Tutorial “Quantification and binding" and "Intensionality”

Session 4

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May 22, 2020

Our agenda today

- **Key concepts**
- **Assignment 2 (Quantification)**
- **Q&A**

Co-reference vs. binding

Binding requires:

1) a quantificational antecedent:

Every girl believes that she is happy. (binding√, co-reference √)

Jane/That girl who lives nextdoor believes that she is happy. (binding*, co-reference √)

Co-reference vs. binding

Binding requires:
2) the presence of a co-varying anaphoric expression (pronouns).

Every girl believes that **she** is happy. (binding√, co-reference √)

Every girl believes that **Jane** is happy. (binding*)

Note: Anaphors can also be covert.

Every girl wants [***PRO*** to be loved]. (binding√)

Co-reference vs. binding

Binding requires:
3) a dependency relation (for the moment, we think of this relation in terms of c-command, since binding is dependent on PA).

Every woman is a professor. John likes her. (binding*, co-reference √)

VP Ellipsis and Pronouns

Communication goes beyond what is explicitly stated.

VP ellipsis: VP is elided, its position marked only by an auxiliary verb.

To let an identical copy of the antecedent "reconstructed" at the ellipsis site, VP ellipsis is governed by an **identity condition**.

The elided VP must be interpreted as being **exactly identical** to the overt VP at LF.

VP Ellipsis and Pronouns

When a pronoun occurs inside an elided VP, ambiguity arises:

Ann likes her sister, and Mary does too.

a. 'Ann likes Ann's sister, and Mary likes Ann's sister.' (strict 1)

b. 'Ann likes Sue's sister, and Mary likes Sue's sister.' (strct 2)

c. 'Ann likes Ann's sister, and Mary likes Mary's sister.' (sloppy 1)

d. *'Ann likes Sue's sister, and Mary likes Mary's sister.' (sloppy 2)

e. *'Ann likes Sue's sister, and Mary likes Margot's sister.' (sloppy 3)

VP Ellipsis and Pronouns

When a pronoun occurs inside an elided VP, ambiguity arises:

Strict: The pronoun has the **same antecedent** in both overt- and elided-VP.

Sloppy: The pronoun has the **different antecedent** in the overt- and elided-VP.

Ann likes her sister, and Mary does too.

a. 'Ann likes Ann's sister, and Mary likes Ann's sister.' (strict 1)

b. 'Ann likes Sue's sister, and Mary likes Sue's sister.' (strct 2)

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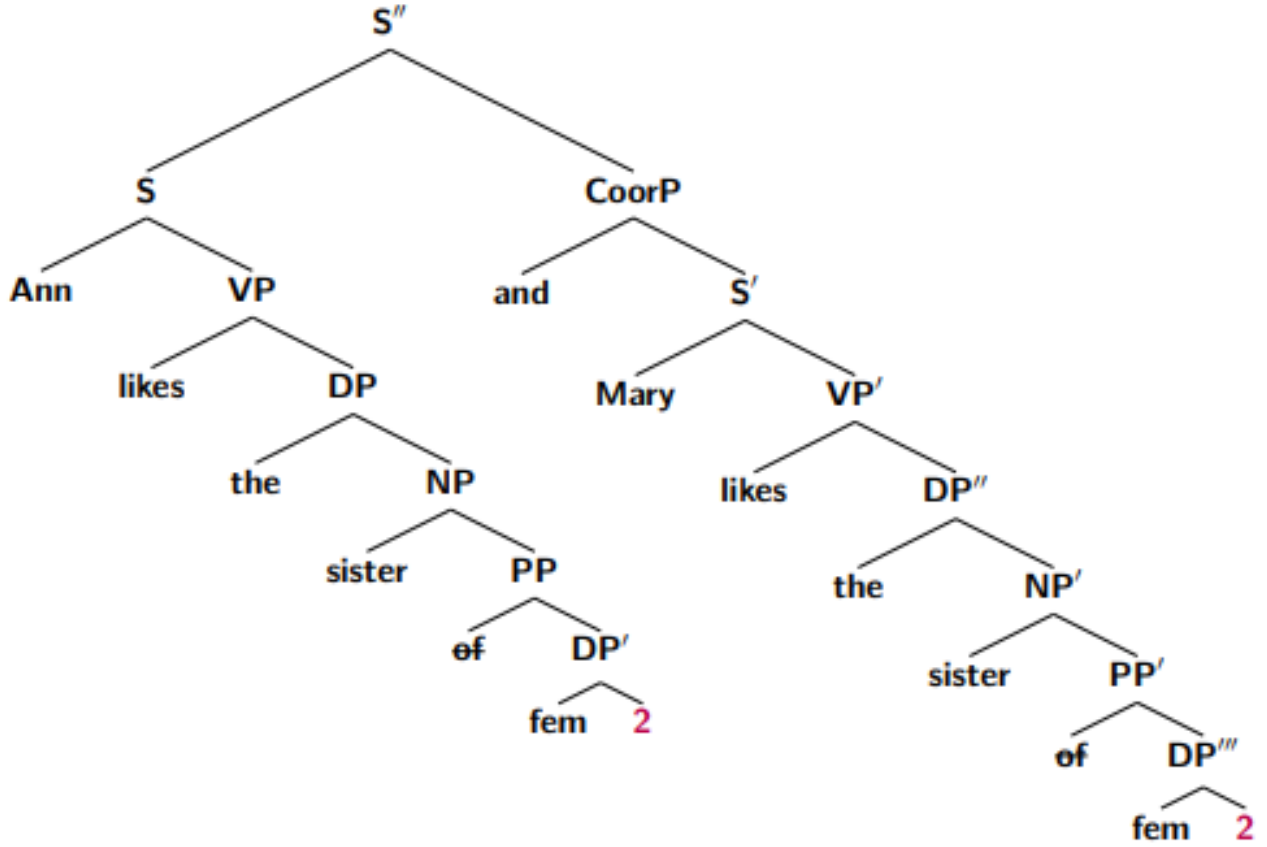
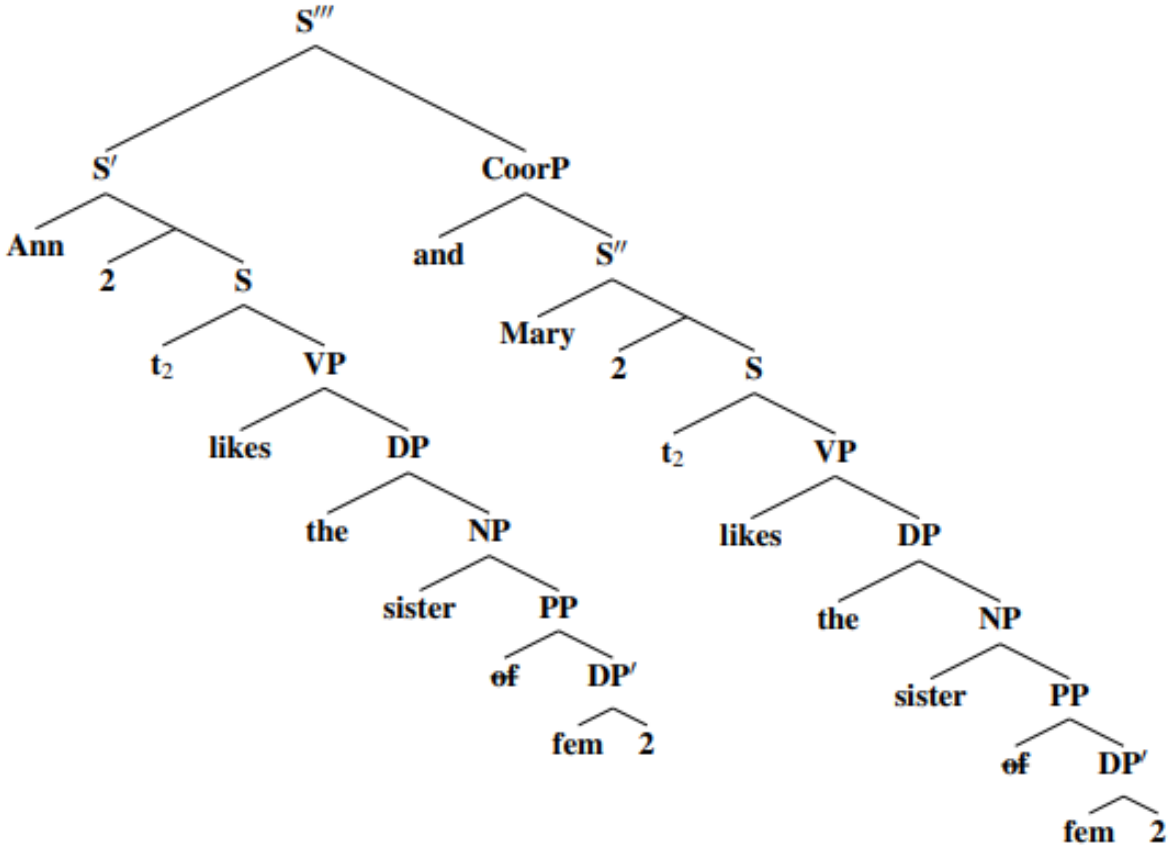
Strict-sloppy ambiguity

When we treat pronouns as referential, we can derive the strict readings 1 and 2.



Strict-sloppy ambiguity

When we treat the pronoun as a bound variable, we can derive the sloppy readings 1. Sloppy readings 2 and 3 are blocked by identity condition.



Why do we need to modify PA?

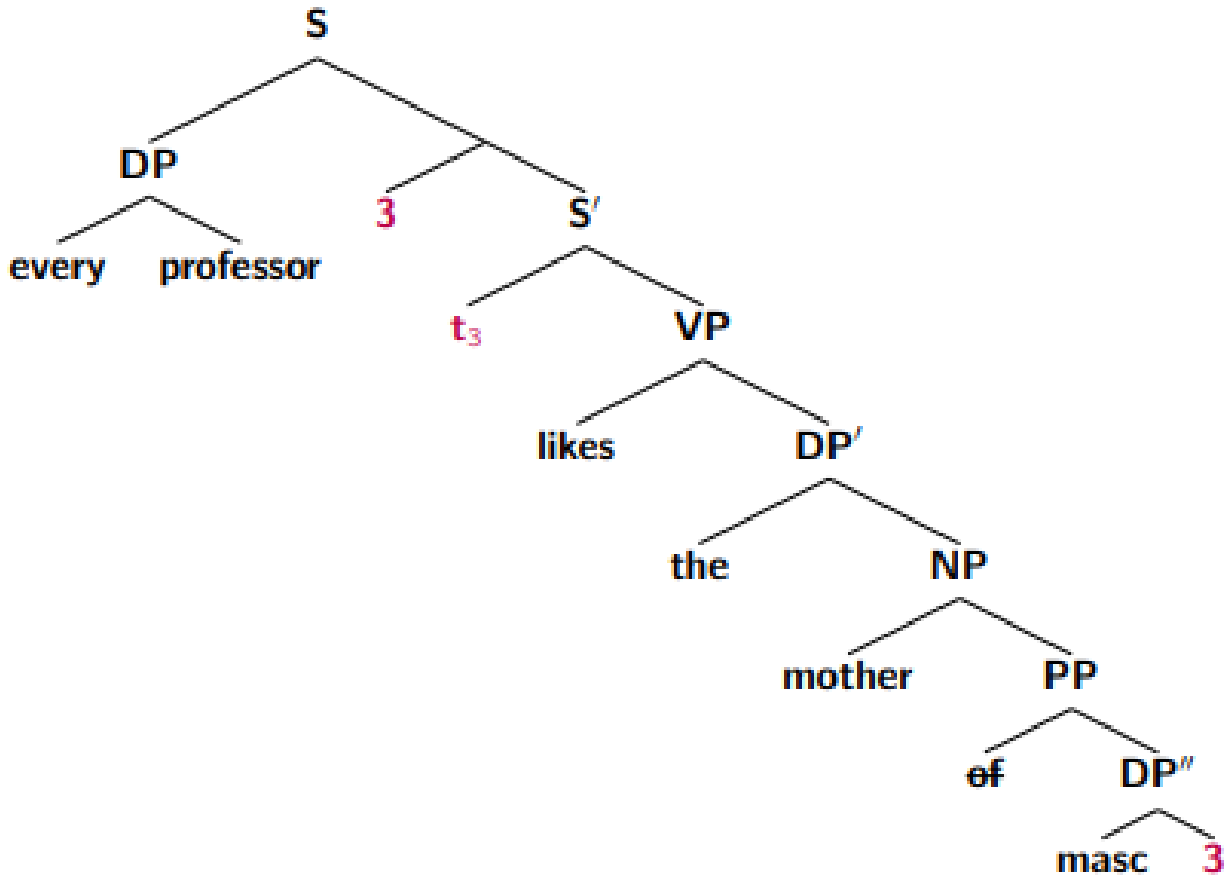
(1) Every professor$_3$ likes his$_3$ mother.

Our intuitions tell us, the bound reading of (1) has the presuppositions:

Every professor is male and has a unique mother.

Our old PA doesn't say anything about the domain restriction on the function denoted by the lambda-abstraction.

LF of bound variable interpretation



Precisifying predicate abstraction

Pedantic version of predicate abstraction: If α is a branching node, whose daughters are a numerical index $\mathbf{i}$ and β then for any world w and assignment a,
$[\![\alpha]\!]^{w,a} = \lambda x : x \in D_e$ and $\beta \in dom([\![\ ]\!]^{w,a^{x/i}})$. $[\![\beta]\!]^{w,a^{x/i}}$.

The pedantic PA turns the presuppositions (i.e. definedness-conditions) of the clause c-commanded by the binder into restrictions on the domain of the function.

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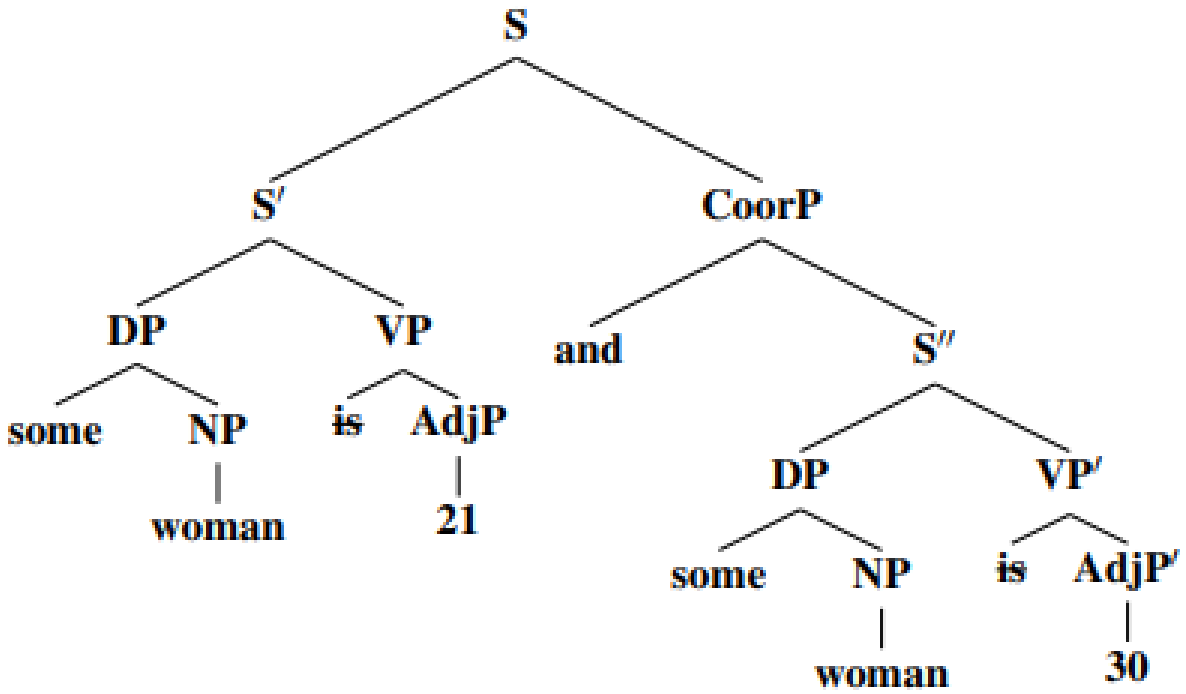
Exercise 1

Exercise 1 Give the types for the nodes in (1b) and compute the truth-conditions assuming the lexical entries in (2). Show that these truth-conditions are non-contradictory, i.e., they can yield both 1 and 0.

(1) a. **Some woman is 21, and some woman is 30.**

b.



(2) a. $[\![\mathbf{21}]\!] = \lambda x \in D_e \,.\, x$ is exactly 21 years old

b. $[\![\mathbf{30}]\!] = \lambda x \in D_e \,.\, x$ is exactly 30 years old

Reminders

We treat [[some]] as a quantifier that sets {x : x is a woman} und {x : x is exactly 21 years old} in relation.

$$[\![\textbf{and}]\!] = \begin{bmatrix} 1 \rightarrow \begin{bmatrix} 1 \rightarrow 1 \\ 0 \rightarrow 0 \end{bmatrix} \\ 0 \rightarrow \begin{bmatrix} 1 \rightarrow 0 \\ 0 \rightarrow 0 \end{bmatrix} \end{bmatrix}$$

$$= \lambda p \in D_t \,.\, [\lambda q \in D_t \,.\, p = q = 1]$$

Proof of **non-contradictory**

If [[S]] is contradictory, it means that [[S']] and [[S'']] can't be true at the same time. Thus, [[S]] must be false.

To show that [[S]] non-contradictory, we need to assume a situation *s* in

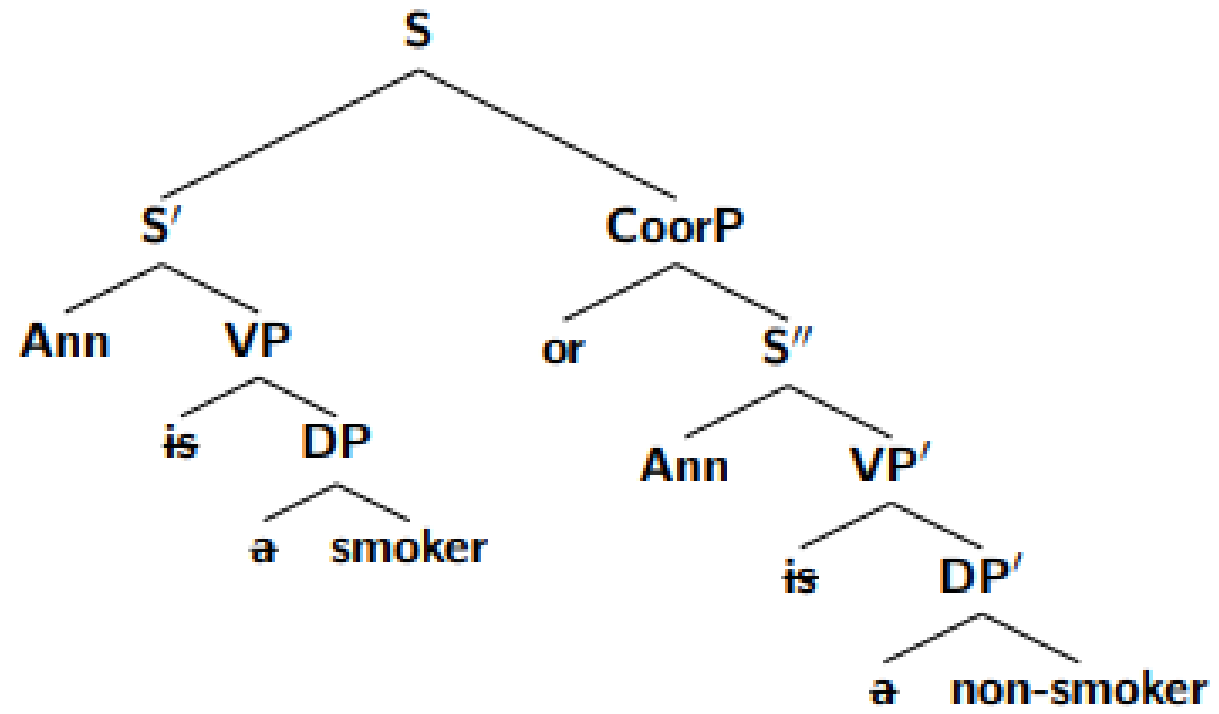
which [[S]] could be true.

Note: Use **set language** to describe a situation.

A small exercise

Compute the truth-conditions in (i). Show that (i) is tautologous.

(i)



Truth-conditions of (i)

$[\![\mathbf{S}']\!] = 1$ iff Ann $\in \{x : x$ is a smoker$\}$

$[\![\mathbf{S}'']\!] = 1$ iff Ann $\in \{x : x$ is a non-smoker$\}$

$$[\![\mathbf{S}]\!] = [\![\mathbf{CoorP}]\!]([\![\mathbf{S}']\!]) \qquad \text{(FA)}$$

$$= [\![\mathbf{or}]\!]([\![\mathbf{S}'']\!])([\![\mathbf{S}']\!]) \qquad \text{(FA)}$$

$$= \begin{bmatrix} 1 \rightarrow \begin{bmatrix} 1 \rightarrow 1 \\ 0 \rightarrow 1 \end{bmatrix} \\ 0 \rightarrow \begin{bmatrix} 1 \rightarrow 1 \\ 0 \rightarrow 0 \end{bmatrix} \end{bmatrix} ([\![\mathbf{S}'']\!])([\![\mathbf{S}']\!]) \qquad \text{(TN1)}$$

$= 0$ iff Ann $\notin \{x : x$ is a non-smoker$\}$ and Ann $\notin \{x : x$ is a smoker$\}$

Proof of tautologousness

Ann $\in D_e$

{x : x is a smoker} $\cup$ {x : x is a non-smoker} = D_e

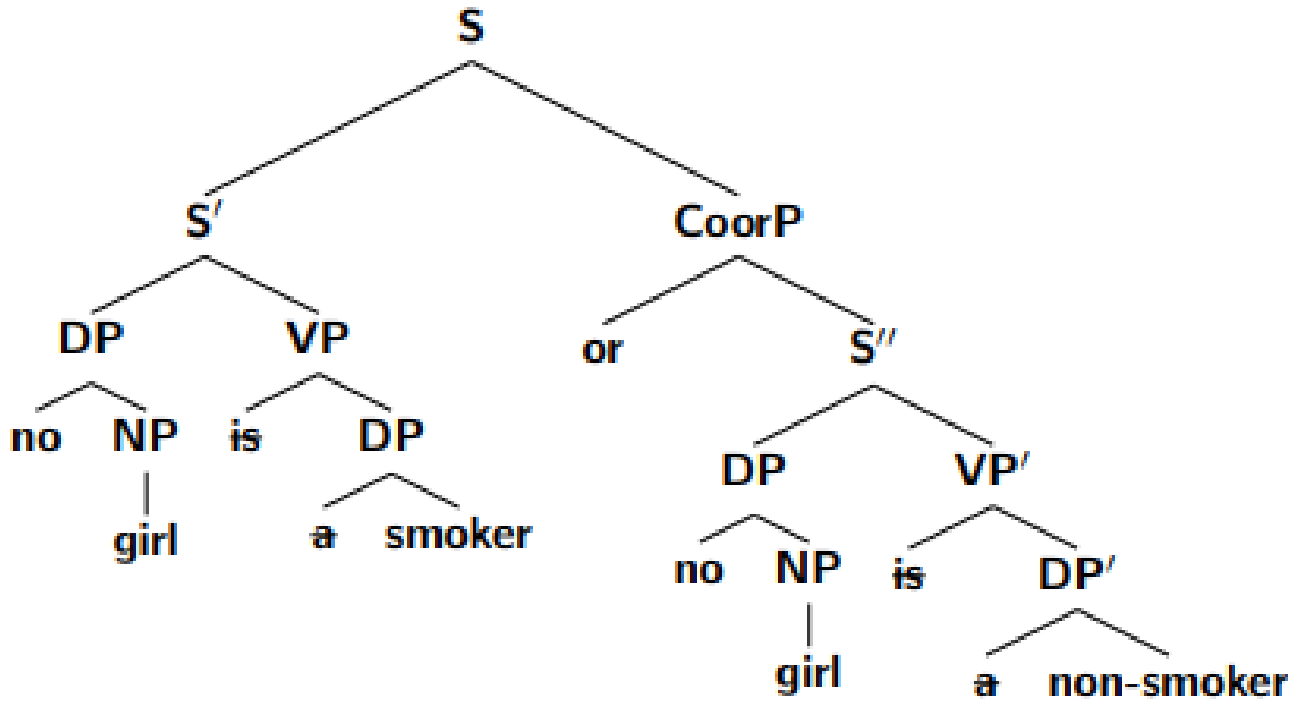
Therefore for any situation *s*, [[S]] = 1 in s.

[[S]] is the tautology.

Another exercise

Compute the truth-conditions in (ii). Show that (ii) is non-tautologous.

(ii)



Truth-conditions of (ii)

$[\![\mathbf{S'}]\!] = 1$ iff $\{x : x \text{ is a girl}\} \cap \{x : x \text{ is a smoker}\} = \varnothing$

$[\![\mathbf{S''}]\!] = 1$ iff $\{x : x \text{ is a girl}\} \cap \{x : x \text{ is a non-smoker}\} = \varnothing$

$$[\![\mathbf{S}]\!] = [\![\mathbf{CoorP}]\!]([\![\mathbf{S'}]\!]) \qquad \text{(FA)}$$

$$= [\![\mathbf{or}]\!]([\![\mathbf{S''}]\!])([\![\mathbf{S'}]\!]) \qquad \text{(FA)}$$

$$= \begin{bmatrix} 1 & \rightarrow & \begin{bmatrix} 1 & \rightarrow & 1 \\ 0 & \rightarrow & 1 \end{bmatrix} \\ 0 & \rightarrow & \begin{bmatrix} 1 & \rightarrow & 1 \\ 0 & \rightarrow & 0 \end{bmatrix} \end{bmatrix} ([\![\mathbf{S''}]\!])([\![\mathbf{S'}]\!]) \qquad \text{(TN1)}$$

$= 0$ iff $\{x : x \text{ is a girl}\} \cap \{x : x \text{ is a smoker}\} \neq \varnothing$ and
$\{x : x \text{ is a girl}\} \cap \{x : x \text{ is a non-smoker}\} \neq \varnothing$

Proof of non-tautologousness

Assume situation *s*:

{x : x is a girl} = {a, b, c}
{x : x is a smoker} = {a, d, e}
{x : x is a non-smoker} = {c, f , g}

In s, {a, b, c} ∩ {a, d, e} = {a} and {a, b, c} ∩ {c, f , g} = {c}.

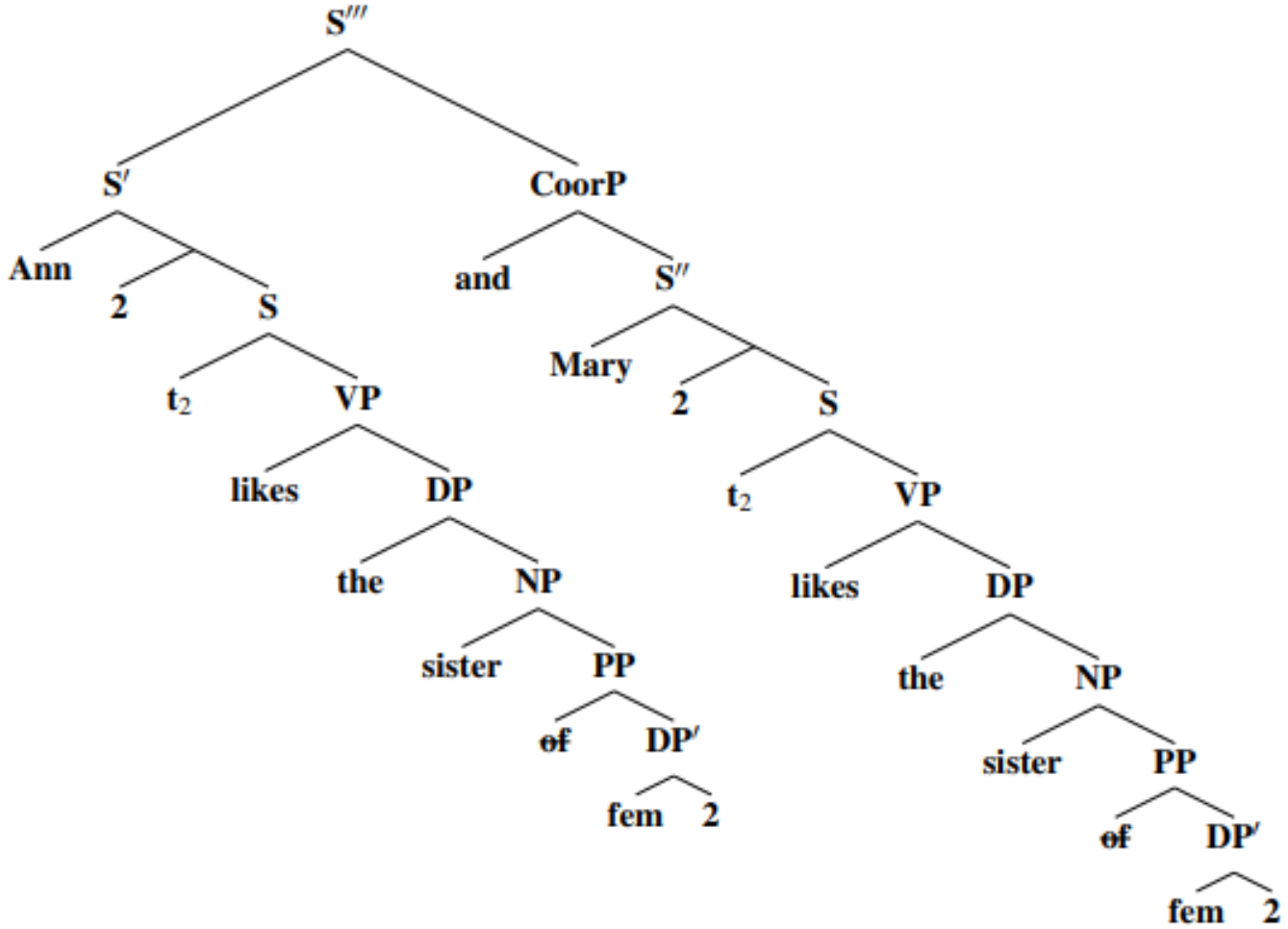
Thus [[S]] = 0 in *s*, i.e., [[S]] is non-tautologous.

Exercise 2

Exercise 2 Compute the sloppy interpretation of (3a) under the representation in (3b). No need to use the pedantic version of PA.

(3) a. **Ann likes her sister, and Mary does too.**

b.



Which sloppy reading?

Ann likes her sister, and Mary does too.

a. 'Ann likes Ann's sister, and Mary likes Ann's sister.'
(strict 1)

b. 'Ann likes Sue's sister, and Mary likes Sue's sister.'
(strct 2)

c. 'Ann likes Ann's sister, and Mary likes Mary's sister.'
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e. *'Ann likes Sue's sister, and Mary likes Margot's sister.'
(sloppy 3)

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Any questions?

Thanks and see you next week!