# Binding

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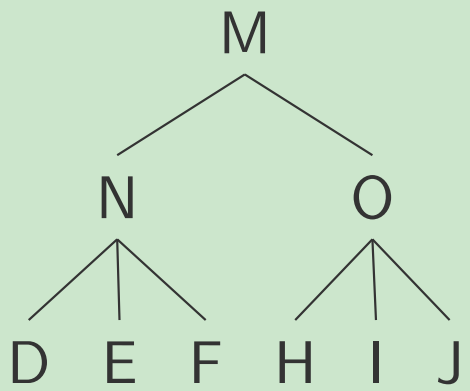
March 20, 2019

# Outline

# The parts of a tree

## Example




Rules

- M→N O
- N→D E F
- O→H I J

## Nodes

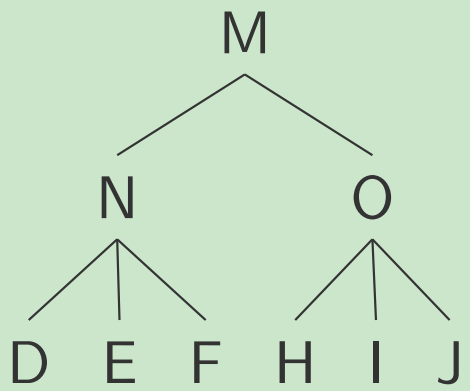
**Branch** A line connecting two parts of a tree.

**Node** The end of a branch.

**Label** The name given to a node.

# The parts of a tree (cont)

## Example




Rules

- M→N O
- N→D E F
- O→H I J

## Concepts

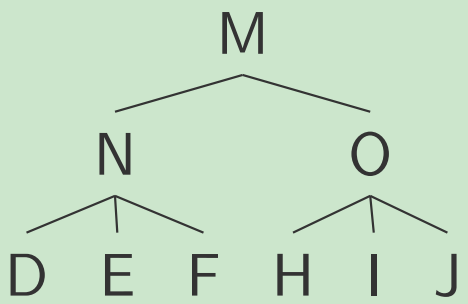
**Root node** The node with no line on top of it.

**Terminal node** Any node with no branch underneath it.

**Non-terminal node** Any node with a branch underneath it.

# Domination

## Example




- Trees show a hierarchy of constituents.
- Some nodes are higher in the tree than others.

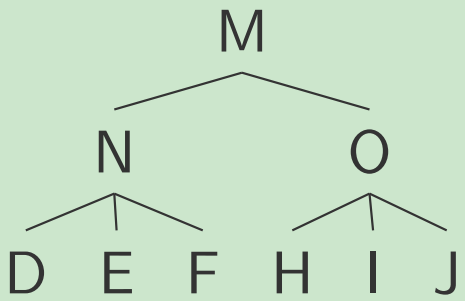
## Domination

Node A dominates node B if and only if A is higher up in the tree than B and if you can trace a line from A to B going only downwards.

- M dominates all the other nodes (N, O, D, E, F, H, I, J).
- N dominates D, E, and F.
- O dominates H, I, J.

# Exhausitive domination

## Example




## Exhaustive domination

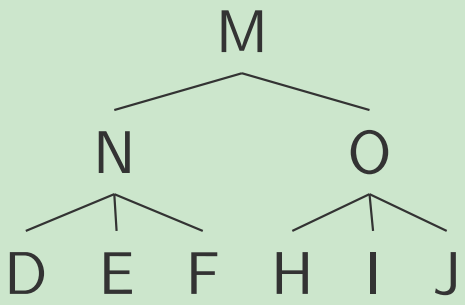
A exhaustively dominates a set of terminal nodes, provided

- it dominates all the members of the set and
- there is no terminal node G dominated by A that is not a member of the set.

- M exhausitively dominates {D, E, F, H, I, J}.

# Immediate domination

## Example



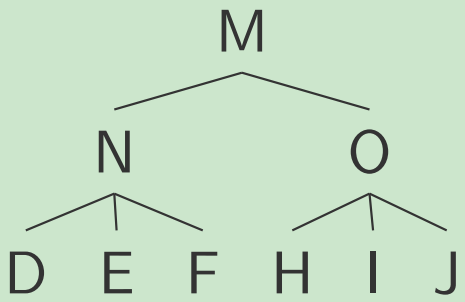

## Immediate domination

Node A immediately dominates node B if there is no intervening node G that is dominated by A, but dominates B.

- M dominates all the other nodes in the tree, but it only immediately dominates N and O.

# Immediate domination

## Example

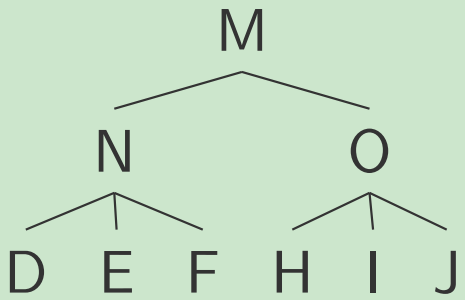



## Mother, daughter, sister

- **Mother/Parent:** A is the mother of B if A immediately dominates B.
- **Daughter/Child:** B is the daughter of A if B is immediately dominated by A.
- **Sister/Sibling:** Two nodes that share the same mother.

# Precedence

## Example

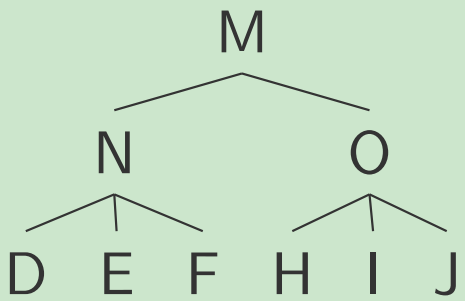



## Precedence

- **Sister precedence:** Node A sister-precedes node B if and only if both are immediately dominated by the same node, and A appears to the left of B.
- **Precedence:** Node A precedes node B if and only if neither A dominates B nor B dominates A and A or some node dominating A sister-precedes B or some node dominating B.

# Precedence

## Example




## No crossing branches constraint

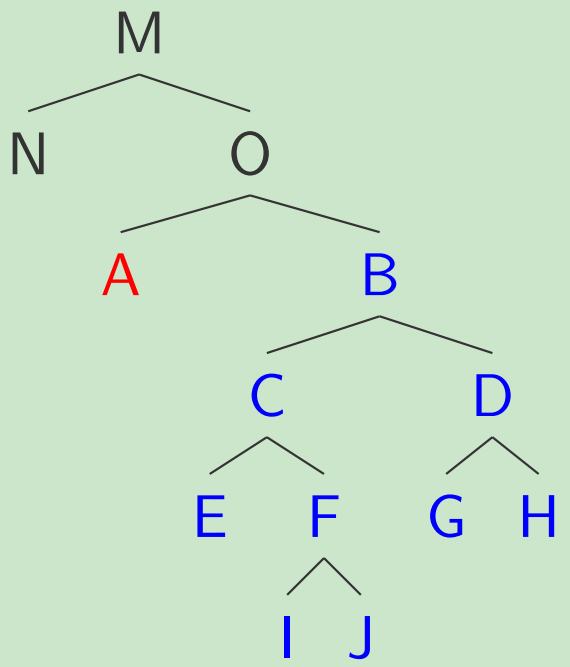
If one node X precedes another node Y then X and all nodes dominated by X must precede Y and all nodes dominated by Y.

# C-command

## Definition (C-command)

Node A c-commands node B if every node dominating A also dominates B, and neither A nor B dominate the other.

## Example




A node c-commands its sisters and all the descendants of its sisters.

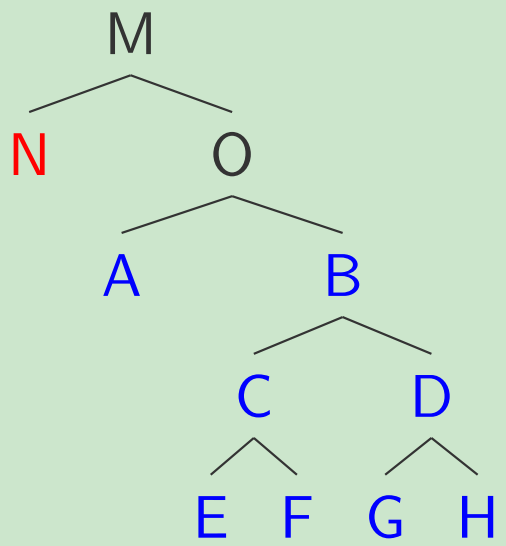
# C-command (cont)

## Symmetric vs. Asymmetric

**Symmetric c-command** A symmetrically c-commands B, if A c-commands B and B c-commands A

**Asymmetric c-command** A asymmetrically c-commands B if A c-commands B but B does not c-command A.

## Example




- N and O symmetrically c-command each other.
- N asymmetrically c-commands A, B, C, D, E, F, G, H.

# Outline

# R-expression, anaphor and pronoun

## Definition

- R-expression: A DP that gets its meaning by referring to an entity in the world.
- Anaphor: A DP that obligatorily gets its meaning from another DP in the sentence.
- Pronoun: A DP that may (but need not) get its meaning from another DP in the sentence.

## Example

- Typical anaphors are *himself*, *herself*, *themselves*, *myself*, *yourself* (reflexive pronouns), and *each other* (reciprocals).
- Typical pronouns include: *he*, *she*, *it*, *I*, *you*, *me*, *we*, *they*, *us*, *him*, *her*, *them*, *his*, *her*, *your*, *my*, *our*, *their*, *one*.

# R-expression, anaphor and pronoun

(1) a. Felicia wrote a fine paper on Zapotec. (R-expression)

b. Heidi bopped herself on the head with a zucchini. (Anaphor)

c. Aaron said that he played basketball. (Pronoun)

## Key observations

Anaphors, R-expressions, and pronouns can only appear in specific parts of the sentence.

(2) *Herself bopped Heidi on the head with a zucchini.

## Binding Theory

The theory of the syntactic restrictions on where these different DP types can appear in a sentence is called Binding Theory.

# Antecedent

**Definition (Antecedent)**

A DP that gives its meaning to another DP.

**Example**

Heidi bopped herself on the head with a zucchini.

↑ ↑

antecedent anaphor

# Coindexation

Index a DP with a subscript letter:

(3) a. [Colin]$_i$ gave [Andrea]$_j$ [a basketball]$_k$.

b. [Art]$_i$ said that [he]$_j$ played [basketball]$_k$ in [the dark]$_l$.

c. [Art]$_i$ said that [he]$_i$ played [basketball]$_k$ in [the dark]$_l$.

d. [Heidi]$_i$ bopped [herself]$_i$ on [the head]$_j$ with [a zucchini]$_k$.

**Definition (Coindex)**

**Coindexed** Two DPs are said to be coindexed if they have the same index.

**Corefer** DPs that are coindexed with each other are said to corefer.

# Binding (1)

## Key observations

The relations between an antecedent and a pronoun/anaphor must bear particular structural relations.

(4) a. Heidi$_i$ bopped herself$_i$ on the head with a zucchini.

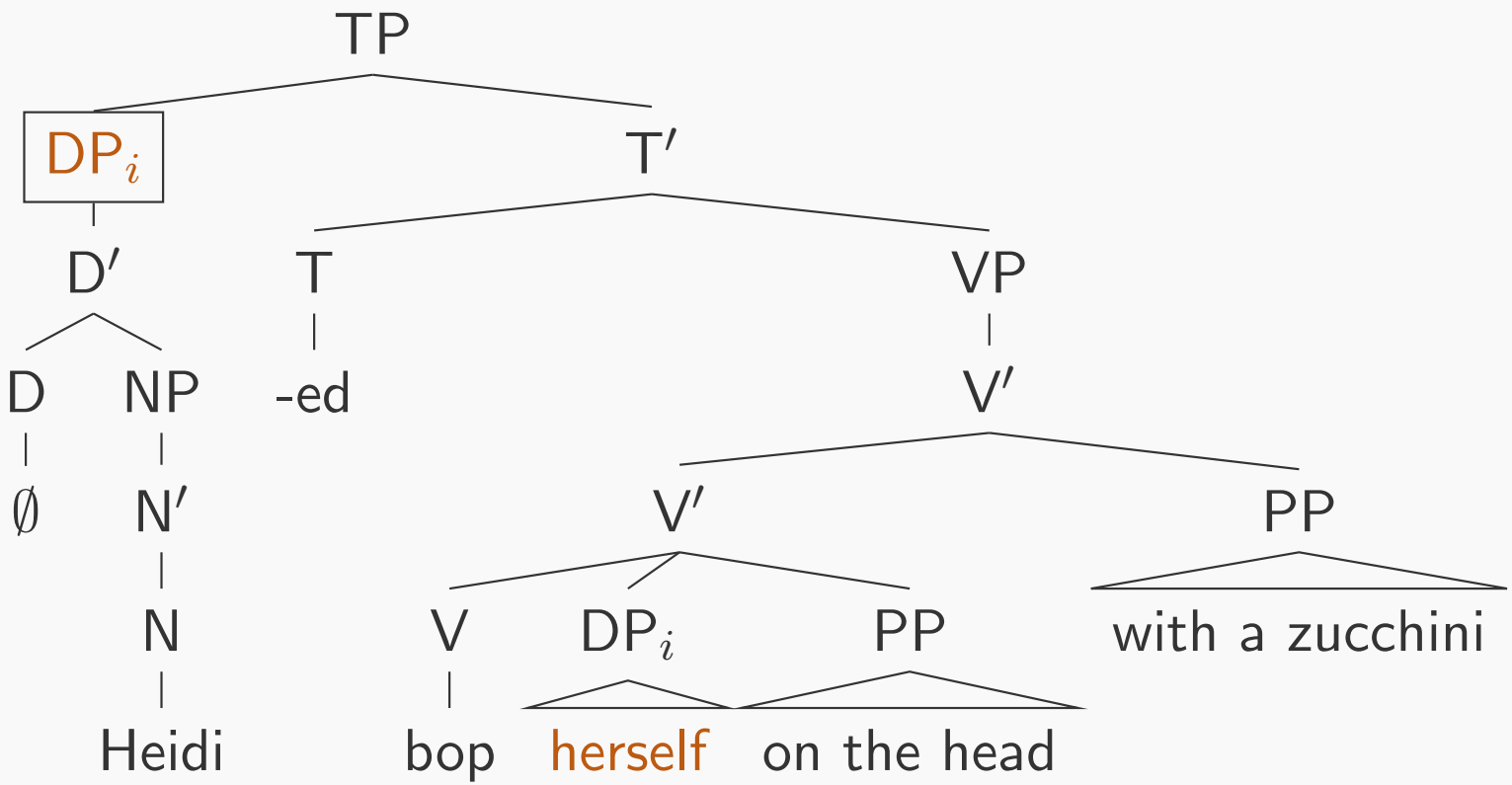
b. [Heidi$_i$'s mother]$_j$ bopped herself$_j$ on the head with a zucchini.

c. *[Heidi$_i$'s mother]$_j$ bopped herself$_i$ on the head with a zucchini.

d. [The mother of Heidi$_i$]$_j$ bopped herself$_j$ on the head with a zucchini.

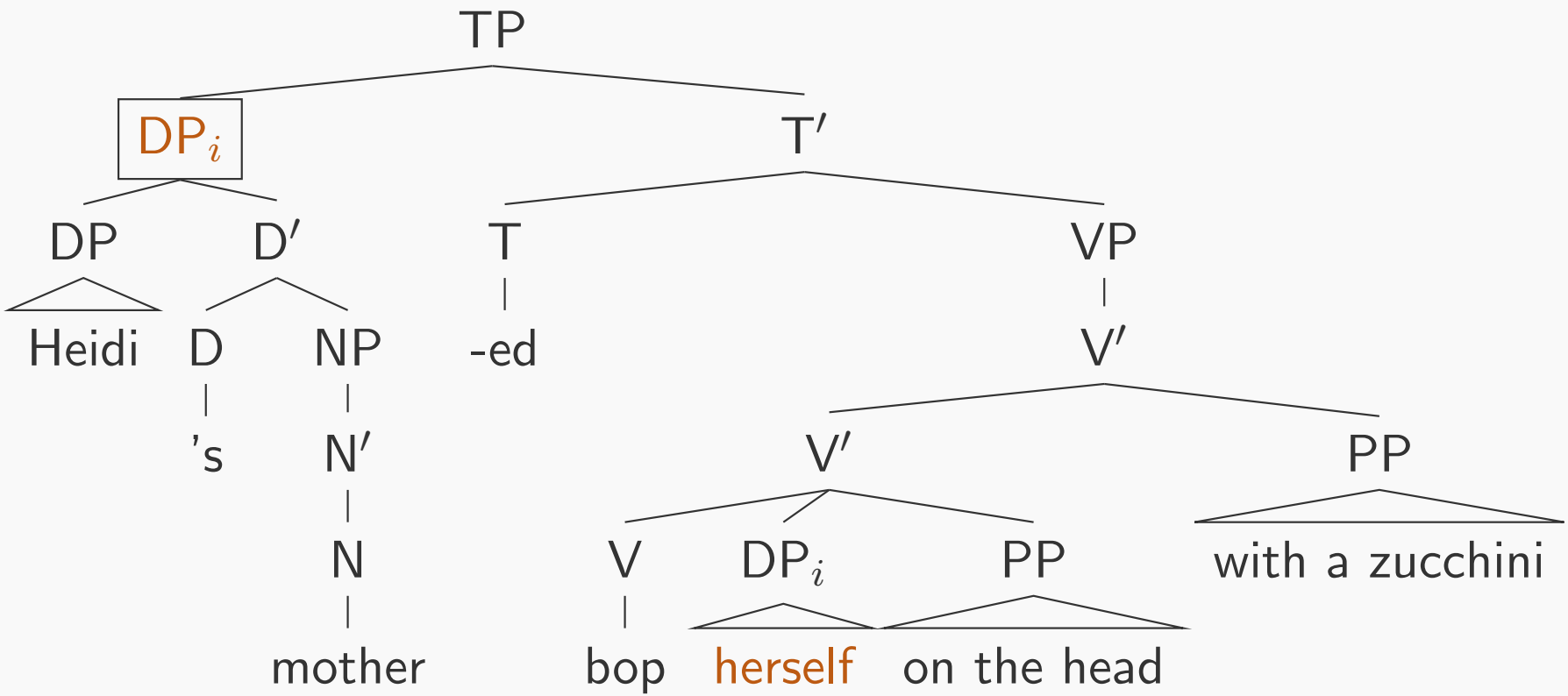
e. *[The mother of Heidi$_i$]$_j$ bopped herself$_i$ on the head with a zucchini.

# Binding (2)



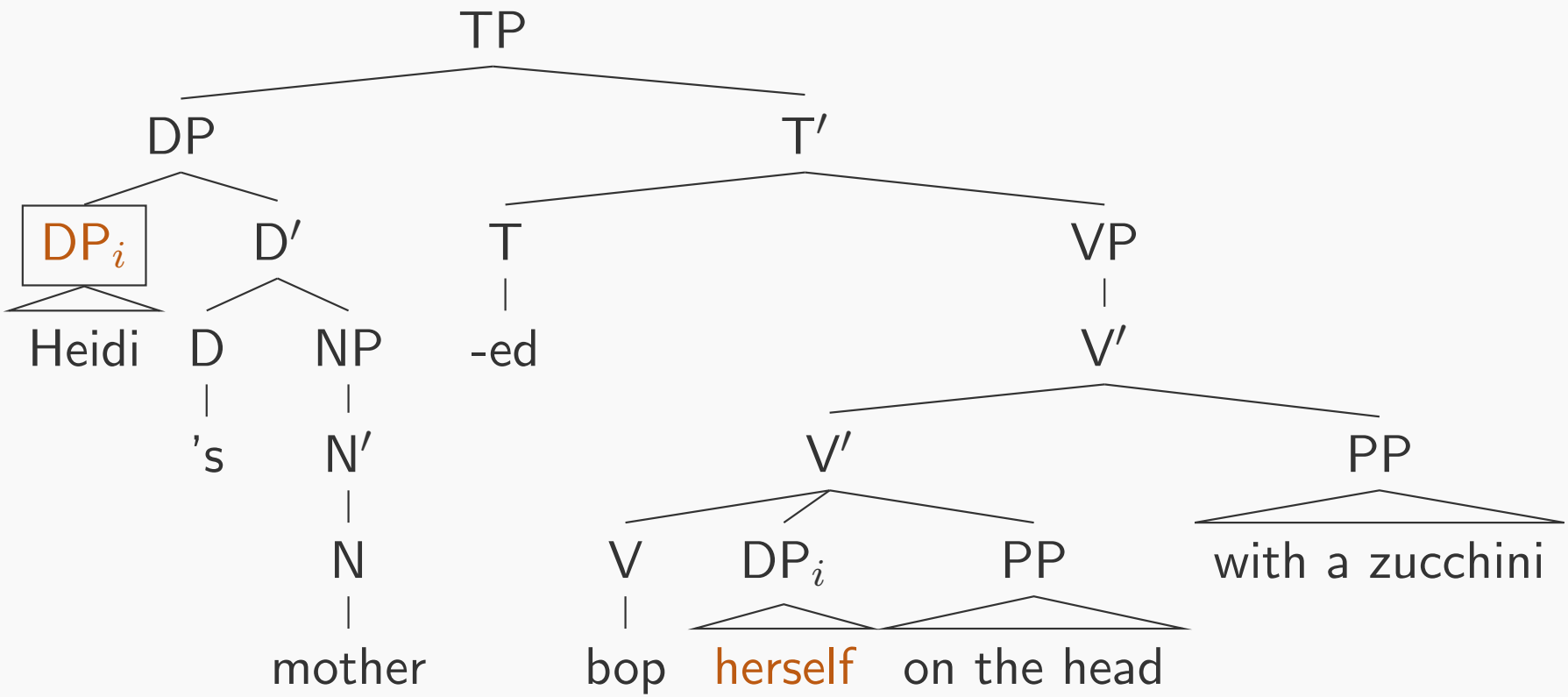

C-command

# Binding (3)



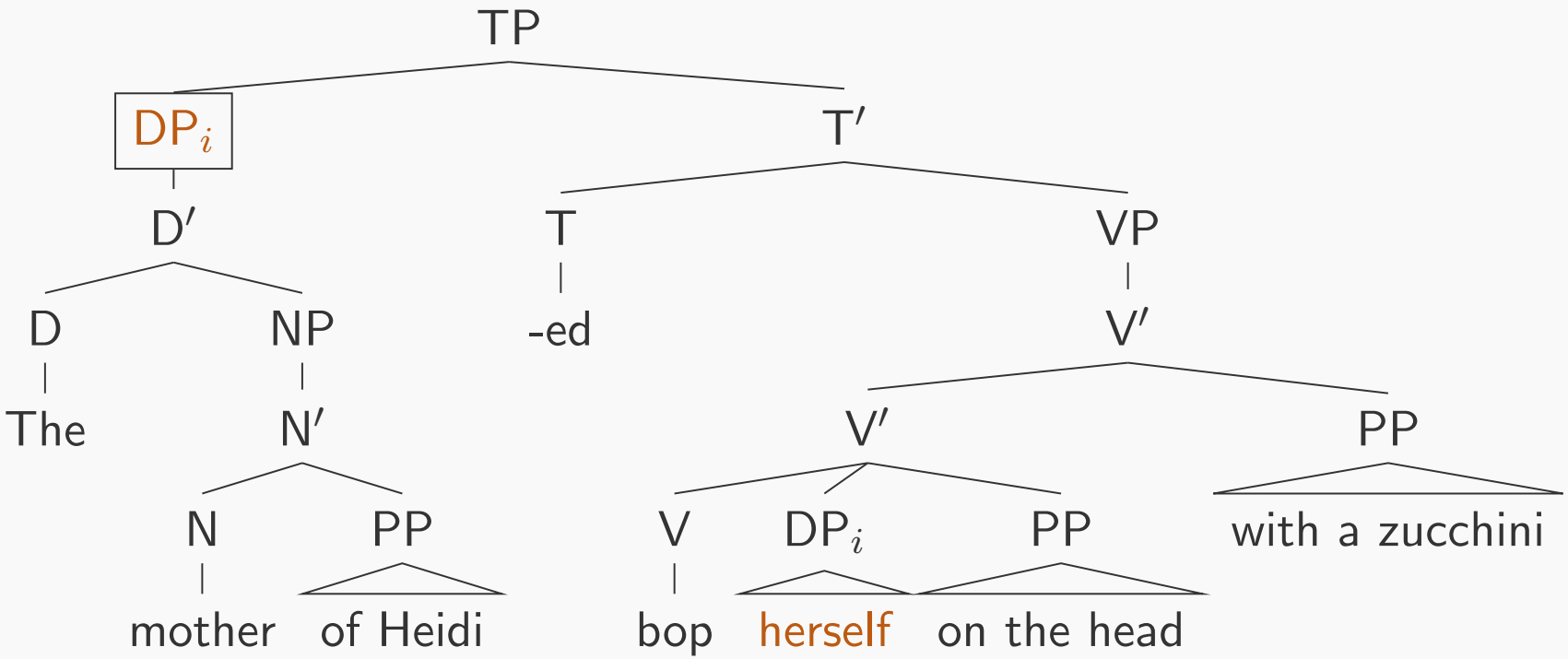

C-command

# Binding (4)



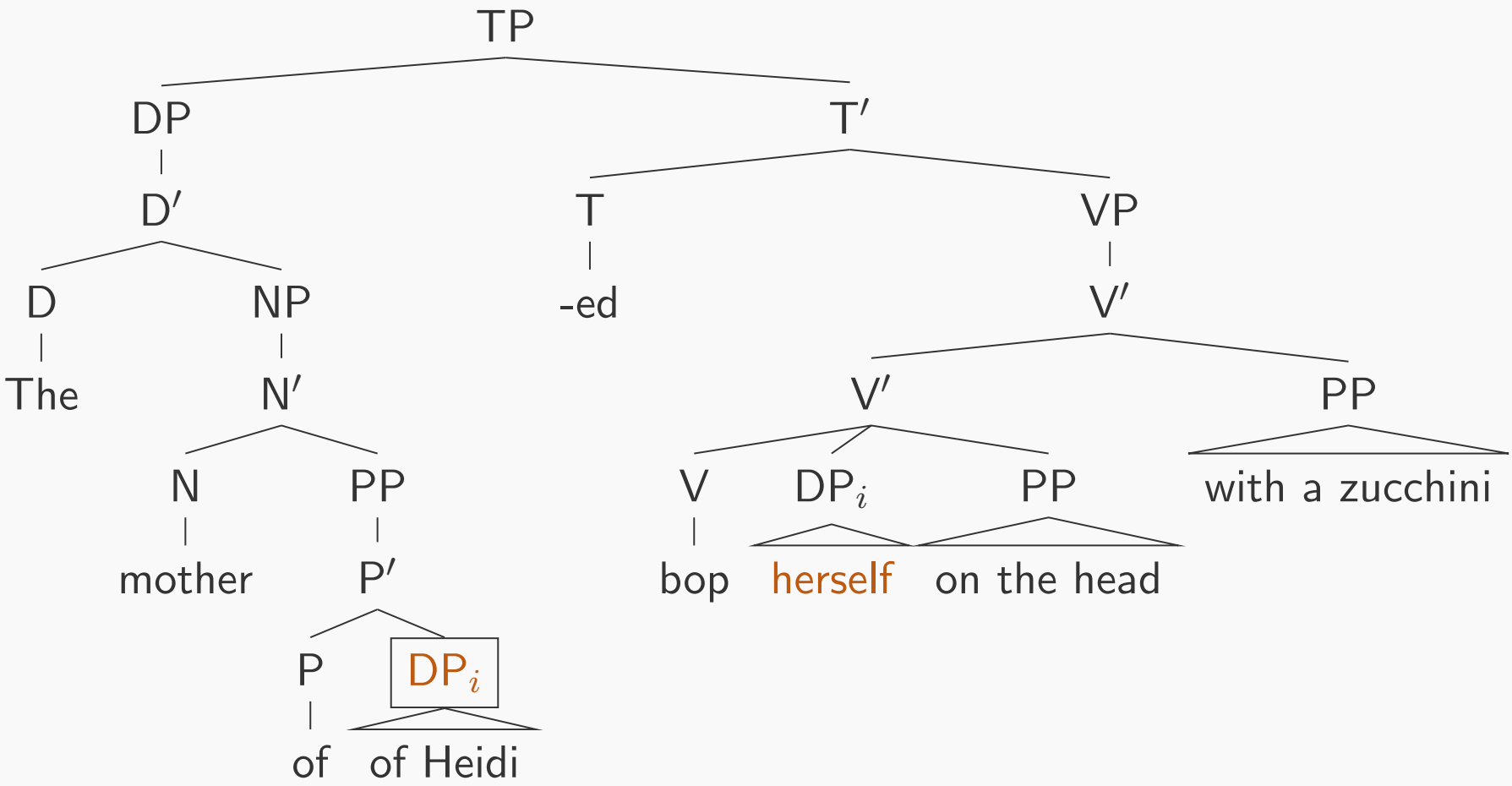

C-command

# Binding (5)




C-command

# Binding (6)




C-command

# Binding principle

**Definition (Bind)**

A binds B if and only if A c-commands B and A and B are coindexed.

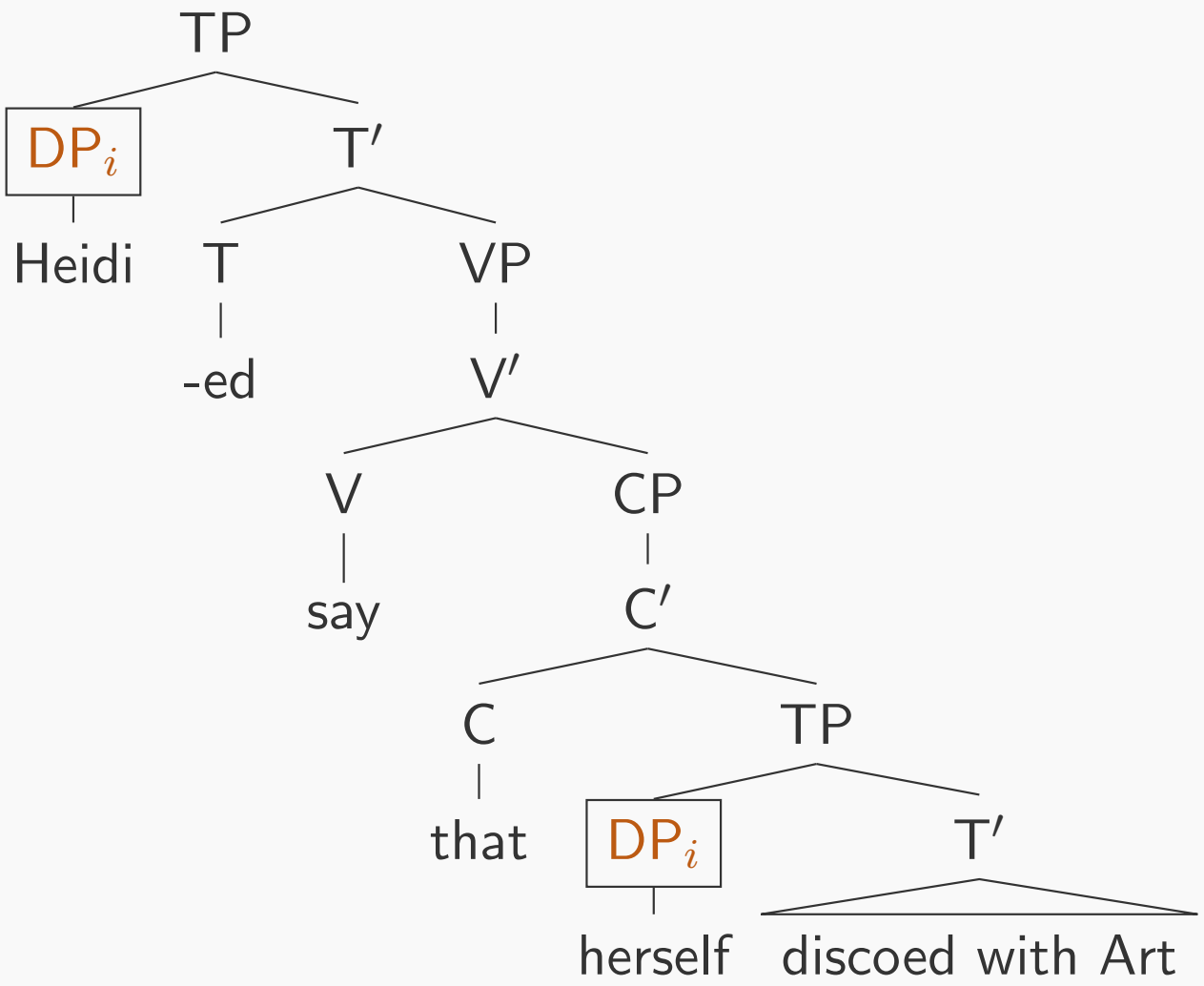
- Binding is a kind of coindexation that happens when one of the two DPs c-commands the other.
- The binder must do the c-commanding of the bindee.

**Proposal**

Principle A: An anaphor must be bound.

# Locality conditions

(5) *Heidi said that herself discoed with Art.



# Locality conditions (cont)

## Key observations

- The anaphor is bound by its antecedent.
- The anaphor seems to need to find its antecedent in the same clause.

## Proposal

- Binding domain: The clause containing the DP (anaphor, pronoun, or R-expression).
- Binding Principle A (revised): An anaphor must be bound in its binding domain.

# The distribution of pronouns

## Key observations

Pronouns may not be bound.

(6) a. Heidi$_i$ bopped her$_j$ on the head with the zucchini.

b. *Heidi$_i$ bopped her$_i$ on the head with the zucchini.

(7) a. Heidi$_i$ said [$_{CP}$ that she$_i$ discoed with Art].

b. Heidi$_i$ said [$_{CP}$ that she$_k$ discoed with Art].

## Proposal

- Free: Not bound.
- Principle B: A pronoun must be free in its binding domain.

# The distribution of R-expressions

## Key observations

R-expressions don't seem to allow any instances of binding at all, not within the binding domain and not outside it either.

- R-expressions receive their meaning from outside the sentence.

(8) a. *Heidi$_i$ kissed Miriam$_i$.

b. *Art$_i$ kissed Geoff$_i$.

c. *She$_i$ kissed Heidi$_i$.

d. *She$_i$ said that Heidi$_i$ was a disco queen.

## Proposal

Principle C: An R-expression must be free.

# Reading

- *Syntax: A Generative Introduction*.
  - § 4, 5.