Movement

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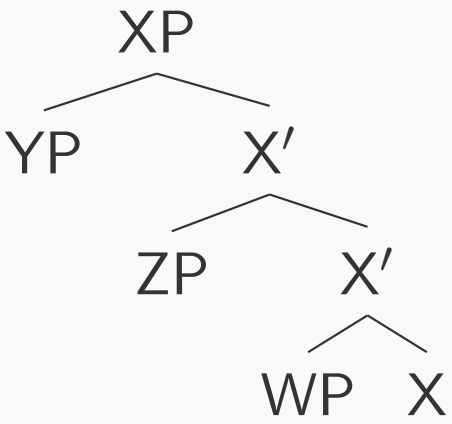
Quick recap

One level of structure in syntax

- Representing the *superficial* syntactic structure of sentences.
- Well-formed *structures* in a given language will be determined by
  - Categorial component: category-neutral X-bar rule schemata
  - Lexicon: Lexical items with their categorial status and contextual restrictions



place

Source/Agent	Theme	Goal
DP	DP	PP
i	j	k

Outline

Motivation

Head Movement

DP Movement

Wh-movement

Move-α

Expressivity

Question

Is CFG powerful enough to generate all sentences of a particular language?

Theorem

The copy language $\{ww|w \in \{a,b\}^*\}$ is not context-free.

Discontinuity

- A given word/phrase is separated from another word/phrase that it depends on.
- A direct connection cannot be established between the two words/phrases.
- ☹ CFG cannot handle discontinuities well.

Cross-serial dependencies (1)

English

that Charles lets Mary help Peter teach John to swim

German

dass der Karl die Maria dem Peter den Hans schwimmen lehren helfen laesst

Dutch

dat Karel Marie Piet Jan laat helpen leren zwemmen

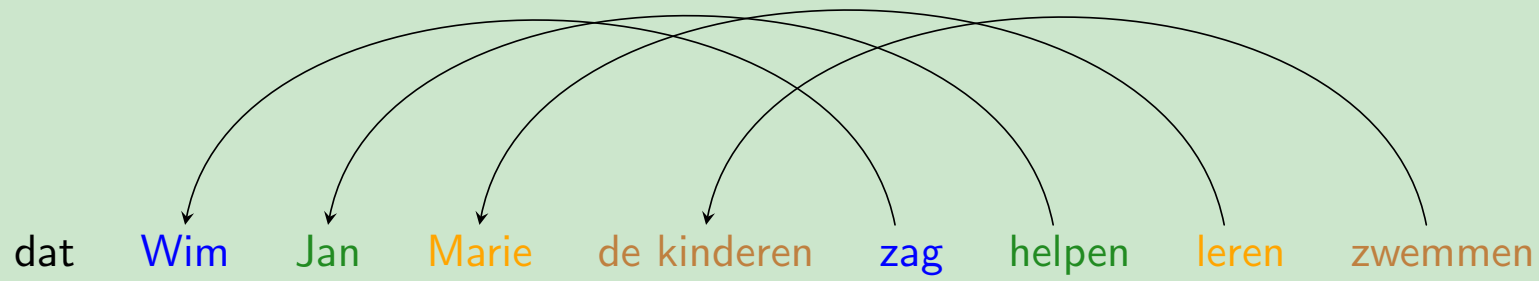
Swiss German

dass de Karl d'Maria em Peter de Hans laat hälfe lärne schwüme

Cross-serial dependencies (2)

Cross-serial dependencies in Dutch

... dat Wim Jan Marie de kinderen zag helpen leren zwemmen
... that Wim Jan Marie the children saw help teach swim
... that Wim saw Jan help Marie teach the children to swim



- Dutch displays cross-serial dependencies.
- Dutch is not context free.

$\Rightarrow$ We need extensions of CFG in order to describe all natural language phenomena!

Cross-serial dependencies (3)

Cross-serial dependencies in Swiss German

... das mer em Hans es huus hälfed aastriiche
... that we Hans$_{Dat}$ house$_{\mathrm{ACC}}$ helped paint
... that we helped Hans paint the house

... das mer d'chind em Hans es huus lönd hälfe aastriiche
... that we the children$_{\mathrm{ACC}}$ Hans$_{Dat}$ house$_{\mathrm{ACC}}$ let help paint
... that we let the children help Hans paint the house

- Swiss German displays cross-serial dependencies.
- Swiss German is not context free.

$\Rightarrow$ We need extensions of CFG in order to describe all natural language phenomena!

Elegancy

Question

Is CFG elegant enough to describe all natural language phenomena? Does it capture regularities in relations between expressions in a good way?

Passivization

(1) a. Noam Chomsky wrote *Syntactic Structures*.

b. *Syntactic Structures* was written (by Noam Chomsky).

Elegancy: Sometimes, X-bar rules don't work well.

Modern Irish Gaelic (VSO)

The subject (a specifier) intervenes between the verb and the object (complement).

(2) Phóg Máire an lucharachán.
Kissed Mary the leprechaun
"Mary kissed the leprechaun."

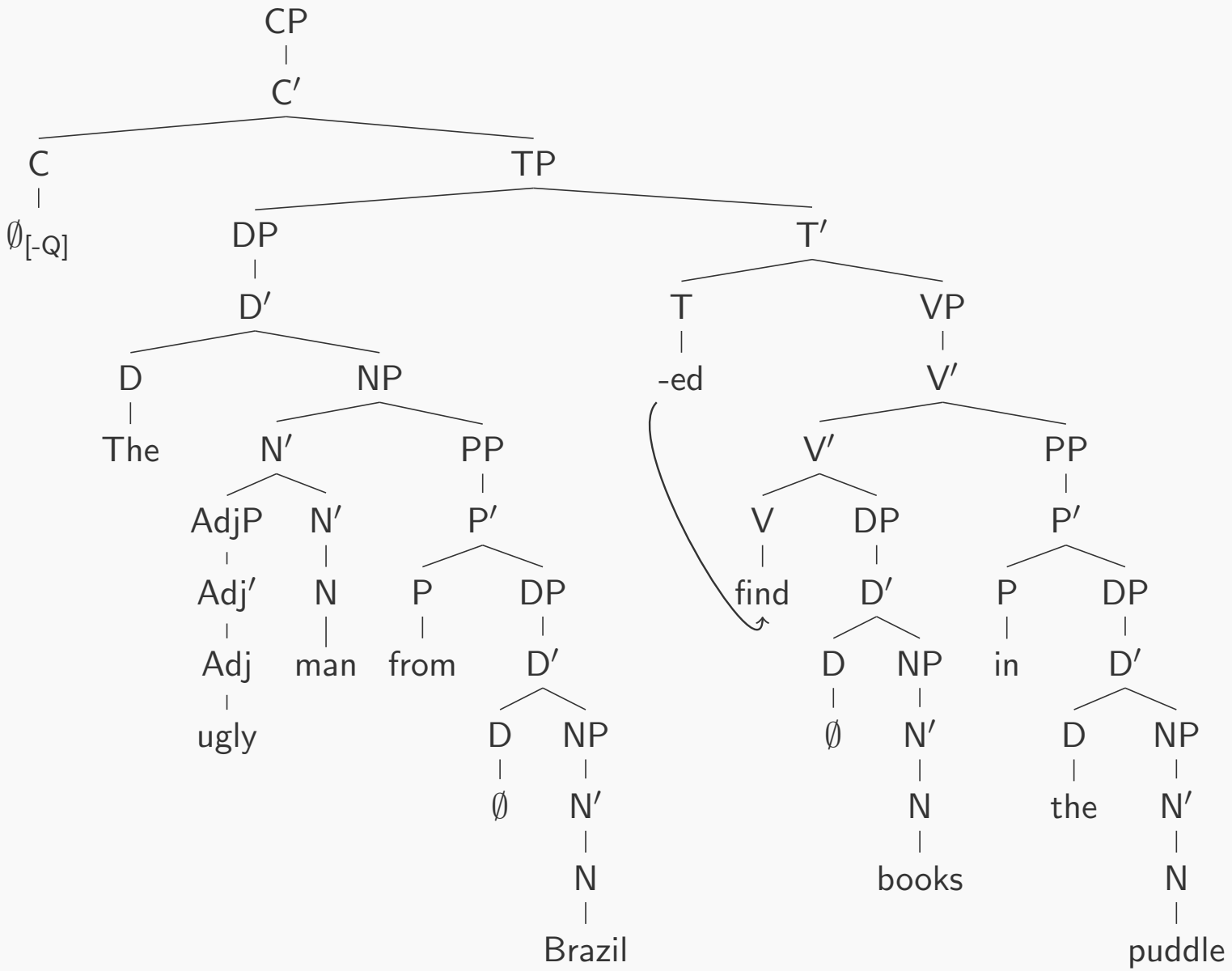
French

An adjunct *souvent* intervenes between the verb and the object.

(3) Je mange souvent des pommes.
I eat often of.the apples
"I often eat apples."

X-bar theory undergenerates the possible grammatical sentences.

Elegancy: Sometimes, X-bar rules don't work well.



Proposal (1)

Problem

A phrase structure grammar (such as X-bar theory) cannot generate all the sentences of a language.

Proposal

- Chomsky proposed that a set of rules was needed to change the structure generated by phrase structure rules.
- These rules are called transformational rules.
- Transformations change the output of X-bar rules (and other transformations) into different trees.
- Transformational rules are in very limited ways.

Proposal (2)

The picture

Proposal (2)

The picture

X-bar rules

Proposal (2)

The picture

X-bar rules

The lexicon

Proposal (2)

The picture

X-bar rules

↓

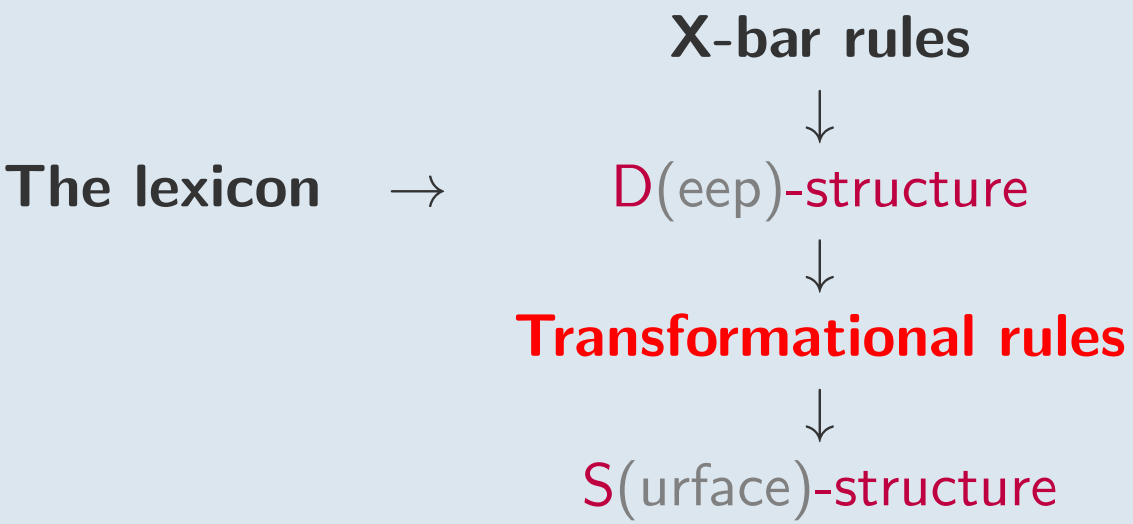
The lexicon → D(eep)-structure

Proposal (2)

The picture

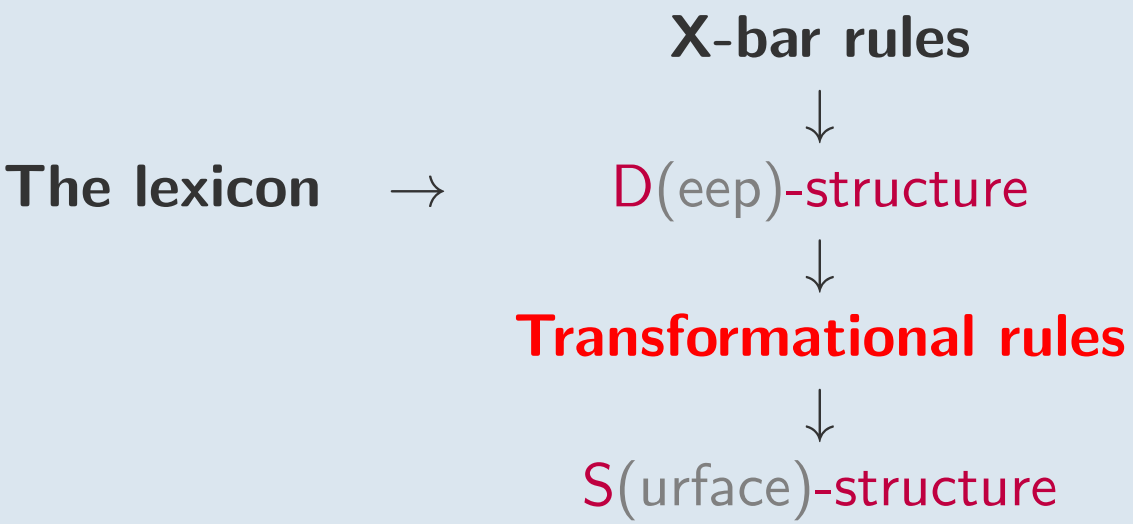
Proposal (2)

The picture



Proposal (2)

The picture



- Transformational grammars which allow symbols to be replaced by arbitrary other symbols are of type 0.
- A grammar of type 0 is too complex for natural language.
- One wants to have a restrictive formal apparatus for the description of grammatical knowledge.
- Transformational rules provided by GB are **highly restricted**.

Outline

Motivation

Head Movement

DP Movement

Wh-movement

Move-α

T-to-C movement

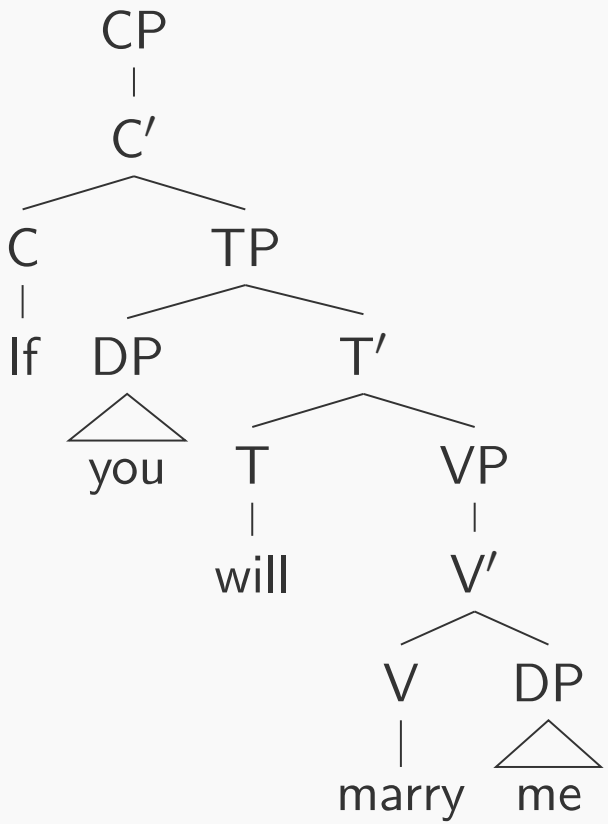
J Honey-buns, there's something I wanted to ask you
M What, sweetie-pie?
J **If you will marry me?**
M *(pretending not to hear)*: What d'you say, darlin'?
J **Will you marry me?**

Key observations

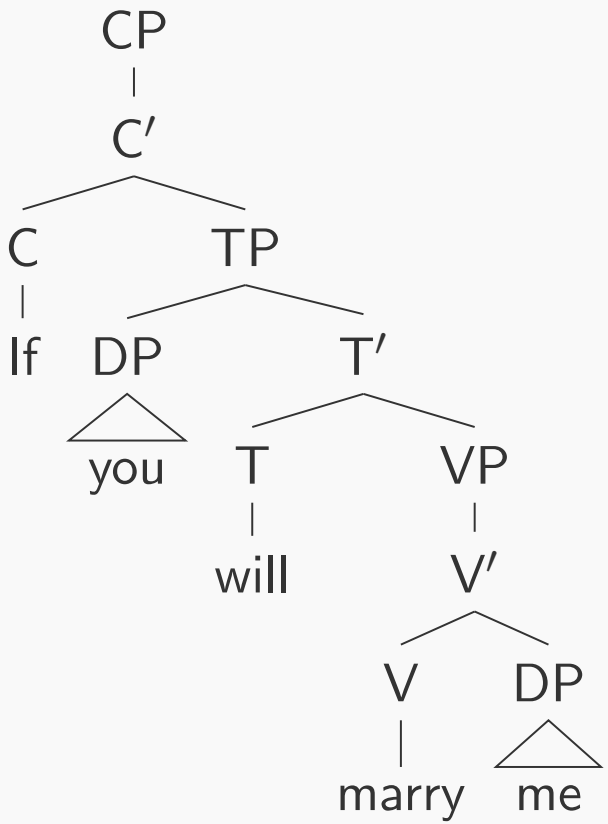
Complementizer *if* is in complementary distribution with auxiliary inversion.

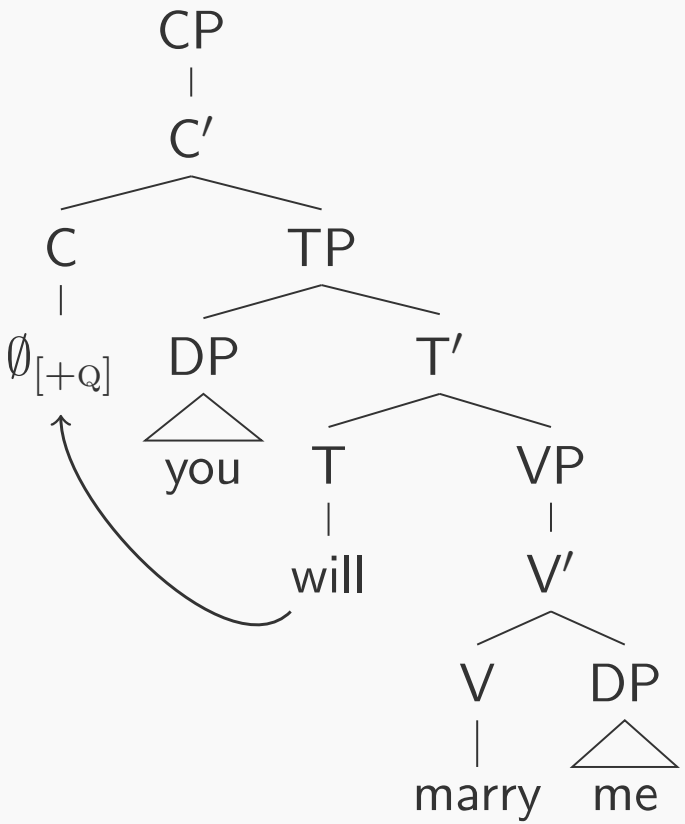
(4) a. If you will marry me?
b. Will you marry me?
c. *If will you marry me?

T-to-C movement

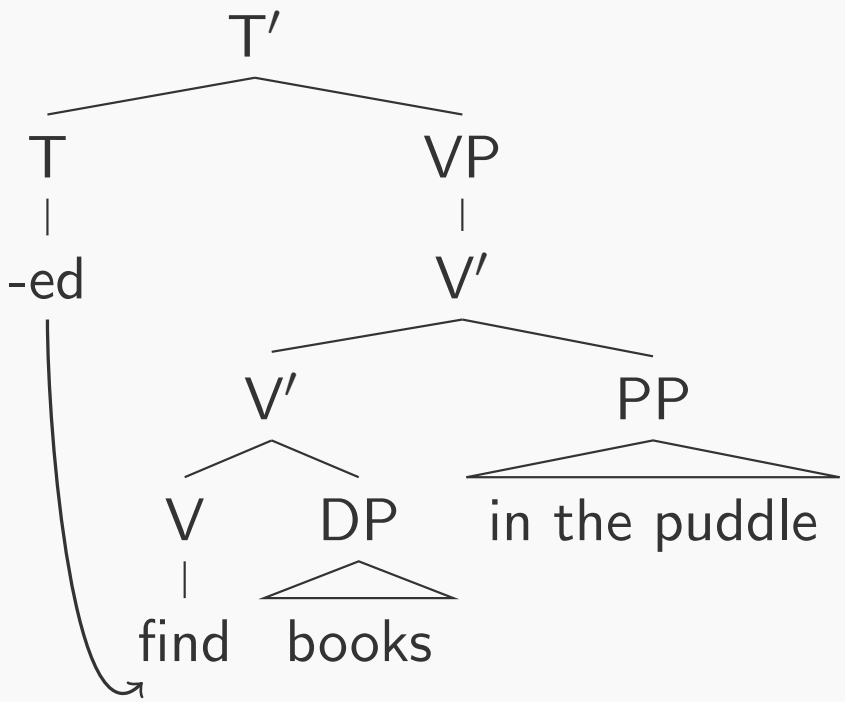


T-to-C movement





Affix lowering or V-to-T movement



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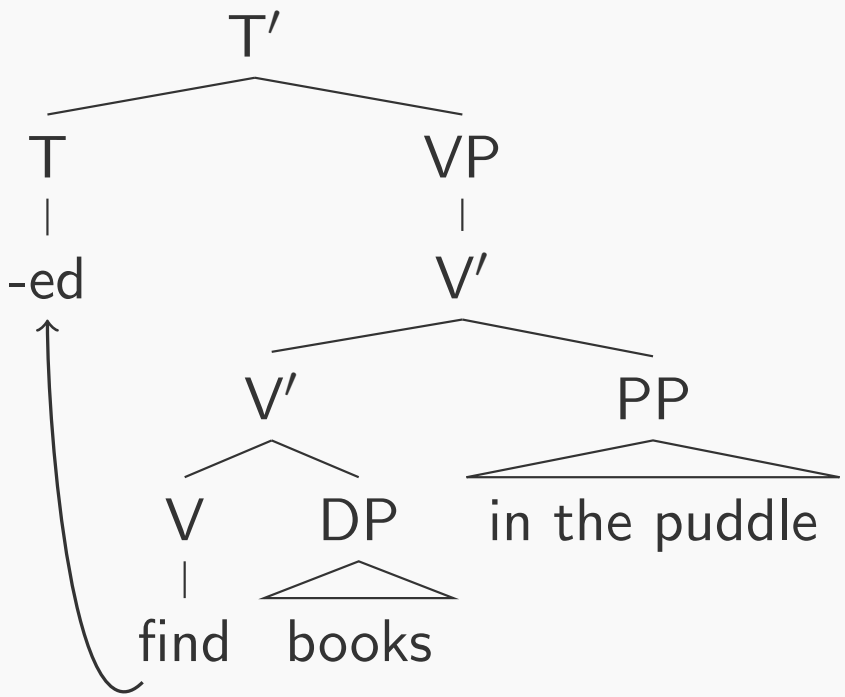


V-to-T movement

Elizabethan English

The English used during the reign of Queen Elizabeth I, when Shakespeare was writing around 400 years ago.

(5) a. She shall not see me

b. I will not think it

c. Thou hast not left the value of a cord

(6) a. Have I not heard the sea rage like an angry boar?

b. Didst thou not hear somebody?

c. Will you not dance?

V-to-T movement

Elizabethan English

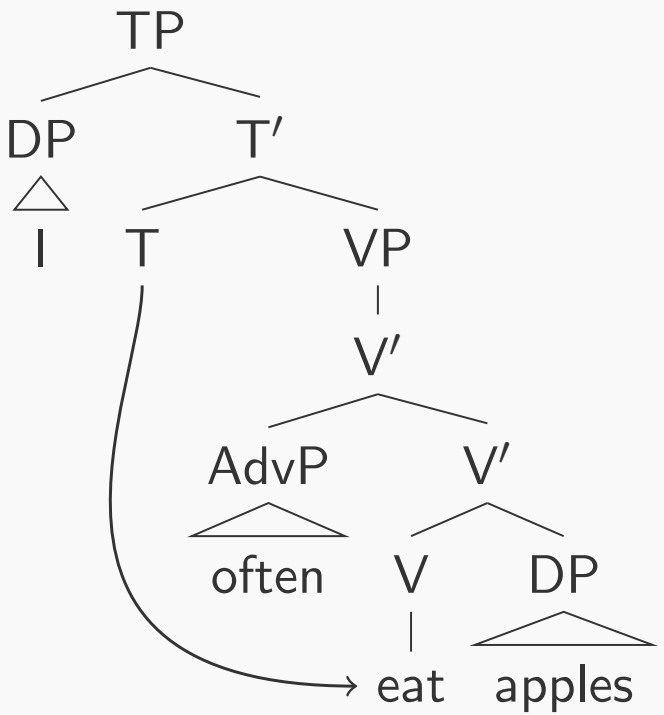
(7) a. I care not for her
b. He heard not that
c. My master seeks not me
d. I know not where to hide my head

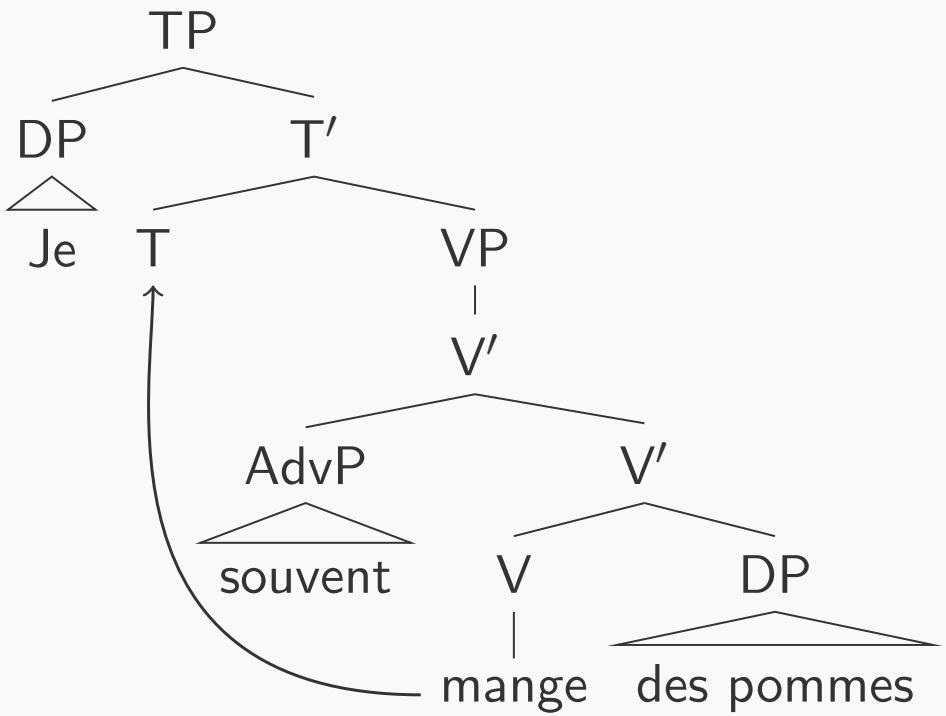
Chomsky's *strength* metaphor

- A finite T is strong in Elizabethan English and so must be filled.

$\Rightarrow$ In a sentence in which the T position is not filled by an auxiliary, the verb moves from V to T in order to fill the strong T position.

Affix lowering or V-to-T movement





Verb movement/raising

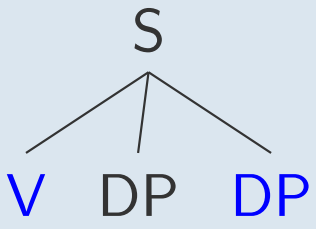
- *V-to-T movement*: Move the head V to the head T.
- *Verb raising parameter*: Verbs raise to T or T lowers to V.

VSO structure

This is the Verb-Subject-Object (VSO) order of Irish.

(8) Phóg Máire an lucharachán.
Kissed Mary the leprechaun
"Mary kissed the leprechaun."

A flat structure



- There is no VP constituent.
- The subject and the object have the same mother.
- The subject and the object mutually c-command one another.

VSO structure (1)

Is there a VP constituent?

(9) Tá Máire [ag-pógail an lucharachán].
Is Mary ing-kiss the leprechaun
"Mary is kissing the leprechaun."

Coordination:

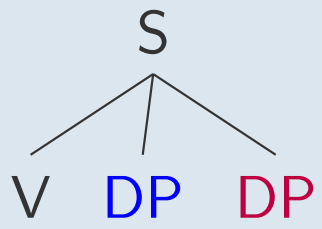
(10)
Tá Máire [ag-pógail an lucharachán] agus [ag-goidú a ór].
Is Mary [ing-kiss the leprechaun] and [ing-steal his gold]
"Mary is kissing the leprechaun and stealing his gold."

Clefting:

(11)
Is [ag-pógáil an lucharachán] atá Máire.
It-is [ing-kiss the leprechaun] that.be Mary
"It's kissing the leprechaun that Mary is."

VSO structure (2)

Should the subject and the object mutually c-command each another?



Binding:

(12) a.
Chonaic Síle$_i$ í-fein$_i$.
Saw Sheila herself
"Sheila saw herself."

b. *Chonaic í-fein$_i$ Síle$_i$.
Saw herself Sheila
"Sheila saw herself."

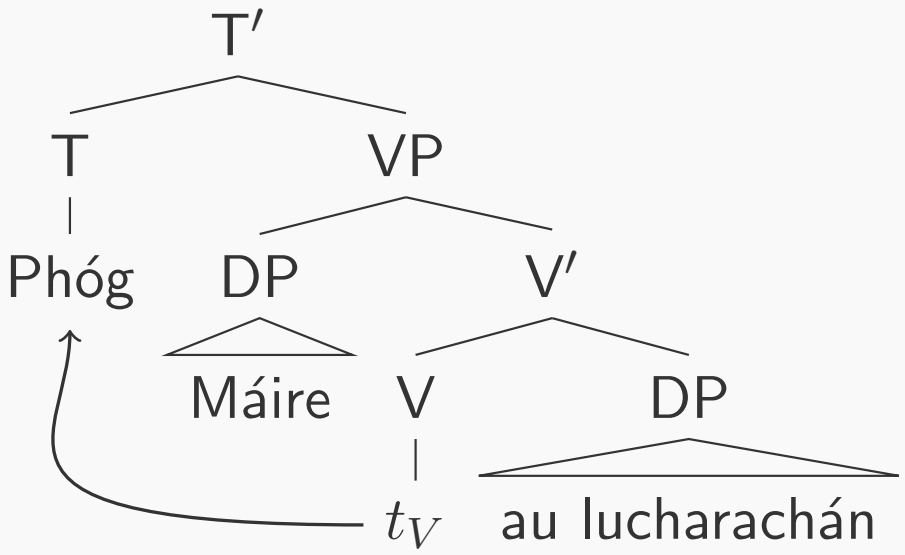
SVO⇒VSO (Koopman&Sportiche, 1991)

VP-internal subject hypothesis

Subjects are not generated in the specifier of TP; they are underlyingly generated in the specifier of VP.

The locality constraint on theta role assignment

Theta roles are assigned within the projection of the head that assigns them (i.e., the VP or other predicate).



Belfast English (1)

Standard English:

(13) a. Some students should get distinctions

b. Lots of students have missed the classes

Belfast English also has *expletive* structures below:

(14) a. There should some students get distinctions

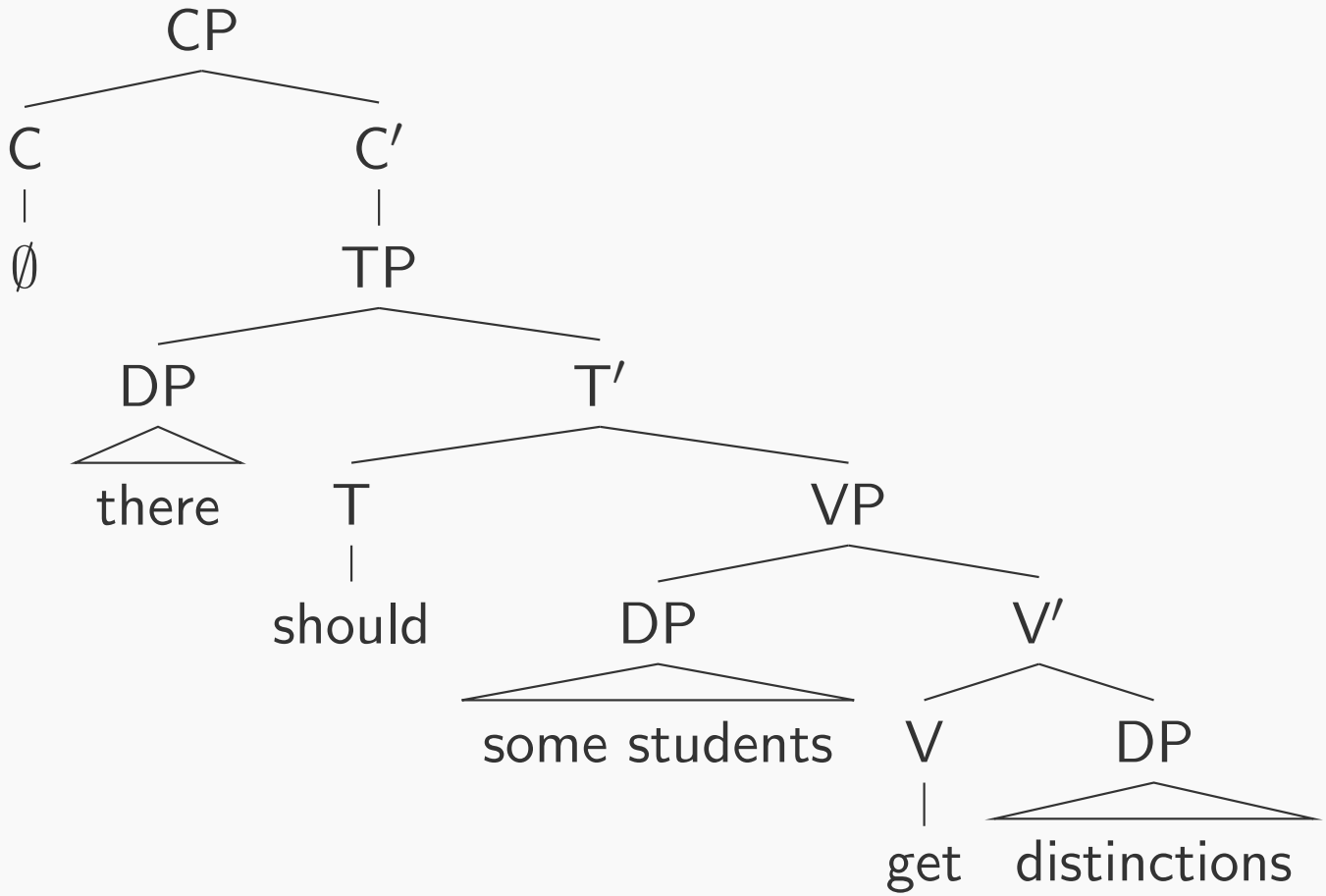
b. There have lots of students missed the classes

T-to-C movement

(15) a. Should there some students get distinctions?

b. Have there lots of students missed the classes?

Belfast English (2)



Multiple auxiliaries

(16) Shannon should have been being fed at the table.

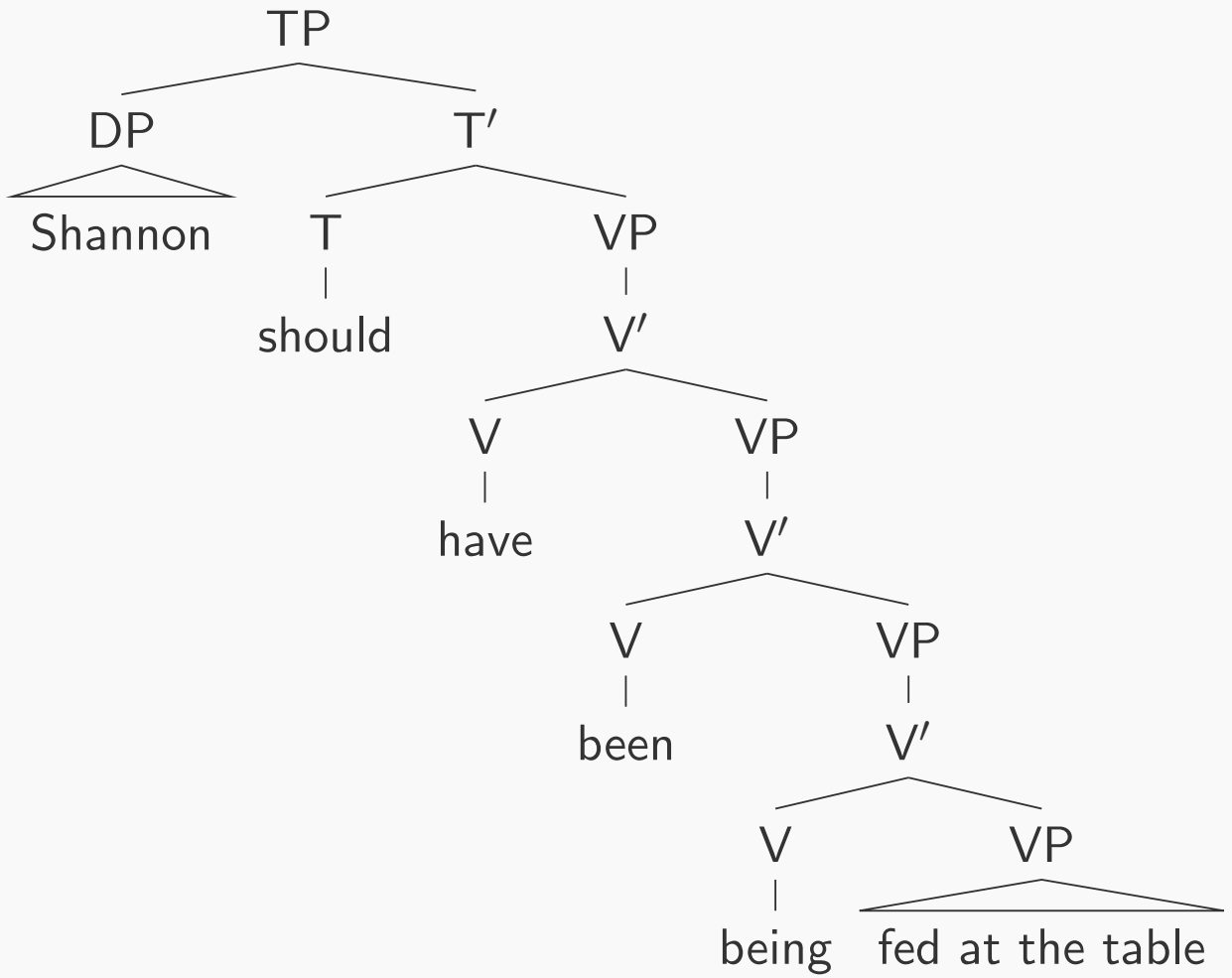
(17) a. Shannon should not have been being fed at the table.

b. Shannon should never have been being fed at the table.

(18) a. *Shannon not should have been being fed at the table.

b. *Shannon did not should have been being fed at the table.

Proposal: to treat some auxiliaries as Vs

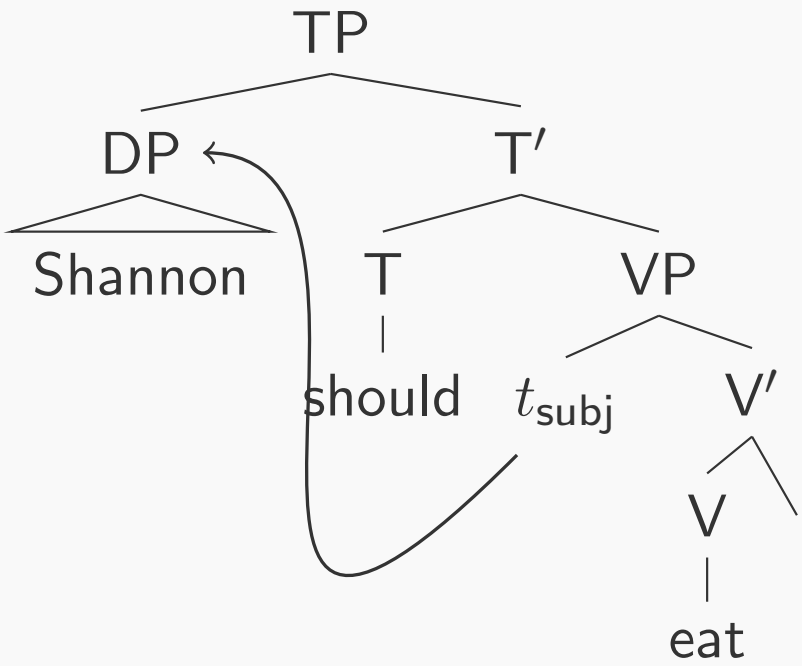


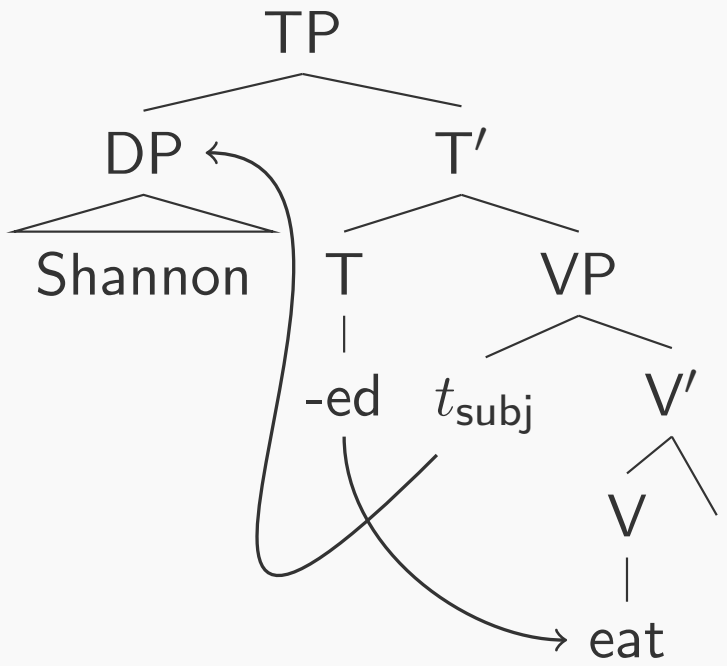
Multiple auxiliaries (2)

Verb Movement Parameter

Option 1 All tensed verbs raise to T.

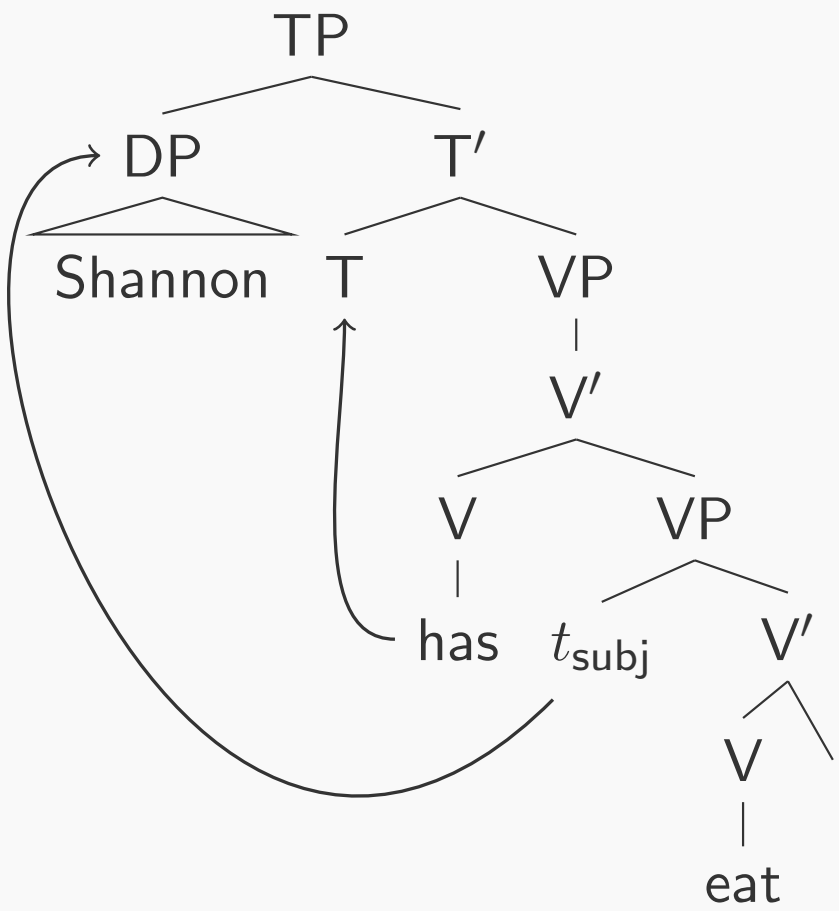
Option 2 Tensed Auxiliaries raise to T and T lowers to tensed main verbs.





Multiple auxiliaries (3)

Option 2 Tensed Auxiliaries raise to T and T lowers to tensed main verbs.

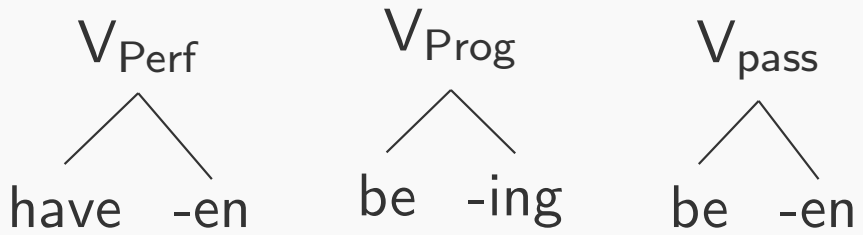


Affix hopping (1)

Simple Past and Present	V+ed/ V+s/ V+$\emptyset$
Modal	modal V
Perfective	have V+en
Progressive	be V+ing
Passive	be V+en

Shannon should have been being fed at the table.

have + be + en + be + ing + V + en



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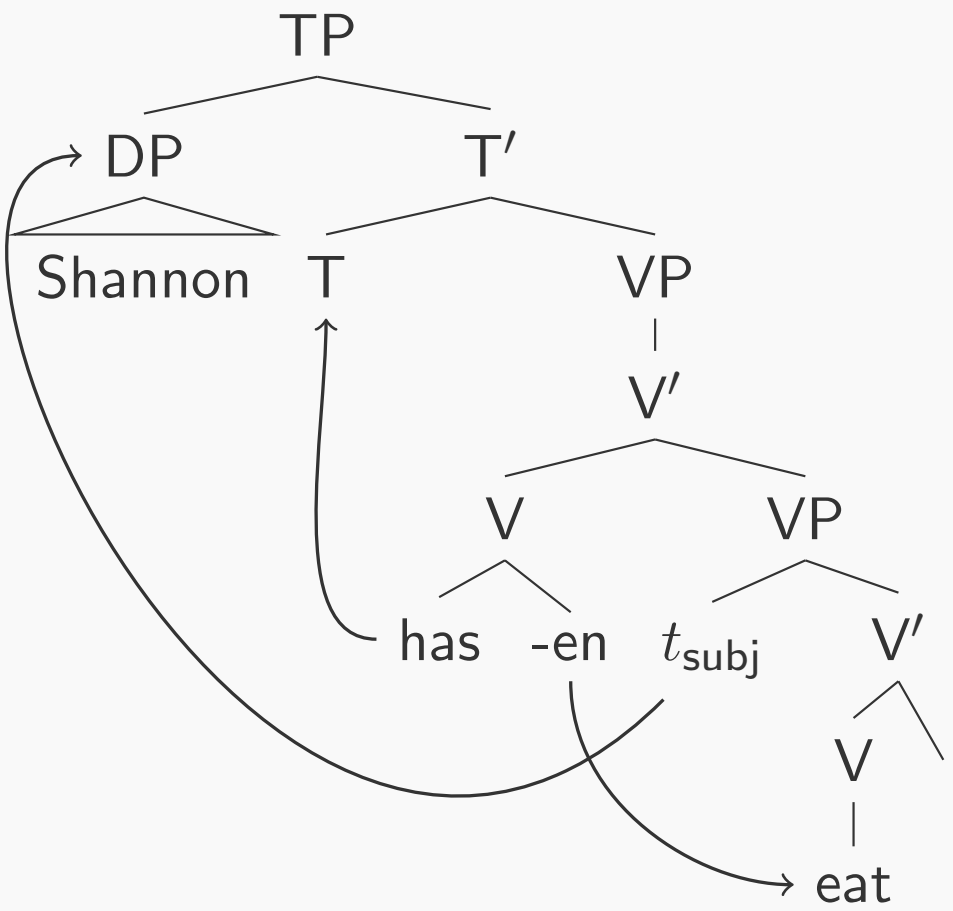
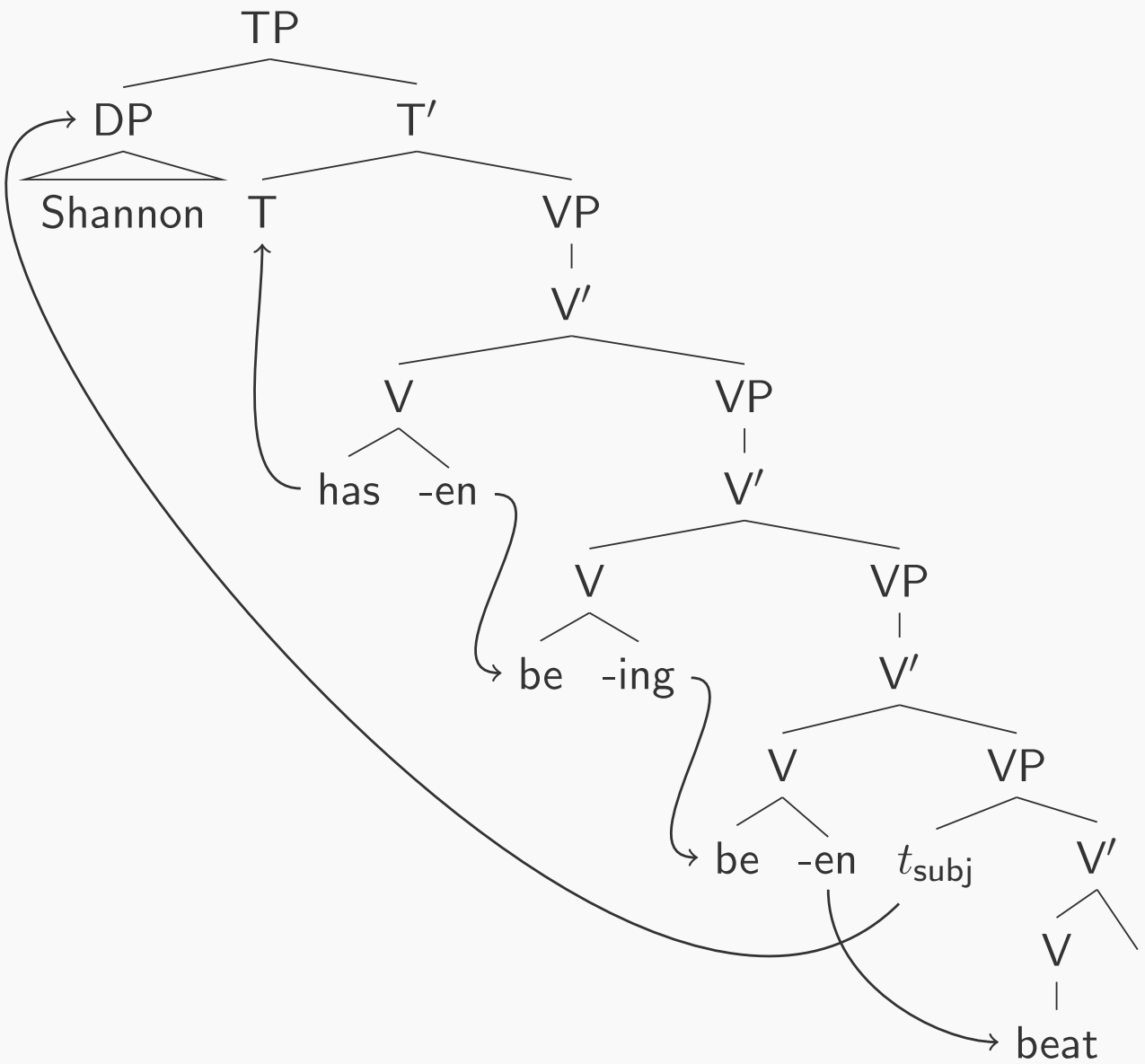


Affix hopping (3)



TBBT English

Example

Sheldon Is *placed* the right tense for something that would've happened in the future of a past that was affected by something from the future?

Leonard Had will have placed?

Discussion

How to analyze *had will have placed* ?

Outline

Motivation

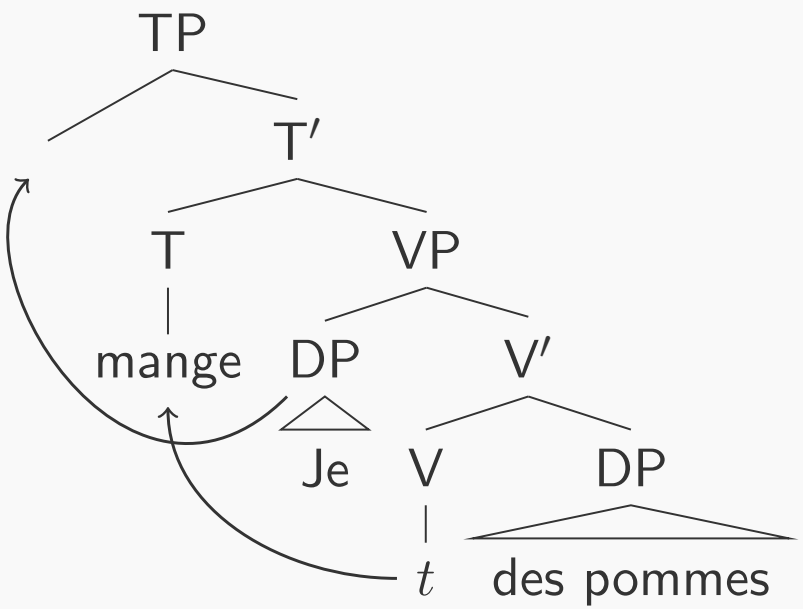
Head Movement

DP Movement

Wh-movement

Move-α

DP movement

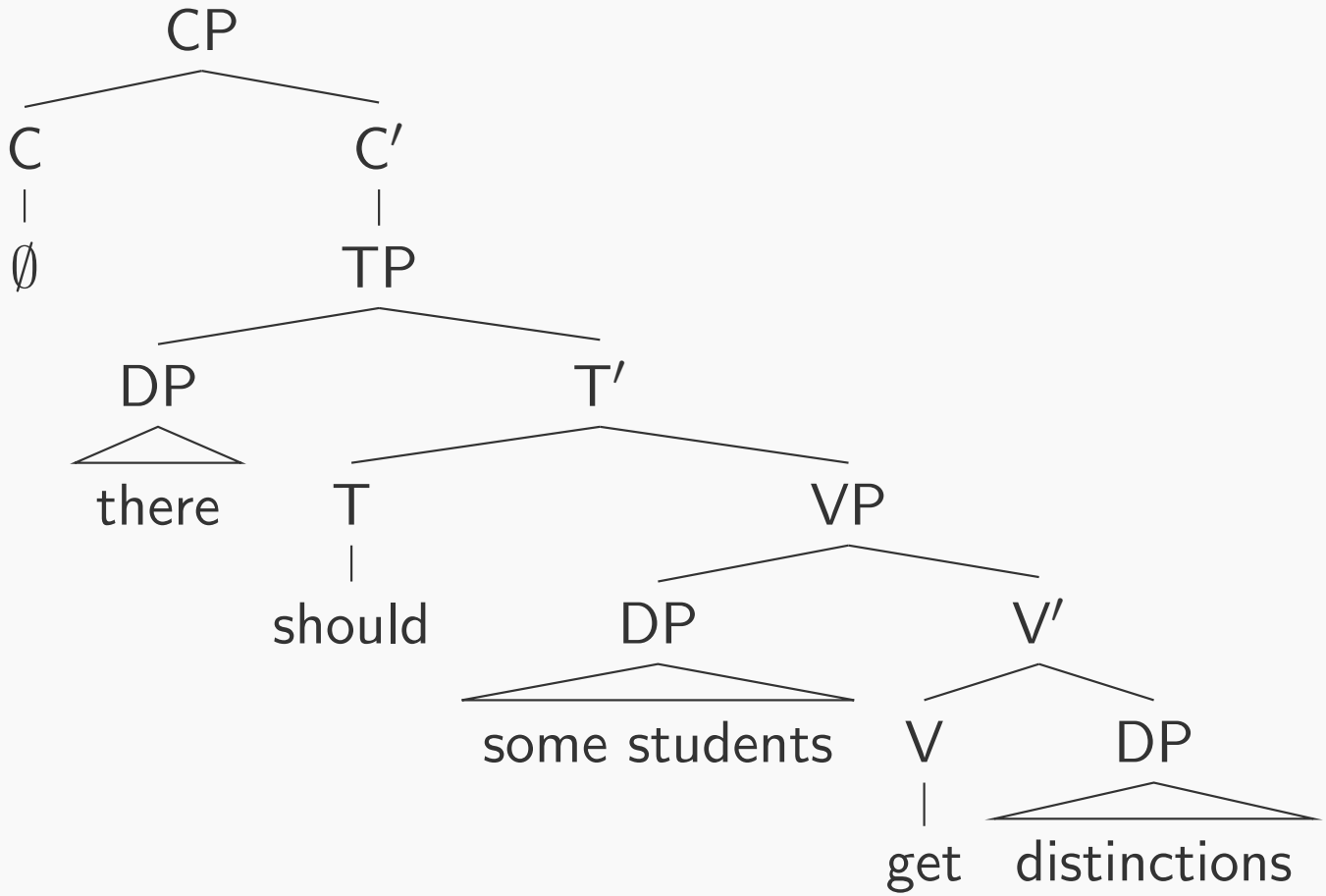


DP movement

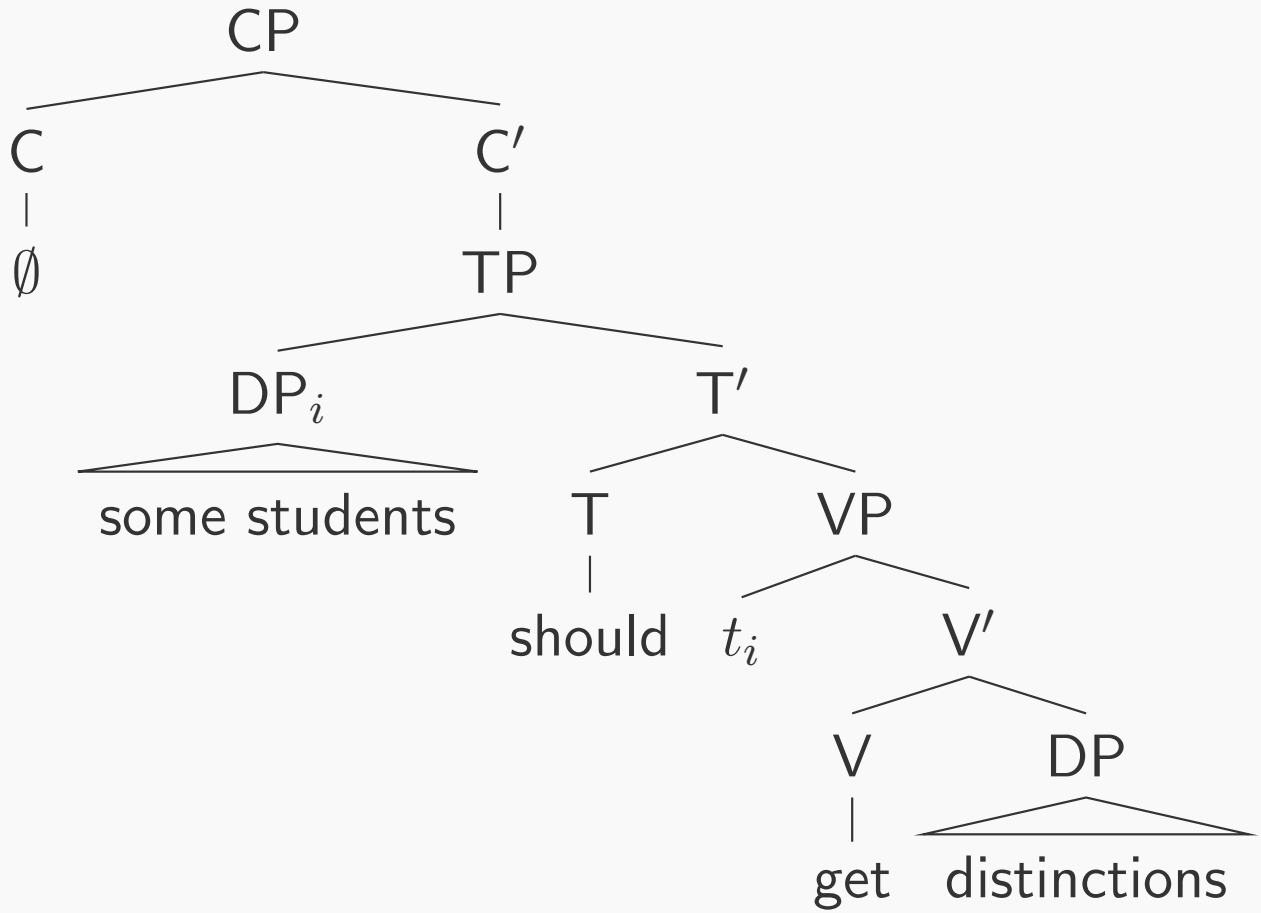
Move a DP to a specifier position.

- Head-to-head movement is motivated by word orders that cannot be generated using X-bar theory.
- DP movement is motivated by the fact that certain DPs can appear in bad positions from a thematic view.

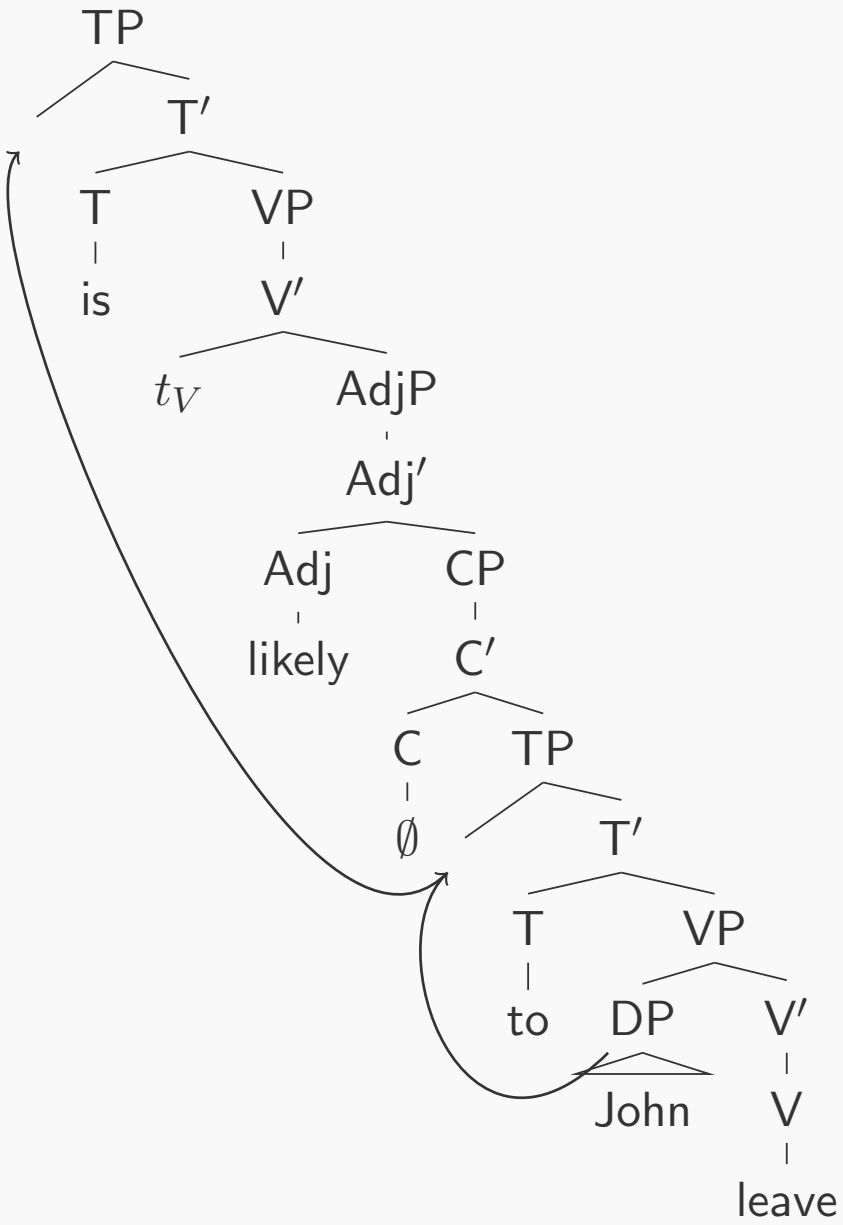
Belfast English



Standard English



Raising


TP
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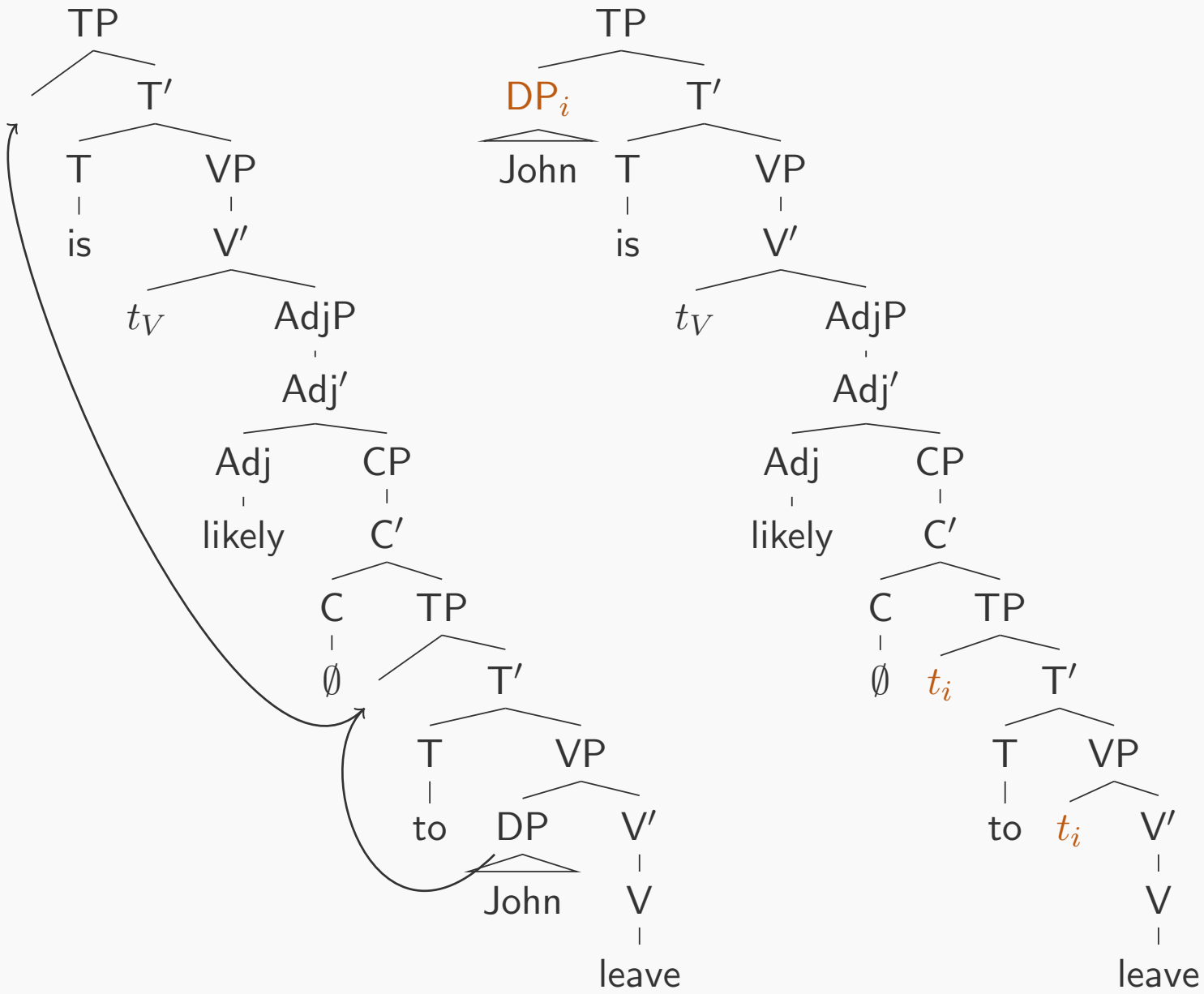
T
VP
is
V′
t_V
AdjP
Adj′
Adj
CP
likely
C′
C
TP
∅
T′
T
VP
to
DP
V′
John
V
leave

Raising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T
VP
is
V′
t_V
AdjP
Adj′
Adj
CP
likely
C′
C
TP
∅
t_i
T′
T
VP
to
t_i
V′
V
leave

Passives

Different thematic information

In the passive sentence, the agent is represented by an optional prepositional phrase headed by *by*.

- This phrase is an adjunct.
- Adjuncts are not included in the basic theta grid and are not subject to the theta criterion.

(19) a. The policeman kissed the puppy.
b. The puppy was kissed (by the policeman).

Proposal: The -en absorbs the agent role

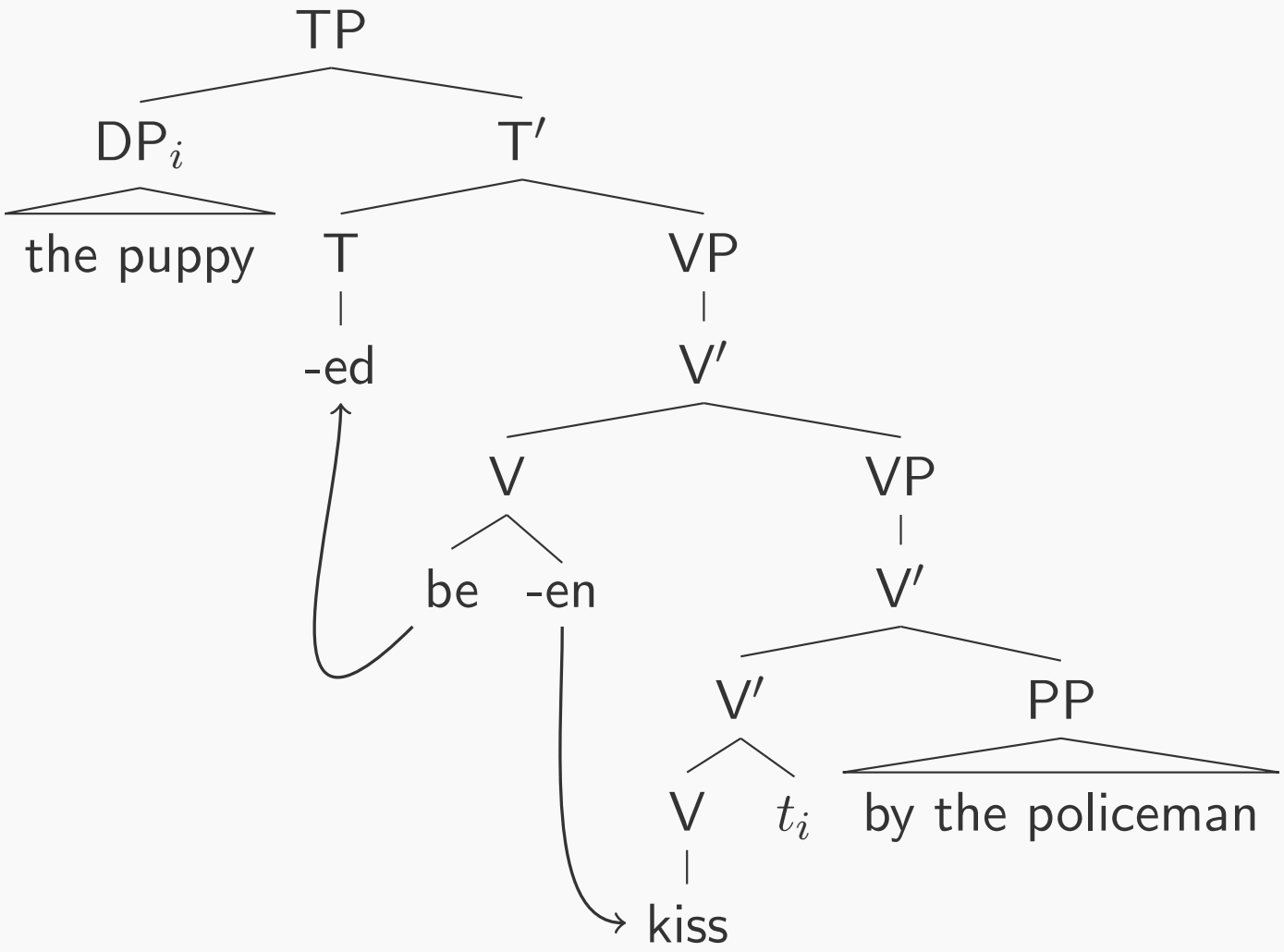
kiss

Agent DP	Theme DP

kiss+en ($\rightarrow$*kissed*)

Agent DP	Theme DP
-en	

Passives


TP
DP$_i$
T′
the puppy
T
VP
-ed
V′
V
VP
be
-en
V′
V′
PP
V
t_i
by the policeman
kiss

Why move?

Motivations of DP movement

- Extended Projection Principle
- Case

The Projection Principle

Lexical information is syntactically represented at all levels.

Extended Projection Principle (EPP)

All clauses must have subjects (i.e. the specifier of TP must be filled by a DP or CP) and lexical information is expressed at all levels.

Case

Grammatical relations represent how a DP is functioning in the sentence syntactically.

- In many languages, nouns bearing various grammatical relations take special forms.
- In Japanese,
  - subjects are marked with the suffix *-ga*
  - objects are marked with *-o*
  - indirect objects and certain adjuncts with *-ni*
- English is a morphologically poor language.
  - In sentences with full DPs, there is no obvious case marking.
  - Grammatical relations are represented by the position of the noun in the sentence

Languages that do not carry overt CASE morphology behave just like the ones that do in one very significant respect.

Case

Proposal: Abstract Case

All nouns get case – we just don't see it overtly in the pronounced morphology.

Chomsky (1981)

DPs are given Case iff they appear in specific positions.

- nominative Case is assigned in the specifier of finite T
- accusative Case is assigned as a sister to the verb

- A DP can only get a license (Case) in specific positions.
- If it isn't in one of those positions, it must move to get Case.

The Case Filter

All DPs must be marked with a Case. If a DP doesn't get Case the derivation will crash.

Locality: Case

Locality: CASE is not assigned inside these environments.

ACC is assigned to an NP in the complement position of a verb or preposition.

(20) a. *Him saw Mary
b. Nicole believes him
c. *Nicole believes that him likes Mary
d. Nicole threw the ball to him

NOM is assigned to an NP in the specifier of a tensed IP.

(21) a. He passed the exam
b. That he passed the exam impressed me
c. to pass that exam would be great
d. *He to pass that exam would be great

Feature checking (1)

Feature representation

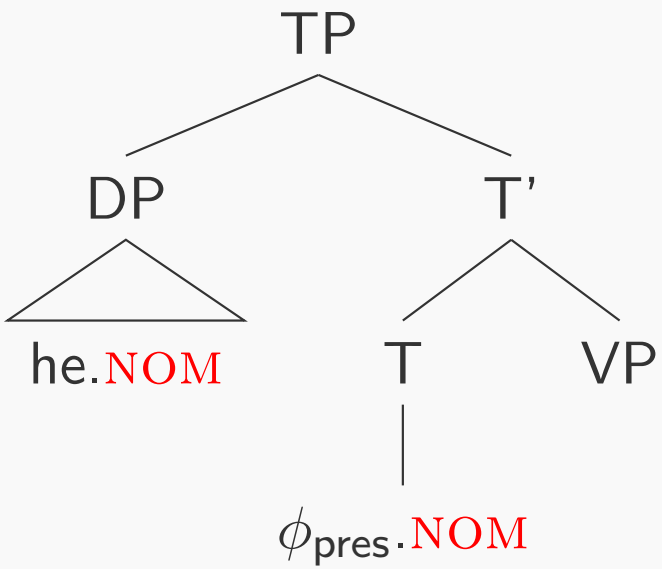
(22) he $\begin{bmatrix} \text{MASCULINE} \\ \text{3RD PERSON} \\ \text{SINGULAR} \\ \text{NOMINATIVE} \end{bmatrix}$

Proposal

Claim that Case assigners like T have a feature matrix:

(23) $\text{T}(\phi_{\text{pres}})$ $\begin{bmatrix} \text{PRESENT} \\ \text{NOMINATIVE} \end{bmatrix}$

Feature checking (2)



If the noun and the Case assigner are not local, then the feature won't be checked and the Case filter is violated.

Feature checking (3)

Case: Assignment

The standard mechanics of Case Theory in GB assumes that

1. on lexical insertion DPs have no Case and
2. Case is acquired through the course of the derivation.

Case: Checking

What happens if we assume that

1. DPs have Case-features at DS and
2. the appropriateness of these features is checked derivationally

Outline

Motivation

Head Movement

DP Movement

Wh-movement

Move-α

Wh-movement

Wh question

who/whom, what, when, where, why, which, how

(24) a. When did you do your syntax homework?
b. What are you eating?
c. How is Louise feeling?

Key challenge

The *wh*-phrase appears in a position far away from the position where its theta role is assigned.

(25) a. What did John buy?
b. What did Mary say John bought?
c. Whom did Matt kiss?

Raising

(26) a. It is likely that Patrick left.

b. That Patrick left is likely.

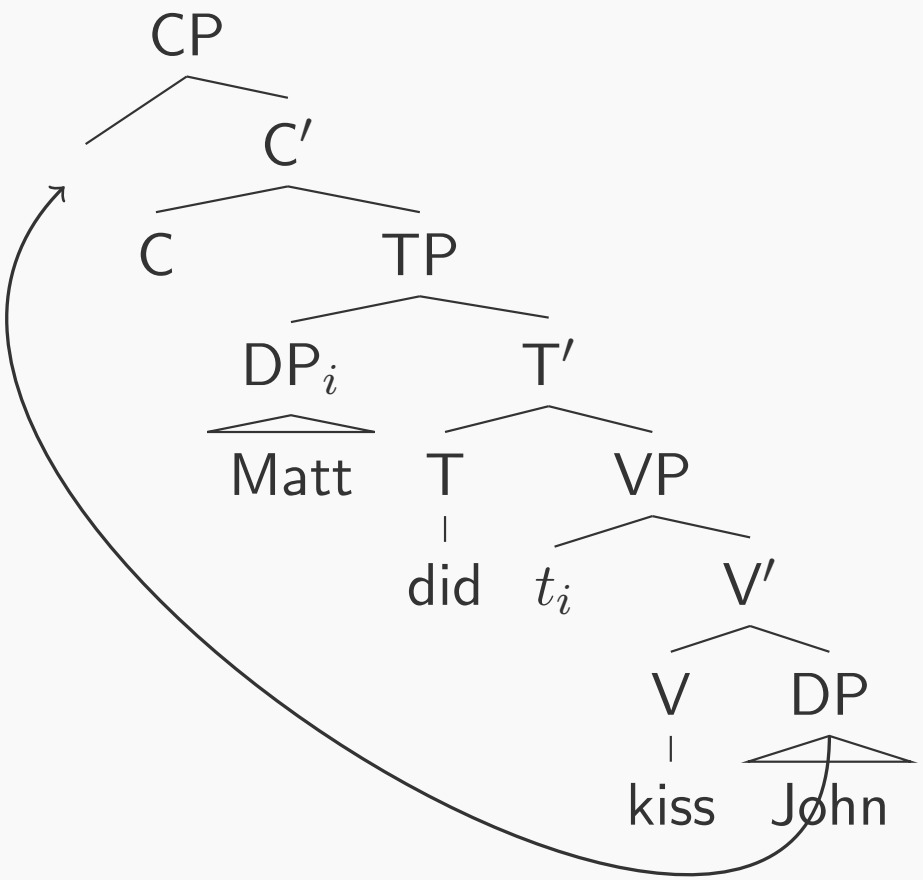
c. *Patrick is likely that t_i left.

d. *It is likely Patrick to leave.

e. *Patrick to leave is likely.

f. Patrick is likely t_i to leave.

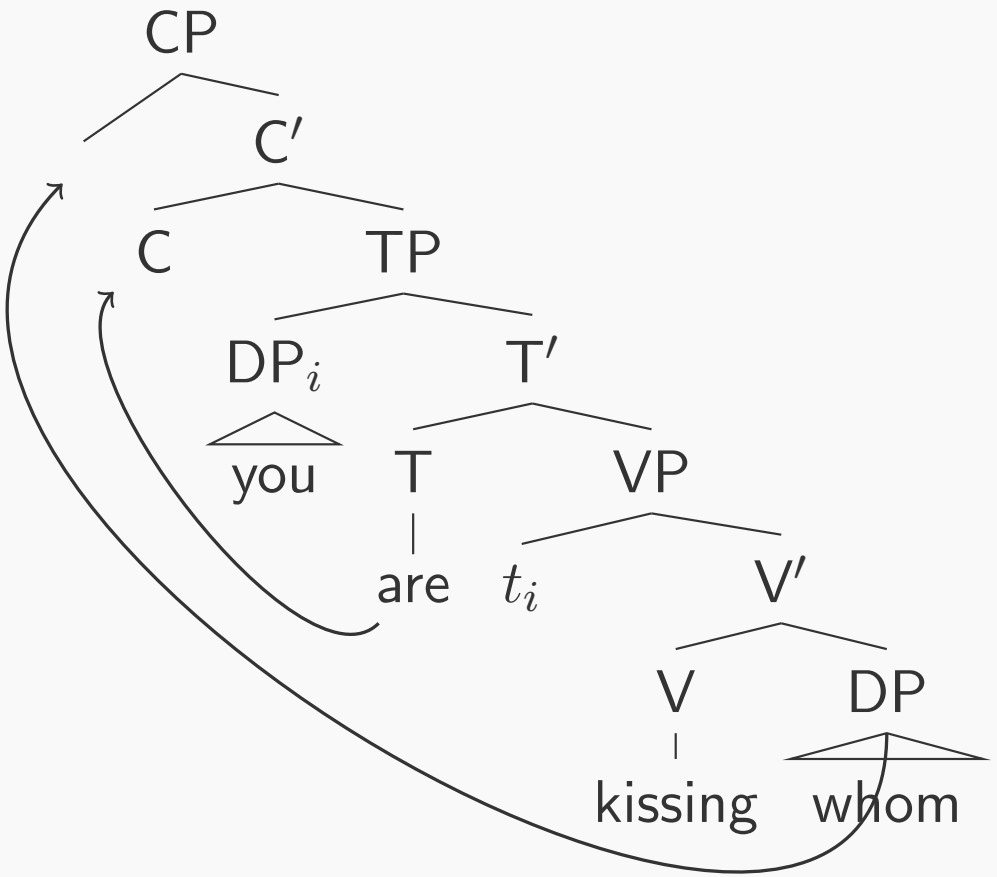
Proposal



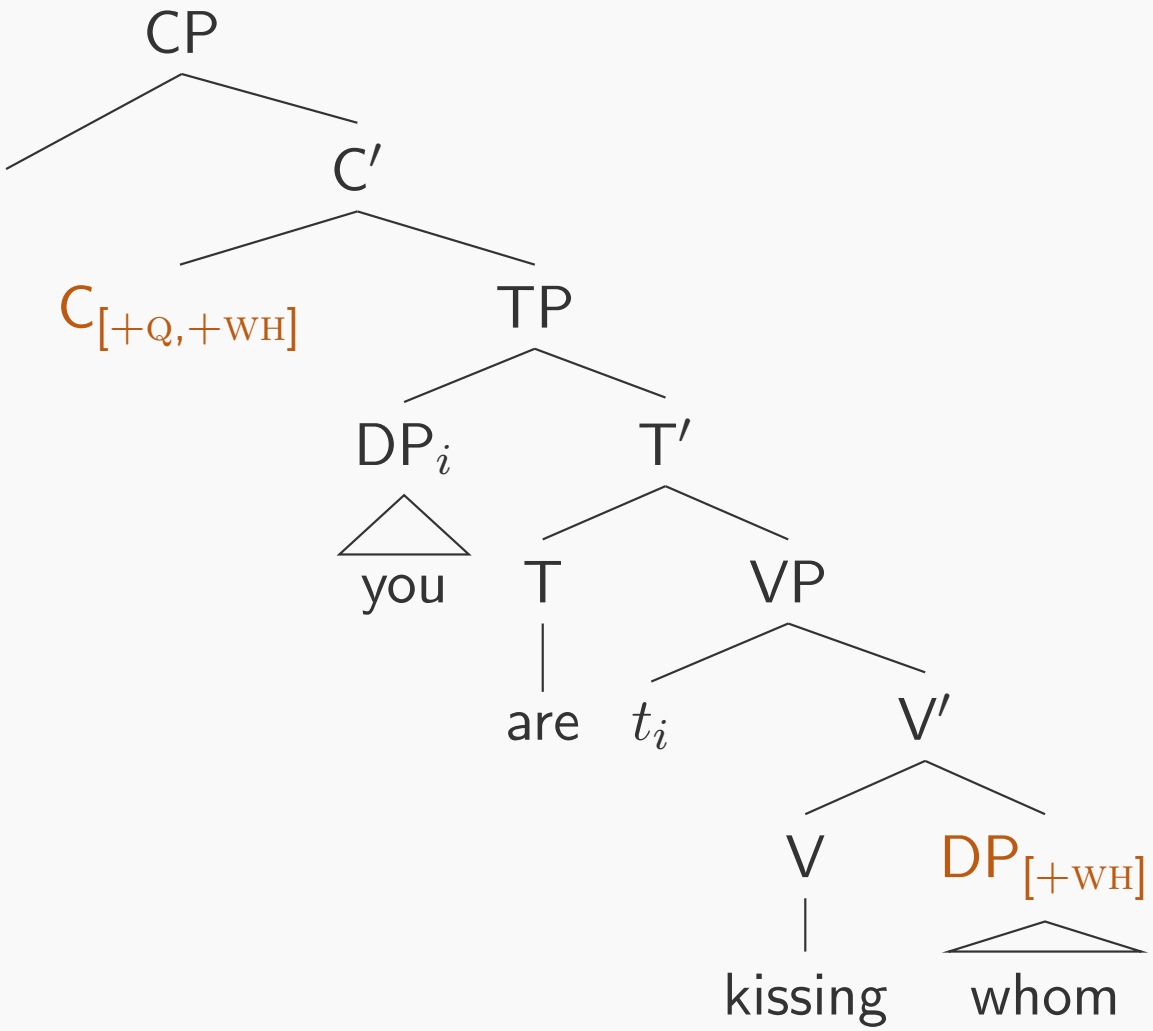
Proposal

Wh-movement

Move a *wh*-phrase to the specifier of CP to check a [+WH] feature in C.



Checking features



Wh-movement happens in relative clauses

(27) a. I met the man who Mary likes

b. I visited the park where Washington gathered the revolutionary army

c. I met the man who Peter said that Zach believes that Fred heard that Mary likes

Outline

Motivation

Head Movement

DP Movement

Wh-movement

Move-α

Motivation

Transformations are very powerful tools $\Rightarrow$ their usages should be limited.

- Transformations thus need motivations or triggers.
- Transformations only apply when required.

Motivation

Head movement	to get a suffix or fill null [+Q]
DP movement	to check case features [NOM] or [ACC]
Wh-movement	to check a [+WH] feature

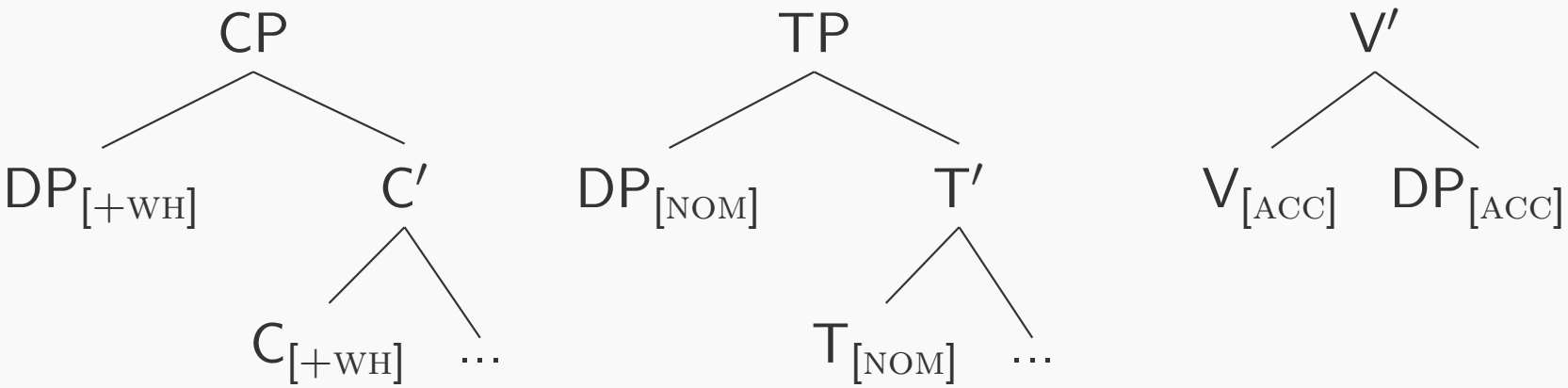
Full Interpretation (FI)

Features must be checked in a local configuration.

Local Configuration

Local Configuration

- [WH], [NOM] features: Specifier-head configuration.
- [ACC] features: Head-complement configuration.



A joke as a summary

A mathematician, a physicist, an engineer, and a linguist are trying to decide if all odd numbers are prime.

- The mathematician says, "one's prime, 3's prime, 5's prime, 7's prime, 9's not prime, so no."
- The physicist says, "one's prime, 3's prime, 5's prime, 7's prime, 9's not prime, but maybe that's experimental error."
- The engineer says, "one's prime, 3's prime, 5's prime, 7's prime, 9's prime ..."
- The linguist says, "one's prime, 3's prime, 5's prime, 7's prime. Aha! We have a universal generalization. Nine doesn't seem to be prime, but it must be prime at some underlying level of representation!"

(Joke told by Arnold Zwicky during his Presidential Address at the Linguistic Society of America, 1992)

Alternative perspectives

http://lingo.stanford.edu/sag/L221a/syll/wk1.html

Reading

* Chap. 9,10,11,12. *Syntax: A Generative Introduction*.