LIN232 Summer 2021 - Week 2

Structural relations, X-bar, DP-Theory

Andrew Peters

May 10 – May 14

University of Toronto

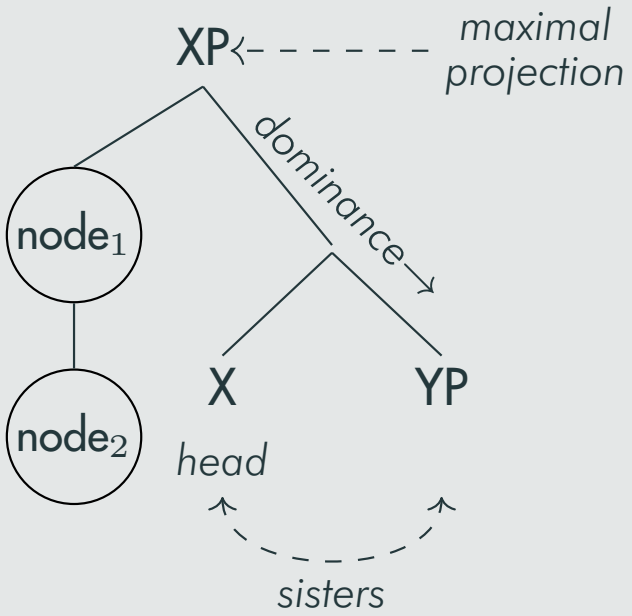
Welcome Linguists!

Understanding Structure

How do we talk about structure?

Some Terminology

Parts of a tree



Some Terminology

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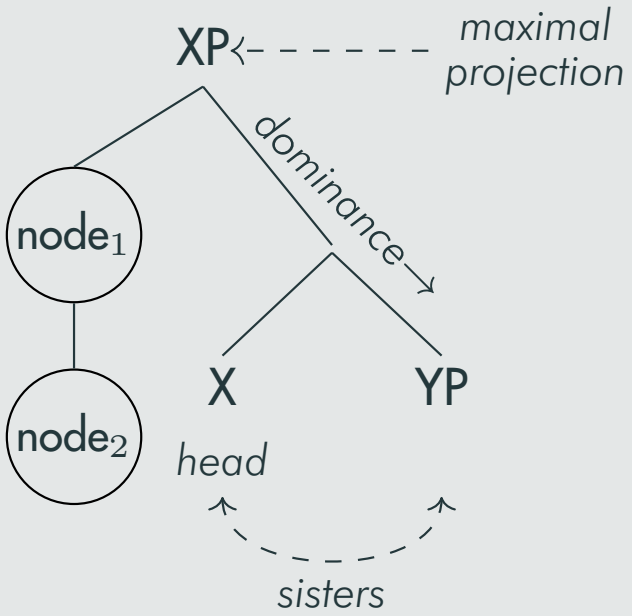

- **Branch:** A line connecting two nodes

Some Terminology

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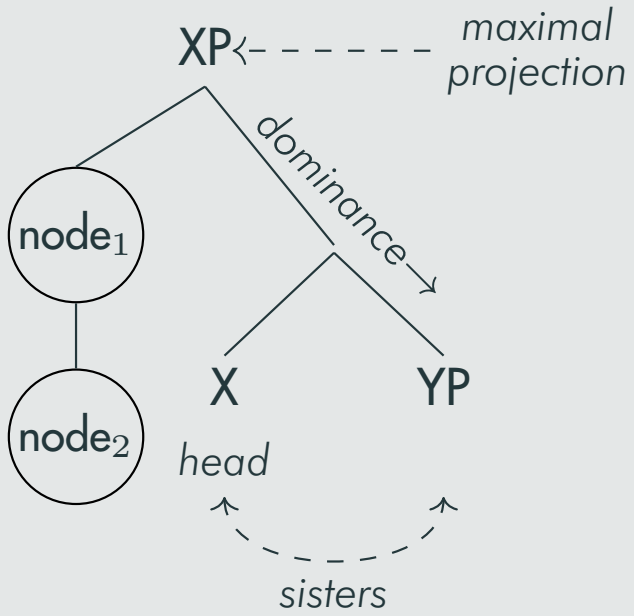
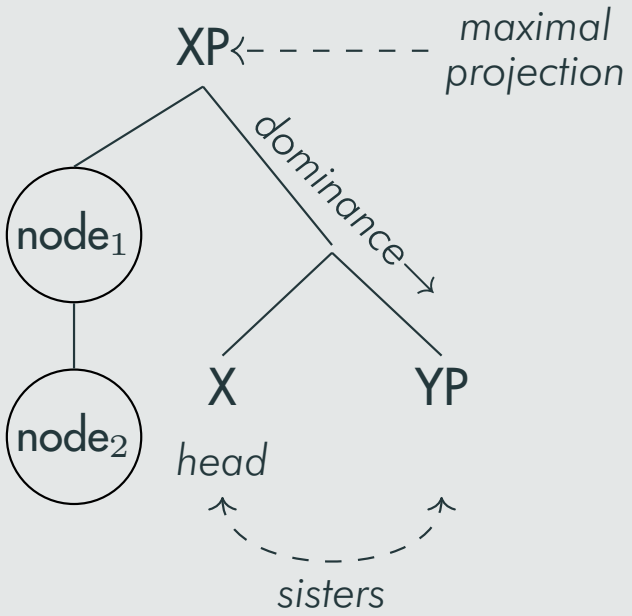


- **Branch:** A line connecting two nodes
- **Label:** The name of a node

Some Terminology

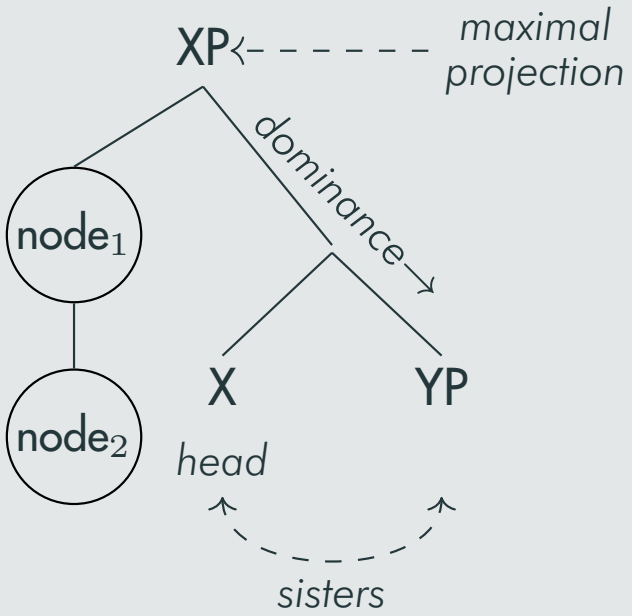
Parts of a tree



- **Branch:** A line connecting two nodes
- **Label:** The name of a node
- **Domination:** Node A dominates node B iff A is "higher up" in the tree than B, and you can trace a branch from A to B going only downwards

Some Terminology

Parts of a tree



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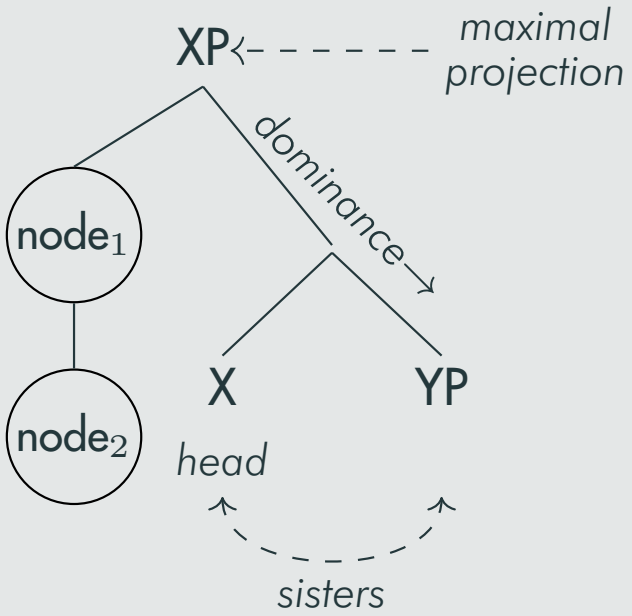
- **Daughter:** If node B is immediately dominated by node A, it is a daughter (or child)
- **Sisters:** Two nodes that share the same mother (also called siblings)

Some Terminology

Parts of a tree



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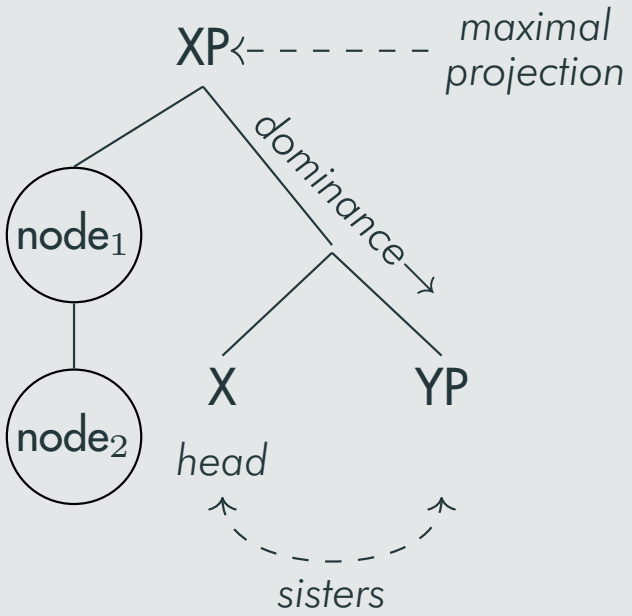

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- **Terminal node:** A node that dominates nothing
- **Maximal projection**: The top node of a phrase that dominates all contents of the phrase; its label is derived from the head

Tree Practice

(1) Tuyaa saw her reflection in the mirror she bought.

(English)

Tree Practice

(2) Tuyaa saw her reflection in the mirror she bought.

(English)

Problem Solving

Okay, lets try to figure out a syntactic problem based on what we know about trees.
Consider the following examples from English:

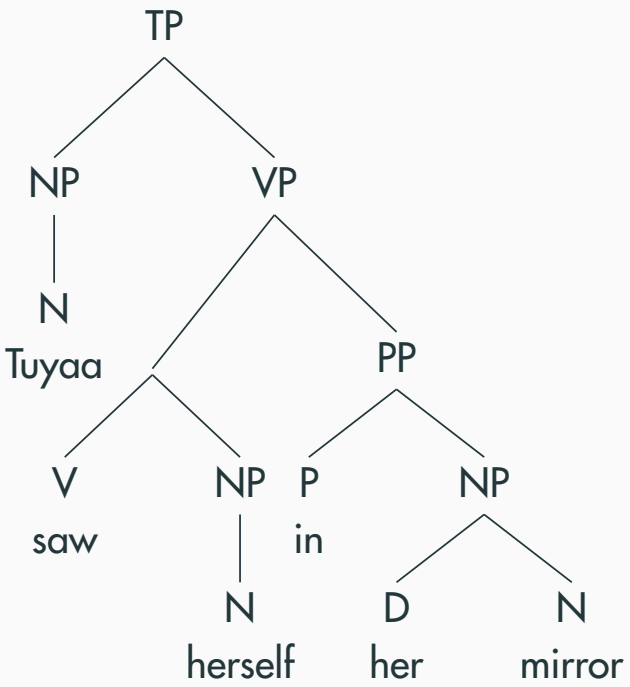
(3) a. Tuyaa saw herself in her mirror.

b. *The mirror from Tuyaa reflected herself.

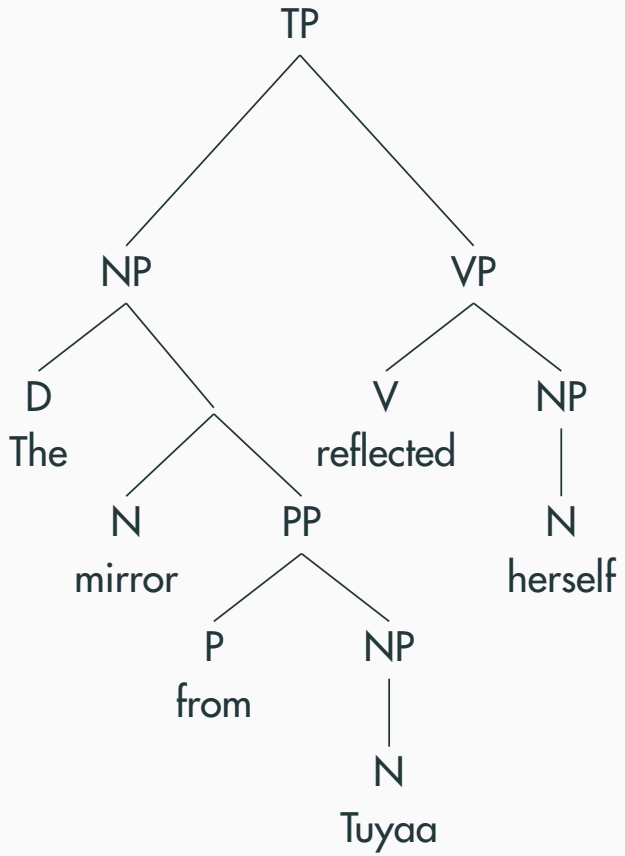
Problem Solving

Let's compare a structure where *herself* is valid to one where it's not.

(4) Tuyaa saw herself in her mirror



(5) *The mirror from Tuyaa reflected herself



Problem Solving

What kind of structural relation do you need to explain the difference between the two sentences in terms of the *antecedent* and the *anaphor*?

Antecedent: *From Latin "come before" – An NP that gives its meaning to another NP*

Anaphor: *From Greek "a carrying back" – An NP that obligatorily gets its reference from another NP*

C-command

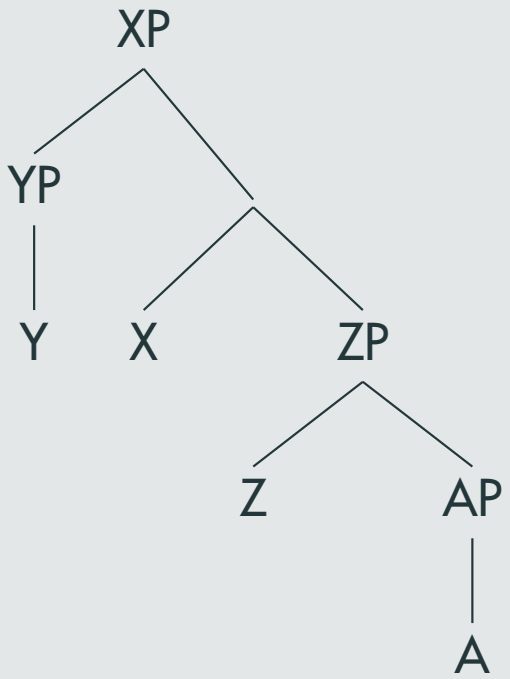
One of the ingredients required to make anaphora work is C-command:

(6) **C-command:** Node A C-commands node B if every node dominating A also dominates B, *and* neither A nor B dominates the other

Informally: *A node C-commands its siblings and all their children nodes*

Structural Relations

Example Tree



Structural Relations

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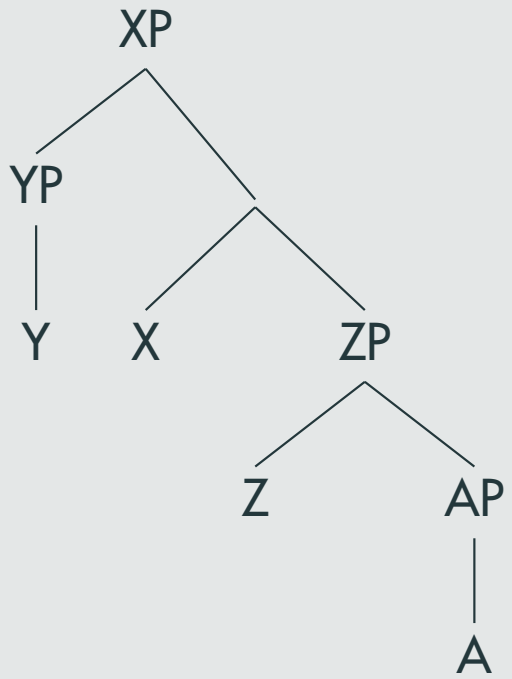

- Y C-commands: nothing
- YP C-commands: X, ZP, Z, AP, A
- X C-commands ZP, Z, AP, A
- ZP C-commands X (mutual / symmetric C-command)
- Z Asymmetrically C-commands A

Structural Relations

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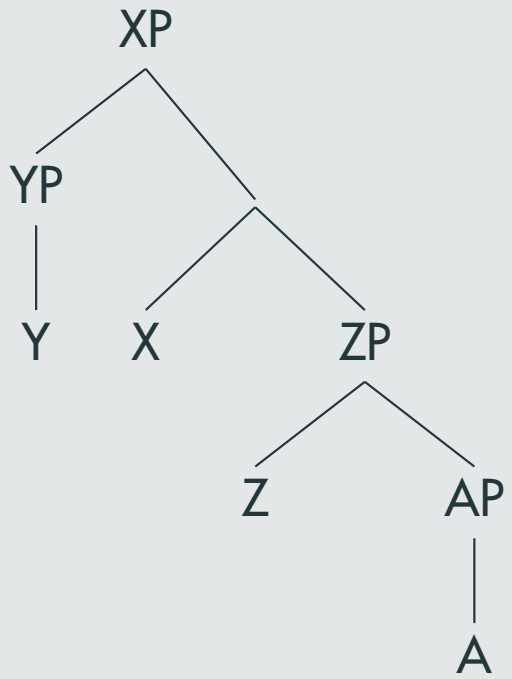

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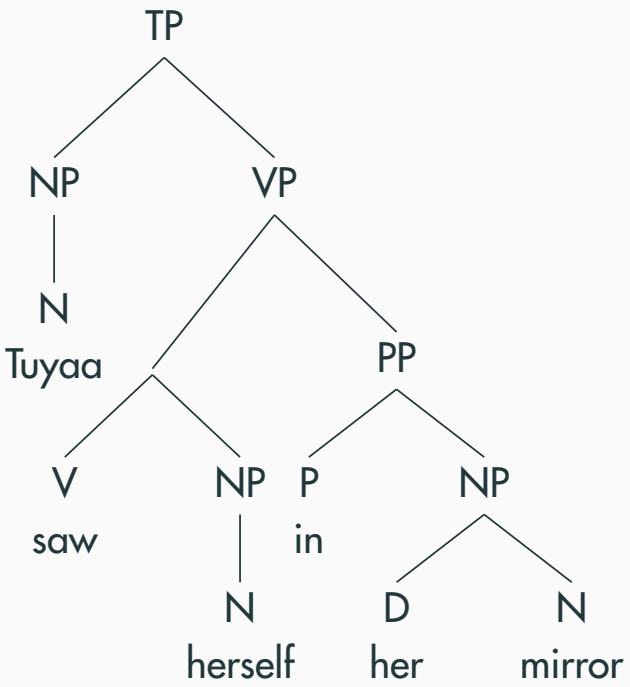
- X C-commands ZP, Z, AP, A
- ZP C-commands X (mutual / symmetric C-command)
- Z Asymmetrically C-commands A
- XP dominates YP, ZP, AP
- XP immediately dominates YP
- ZP immediately dominates AP

Problem Solving

Back to the anaphora examples. What C-commands what?

(7) Tuyaa saw herself in her mirror



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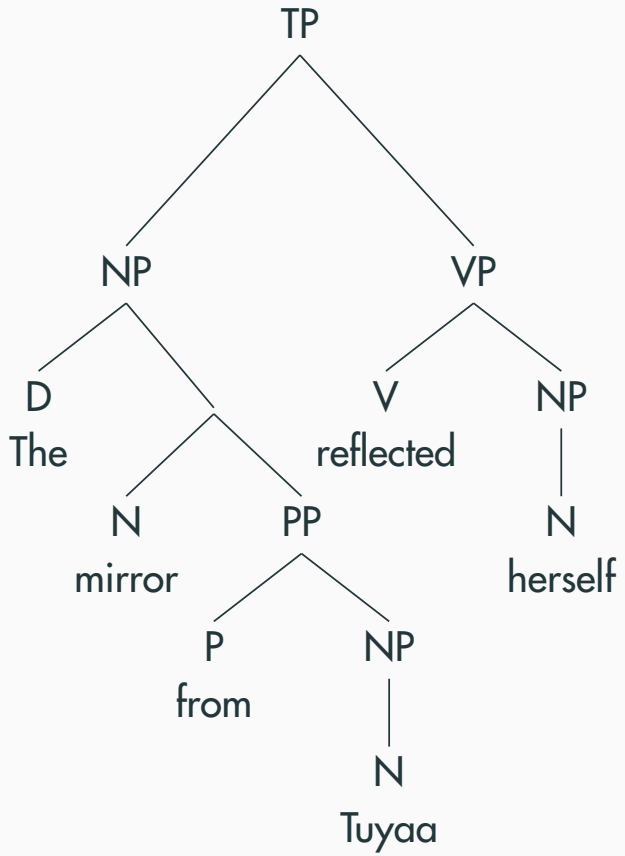

An anaphor must be C-commanded by its antecedent.
The actual answer is a little more complicated, but we will return to it in a later week.

If you are very curious, you can read chapter 5 of the textbook. You have enough knowledge to understand it at this point.

X-bar Theory

Let's break something

“Do so” tests

Some of you may have noticed something funny when you perform this constituent test for VPs in English:

(9) Zhuge Liang played guqin on the fortress walls

a. He played guqin on the fortress walls *He = Zhuge Liang*

b. Zhuge Liang did so *did so = played guqin on the fortress walls*

c. Zhuge Liang did so on the fortress walls *did so = played guqin*

"Do so" tests

Some of you may have noticed something funny when you perform this constituent test for VPs in English:

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It looks like we need another VP inside the VP

Ellipsis & Coordination

You may remember that I warned you to be careful with coordination tests before:

(11) a. Li Bai drank wine

b. Li Bai drank wine, and Du Fu, tea

c. *It is Li Bai wine that drank

d. *It is Du Fu tea that drank

(English)

Ellipsis & Coordination

You may remember that I warned you to be careful with coordination tests before:

(13) a. Li Bai drank wine

b. Li Bai drank wine, and Du Fu, tea

c. *It is Li Bai wine that drank

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(English)

This is because we can have ellipsis / deletion of identical material under coordination:

(14) Li Bai [$_{VP}$ drank wine], and Du Fu [$_{VP}$ ~~drank~~ tea]

(English)

Ellipsis & VPs

Oddly enough, parts of the VP can "survive" ellipsis:

(15) Li Bai will drunkenly recite a poem, and Du Fu will _____ sadly

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But not everything survives ellipsis or 'do so' substitution:

(18) *Li Bai drinks wine all day, but Du Fu *does so* wine in the evening

(English)

Ellipsis & VPs

Oddly enough, parts of the VP can "survive" ellipsis:

(19) Li Bai will drunkenly recite a poem, and Du Fu will _____ sadly

But not everything survives ellipsis or 'do so' substitution:

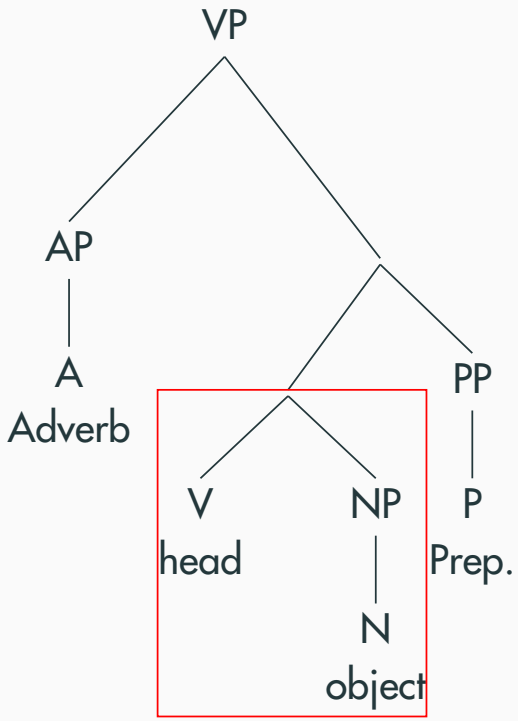
(20) *Li Bai drinks wine all day, but Du Fu *does so* wine in the evening

(English)

So we need to tell the difference between two different types of material in the VP

More Parts of a Phrase

So, it looks like there is a difference between the upper areas of a phrase, and the lower parts:



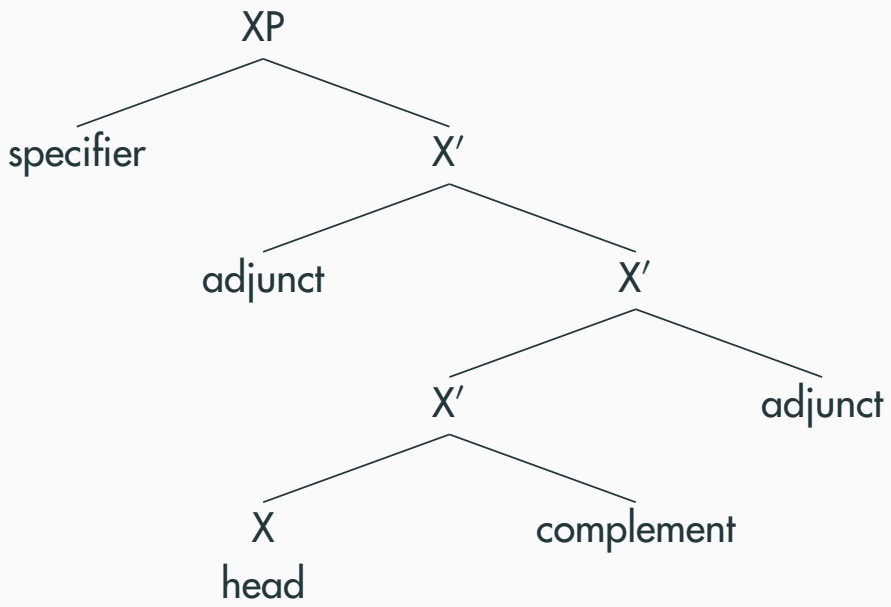
The part in the box must be ellided, but the top part can survive
What do we call this level though?

The X-bar Schema

(21) a. A complement of a phrase XP is a sister of X (X is a head)

b. An adjunct of a phrase X′ is sister and daughter of X′

c. A specifier is the daughter of an XP (and sister to X′)



Let’s apply this to other phrases

Applying X-bar

Let's think about TPs:

(22) a. Li Bai will drink a lot of wine, and Du Fu ~~will drink a lot of wine~~, too

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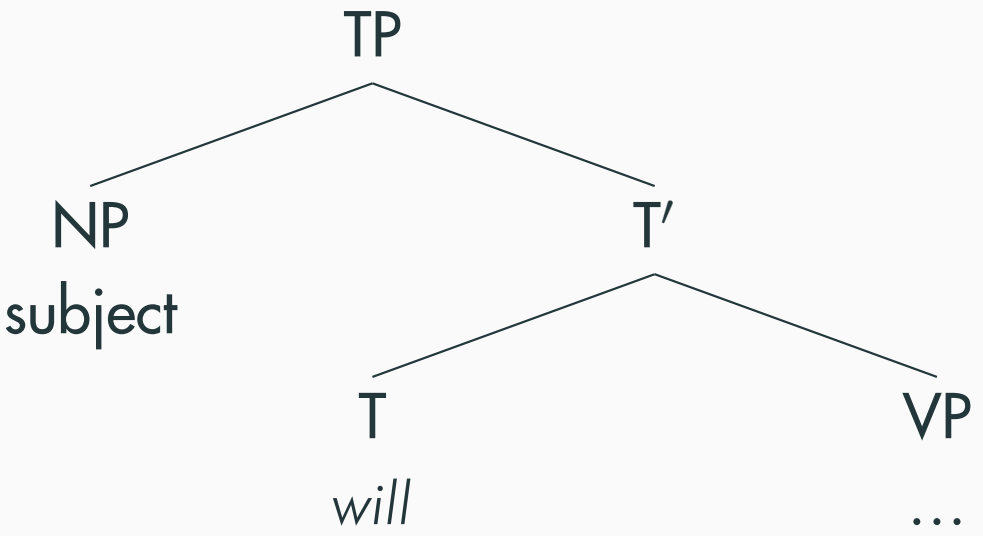


Applying X-bar

Can we revise our coordination rule?

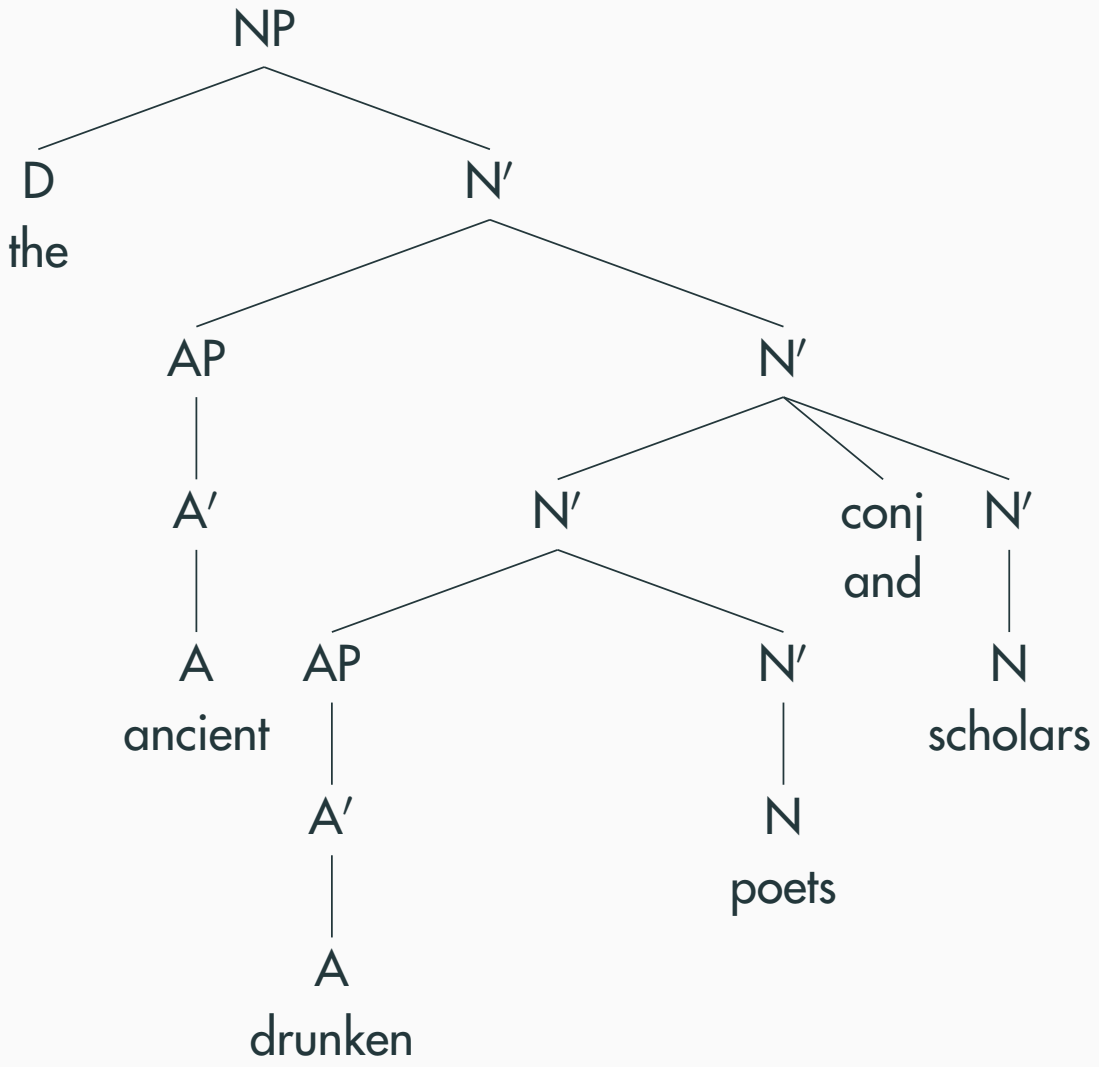
(24) $XP \rightarrow XP$ conj XP

Bracket this English sentence:

(25) The ancient drunken poets and scholars

Applying X-bar

Now we can handle different levels of modification



Applying X-bar

So now we can revise our coordination rule:

(26) $\alpha \rightarrow \alpha$ Conjunction α
where α = any X, X′, or XP.

(Current) X-bar PSRs for English

(27) a. $NP \rightarrow (D)\ N'$
b. $N' \rightarrow AP\ N'$
c. $N' \rightarrow N'\ PP$
d. $N' \rightarrow N\ (PP)$

(28) a. $PP \rightarrow P'$
b. $P' \rightarrow \left\{ \begin{array}{c} AdvP \\ Pqual \end{array} \right\} P'$
c. $P' \rightarrow P\ (NP)$

(29) a. $AdvP \rightarrow Adv'$
b. $Adv' \rightarrow \left\{ \begin{array}{c} AdvP \\ Deg \end{array} \right\} Adv'$
c. $Adv' \rightarrow Adv$

(30) a. $AP \rightarrow A'$
b. $A' \rightarrow \left\{ \begin{array}{c} AdvP \\ Deg \end{array} \right\} A'$
c. $A' \rightarrow A \left\{ \begin{array}{c} (PP) \\ (CP) \end{array} \right\}$

(31) a. $VP \rightarrow V'$
b. $V' \rightarrow V'\ PP$
c. $V' \rightarrow V'\ NP$
d. $V' \rightarrow V'\ AdvP$
e. $V' \rightarrow AdvP\ V'$
f. $V' \rightarrow V \left\{ \begin{array}{c} (NP)\,(PP) \\ (NP)\,(NP) \\ (PP)\,(CP) \\ (AP) \end{array} \right\}$

(32) a. $CP \rightarrow C'$
b. $C' \rightarrow C\ TP$

(33) a. $TP \rightarrow \left\{ \begin{array}{c} NP \\ CP \end{array} \right\} T'$
b. $T' \rightarrow T\ VP$

(34) $\alpha \rightarrow \alpha$ Conjunction α
where α = any X, X′, or XP.

X-bar and NPs

There is an NP-version of the *do so* test:

(35) "That packet of tomato seeds with a yellow label from my neighbour"

a. the *one* with a yellow label from my neighbour

one = packet of tomato seeds

b. the *one* from my neighbour

one = packet of tomato seeds with a yellow label

c. *the one of tomato seeds with a yellow label from my neighbour

one = packet

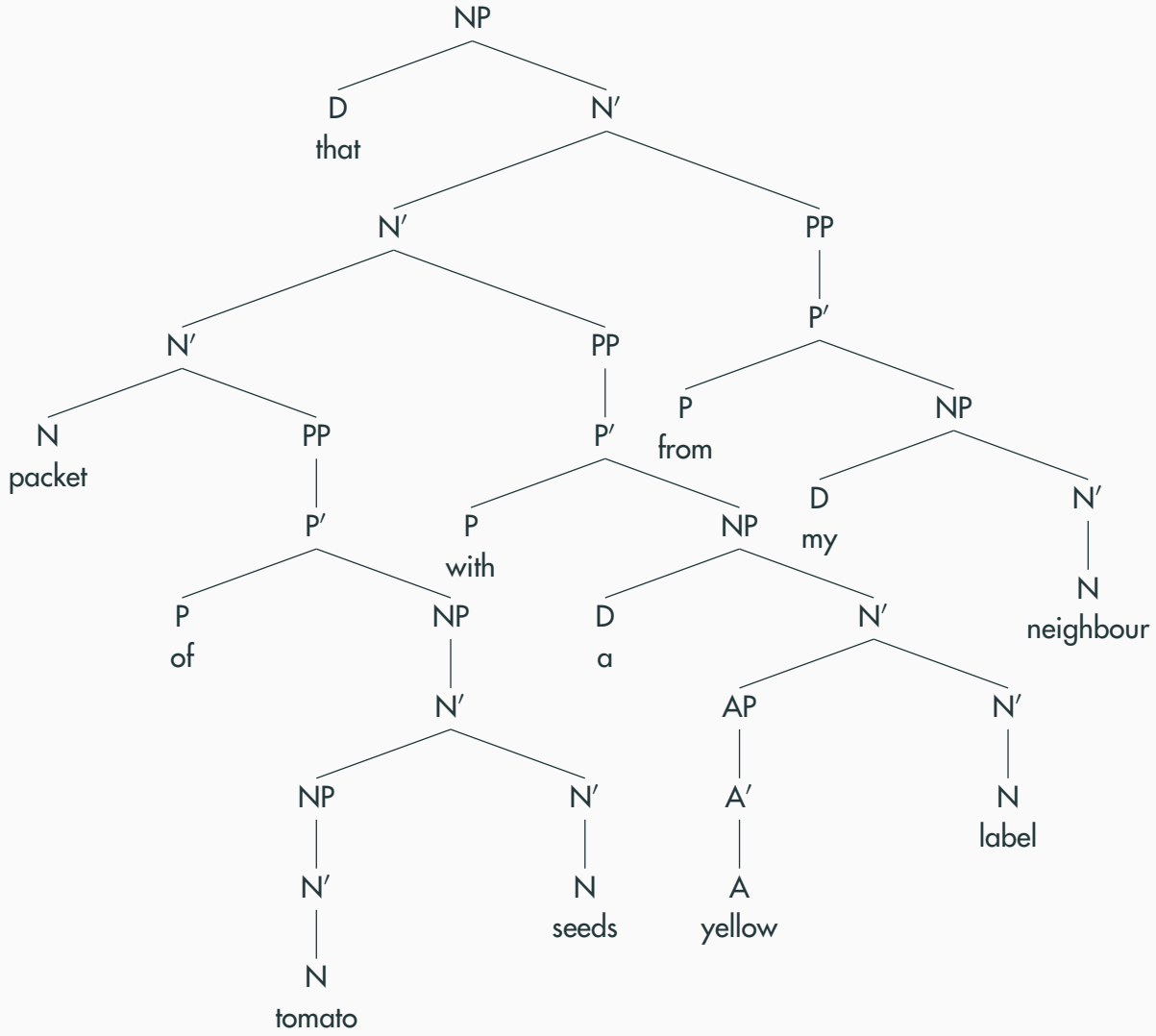
This is called *One-replacement*, and is a productive process in English
It can be used to diagnose complements from bar-levels in an NP

X-bar and NPs

(36) That packet of tomato seeds with a yellow label from my neighbour

X-bar and NPs

(37) That packet of tomato seeds with a yellow label from my neighbour

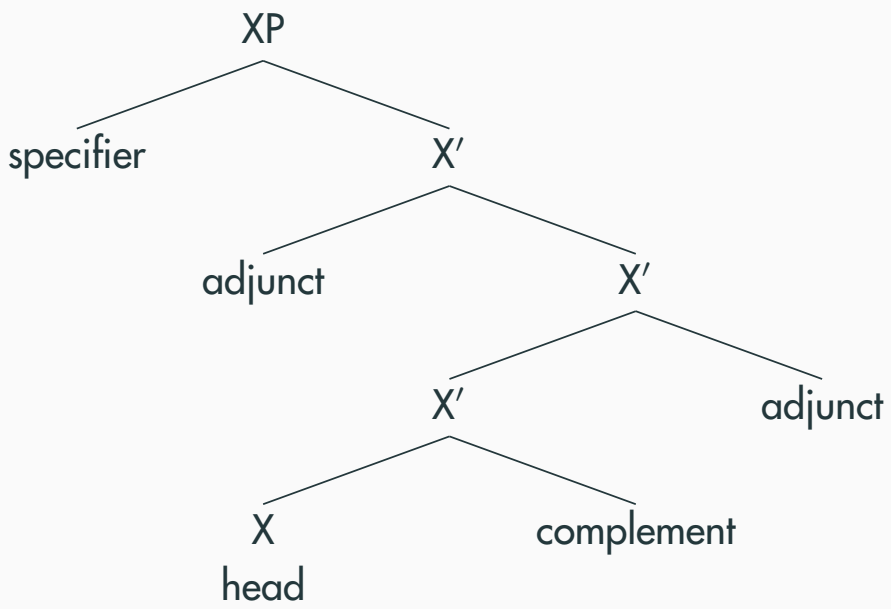


Review: parts of an X-bar tree

(38) a. A complement of a phrase XP is a sister of X (X is a head)

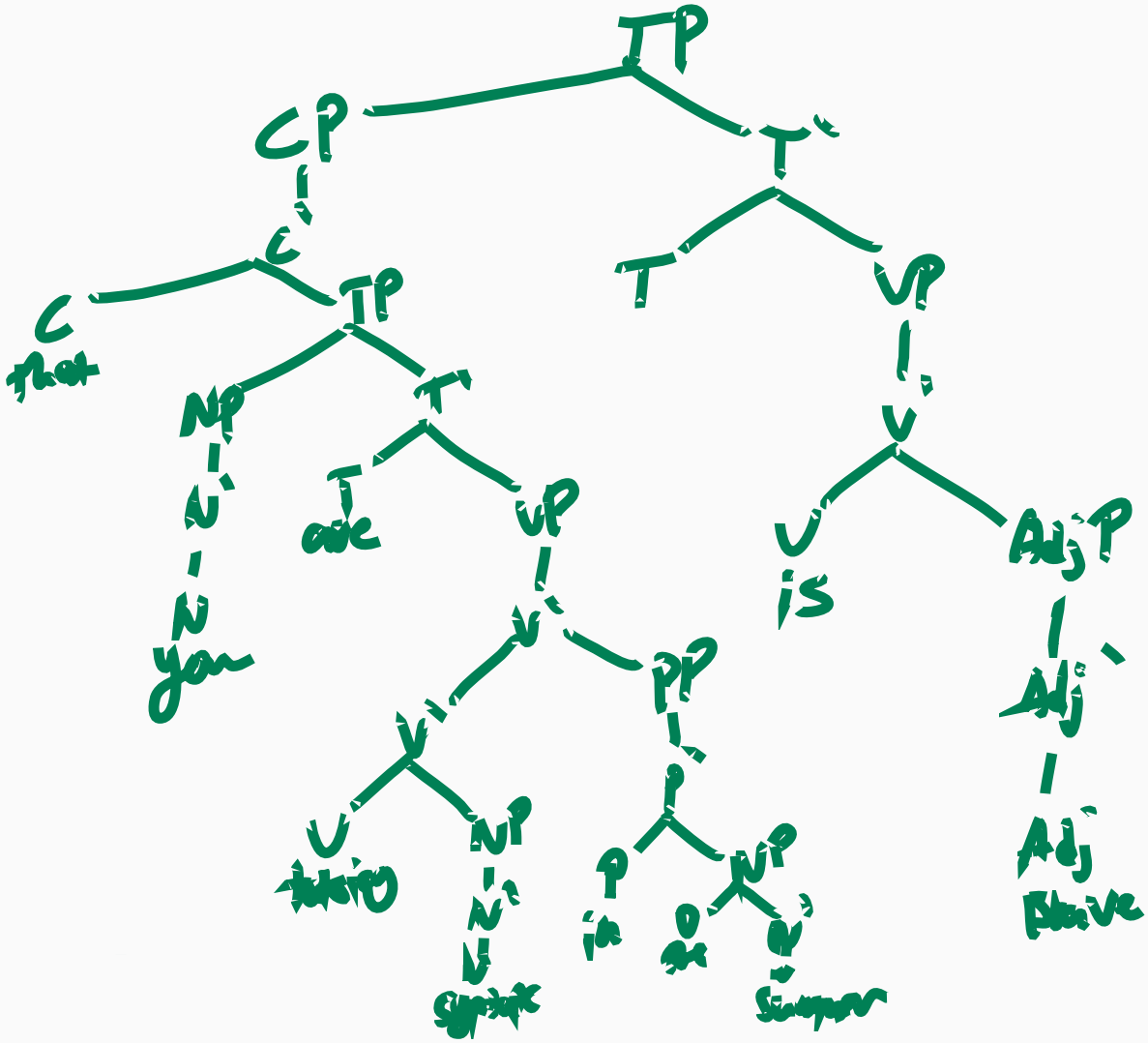
b. An adjunct of a phrase X′ is sister and daughter of X′

c. A specifier is the daughter of an XP (and sister to X′)



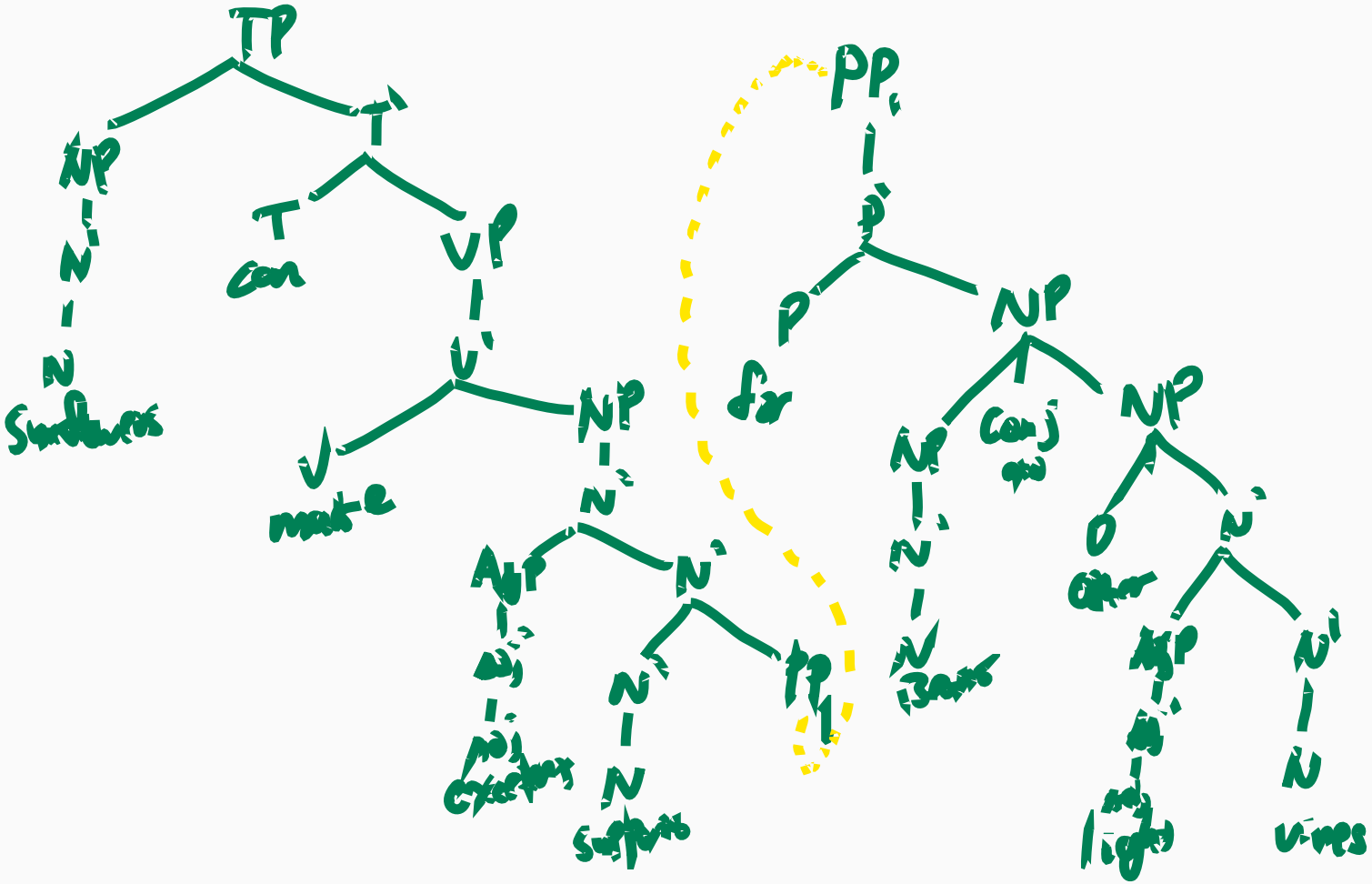
Tree drawing practice - English

(39) That you are taking Syntax in the summer is brave



Tree drawing practice - English

(40) Sunflowers can make excellent supports for beans and other light vines

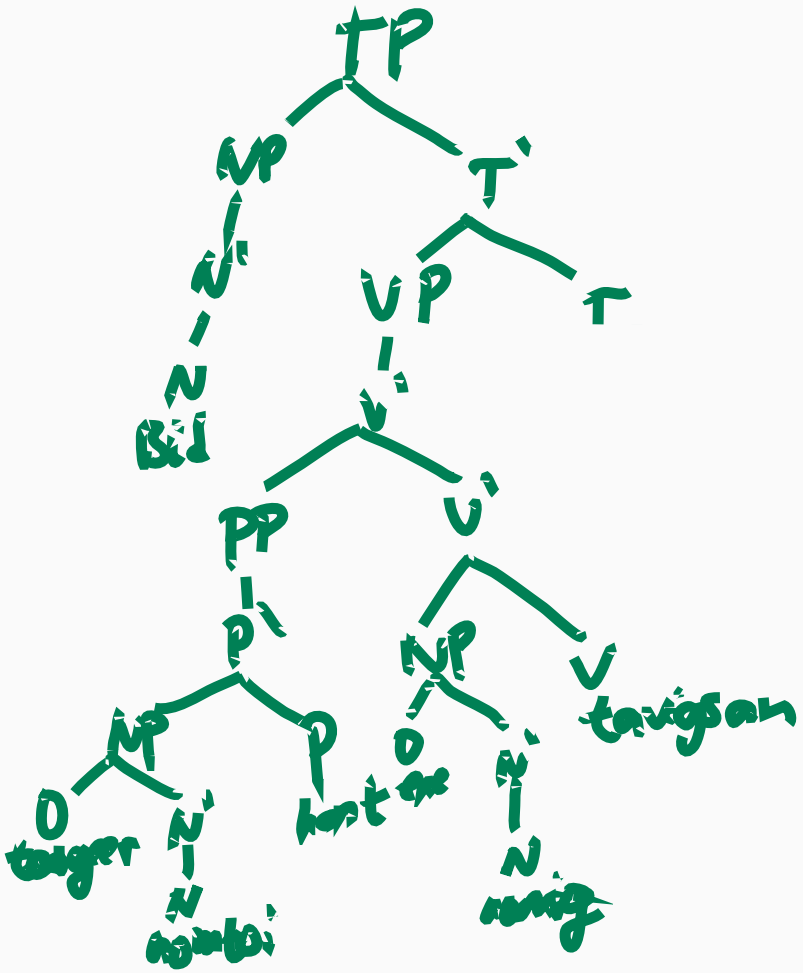


Tree drawing practice - Mongolian

(41)

Бид	тэдгээр	номтой	хамт	энэ	номыг	тавигсан
Bid	tedgeer	nom-toi	hamt	ene	nom-ig	tavigsan
We	those	book	with	this	book	put-past

We put this book with those books.



Branching Direction

- In Mongolian, does the complement come before or after the head?
- In Mongolian, does the specifier come to the left or the right of the bar level that is its sister?
- How about adjuncts?

Abstract Phrase Rules for X-bar

	Mongolian	**English**
Specifier:	$XP \rightarrow (YP)\ X'$	
Adjunct:	$X' \rightarrow (ZP)\ X'$	
Complement:	$X' \rightarrow (ZP)\ X$	

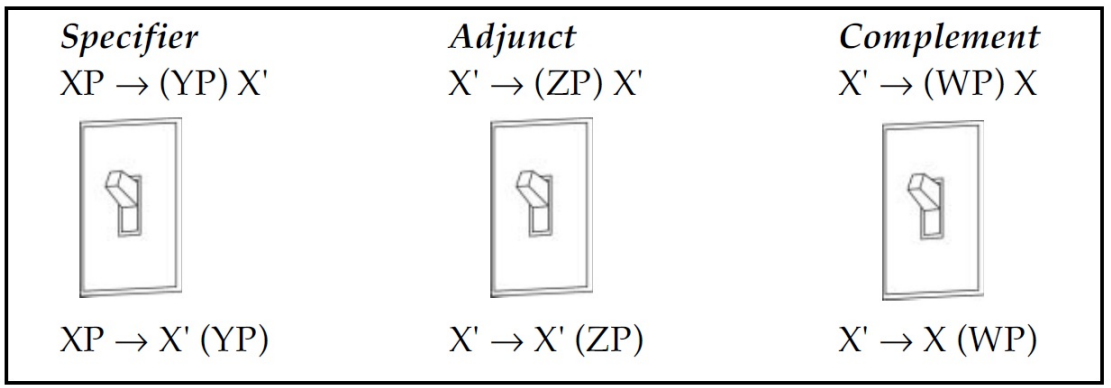
Abstract Phrase Rules for X-bar

	Mongolian	**English**
Specifier:	XP $\rightarrow$ (YP) X′	XP $\rightarrow$ (YP) X′
Adjunct:	X′ $\rightarrow$ (ZP) X′	X′ $\rightarrow$ (ZP) X′ *or* X′ (ZP)
Complement:	X′ $\rightarrow$ (WP) X	X′ $\rightarrow$ X′ (WP)

Parameters

In an early theory of Syntax, these were referred to as *Parameters*
The idea was that children are born with a number of "switches" in their brain ready to be set by language input

118) X-bar parameters switch box



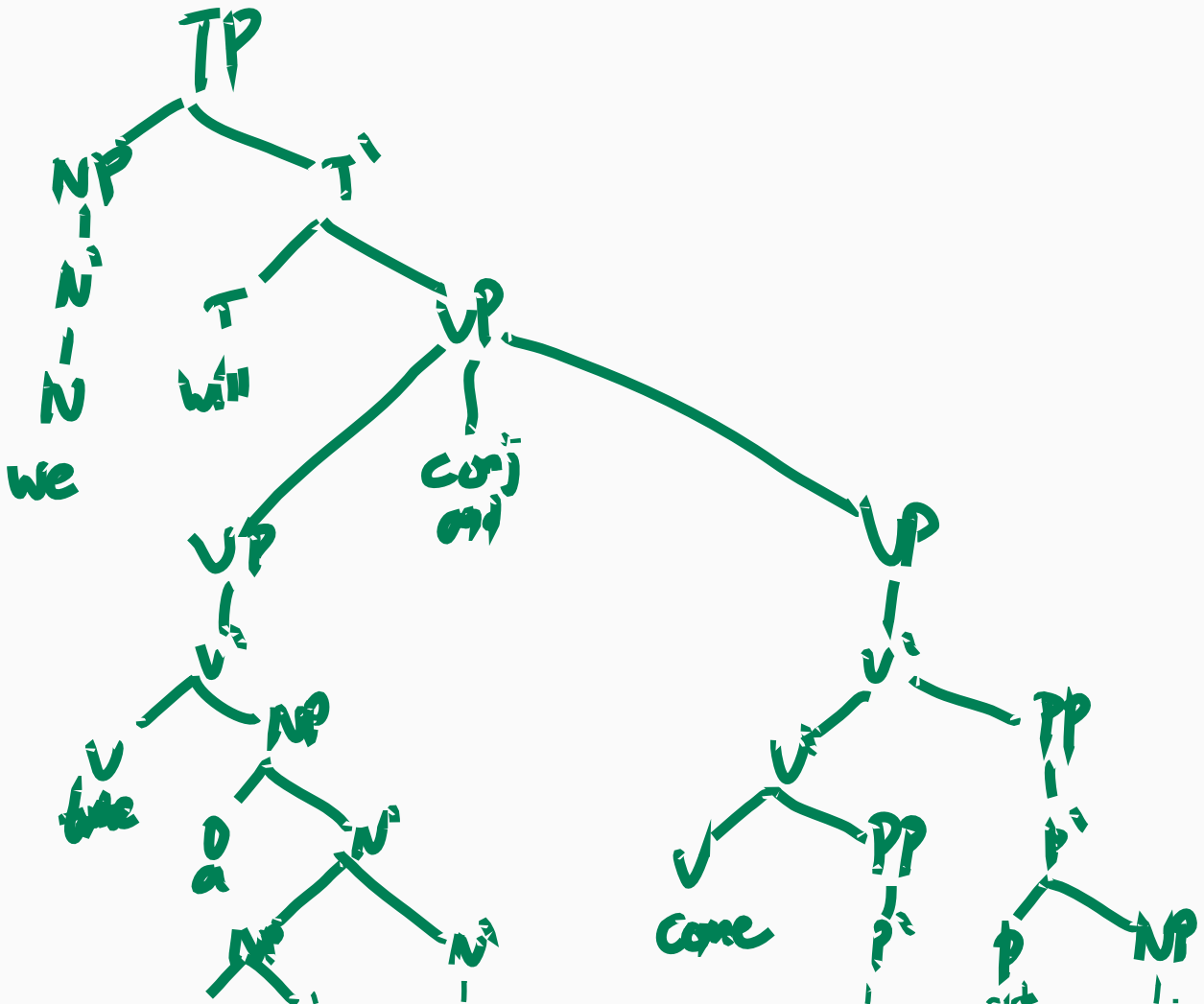
(Carnie textbook p188)

Parameters

The *Principles & Parameters* research programme is no longer widely accepted, and hasn't stood up to some modern work on acquisition, BUT, we still sometimes refer to the consistent rules in a language such as the head-complement order as a "parameter".

X-bar practice

(42) We will take a 10 minute break and come back at 11:15



DP Theory

We have a problem with X-bary theory

The Secret Lives of Determiners

What do we know about D(eterminer)s?

The Secret Lives of Determiners

What do we know about D(eterminer)s?

- There can only be one per NP in English

(44) *the that book

The Secret Lives of Determiners

What do we know about D(eterminer)s?

- There can only be one per NP in English

(45) *the that book

- So they are probably heads

The Secret Lives of Determiners

What do we know about D(eterminer)s?

- There can only be one per NP in English

(46) *the that book

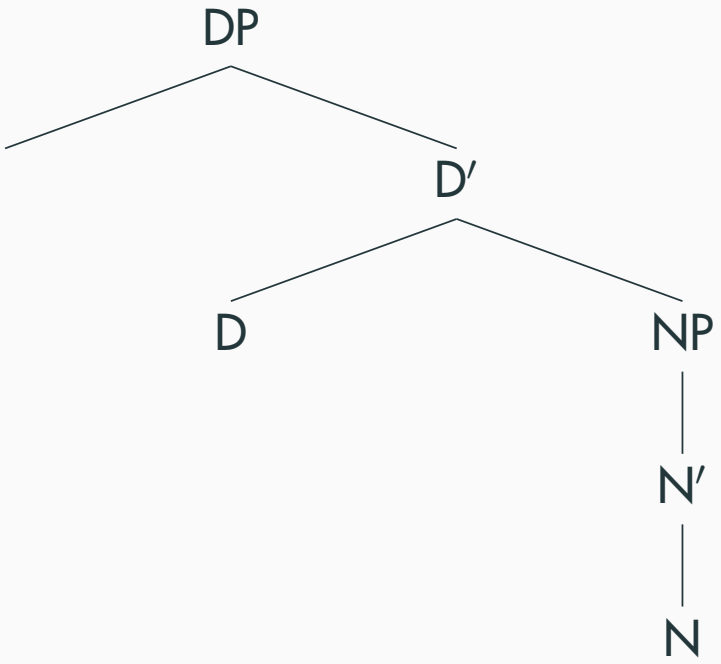
- So they are probably heads
- But this contradicts everything we've said about heads and phrases

DP Proposal

Let's have a new proposal

I'm okay if it takes a bit to convince you this is a good idea :)

(47) *DP Hypothesis*



Evidence for the DP

In English there are two main ways of expressing possession:

(48) *free genitive, 'of'-genitive*

a. the armies of Cao Cao

b. the strings of the cello

c. the joy of my friends

Evidence for the DP

In English there are two main ways of expressing possession:

(50) *free genitive, 'of'-genitive*

a. the armies of Cao Cao

b. the strings of the cello

c. the joy of my friends

(51) *Saxon genitive, construct*

a. Cao Cao's armies

b. the cello's strings

c. my friend's joy

Evidence for the DP

An important thing to notice is that the ’s genitive is not a suffix to a particular word – it appears after an entire phrase:

(52) a. [my friend]’s joy

b. [the old tree in my backyard]’s leaves

Evidence for the DP

An important thing to notice is that the *'s* genitive is not a suffix to a particular word – it appears after an entire phrase:

(54) a. [my friend]'s joy

b. [the old tree in my backyard]'s leaves

It also is in complementary distribution with other determiners:

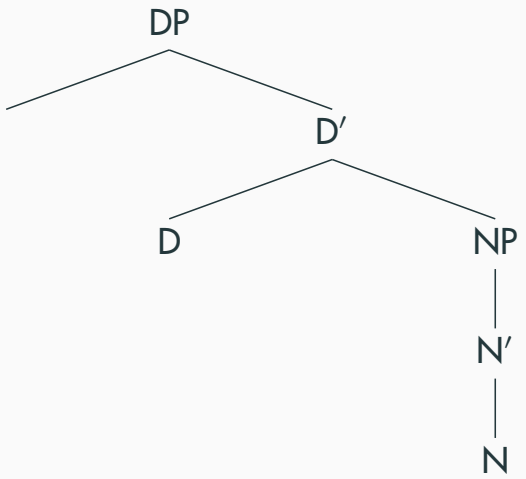
(55) a. *the cello's the strings

b. *my friend's some joy

How to handle possessors

So, in our new DP schema, where do we put possessors?

(56) *DP Hypothesis*



How to handle possessors

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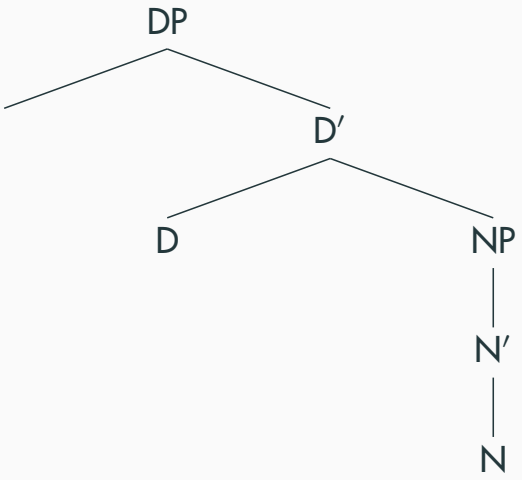
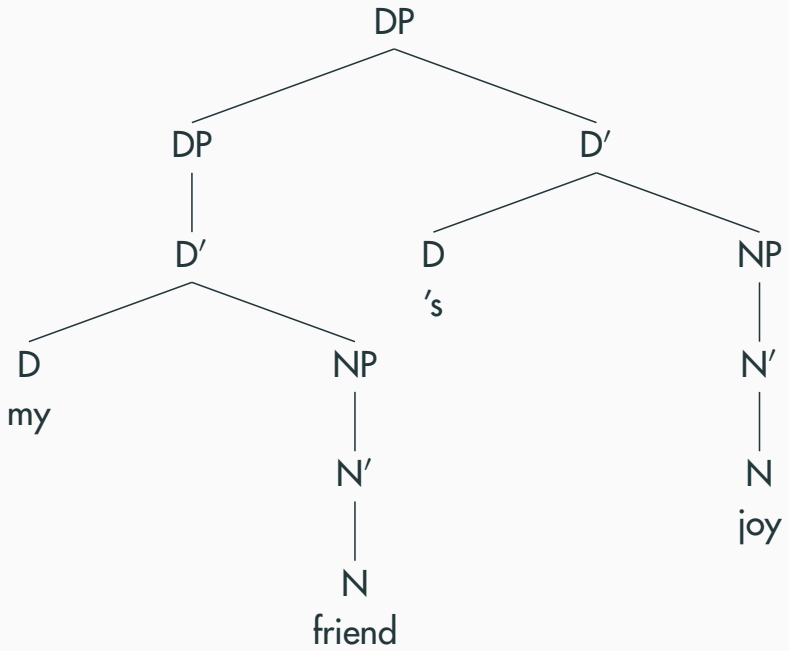
(58) *DP Hypothesis*



(59) *My friend's joy*



When to use a DP, when to use NP

What do we do with "bare" nominals in English?

(60) a. Cats love to nap

b. She loves skating

c. Ivan gave me a gift

What kind of test can tell us the category of these phrases?

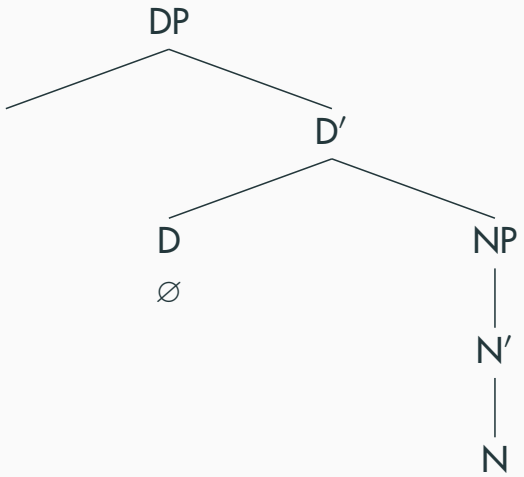
When to use a DP, when to use NP

(61) a. Cats and [$_{DP}$ all tired students] love to nap.

b. She loves skating and [$_{DP}$ other winter sports].

c. Ivan and [$_{DP}$ his friends] gave me a gift.

So, even bare nominals are probably DP's. We can represent them with a null D head:

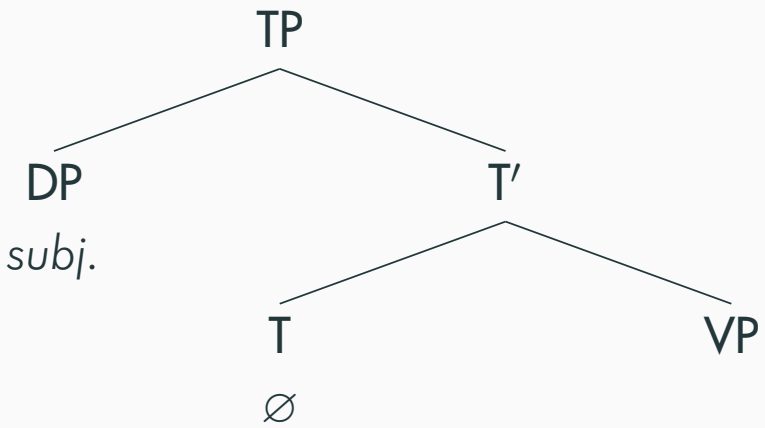


However, for expediency, I will accept NP's in trees for bare nominals, so long as you remember there is really a D there.

An aside: Empty heads

However, there are two other heads that must always be drawn, even if they are empty:

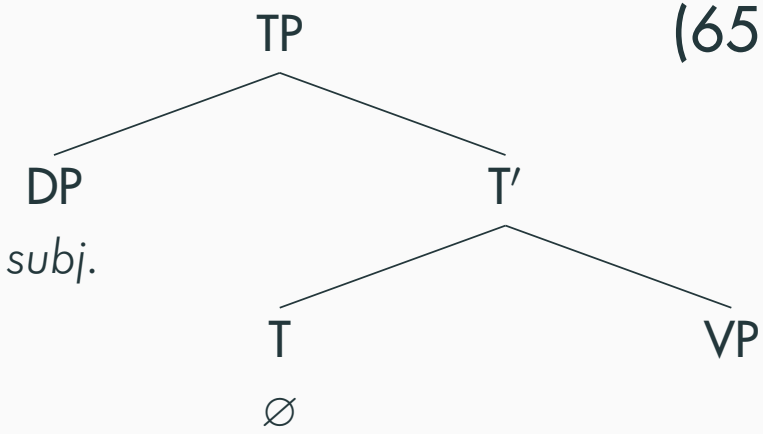
(62)



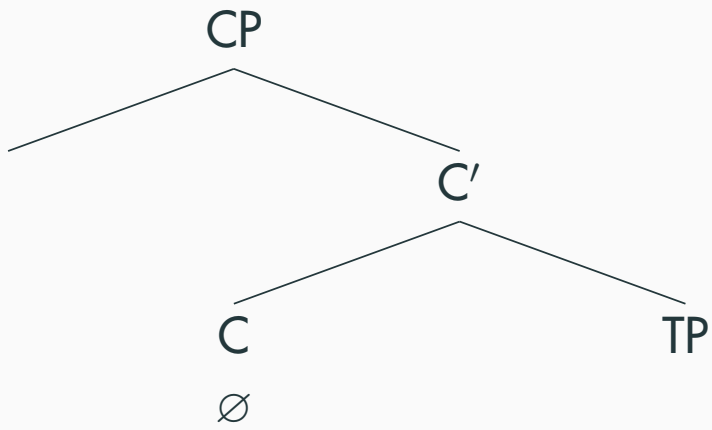
An aside: Empty heads

However, there are two other heads that must always be drawn, even if they are empty:

(64)



(65)



What category are pronouns?

We previously treated possessive pronouns as D, but others as NP. However, consider their distribution in English:

(66) a. *the she

b. *every you

c. *Your they from Scarborough

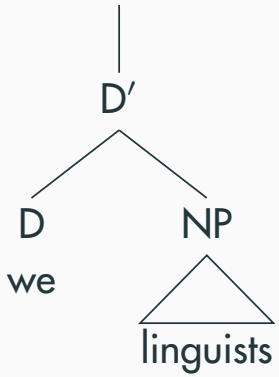
d. We linguists

Pronouns are Determiners

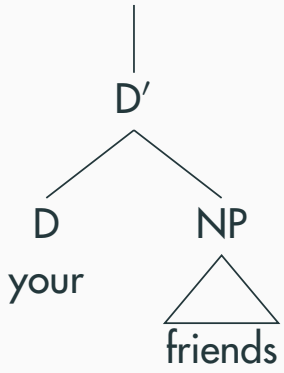
We can conclude that all pronouns are determiners:

(67)

(68)



(69)



Is there another option for possessives?

The Genitive

There are some issues with the D analysis for the Saxon genitive (*'s*):
Some determiners are compatible with possessors in English:

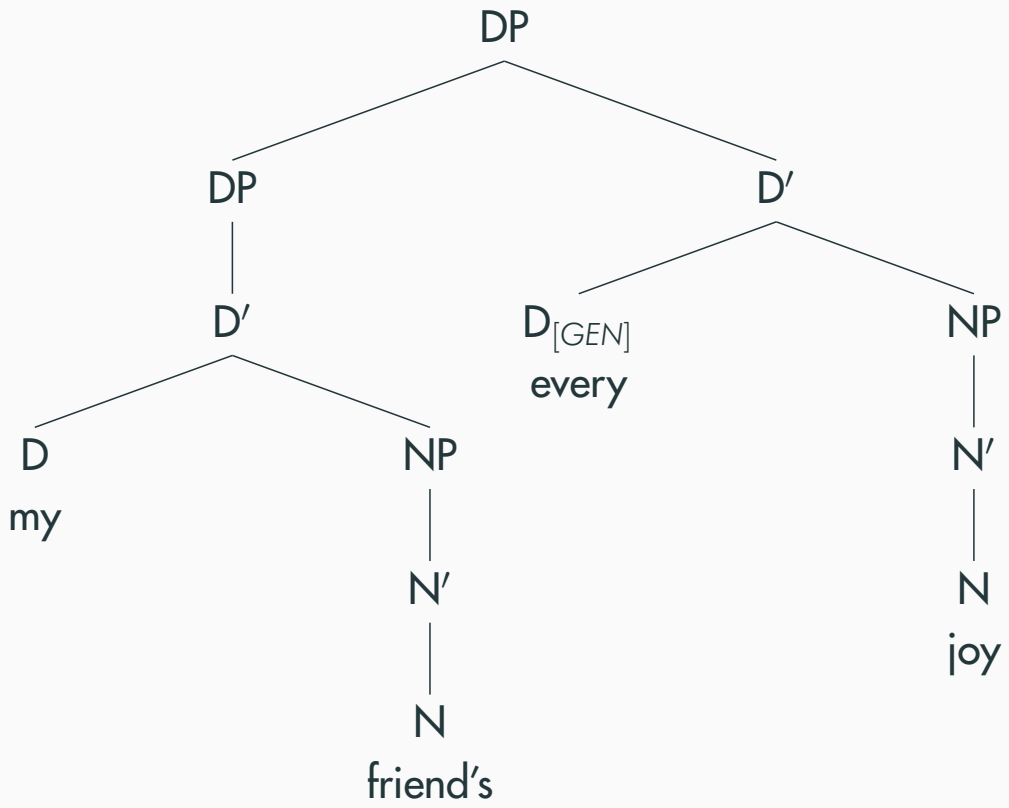
(70) a. Bolod's every thought was brilliant

b. Her every dream came true

The Genitive

We have an alternative, if we allow some marking of features / case in DPs:

(71) *My friend's every joy*



Case

This approach is most useful in other languages that mark case directly on nominals:

(72) Mongolian case markers

a. surugci-∅
student-NOM

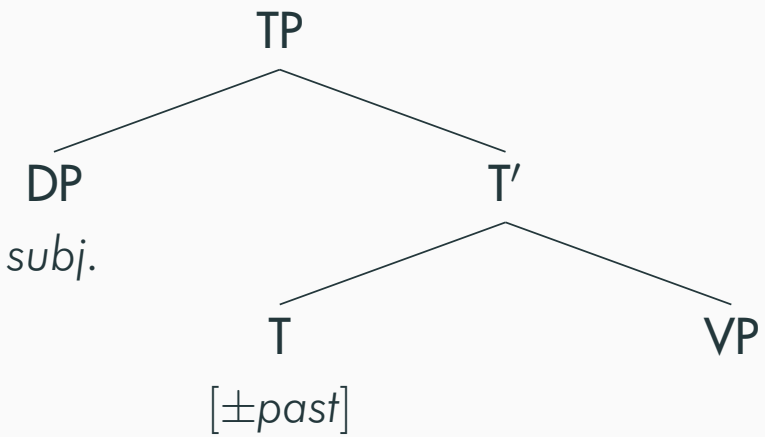
b. surugci-ig
student-ACC

c. surugci-iin
student-GEN

Features on T

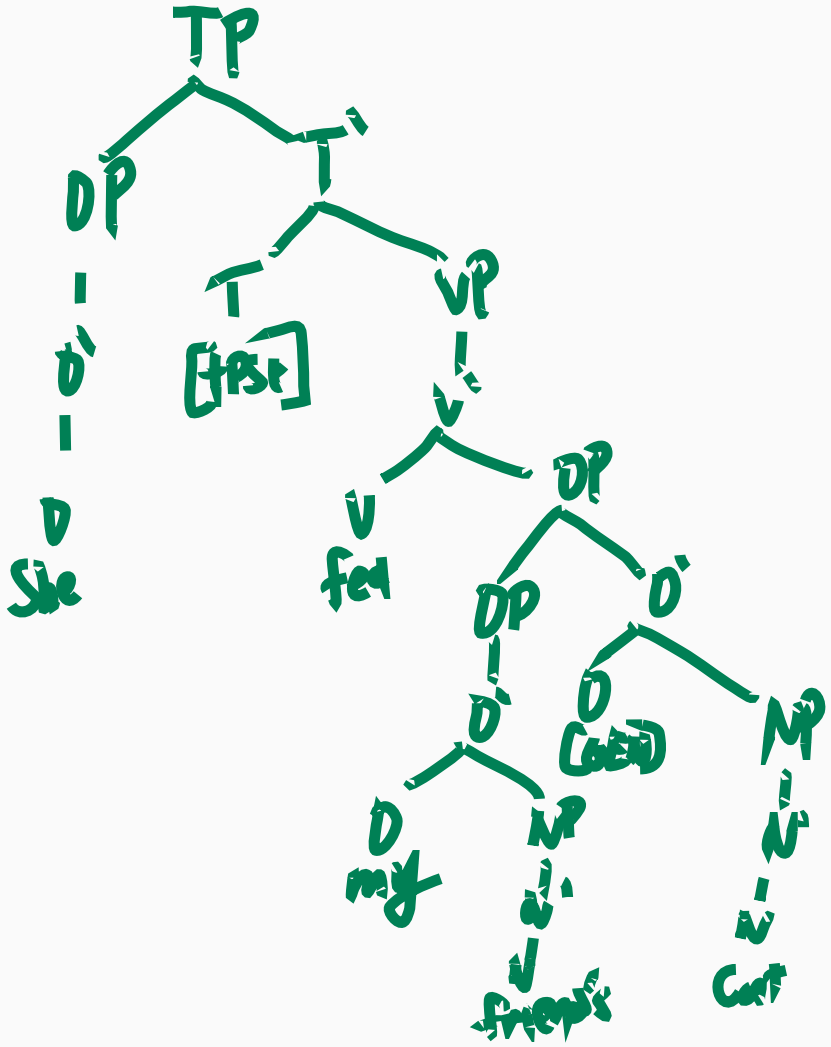
Adding features also lets us handle tense:

(73)



Putting it together

(74) She fed my friend's cat



Putting it together

(75) This linguist's research impacts every discipline