# Lecture 04-2: Heads and Complements. X-Bar Theory.

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LIN 311: Syntax

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# Outline

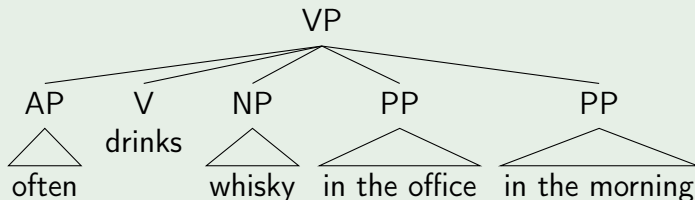# Revising PSR

# Revisiting VP structure

**VP Structure**

Recall our rule for VP: VP → (AdvP*) V (NP) (NP) (AdvP*) (PP*) (AdvP*)

**often drinks whisky alone in the office**

# Revising VP structure

## Reminder: Replacement test

- Let's replace parts of VP with do so.

## Sub-constituents

(1)  a.  John [often] [drinks whisky] [in the office] [in the morning] and Mary [does so] too.

  b.  John [often] [drinks whisky] [in the office] [in the morning] but Mary [rarely] [does so].

  c.  John [often] [drinks whisky] [in the office] [in the morning] and Mary [frequently] [does so] [in the evening].

  d.  John [often] [drinks whisky] [in the office] [in the morning] and Mary [frequently] [does so] [in the basement] [in the evening].
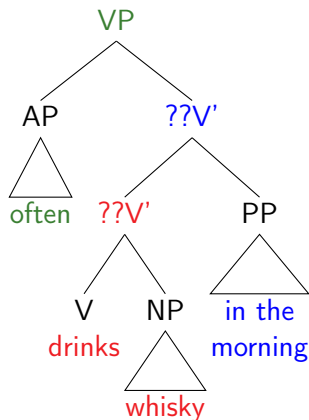
# Revisiting VP structure

- This situation is similar to what we observed with NPs
- There must be some subconstituents within VP, and the flat structure does not allow us to account for it!
- We need to add phrases one by one, as before.

(2)     often drinks whisky in the office in the morning
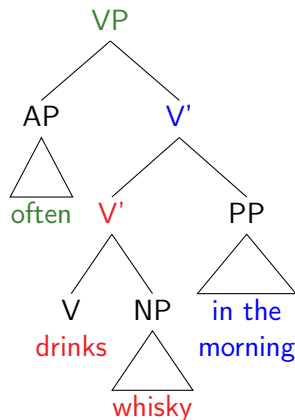
## Structure
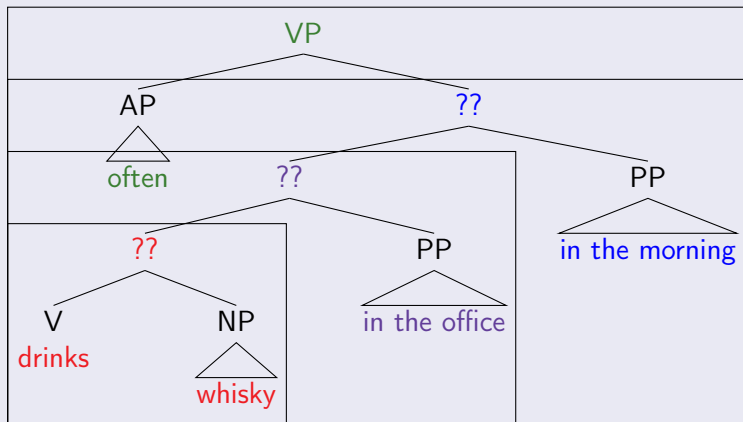
# Revisiting NP structure



### V' (V-bar)

What kind of category is ??? We can take the similar approach as before, and call it V'.

# Revisiting NP structure



## New rules

create a phrase
VP → (AdvP) V'

**recursive rules** to add as many AdvPs and PPs as needed one at a time
V' → (AdvP) V'
V' → V' (AdvP)
V' → V' (PP)

introduce V
V' → V (NP$_{ARG}$)

# Revisiting VP structure

## Final VP rules

$$VP \rightarrow (AdvP)\ V'$$

$$V' \rightarrow (AdvP)\ V'$$
$$V' \rightarrow V'\ (AdvP)$$
$$V' \rightarrow V'\ (PP)$$

$$V' \rightarrow V\ (NP_{ARG})$$

## Similar generalizations (as for NP) work for VP:

- Three types of rules.
- There must be a V or V' in the right-hand side.
- Everything else is phrasal and optional.

# X-Bar Theory

# VP vs. NP

## Final NP and VP rules

| | | |
|---|---|---|
| NP → (D) N' | VP → (AdvP) V' | XP → (YP) X' |
| | | |
| N' → (AP) N' | V' → (AdvP) V' | X' → (ZP) X' |
| N' → N' (PP) | V' → V' (AdvP) | X' → X' (ZP) |
| | V' → V' (PP) | |
| | | |
| N' → N (PP$_{\mathrm{ARG}}$) | V' → V (NP$_{\mathrm{ARG}}$) | X' → X (WP$_{\mathrm{ARG}}$) |

# X-Bar Schema

## General rules

As we can see, the shape of rules is same for both NP and VP:

- Specifier Rule:          $XP \rightarrow (YP)\ X'$
- Adjunct Rule:           $X' \rightarrow (ZP)\ X'$ or $X' \rightarrow X'\ (ZP)$
- Complement Rule:     $X' \rightarrow X\ (WP_{ARG})$
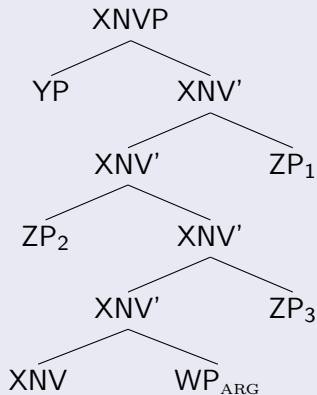
What are

- specifiers (YP),
- adjuncts (ZP), and
- complements (WP)?

Is there any difference between them?

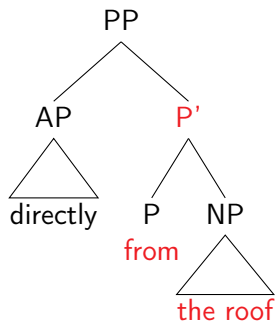- We will explore it soon!

# X-Bar Schema

## General tree for X-Bar schema

# Revisiting PP structure

**PP structure:**

(3)    directly from the roof



**New rules for PP**

Similar story for to PP:

PP → (AP) P'
P' → P NP$_{\text{ARG}}$

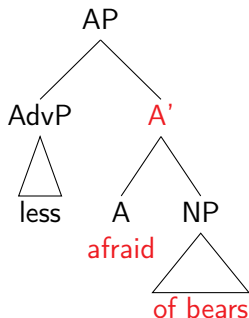- flat structure won't account for:

(4)    directly [[from the roof] and [into the trashcan]]

- There might not be enough evidence for recursive rule though...

# Revisiting AP structure

## AP structure:

(5)     less afraid of bears



## New rules for AP

Similar story for AP:

AP $\rightarrow$ (AdvP) A'
A' $\rightarrow$ A PP$_{\text{ARG}}$

- There might not be enough evidence for recursive rule though...

(6)     John was very [afraid of bears] and Mary was less [so].

# Merge

# Forming constituents

What are the general principles according to which constituents are formed?

- We always start with one word of the category X (N, V, P, etc.).
- We add phrases to it one by one, forming a new X' after each step.
    - at least, that seemed like the best approach so far to account for various constituents. . .
- Eventually, after everything is added, we get XP.

Let's formalize this process.

# Forming constituents

## Substitution rule

If we start with N, everything we get on the way is also "nounish" [N]: can occur in the same contexts as the original N:

(7)  a.  I bought sausages.
     b.  I bought delicious sausages.
     c.  I bought expensive delicious sausages.
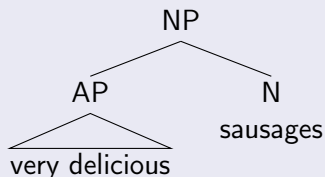     d.  I bought expensive delicious sausages from France.
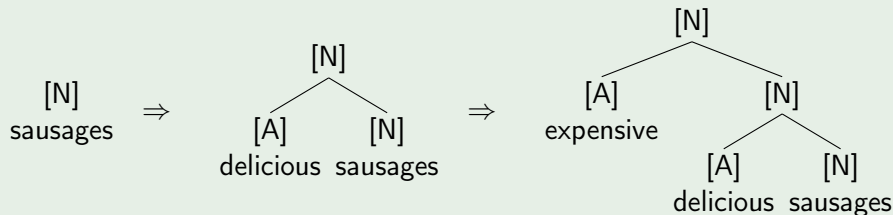
# Heads

Head: the element that determines properties of the phrase.

## Example

- The head of [very delicious] [sausages] is sausages.
- very delicious is not the head:

  (8)　　a.　　I like very delicious sausages.
  　　　　b.　　*I like very delicious.

- very delicious sausages is an NP.

```
              NP
           ___/\___
          AP        N
        _/\_      sausages
   very delicious
```
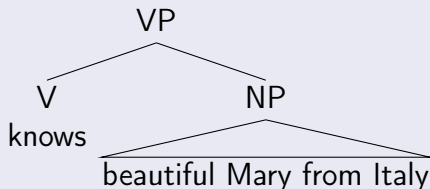
# Heads

Head: the element that determines properties of the phrase.

## Example

- The head of [knows] [beautiful Mary from Italy] is knows.
- V knows is a head, because entire phrase behaves like a verb: it follows subjects, it can be placed after infinitive to, can be substituted with does so, etc.
- It is an VP, because its head is V.

```
            VP
          /    \
         V      NP
       knows   /    \
         beautiful Mary from Italy
```
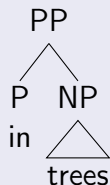
# Heads

Head: the element that determines properties of the phrase.

## Example

- The head of [in] [trees] is in.
- trees is not a head, because in trees behaves differently:
  (9)    a.    I like trees; the trees
         b.    *I like in trees; *the in trees

- in trees is a PP.

# Merge

- In all of the examples above the head is merged with a phrase.
  - NP → AP N;
  - VP → V NP;
  - PP → P NP; etc.

Merge: the main syntactic operation responsible for the creation of larger constituents out of smaller constituents.

$$[X\ ZP]_{XP} \text{ or } [ZP\ X]_{XP}$$

- Every phrase contains a head
- Phrases can contain one more more other phrases, which can have one or several words.