives in (13a-c) are not heads**

- (14) a. the [_{NP} serious error]
 b. the [_{NP} error]
 c. *the [_{AP} serious]

→ The **adjectives** in (13a-c) are **not complements** either: they do not follow the head noun (and as we have seen, in English, all complements follow their heads)

→ Specifiers precede their heads, so are the adjectives in (13) **specifiers**?

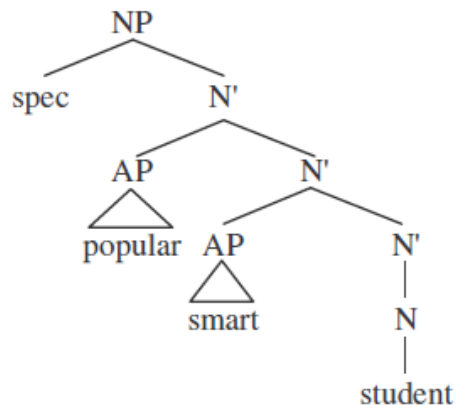
No, because

- specifiers tend to be arguments – adjectives, however, are not arguments as we can leave them out and the construction will still be grammatical, cf. (14b)
- a construction may only have one specifier, while there can be more than one adjectival modifier of a noun (15a-c):

- (15) a. popular smart student
 b. big evil vicious dog
 c. solitary disastrous unforgivable serious mistake

→ they are **adjuncts**:

(16)

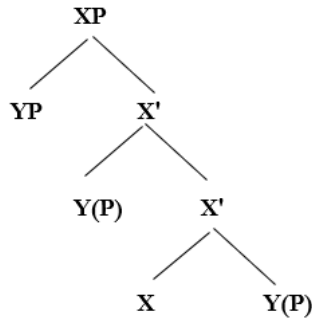


The adjunct rule:

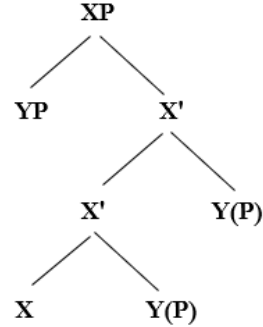
(17)

$$X^n \rightarrow X^n, Y/YP$$

(18a)



(18b)



- X^n may stand for XP (= X^n), X' or X (= X^0)
- adjunction = we may add either a word (Y) or a phrase (YP) to X^n , X' or X in a way that it does not introduce a new “projection level”: adjunction does not add a new projection level (it differs in this respect from the complement rule and the specifier rule)
- The comma indicates that the order between the adjunct and the X^n is not determined by the rule:
 - while in English the complement follows the head and the specifier precedes it, the **adjunct may precede or follow the head** depending on other conditions (e.g., PP adjuncts follow the head, e.g. *Ricky gave a concert on Saturday*)
- The adjunction rule is **recursive**: the same symbol appears on the left and the right of the rewrite arrow. Any number of adjuncts may be added to a structure

2 Summary: X-bar theory

- A theory of basic structure comprising of just three rules (1a-c).
- These rules are generally applicable to all structures and substructures, no matter what their category: they are category neutral.
- One word acts as the **head** of each phrase and this determines the category of the phrase by projecting its own categorial properties (V/D/N/P/A/C etc.), established in the lexicon, to the X' node above it and ultimately to the XP.
- Three elements besides the head:
 - The **complement** is introduced as the sister of the head. It always follows the head in English and its category is restricted by the head’s subcategorisation requirements.
 - The **specifier** is the sister of X' and the daughter of XP. Specifiers precede the head and are restricted to one per phrase.
 - The **adjunct** can be introduced at any X-bar level: X, X' and XP. This element expands what it is adjoined to into another element of the **same type**. Therefore the process is recursive and in principle any number of adjuncts can be added to a structure.

Exercise 14

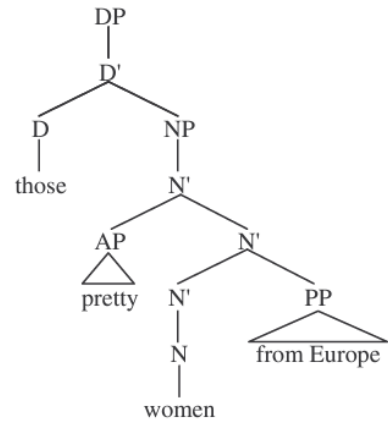
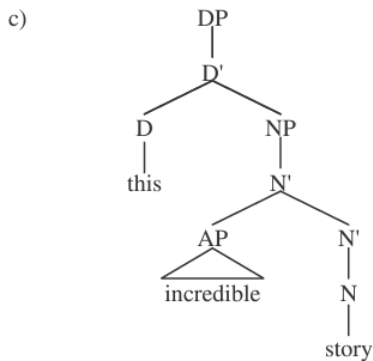
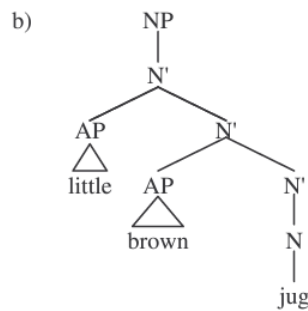
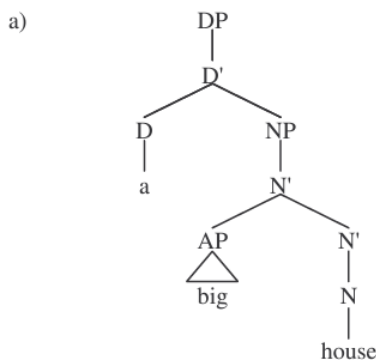
The X-bar theory predicts that in English the following sentences are ungrammatical. Explain how the X-bar theory can account for the ungrammaticality of the sentences below. Notice that the phrases in *italics* are responsible for the ungrammaticality of the sentences.

- (1) a **The teacher from France of English* likes going to open lectures.
 b *Mary often *drives too fast her car*.
 c **Every student in Cambridge of Physics* gets an excellent job.

Exercise 15

Give the tree diagram of the following phrases.

- (1) a a big house d a tall handsome student of physics
 b little brown jug e funny little thing
 c this incredible story f those pretty women from Europe

**Exercise 17**

Why are these sentences ill-formed?

- (1) a *Penny promised.
 b *The boy slept a car.
 c *Garry gave Greg.
 d *Gave a cent to Marion.
 e *Adam ate an apple for Anne.
 f *Daniel danced Dora.