Tutorial ‘Introduction to Semantic Theory’ (No. 4)

Lecture 6

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Session 5

November 29, 2019

Our agenda today

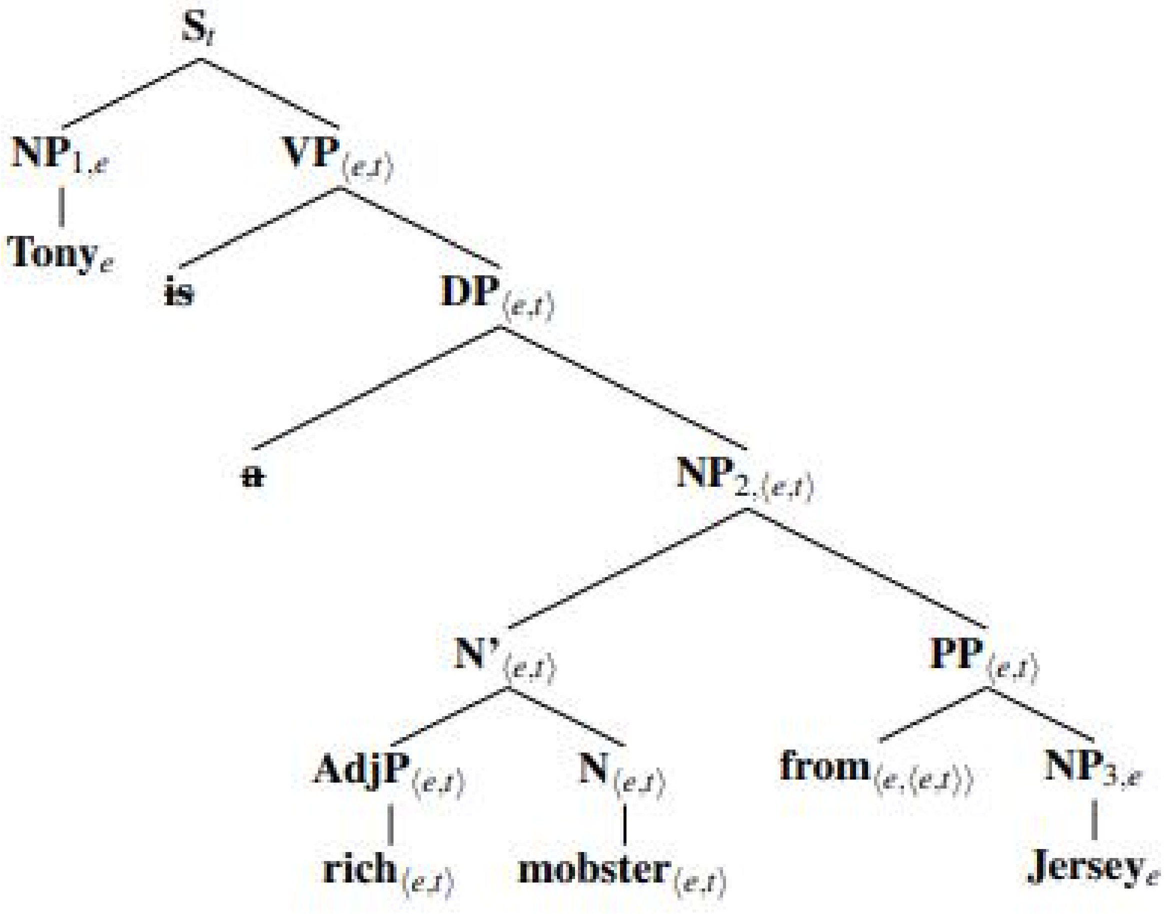
- Assignment 5

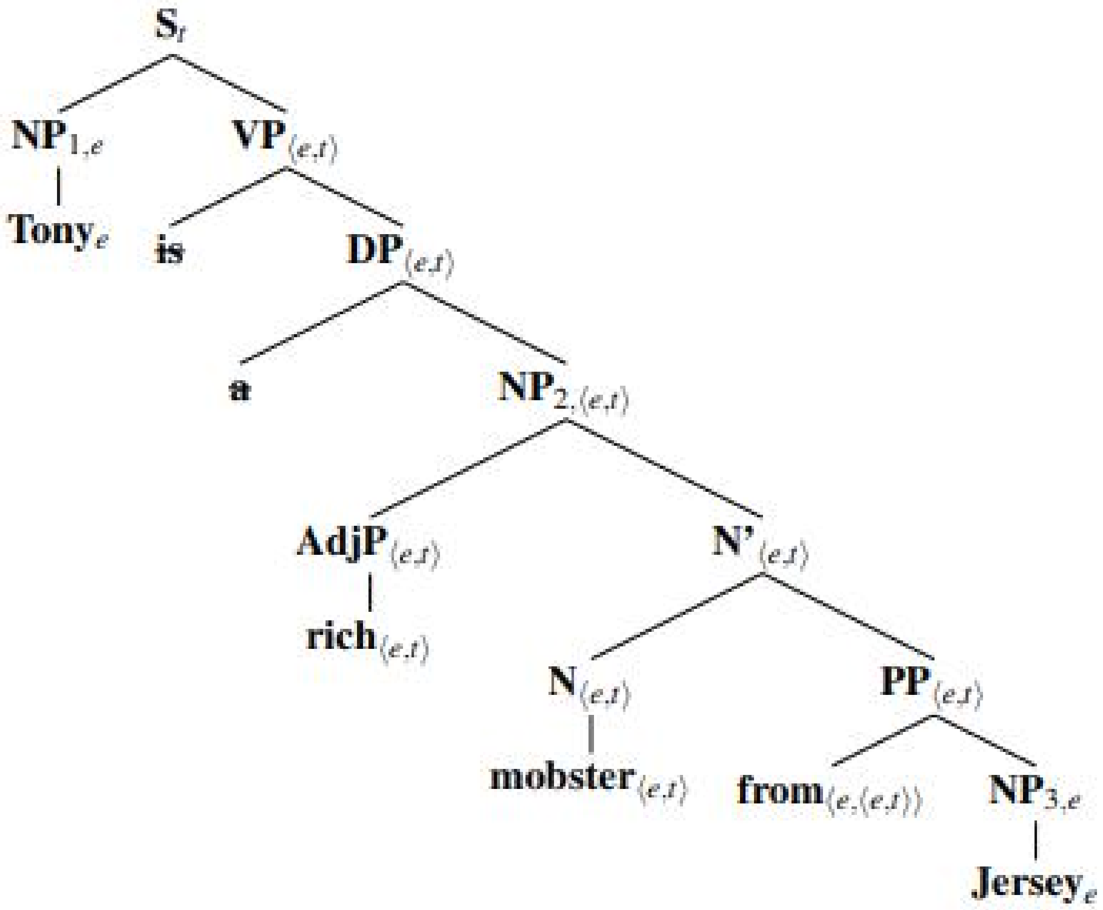
- Also something new:

  Presupposition failure, (Un)definedness, definite article

- Some exercise to help you with assignment 6 and the mid-term exam

Assignment 5





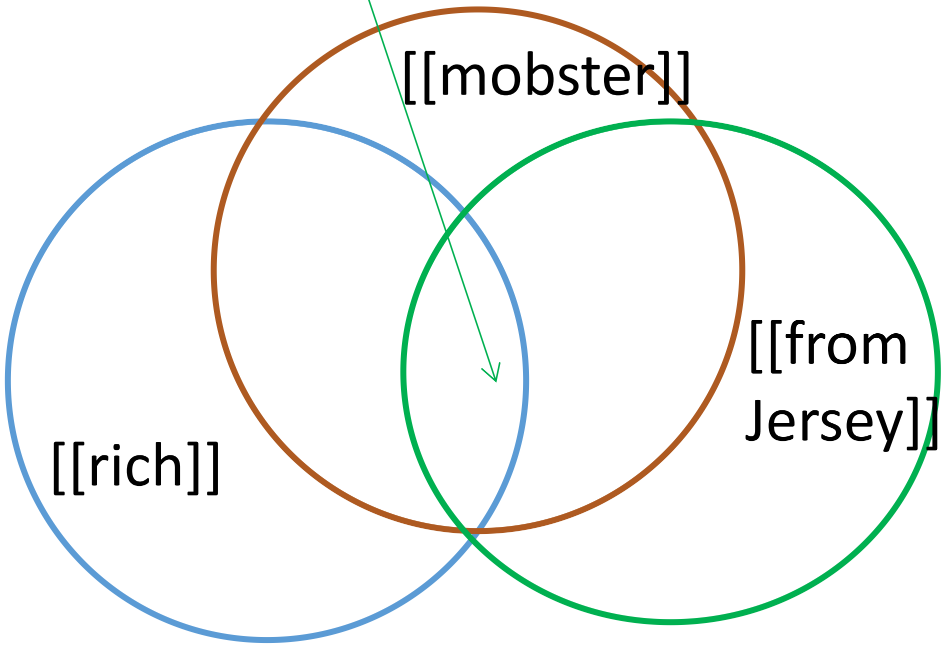
Intersective modification and entailment

(1) a. Tony is a rich mobster from Jersey. **Intersective modification**

b. Tony is rich.

c. Tony is a mobster.

d. Tony is from Jersey.



Non-intersective modification and entailment

(1) a. Tony is a typical/skillful/ lousy dancer. **Non-Intersective modification**

b. Tony is typical.?

c. Tony is skillful.

c. Tony is a lousy.

d. Tony is a dancer.

Presupposition failure

(2) The king of France is bald.

What is the truth-value of sentence (2)?

(Assume the world is the same as our reality.)

In this case, the presupposition is not true in the common ground. We say that there is a **presupposition failure**.

The Russell-Strawson debate

(2) The king of France is bald.

What is the truth-value of sentence (2)?
(Assume the world is the same as our reality.)

<u>Russell, B:</u> 0, because there is no king of France.

<u>Strawson, P.F.:</u> Undefined. Because we cannot check whether the statement is true or false.

Encoding of presuppositions

$$[\![\mathbf{win}]\!] = \lambda x \in D_e \,.\, [\lambda y : y \in D_e \text{ and } y \text{ took part in } x \,.\, y \text{ came first in } x]$$

[[win]] is only defined for individuals x and y if the context c is such that it is mutual shared belief in c that **y took part in x.**

Presuppositions is encoded in such definedness.

p is a presupposition of ϕ iff ϕ is only in the domain of $[\![\;]\!]$ if $p = 1$.

Interpretation rules projecting (un-)definedness

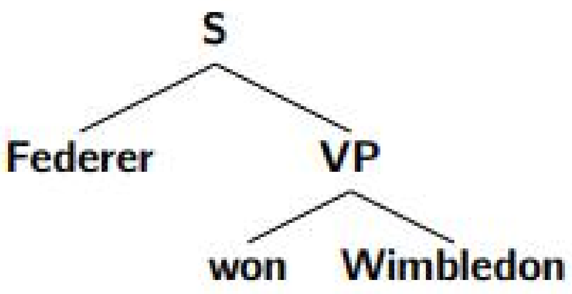
FA If $\boldsymbol{\alpha}$ is a branching node, $\{\boldsymbol{\beta}, \boldsymbol{\gamma}\}$ is the set of $\boldsymbol{\alpha}$'s daughters, then $\boldsymbol{\alpha}$ is in the domain of $[\![\ ]\!]$ if $\boldsymbol{\beta}$ and $\boldsymbol{\gamma}$ are in the domain of $[\![\ ]\!]$ and $[\![\boldsymbol{\gamma}]\!]$ is in the domain of $[\![\boldsymbol{\beta}]\!]$. Then $[\![\boldsymbol{\alpha}]\!] = [\![\boldsymbol{\beta}]\!]([\![\boldsymbol{\gamma}]\!])$.

NN If $\boldsymbol{\alpha}$ is a non-branching node, and $\boldsymbol{\beta}$ is $\boldsymbol{\alpha}$'s daughter, then $\boldsymbol{\alpha}$ is in the domain of $[\![\ ]\!]$ if $\boldsymbol{\beta}$ is in the domain of $[\![\ ]\!]$. Then $[\![\boldsymbol{\alpha}]\!] = [\![\boldsymbol{\beta}]\!]$.

PM If $\boldsymbol{\alpha}$ is a branching node, $\{\boldsymbol{\beta}, \boldsymbol{\gamma}\}$ is the set of $\boldsymbol{\alpha}$'s daughters, then $\boldsymbol{\alpha}$ is in the domain of $[\![\ ]\!]$ if $\boldsymbol{\beta}$ and $\boldsymbol{\gamma}$ are in the domain of $[\![\ ]\!]$ and $[\![\boldsymbol{\beta}]\!]$ and $[\![\boldsymbol{\gamma}]\!]$ are both in $D_{\langle e,t\rangle}$. Then $[\![\boldsymbol{\alpha}]\!] = \lambda x \in D_e$. $[\![\boldsymbol{\beta}]\!](x) = [\![\boldsymbol{\gamma}]\!](x) = 1$.

TN If $\boldsymbol{\alpha}$ is a terminal node, then $\boldsymbol{\alpha}$ is in the domain of $[\![\ ]\!]$ if $[\![\boldsymbol{\alpha}]\!]$ is specified in the lexicon.

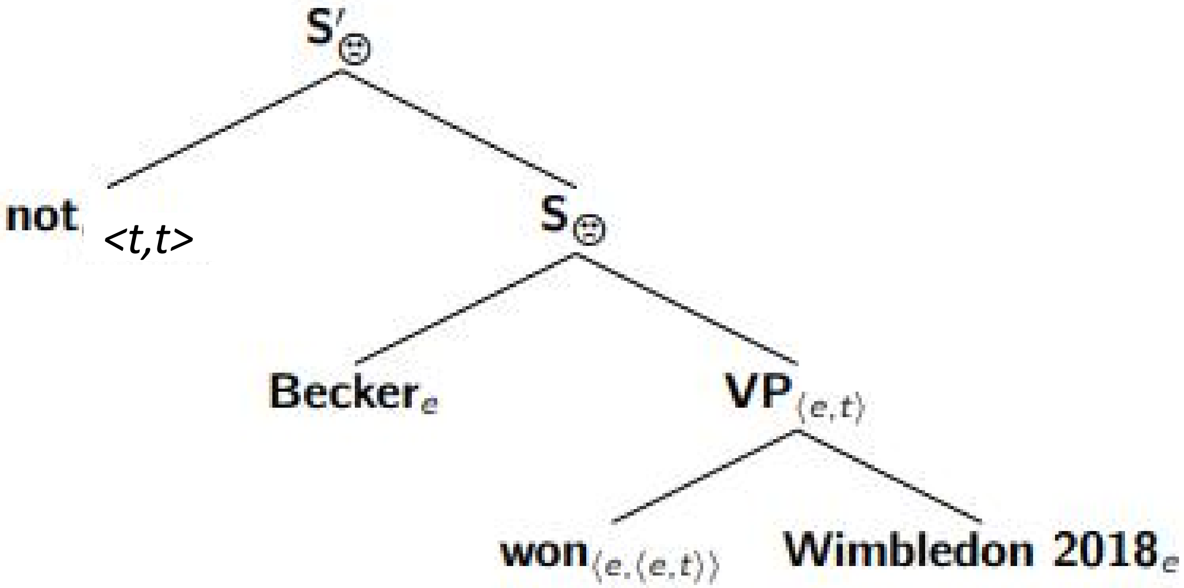
Truth-conditions and definedness



$$
\begin{aligned}
[\![\text{S}]\!] &= [\![\text{VP}]\!]([\![\text{Federer}]\!]) && \text{(FA)}\\
&= [\![\text{won}]\!]([\![\text{Wimbledon}]\!])([\![\text{Federer}]\!]) && \text{(FA)}\\
&= [\lambda x \in D_e\ .\ [\lambda y : y \in D_e \text{ and } y \text{ took part in } x\ .\ y \text{ came first in } x]]\\
&\quad (\text{Wimbledon})(\text{Federer}) && (3{\times}\text{TN})\\
&= [\lambda y : y \in D_e \text{ and } y \text{ took part in Wimbledon}\ .\ y \text{ came first in Wimbledon}]\\
&\quad (\text{Federer})\\
&= 1 \text{ iff Federer came first in Wimbledon} && \text{(FA)}\\
&\quad \text{defined only if Federer is an individual who took part in Wimbledon}
\end{aligned}
$$

Undefined semantic value and negation

(3) It is not the case that Becker won Wimbledon 2018.



[[S]]= # (undefined)
[[S']]= # (undefined)

Exercise 13: Truth-values and undefinedness

Let the situation *S* be: D={John, Jane, Sue}.

John and Sue used to smoke. John is the only one who stops smoking.

Which results do our semantic rules give for (4a-e)?

(4) a. Jane stops smoking.

b. John stops smoking.

c. It is not the case that John stops smoking.

d. It is not the case that Jane stops smoking.

e. Sue stops smoking.

Solution: Exercise 13

(4) a. [[Jane stops smoking]]= #

b. [[John stops smoking]]= 1

c. [[It is not the case that John stops smoking]]= 0

d. [[It is not the case that Jane stops smoking]]= #

e. [[Sue stops smoking]]= 0

Intuitions about definite expressions

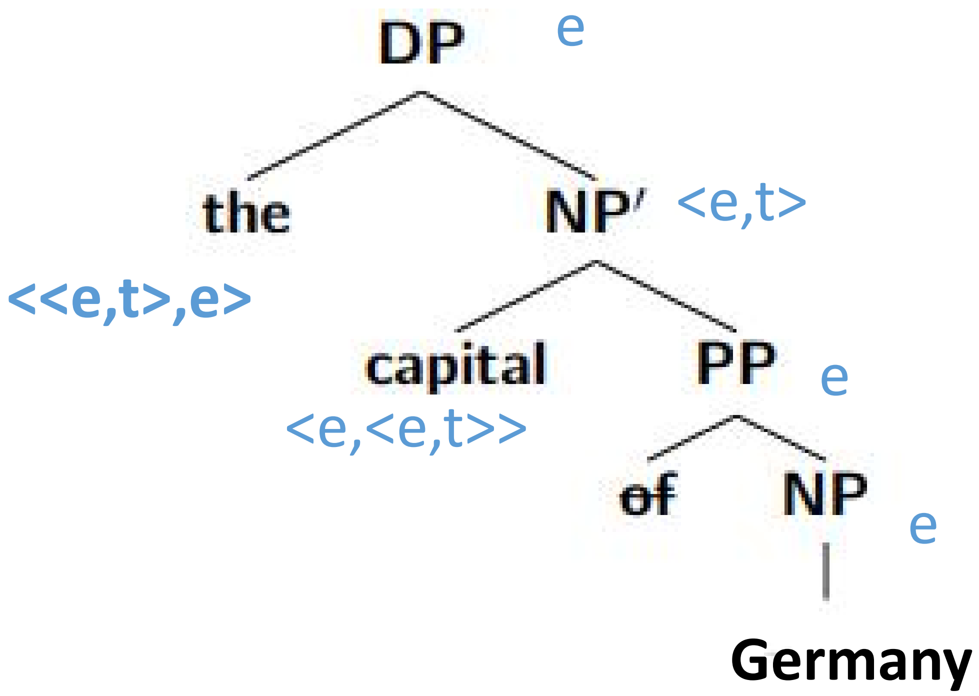
What is the difference between (a) and (b) in the follwoing sentence?

(5) a. A white cat.
 b. The white cat.

(6) a. A city in Germany
 b. The capital of Germany

Our Intuitions tell us, **uniqueness** seems to be encoded in [[the]].

Which semantic type?



Lexical entry for [[the]]

Type <<e,t>,e>

$[\![\textbf{the}]\!] = \lambda f : f \in D_{\langle e,t \rangle}$ and there is exactly one x such that $f(x) = 1$. the unique y such that $f(y) = 1$.

This can be abbreviated as:

$[\![\textbf{the}]\!] = \lambda f : f \in D_{\langle e,t \rangle}$ and $\exists! x[f(x) = 1]$. $\iota y[f(y) = 1]$.

"$\exists! x[\phi]$" = "there is exactly one x such that ϕ"

"$\iota x[\phi]$" = "the unique x such that ϕ"

Uniqueness and undefinedness

Definite expressions are only defined only if for functions with the type <e,t> mapping **exactly one individual** to 1.

(7) a. [[the king of the USA]]= #

Because [[king of the USA]] is not in the domain of [[the]]

b. [[the airport in Göttingen is big]]= #

Because [[airport in Göttingen]] is not in the domain of [[the]]. There is no airport in Göttingen.

c. [[the student in Göttingen is happy]]= ?

Uniqueness and undefinedness

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Because [[king of the USA]] is not in the domain of [[the]]

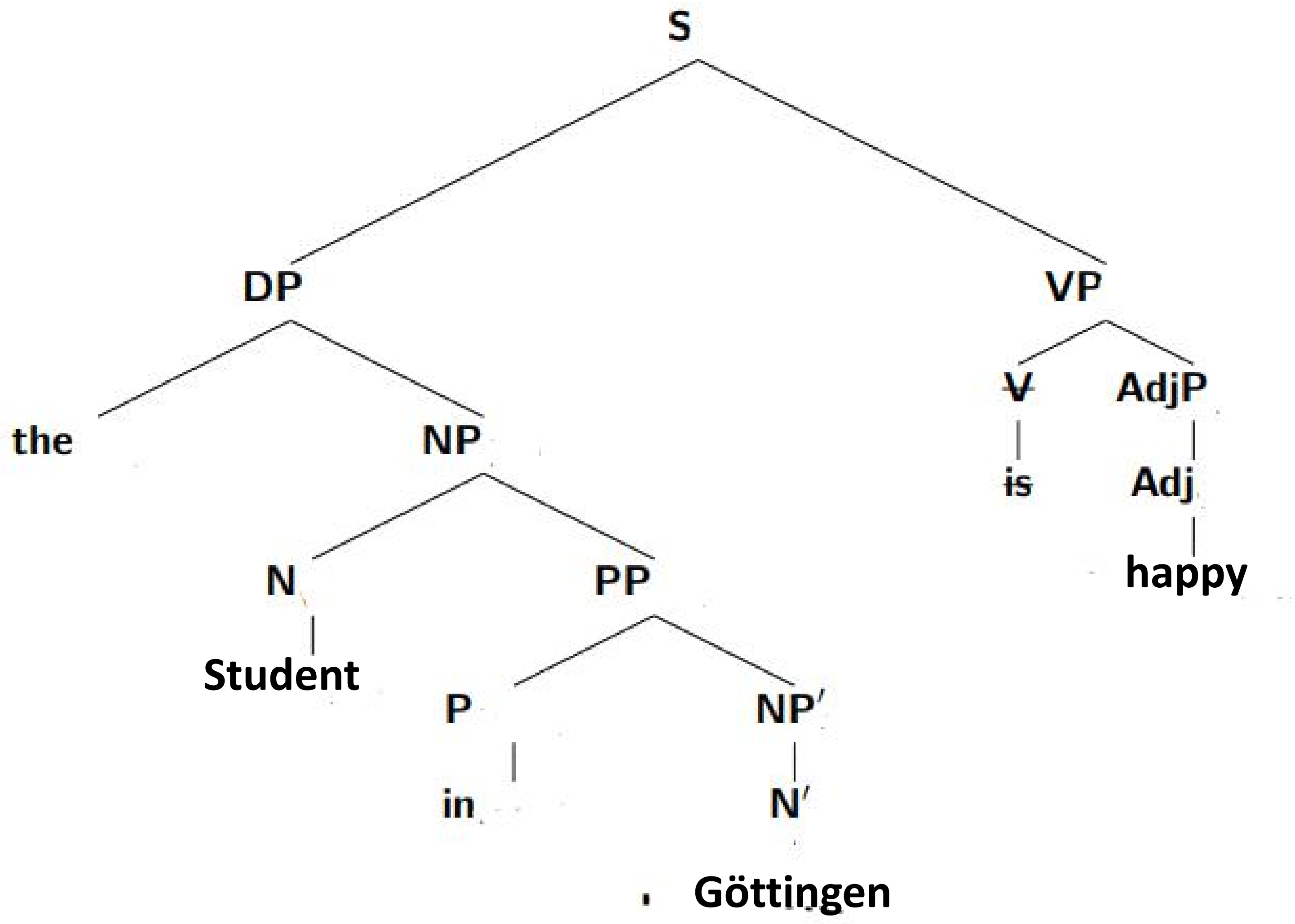
b. [[the airport in Göttingen is big]]= #

Because [[airport in Göttingen]] is not in the domain of [[the]]. There is no airport in Göttingen.

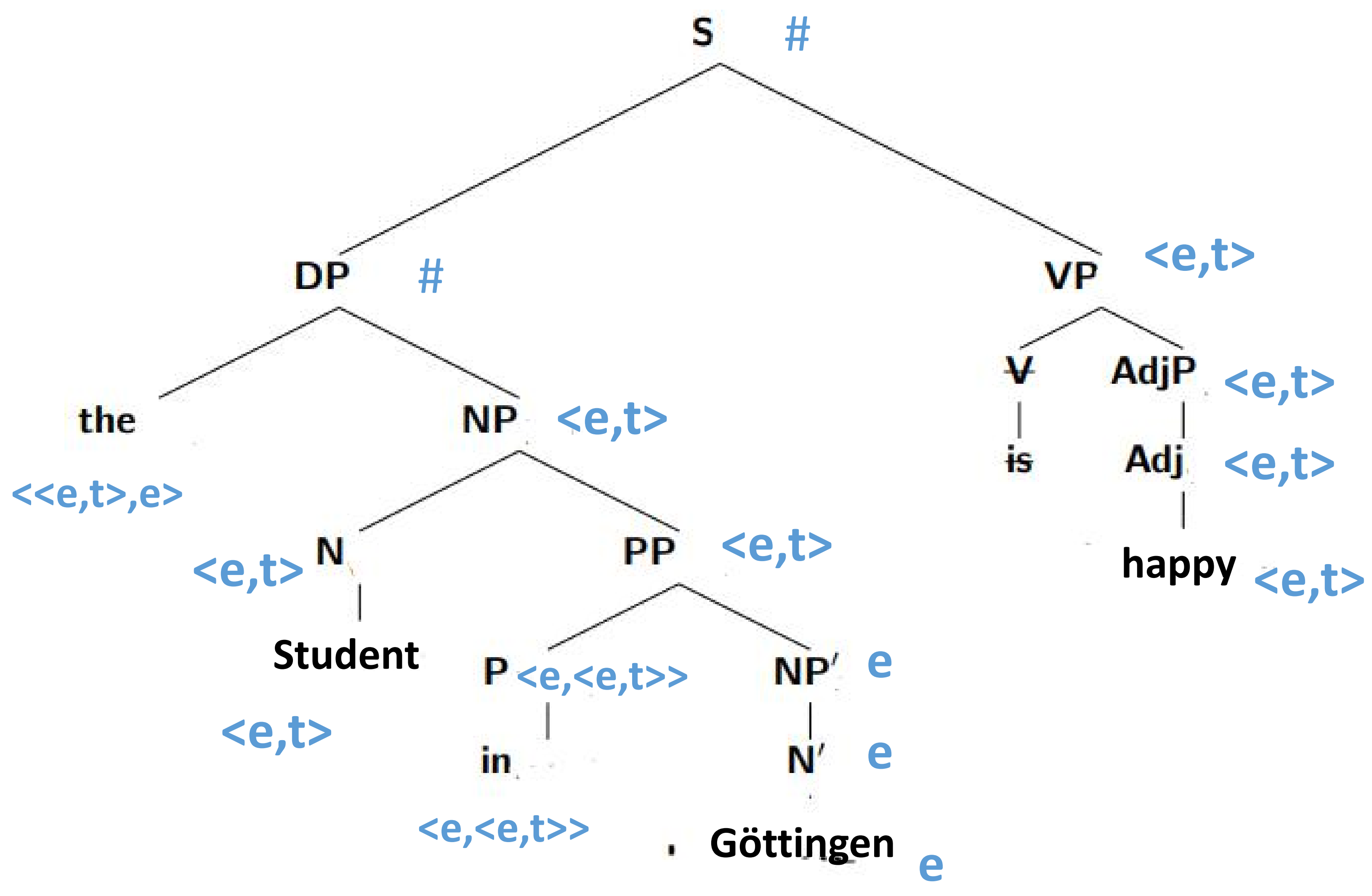
c. [[the student in Göttingen is happy]]= #

Because [[airport in Göttingen]] is not in the domain of [[the]]. There is more than one student in Göttingen.

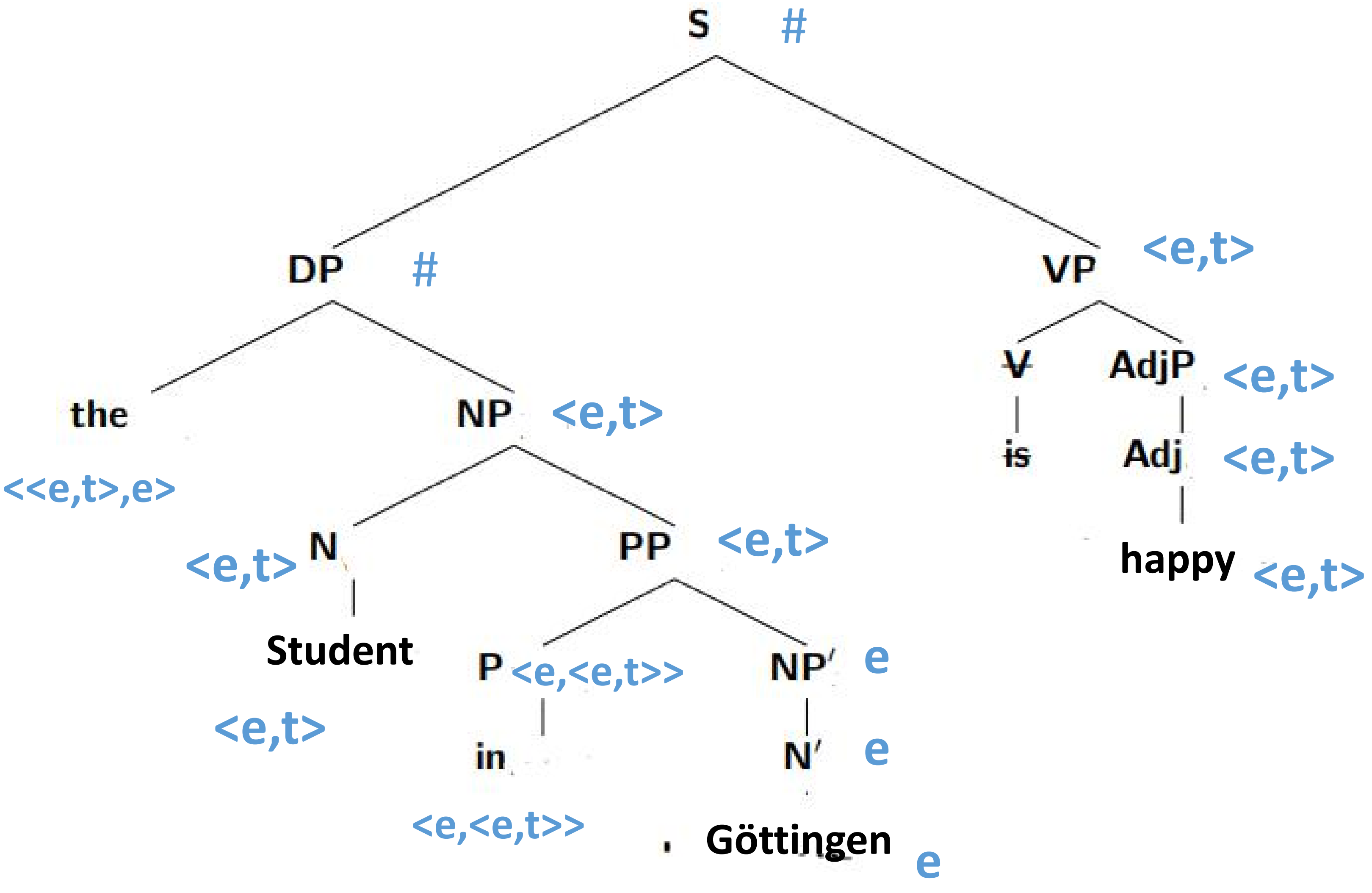
Exercise 14a: Annotate the tree with denotation types



Solution: Exercise 14a



Exercise 14b: Compute the truth-conditions and definedness conditions



Solution: Exercise 14b

[[VP]] = [[AdjP]] = [[Adj]] = [[happy]] =$\lambda x \in D_e$. x is happy (3x NN, TN)

[[NP']] = [[N]] = [[Göttingen]] = Göttingen (2xNN, TN)

[[P]] = [[in]] = $\lambda x \in D_e$. [$\lambda y \in D_e$. y is located in x] (NN,TN)

[[N]] = [[student]] = $\lambda x \in D_e$. x is a student (NN,TN)

[[PP]] = [[P]]([[NP']]) (FA)

= [$\lambda x \in D_e$. [$\lambda y \in$ De . y is located in x]] (Göttingen) ([[P]],[[NP']])

= $\lambda y \in D_e$. y is located in Göttingen

[[NP]] = $\lambda x \in D_e$. [[N]](x) = [[PP]](x) = 1 (PM)

= $\lambda x \in D_e$. [$\lambda y \in D_e$. y is a student](x)=

[$\lambda y \in D_e$. y is located in Göttingen](x)=1 ([[N]], [[pp]])

= $\lambda x \in D_{e\,.}$ x is a student located in Göttingen

Solution: Exercise 14b

[[DP]] = [[the]]([[NP]]) (FA)

= [λf : f ∈ $D_{<e,t>}$ and there is exactly one x such that f (x) = 1 . (TN, [[NP]])

the unique y such that f (y) = 1]([λz ∈ De . z is a student located in Göttingen])

= the unique y such that [λz ∈ De . z is a student located in Göttingen(y)=1]

defined only if there is exactly one x such that [λz ∈ De . z is a student

located in Göttingen(x)=1]

= the unique x such that x is a student located in Göttingen

defined only if there is exactly one y such that y is a student located in Göttingen

= undefined

[[S]] = [[VP]]([[DP]]) (FA)

= undefined

Exercise 14c: Construct situations

(7c) The student in Göttingen is happy.

[[(7c)]]= 1

[[(7c)]]= 0

[[(7c)]]= #

Solution: Exercise 14c

Assume a situation S1 in which [[student in Göttingen]]= {John}. John is happy.

In S1, [[(7c)]]= 1

Assume a situation S2 in which [[student in Göttingen]]= {Jane}. Jane is not happy.

In S2, [[(7c)]]= 0

Assume a situation S3 in which [[student in Göttingen]]= {Jane, John}. Jane and John are not happy.

In S3, [[(7c)]]= #

Exercise 15 for the mid-term

1. Entailment or Presupposition? Use the tests.

(1) a. Joan didn't begin doing his homwork.

b. Joan had not been doing his homework before.

(2) a. It was his wallet that Bill lost.

b. Bill lost something.

(3) a. I know that Sue and Fred went to the party.

b. Sue went to the party.

Exercise 15 for the mid-term

2. Characteristic function and schönfinkelization

Assume D= {Mary, John, Jane}. The binary relation $R_{\text{pround of}}$ is defined as in (1).

(1) $R_{\text{pround of}}$ = {<Mary, John>, <Jane, Mary>}

a. Write the characteristic function of $R_{\text{pround of.}}$

b. Which schönfinkelization of the characteristic function of

$R_{\text{pround of}}$ do we assume in English? Write the schönfinkelization out.

Exercise 15 for the mid-term

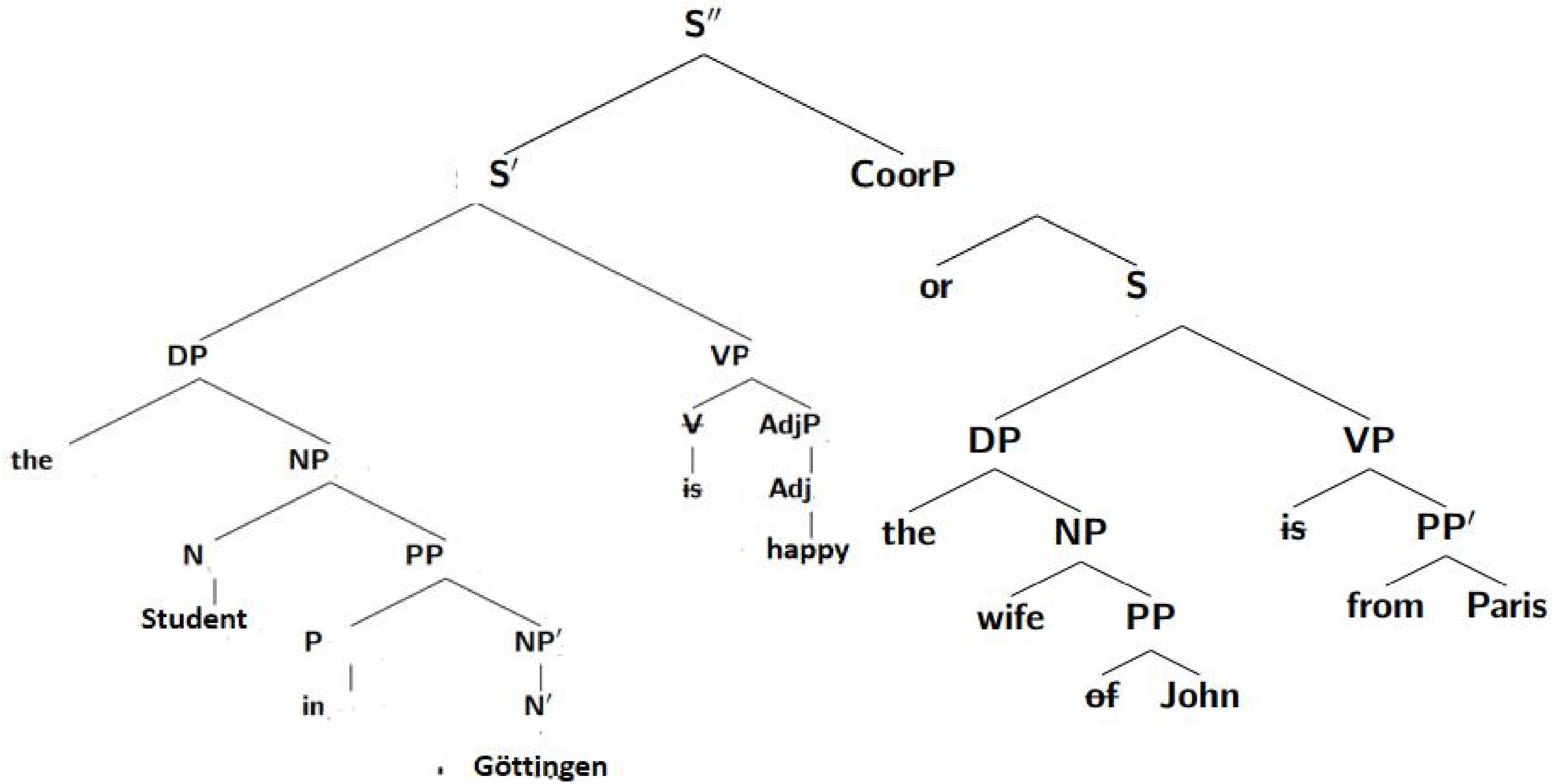
3. For sentences (1) and (2):

a. first annotate the tree with denotation types

b. Compute the truth-conditions (and definedness conditions if necessary)

Exercise 15 for the mid-term

(1) The student in Göttingen is happy or the dog of John is from Paris.



Exercise 15 for the mid-term

(2) It is not the case that Tony introduced John Jane.