

X-bar Theory

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Outline

Principles and Parameters

X-bar Theory

Principles and Parameters

- ▶ An approach to the question of how children acquire language
- ▶ Ideas started shaping since the early days of modern generative grammar
- ▶ The version that is usually referred to was presented in the 1980s
- ▶ Principles and Parameters is an approach, and not (meant to be) a specific theoretical system

Principles and Parameters

Observations

- ▶ Despite large variations, languages have many common properties on an abstract level
- ▶ Children learn languages easily, despite the fact that language are highly complex
- ▶ Idea: the common properties of languages are innate, so only variations need to be learned

Universality

A theory of grammar should provide us with the tools needed to describe the grammar of **any** natural language adequately.

Principles and Parameters

Key ideas

- ▶ **Universal Grammar** can be defined as:
 - ▶ The set of **Principles** that are common to all languages.
 - ▶ The initial state of language knowledge for human beings.
- ▶ Principles may include **parameters**, which represent settings that may vary from language to language.
- ▶ Children *simply* need to learn the values of relevant parameters to acquire the grammar of their native language.

Questions

- ▶ What are the principles that are part of UG?
- ▶ What parameters are there in UG, and what are their possible values in individual languages?

Government and Binding

Government and Binding

- ▶ GB refers to a specific approach to linguistic theory
- ▶ GB focus on principles rather than rules.
- ▶ More modularity: it actually consists of a set of theories that interact.
 - ▶ $\bar{X}$ (X-bar) theory
 - ▶ θ theory
 - ▶ Case theory
 - ▶ Binding theory
 - ▶ Bounding theory
 - ▶ Control theory
 - ▶ Government theory

Outline

Principles and Parameters

X-bar Theory

X-bar theory

- ▶ X-bar theory was developed in the 1970s to design phrase structures in a more theoretically sound way.
 - ▶ First presented by Chomsky (1970).
 - ▶ More extensively developed by Jackendoff (1977).
- ▶ X-bar theory forms the basis of syntactic structure in the transformational tradition.
- ▶ X-bar theory seeks to be **general**.

Key concerns

- ▶ Can we define phrase structure rules in a way that captures **cross-linguistic** properties of syntactic structures?
- ▶ Can we define phrase structure rules in a way that allows to capture commonalities in structure within a language? (**cross-categorical**)
- ▶ Can we define phrase structure rules in a way that distinguishes **complements** from **adjuncts**?

X-bar theory

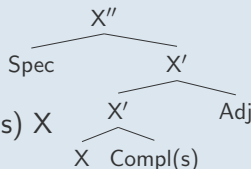
Syntactic headship was defined and phrases viewed in terms of heads, complements and specifiers.

Phrase Structure Rules

$X'' \rightarrow \text{Specifier } X' \mid X' \text{ Specifier}$

$X' \rightarrow \text{Adjunct } X' \mid X' \text{ Adjunct}$

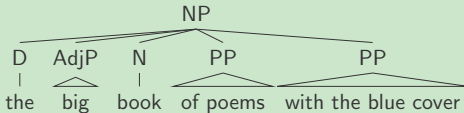
$X' \rightarrow X \text{ Complement(s)} \mid \text{Complement(s)} X$



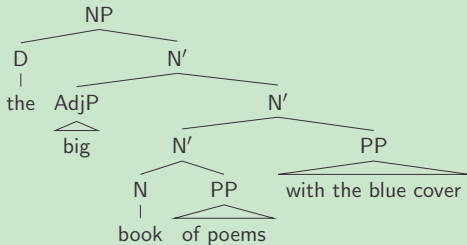
- ▶ X: an arbitrary lexical category
- ▶ XP: X phrase
- ▶ X-bar, X' , $\bar{X}$: intermediate level
- ▶ Endocentric structures only

An example (N)

Flat



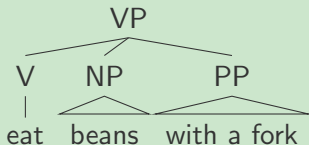
Highten



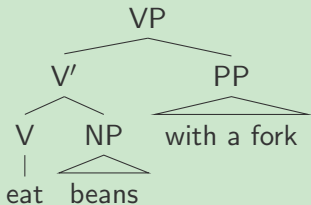
- ▶ $NP \rightarrow D \ N'$
- ▶ $N' \rightarrow AdjP \ N'$
- ▶ $N' \rightarrow N' \ PP$
- ▶ $N' \rightarrow N \ PP$

An example (V)

Flat

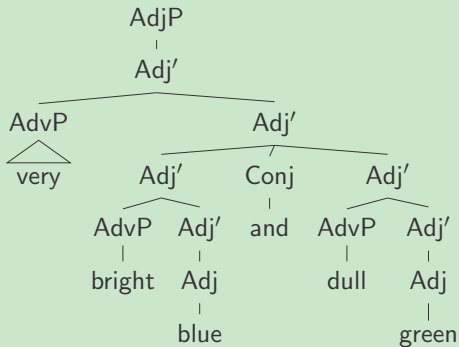


Highten



- ▶ $VP \rightarrow V'$
- ▶ $V' \rightarrow N' PP$
- ▶ $V' \rightarrow V NP$

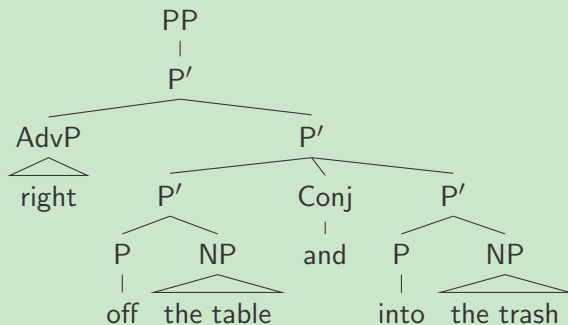
An example (Adj)



- ▶ $\text{AdjP} \rightarrow \text{Adj}'$
- ▶ $\text{Adj}' \rightarrow \text{AdvP Adj}'$
- ▶ $\text{Adj}' \rightarrow \text{Adj}$

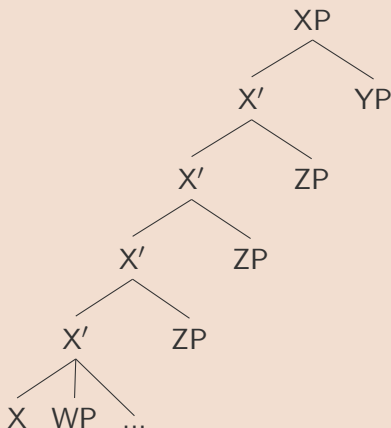
An example (P)

PP



- ▶ $PP \rightarrow P'$
- ▶ $P' \rightarrow AdvP \ P'$
- ▶ $P' \rightarrow P$

Projection



- ▶ The XP is called the **maximal projection**.
- ▶ The X' is called the **intermediate projection**.

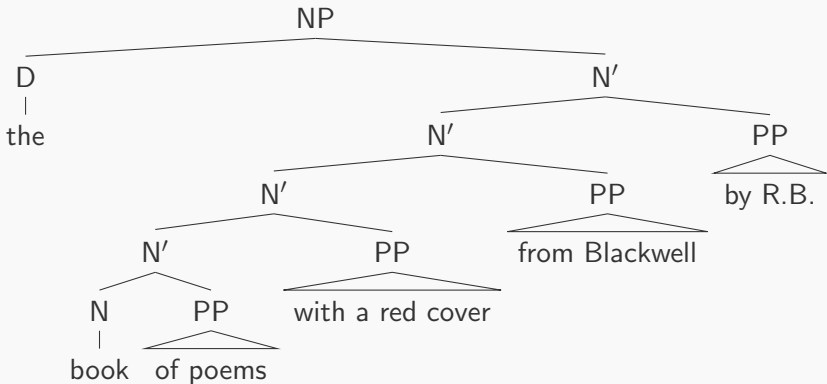
Complements and Adjuncts

PP is a complement	PP is an adjunct
<pre> graph TD NP1[NP] --- D1[D] NP1 --- Np1[N'] D1 --- the1[the] Np1 --- N1[N] Np1 --- PP1[PP] N1 --- book1[book] PP1 --- of[of] PP1 --- poems1[poems] </pre>	<pre> graph TD NP2[NP] --- D2[D] NP2 --- Np2[N'] D2 --- the2[the] Np2 --- Np2p[N'] Np2 --- PP2[PP] Np2p --- N2[N] N2 --- book2[book] PP2 --- with[with] PP2 --- a[a] PP2 --- red[red] PP2 --- cover[cover] </pre>
The PP seems to complete the meaning of the noun.	The PP seems more optional and more loosely related to the head.

- (1) a. the book of poems with a red cover
 b. *the book with a red cover of poems

Complements and Adjuncts (cont)

- (2) a. the book [of poems] [with a red cover] [from Blackwell]
[by Robert Burns]
b. *the book [of poems] [of fiction] [with a red cover]



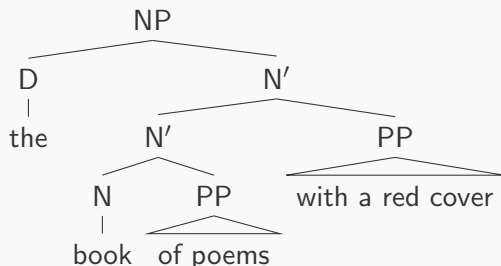
Complements and adjuncts (cont)

- (3)
- a. the book of poems with a red cover from Blackwell by Robert Burns
 - b. the book of poems from Blackwell with a red cover by Robert Burns
 - c. the book of poems from Blackwell by Robert Burns with a red cover
 - d. *the book with a red cover of poems from Blackwell by Robert Burns
- (4)
- a. the book of poems with a red cover and with a blue spine
 - b. the book of poems and of fiction from Blackwell
 - c. *the book of poems and from Blackwell

Complements and adjuncts (cont)

One-replacement

Replace an N' node with one.



- (5)
- a. the one
 - b. the one with a red cover
 - c. *the one of poems with a red cover

Complements and adjuncts (cont)

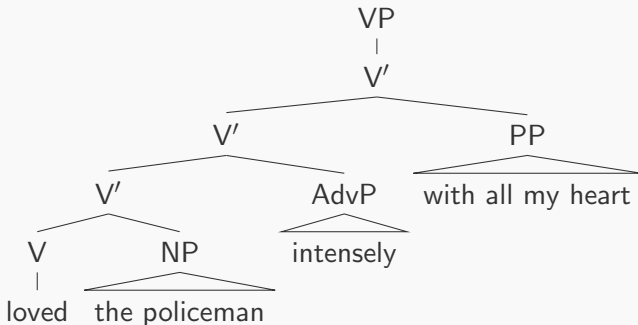
Summary

- ▶ Adjuncts but not complements can be **iterated** and **reordered** and can stand **next to one**.
- ▶ Complements must be located **next to the head** and can't be reordered.
- ▶ We could **conjoin complements with complements** and **adjuncts with adjuncts**, but we couldn't mix the two.

The complement/adjunct distinction holds for categories other than NP as well.

Complements and adjuncts (V)

- (6) I [_V loved] [_{direct object} the policeman] [_{adjunct} intensely]
 [_{adjunct} with all my heart].



- (7) a. *I loved intensely the policeman with all my heart.
 b. *I loved the policeman the baker intensely with all my heart.

Complements and adjuncts (V)

Did-so (did-too) replacement targets V'. It can only apply before an adjunct and not before a complement.

- (8) Mika loved the policemen intensely and
- a. Susan did so half-heartedly.
 - b. *Susan did so the baker.

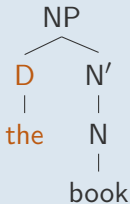
In general, complements of all categories (N, V, A, P, etc.) are the semantic objects of the head.

- (9)
- a. John fears dogs. (verb)
 - b. John is afraid of dogs. (adjective)
 - c. John has a fear of dogs. (noun)

Determiner phrases (DP)

According to X-bar theory

All non-head material must be phrasal. We don't like,



Determiner phrases (DP)

Proposal

- ▶ Determiners are heads.
- ▶ Determiners are not part of the NP.
- ▶ NP is the complement to the determiner head.

Old view	DP hypothesis

Genitive NPs

of-genitive

- (10)
- a. the coat of the panther
 - b. the roof of the building
 - c. the hat of the man standing over there

s'-genitive

- (11)
- a. the panther's coat
 - b. the building's roof
 - c. the man standing over there's hat
 - d. *the man's standing over there hat

Genitive NPs

Key observations

- ▶ the 's marker appears after the entire possessor NP.
- ▶ 's is not a suffix. Instead it seems to be a small word indicating possession.
- ▶ 's is in complementary distribution with (i.e., cannot co-occur with) determiners.

- (12) a. the man standing over there's hat
 b. *the man's standing over there hat

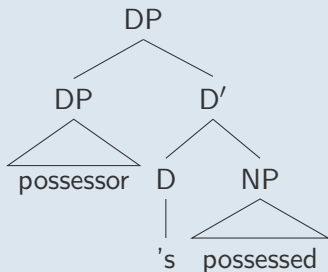
- (13) a. *the building's **the** roof (cf. **the** roof of **the** building)
 b. *the panther's **the** coat (cf. **the** coat of **the** panther)
 c. *the man standing over there's **the** hat (cf. **the** hat of **the** man standing over there)

Genitive NPs

Linguistic view

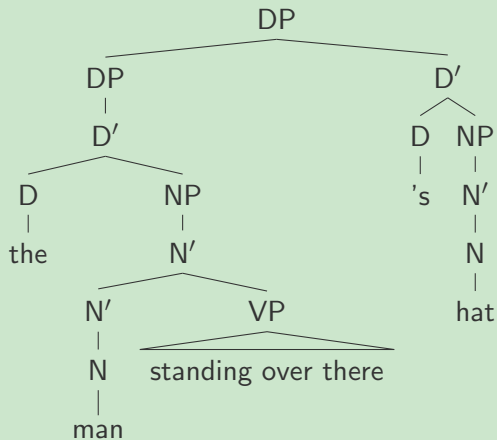
When two items are in complementary distribution, they are instances of the same thing.

Proposal



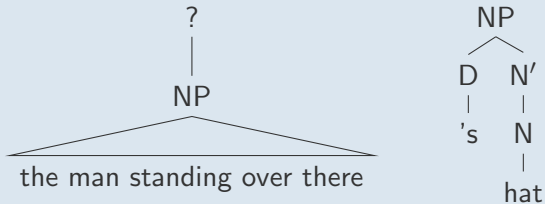
An example (DP)

DP



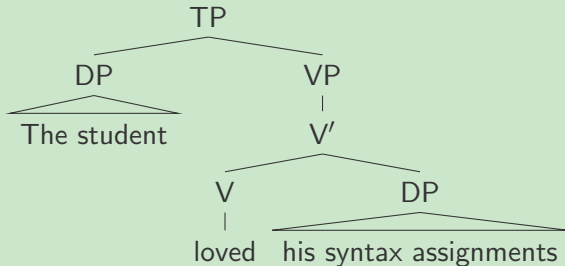
An example (DP)

Old view



Tense phrases (TP)

Example



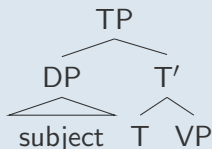
Context-free rule

- ▶ Other courses: $S \rightarrow NP VP$
- ▶ This course so far: $TP \rightarrow DP VP$

Tense phrases (TP)

In order to reanalyze the $TP \rightarrow DP VP$ in X-bar terms, we need to determine TP's **head**, **complement**, and **specifier**

Proposal



- ▶ T is a functional head.
- ▶ The subject DP sits in the specifier of TP.
- ▶ The VP is the complement to T.

Problem

T is optional in this view.

Tense phrases (TP)

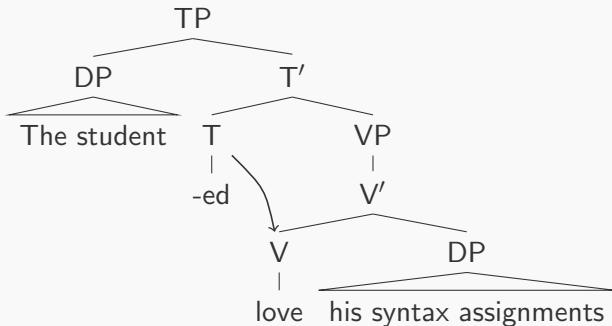
Key observations

- ▶ Tense **inflection** on a verb is in complementary distribution with auxiliaries
- ▶ We can conjoin a T' that has an auxiliary with a T' that has a tensed verb.

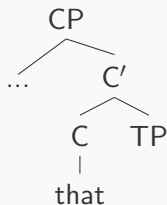
- (14) a. The roadrunner walks funny.
b. The roadrunner is walking funny.
c. *The roadrunner is walks/walkings funny.

- (15) I [T' [T' kissed the toad] and [T' must go wash my mouth now]].

Movement



Complementizer phrases (CP)



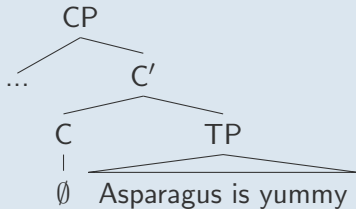
Question

Do all clauses have CPs, or do only embedded clauses have CPs?

- (16)
- a. John thinks that asparagus is yummy.
 - b. *That asparagus is yummy. (cf. Asparagus is yummy.)

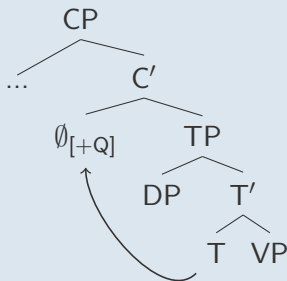
Complementizer phrases (CP)

Proposal: null complementizer



Yes/No questions

Proposal



Yes/No questions

if

- ▶ English does, in fact, have an overt $[+Q]$ complementizer (i.e. *if*), but it is only found in embedded questions.
- ⇒ *If* occupies the $[+Q]$ complementizer, so no subject-aux inversion is required (or allowed).

- (17)
- a. Fabio asked if Claus had run a marathon.
 - b. *Fabio asked if had Claus run a marathon.
 - c. *Fabio asked had if Claus run a marathon.

Yes/No questions

Cross-linguistic concern

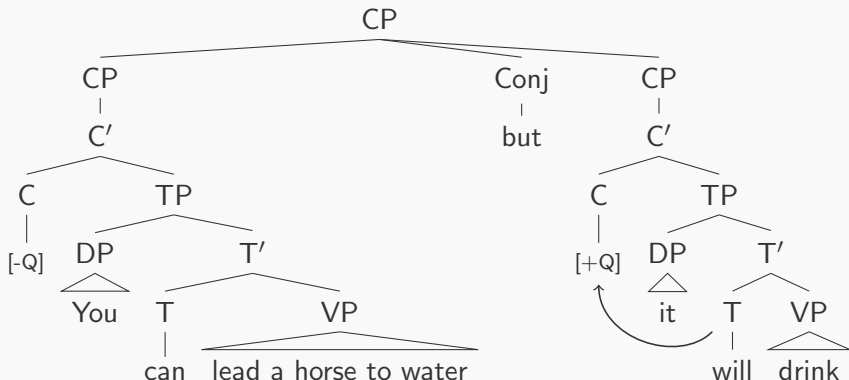
In many other languages (e.g. Irish), yes/no questions are formed with a complementizer particle that precedes the verb.

- (18) Ar thit Sean?
 Q fall John
 Did John fall?

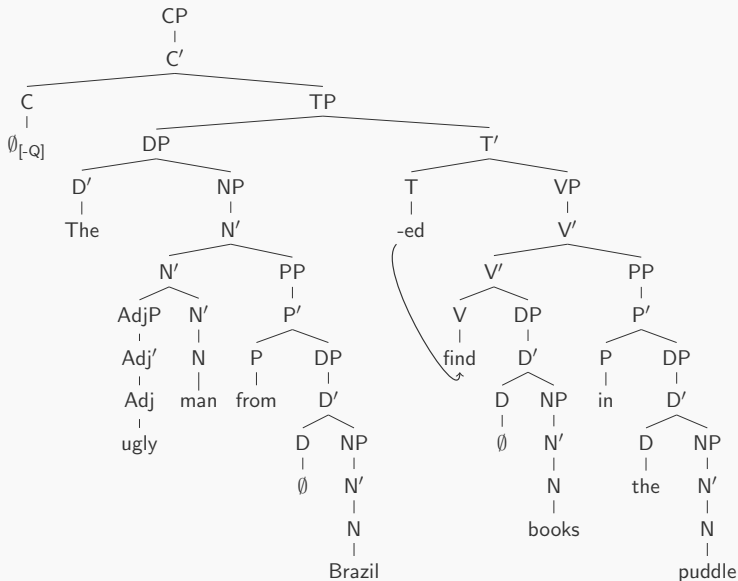
Complementizer phrases (CP)

Coordination

(19) You can lead a horse to water but will it drink?



A big picture



Homework I

- ▶ X-bar analysis for sample Chinese sentences.
- ▶ Select ca. 20 sentences from our Test Suite and present coherent X-bar analysis for them.

Reading

- ▶ Chap. 6&7. *Syntax: A Generative Introduction*.
- * Chap. 1. *Syntactic Theory and the Structure of English: A Minimalist Approach*.
- * 徐列炯, 沈阳. 1998. 《题元理论与汉语配价问题》