Semantics 1

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Pronouns

- Reflexive and personal pronouns depend on context for their interpretation.
- **Reflexives** can be interpreted in two ways:

1. **coreferent:**

(1) Peter$_i$ shaved himself$_i$.

2. **(semantically) bound:**

(2) a. **by a quantifier:** Every player$_i$ shaved himself$_i$
b. **by a wh-phrase:** A man who$_i$ shaved himself$_i$ arrived.

Pronouns

- **Personal pronouns** can be interpreted in three ways:

1. **free:** (denotation is fixed by the context of utterance)

(1) Mary$_i$ likes him$_i$.

2. **coreferent:**

(2) [Peter$_i$'s father]$_k$ shaved him$_i$.

2. **(semantically) bound:**

(3) a. **by a quantifier:** Every philosopher$_i$ praised a book that he$_i$ wrote.
b. **by a wh-phrase:** A philosopher who$_i$ praised every book that he$_i$ wrote arrived.

Reflexives

- lexical meaning:

$$\|\text{himself}_i\| = x_i$$

(and likewise for all other reflexives)

Reflexives

- Coreferent reading:

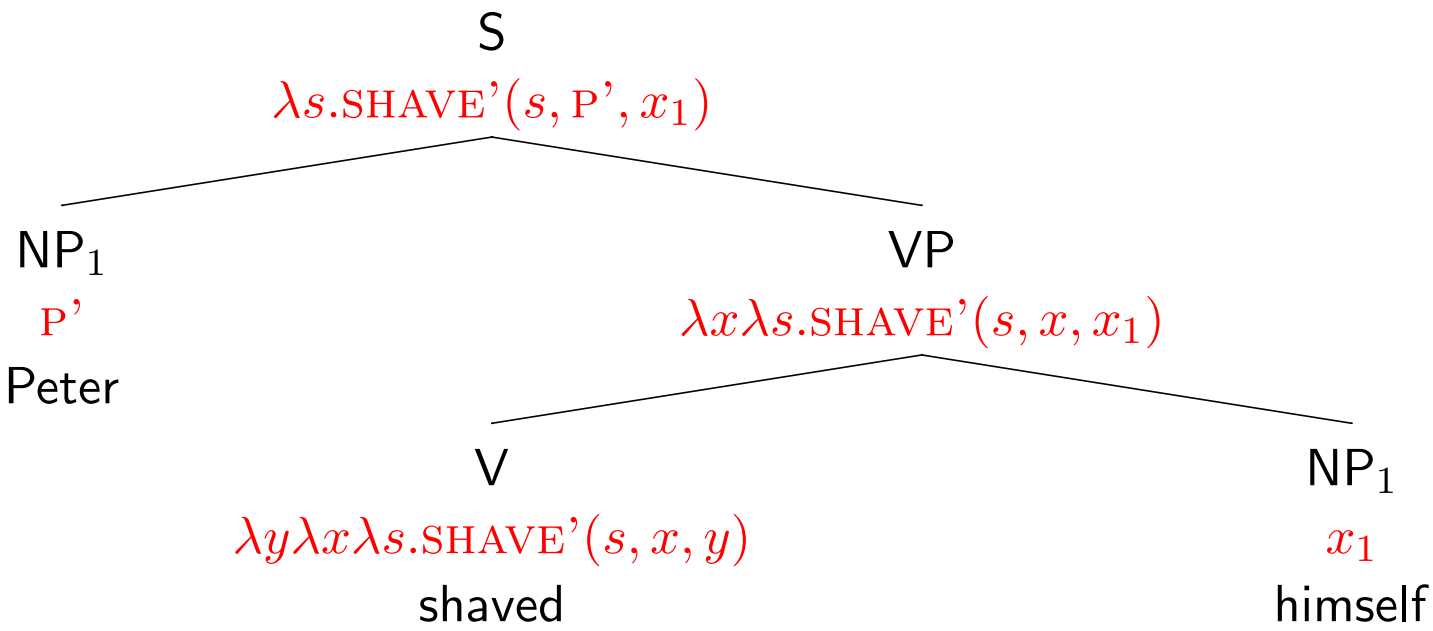
(1) Peter$_1$ shaved himself$_1$.

- Index 1 on name *Peter* restricts the context of interpretation to such assignment functions where

$$x_1 = \text{P'}$$

Reflexives

- compositional derivation:



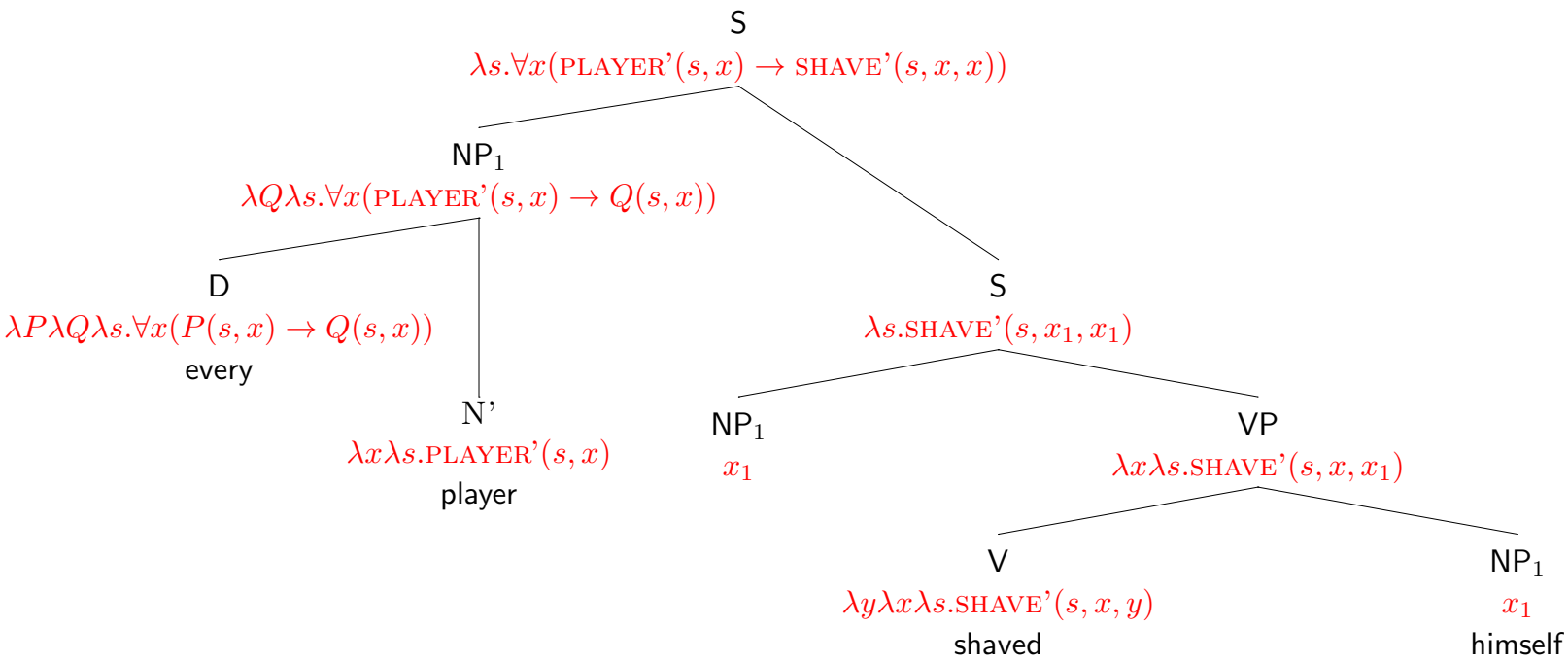
- contextual equivalence:

$$x_1 = \text{P'} \vdash \lambda s.\text{SHAVE'}(s, \text{P'}, x_1) = \lambda s.\text{SHAVE'}(s, \text{P'}, \text{P'})$$

Reflexives

- binding by a quantifier

(1) Every player$_1$ shaved himself$_1$.



Reflexives

Recall the interpretation rule for the root node, ie. a structure that results from QR:

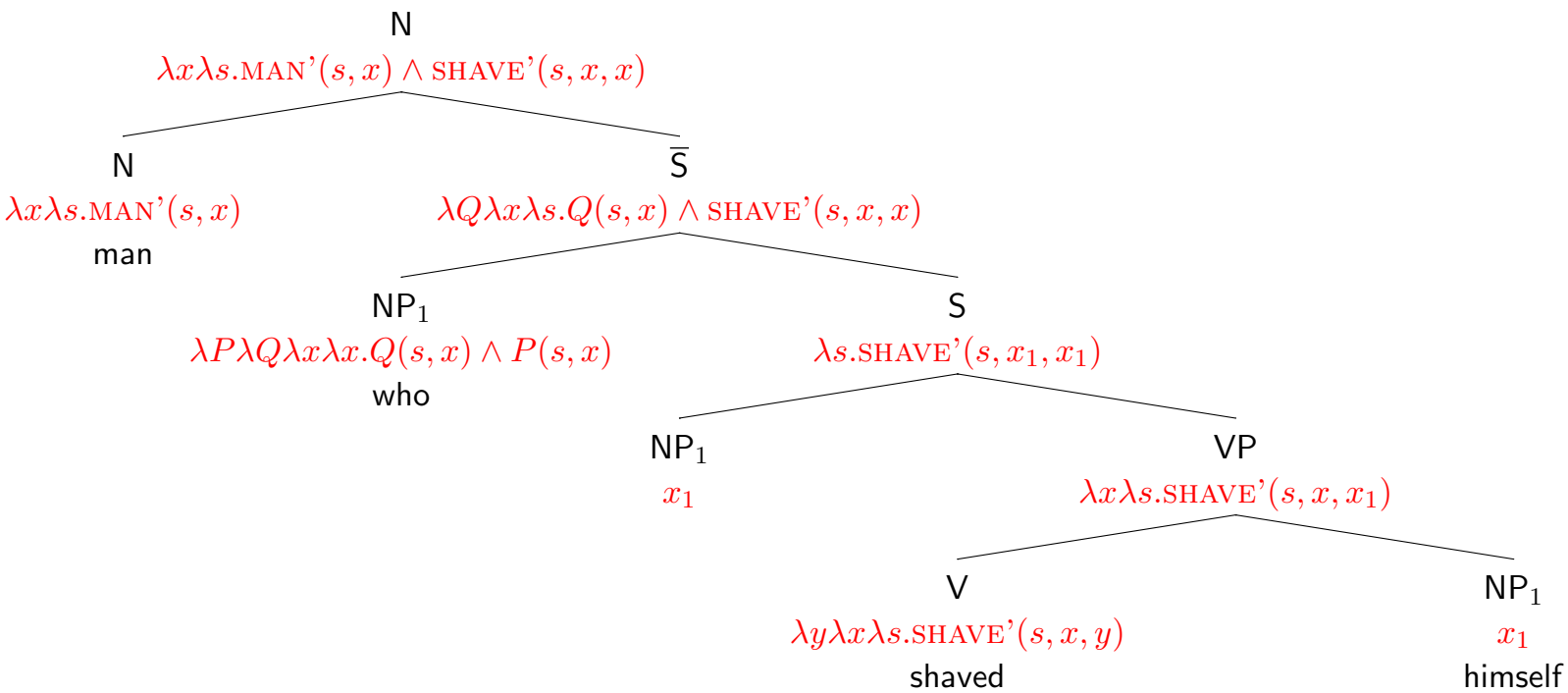
$$\begin{aligned} \|S^{\uparrow}\| &= \|NP_1\|(\lambda x_1.\|S^{\downarrow}\|) \\ &= \lambda Q \lambda s.\forall x(\text{PLAYER'}(s,x) \rightarrow Q(s,x))(\lambda x_1 \lambda s.\text{SHAVE'}(s,x_1,x_1)) \\ &= \lambda s.\forall x(\text{PLAYER'}(s,x) \rightarrow \text{SHAVE'}(s,x,x)) \end{aligned}$$

- Rule for QR involves applying λx_1 to the lower S-segment
- this λ-operator binds the (variable corresponding to) the trace as well as the (variable corresponding to) the reflexive
- Unlike in cases of coreference, the final interpretation does not contain free variables, and the indexing does not impose constraints on the context

Reflexives

- binding by a *wh*-pronoun

(1) A **man who shaved himself** arrived.



Reflexives

Recall the interpretation rule for the $\overline{\text{S}}$-node, ie. a structure that results from *wh*-movement:

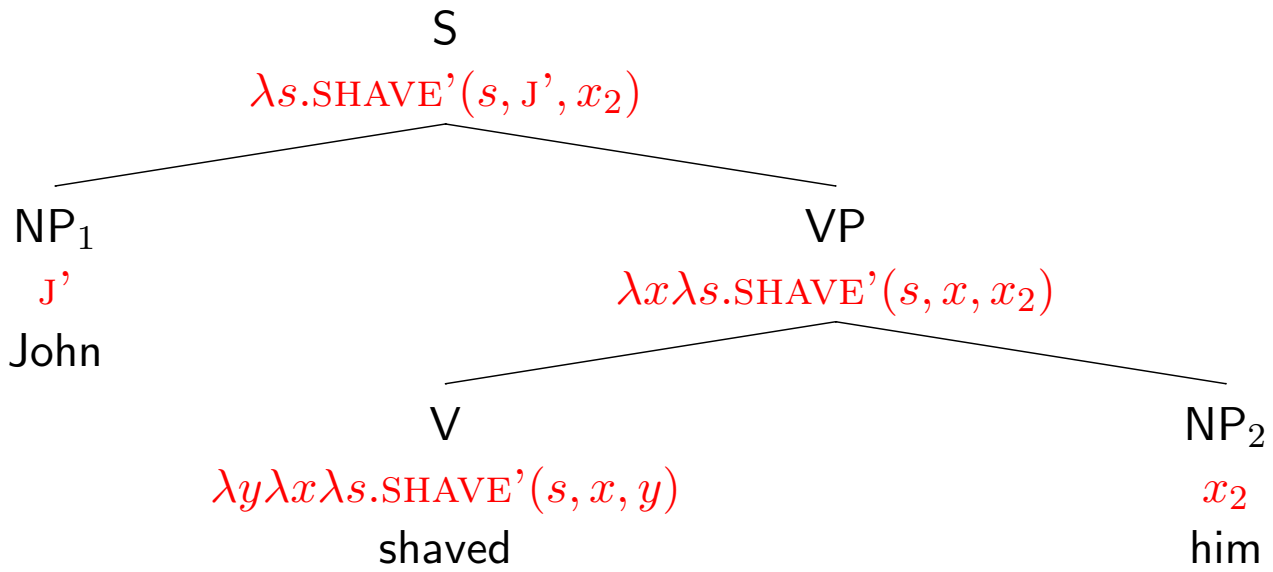
$$\begin{aligned} \|\overline{S}\| &= \|_1\|(\lambda x_1.\|S\|) \\ &= \lambda P\lambda Q\lambda x\lambda s.Q(s,x) \wedge P(s,x)(\lambda x_1\lambda s.\text{SHAVE'}(s,x_1,x_1)) \\ &= \lambda Q\lambda x\lambda s.Q(s,x) \wedge \text{SHAVE'}(s,x,x) \end{aligned}$$

- Rule for interpreting moved *wh*-elements involves applying λx_1 to the S-node
- this λ-operator binds the (variable corresponding to) the trace as well as the (variable corresponding to) the reflexive

Personal pronouns

- **Free pronouns:**
  - coindexed neither with a c-commanding binder (quantifier or *wh*-phrase) nor with any proper noun within the same sentence
  - correspond to free variables in semantic representation
  - interpretation is determined by assignment function, i.e. by the context
  - behave like proper nouns with respect to semantic composition

(1) John$_1$ shaved him$_2$

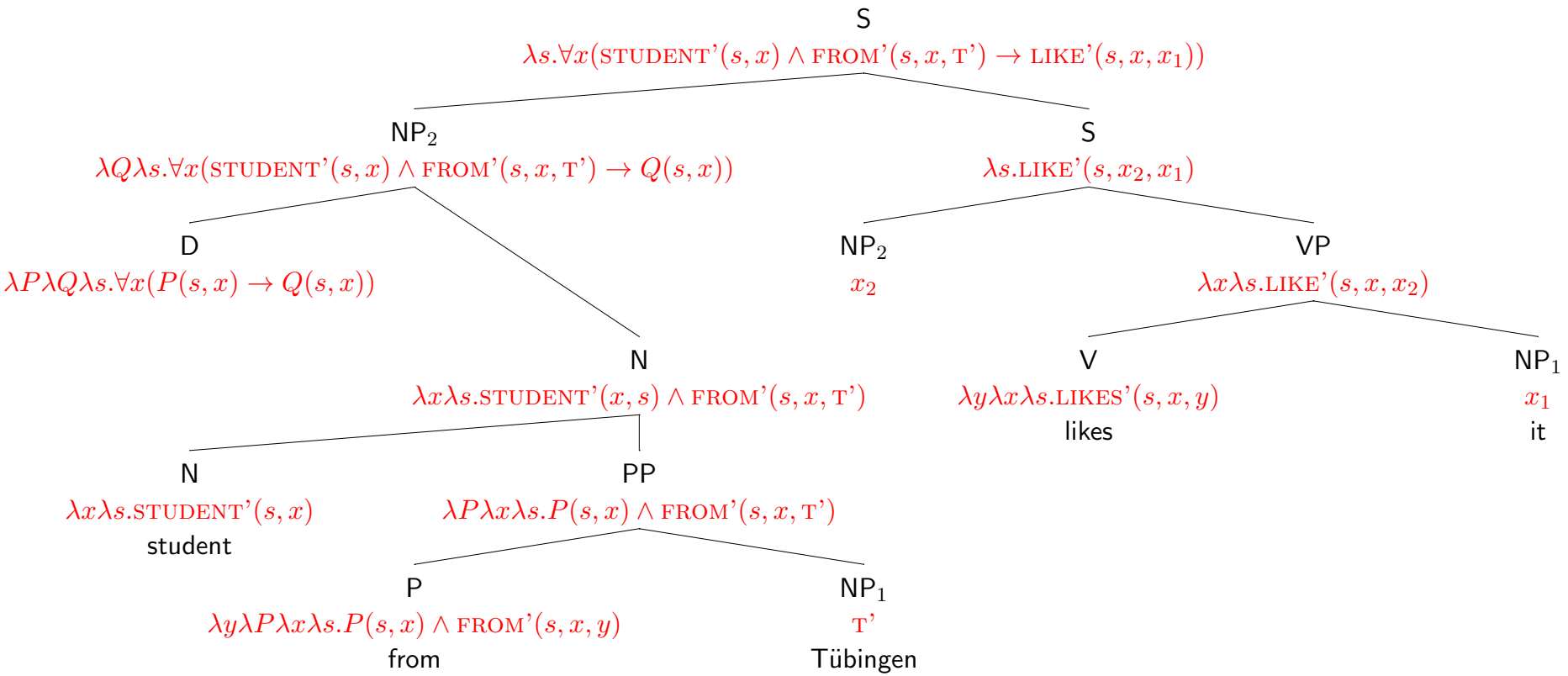


Personal pronouns

- **Coreferent pronouns:**
  - coindexed with some proper noun within the same sentence
  - due to Binding Principle B, this NP must not c-command the pronoun if it occurs within the same local clause
  - behave like free pronouns with respect to semantic composition
  - interpretation is constrained by context (just like for coreferent reflexives)

Personal pronouns

(1) [Every student from Tübingen$_1$]$_2$ likes it$_1$.



Personal pronouns

- Index 1 on name *Tübingen* restricts the context of interpretation to such assignment functions where

$$x_1 = \text{T'}$$

- contextual equivalence:

$$x_1 = \text{T'} \vdash \|S\| = \lambda s.\forall x(\text{STUDENT'}(s,x) \wedge \text{FROM'}(s,x,\text{T'}) \rightarrow \text{LIKE'}(s,x,\text{T'}))$$

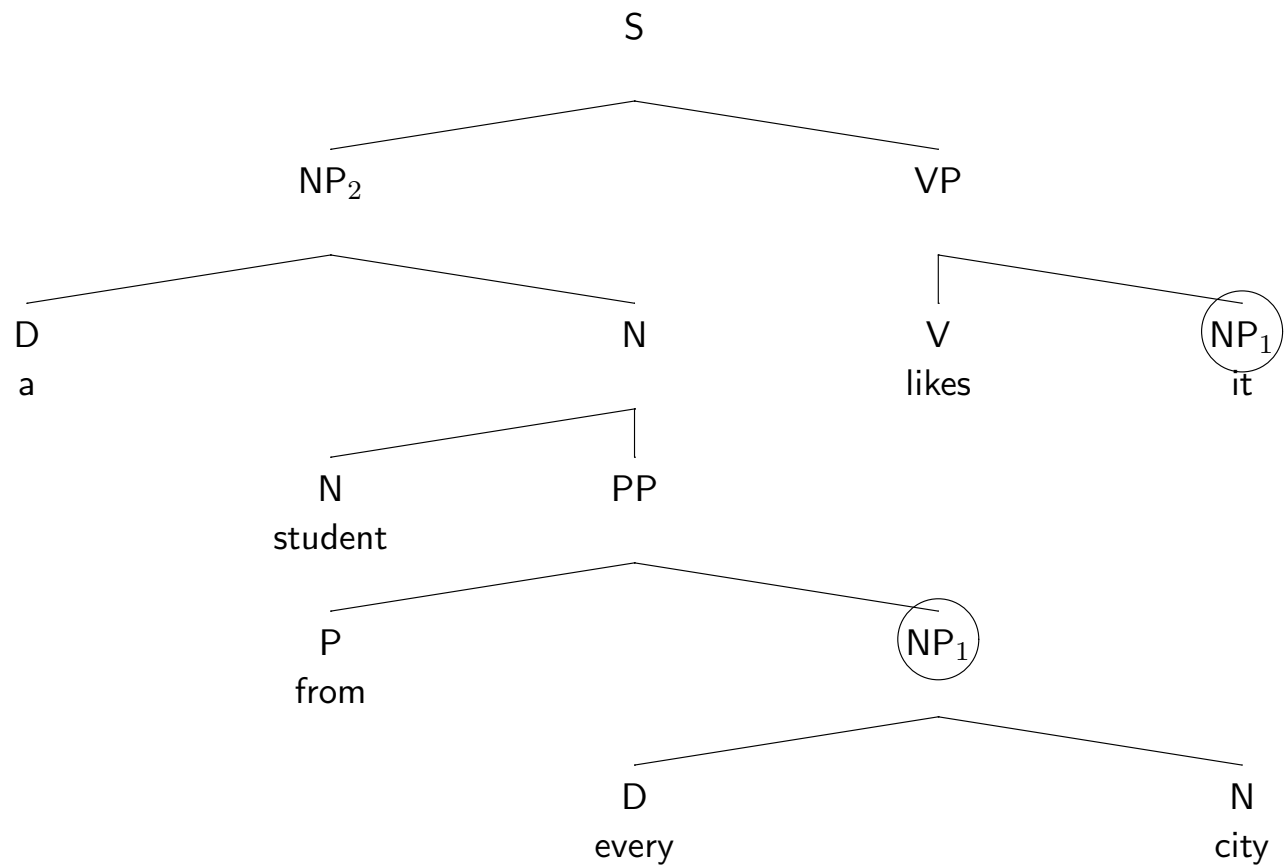
Personal pronouns

- **Bound pronouns:**
  - co-indexed with a binder — i.e. a quantifier or a *wh*-phrase — that **c-commands** the pronoun **at LF**
  - due to Binding Principle B, this binder must **not c-command** the pronoun at **S-structure**

Personal pronouns

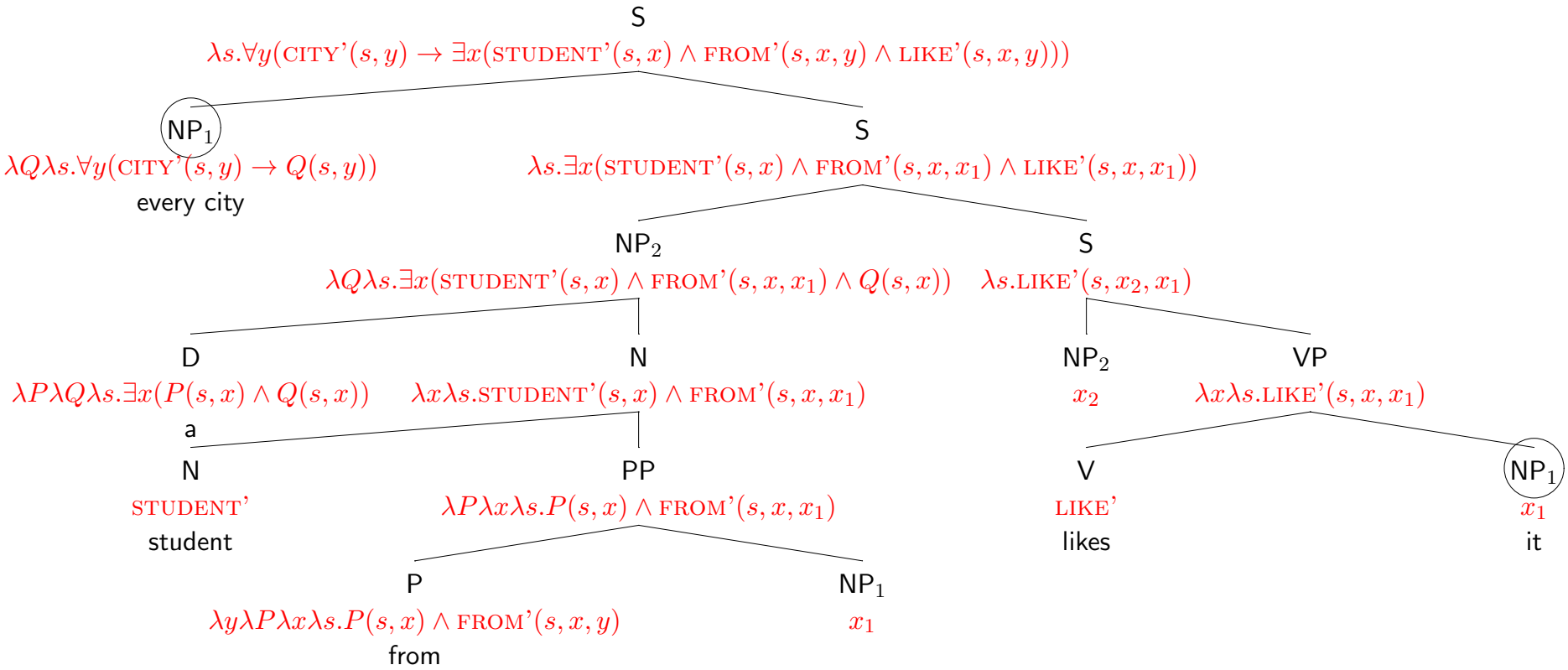
(1) [A student from [every city]$_1$]$_2$ likes it$_1$.

- **S-Structure:** no c-command $\rightsquigarrow$ BT Principle B is fulfilled



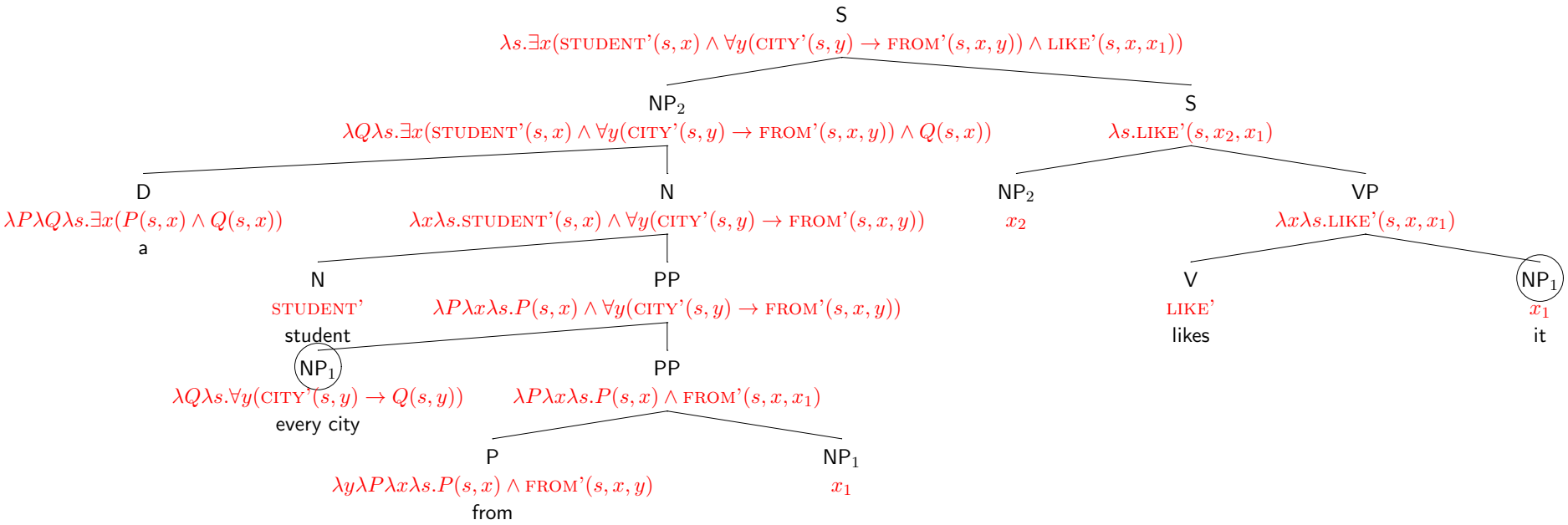
Personal pronouns

- **LF:** inverse linking reading $\rightsquigarrow$ c-command $\rightsquigarrow$ binding



Personal pronouns

- **LF:** narrow scope reading $\rightsquigarrow$ no c-command $\rightsquigarrow$ pronoun remains free



Personal pronouns

Derivation of previous reading, step by step

$$
\begin{aligned}
\|PP^{\downarrow}\| &= \lambda P \lambda x \lambda s.P(s,x) \wedge \textsc{from'}(s,x,x_1) \\
\|PP^{\uparrow}\| &= \lambda P \lambda x \lambda s.P(s,x) \wedge \|NP_1\|(s, \lambda x_1 \lambda s.\|PP^{\downarrow}\|(\lambda x \lambda s.\top)(x)) \\
\|PP^{\downarrow}\|(\lambda x \lambda s.\top)(x) &= (\lambda P \lambda x \lambda s.P(s,x) \wedge \textsc{from'}(s,x,x_1))(\lambda x \lambda s.\top)(x) \\
&= \top \wedge \textsc{from'}(s,x,x_1) \\
&= \textsc{from'}(s,x,x_1) \\
\|PP^{\uparrow}\| &= \lambda P \lambda x \lambda s.P(s,x) \wedge \|NP_1\|(s, \lambda x_1 \lambda s.\textsc{from'}(s,x,x_1)) \\
&= \lambda P \lambda x \lambda s.P(s,x) \wedge \\
&\quad (\lambda Q \lambda s. \forall y(\textsc{city'}(s,y) \rightarrow Q(s,y)))(\lambda x_1 \lambda s.\textsc{from'}(s,x,x_1)(s) \\
&= \lambda P \lambda x \lambda s.P(s,x) \wedge \forall y(\textsc{city'}(s,y) \rightarrow \textsc{from'}(s,x,y)))
\end{aligned}
$$