Semantics I
Lecture 8

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"The"

$[\![\textbf{the}]\!] = \lambda P_{\text{predicate}}.$ the unique entity x salient in c such that $P(x) = 1$
(undefined if there is no such entity or if there is more than one)

$[\![\textbf{the rabbit}]\!] = [\![\textbf{the}]\!]([\![\textbf{rabbit}]\!]) = [\![\textbf{the}]\!](\lambda x.x$ is a rabbit$) =$

$(\lambda P.$ the unique entity x salient in c such that $P(x) = 1)(\lambda x.x$ is a rabbit$)=$

(the unique entity x salient in c such that $[\lambda x.x$ is a rabbit$](x) = 1) =$

(the unique entity x salient in c such that x is a rabbit$) =$

more about mechanics

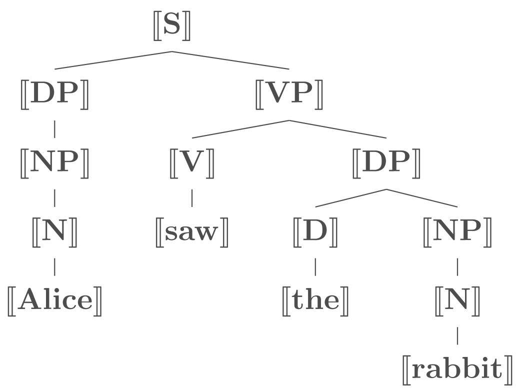
$[\![\textbf{woman}]\!] = \lambda y.y$ is a woman $[\![\textbf{the}]\!](\lambda y.y$ is a woman$) =$

$(\lambda P.$ the unique entity x salient in c such that $P(x) = 1)(\lambda y.y$ is a woman$)=$

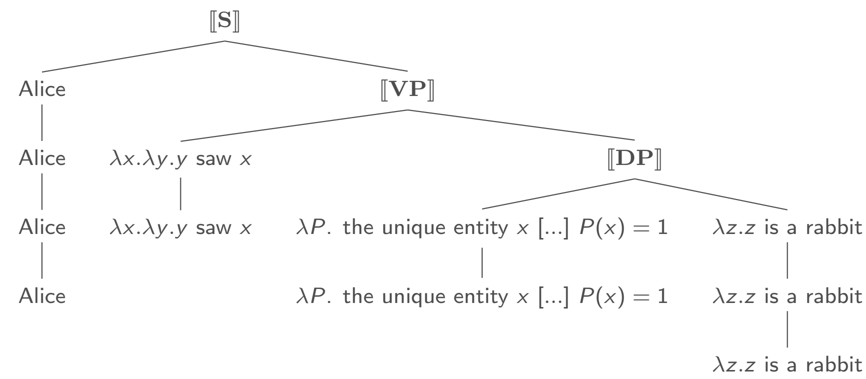
the unique entity x salient in c such that $[\lambda y.y$ is a rabbit$](x) = 1$

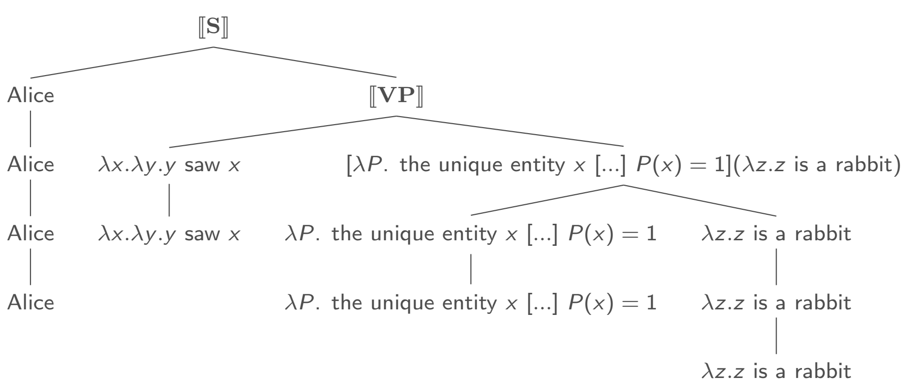
the unique entity x salient in c such that x is a rabbit

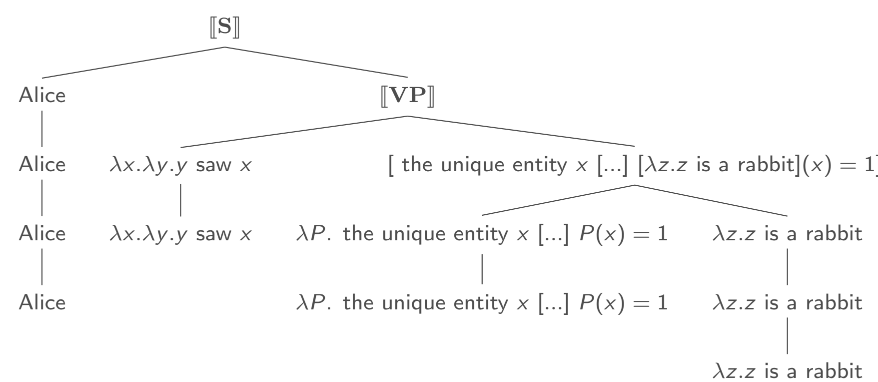
A full example



[[**Alice**]] = Alice
[[**saw**]] = $\lambda x.\lambda y.y$ saw x
[[**the**]]= $\lambda P.$ the unique entity x salient in c such that $P(x) = 1$
[[**rabbit**]] = $\lambda z.z$ is a rabbit







$[\lambda z.z \text{ is a rabbit}](x) = x \text{ is a rabbit}$

- $[\![\mathbf{S}]\!]$
  - Alice
    - Alice
      - Alice
        - Alice
  - $[\![\mathbf{VP}]\!]$
    - $\lambda x.\lambda y.y$ saw x
      - $\lambda x.\lambda y.y$ saw x
    - [the unique entity x [...] x is a rabbit]
      - $\lambda P.$ the unique entity x [...] $P(x) = 1$
        - $\lambda P.$ the unique entity x [...] $P(x) = 1$
      - $\lambda z.z$ is a rabbit
        - $\lambda z.z$ is a rabbit
          - $\lambda z.z$ is a rabbit

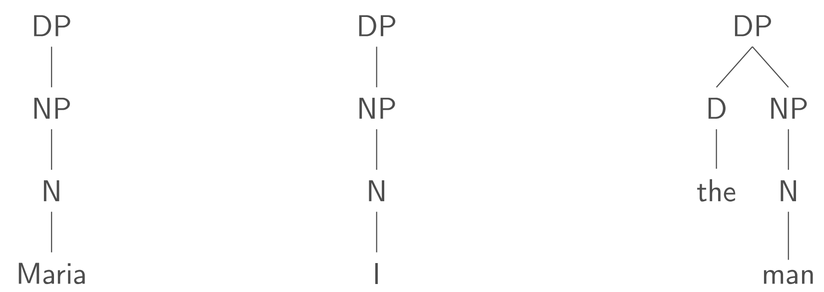
- $[\![\mathbf{S}]\!]$
  - Alice
    - Alice
      - Alice
        - Alice
  - $\lambda y.y$ saw the unique entity x[...]x is a rabbit
    - $\lambda x.\lambda y.y$ saw x
      - $\lambda x.\lambda y.y$ saw x
    - [the unique entity x [...] x is a rabbit]
      - $\lambda P.$ the unique entity x [...] $P(x) = 1$
        - $\lambda P.$ the unique entity x [...] $P(x) = 1$
      - $\lambda z.z$ is a rabbit
        - $\lambda z.z$ is a rabbit
          - $\lambda z.z$ is a rabbit

- 1 iff Alice saw the unique entity x [...] x is a rabbit
  - Alice
    - Alice
      - Alice
        - Alice
  - $\lambda y.y$ saw the unique entity x[...]x is a rabbit
    - $\lambda x.\lambda y.y$ saw x
      - $\lambda x.\lambda y.y$ saw x
    - [the unique entity x [...] x is a rabbit]
      - $\lambda P.$ the unique entity x [...] $P(x) = 1$
        - $\lambda P.$ the unique entity x [...] $P(x) = 1$
      - $\lambda z.z$ is a rabbit
        - $\lambda z.z$ is a rabbit
          - $\lambda z.z$ is a rabbit

- we saw that our definition blocks **the Maria**
- how do we block **the sneeze**?

so far...

- So far we have seen the meanings of some DPs
  - Maria [proper names]
  - I [some pronouns]
  - The man [definite descriptions]

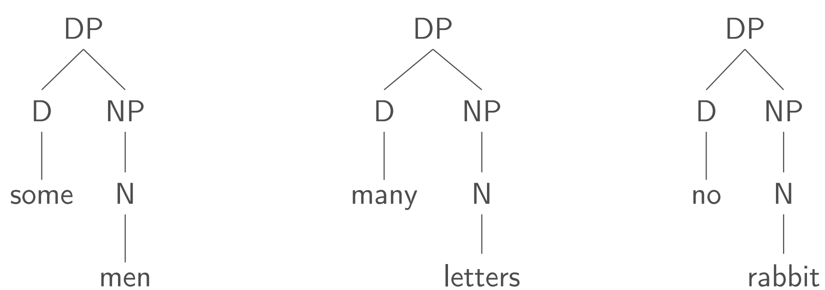


We know that all those DPs are referential expressions...

... but we also know that not all DPs are referential expressions.

- some men
- many letters
- no rabbit

All of DPs above are quantified DPs



today's goal

- What is the denotation of non referential DPs?
  - more precisely, what is the denotation of quantified DPs?
- We will start by looking at quantified DPs like
  - everybody
  - nobody
  - somebody
- we will then look at more complicated ones (but maybe not today...)

everybody

Everybody slept

What does it mean?

- In this case, it is not that we predicate anything of anyone..., i.e. it is not that "sleep" is predicated of an entity.
  - the utterance **everybody slept** tells us that no matter what argument we feed into $[\![\textbf{slept}]\!]^c$, the output will be truth.
    - If the sentence above is true, $[\![\textbf{slept}]\!]^c$ will return truth for all its inputs

1 iff for all x in the set of entities in c, x slept

- $[\![\textbf{DP}]\!]^c$
  - $[\![\textbf{NP}]\!]^c$
    - $[\![\textbf{N}]\!]^c$
      - $[\![\textbf{everybody}]\!]^c$
- $[\![\textbf{VP}]\!]^c$
  - $[\![\textbf{V}]\!]^c$
    - $[\![\textbf{slept}]\!]^c$

adding more pieces

1 iff for all x in the set of entities in c, x slept

- $[\![\textbf{DP}]\!]^c$
  - $[\![\textbf{NP}]\!]^c$
    - $[\![\textbf{N}]\!]^c$
      - $[\![\textbf{everybody}]\!]^c$
- $[\lambda x.x \text{ slept}]$
  - $[\lambda x.x \text{ slept}]$
    - $[\lambda x.x \text{ slept}]$

is everybody a referential expression?

1. I am over 30 years old or I am under 40 years old
2. Everybody is over 30 years old or everybody is under 40 years old

- (1) is trivially true
- (2) is not true in all situations (imagine a situation in which we have someone who is 29 and someone who is 41)
- We know that **I** is a referential expression. If **everybody** were a referential expression, then it would behave "always" like a referential expression. However, the contrast between (1) and (2) explained above shows that with respect to that particular test, **everybody** does not behave like a referential expressions. Hence, **everybody** is not a referential expression.

what are the consequences of what we discovered?

1 iff for all x in the set of entities in c, x slept

$[\![\mathbf{DP}]\!]^c$ $\quad$ $[\lambda x.x \text{ slept}]$

$[\![\mathbf{NP}]\!]^c$ $\quad$ $[\lambda x.x \text{ slept}]$

$[\![\mathbf{N}]\!]^c$ $\quad$ $[\lambda x.x \text{ slept}]$

$[\![\mathbf{everybody}]\!]^c$

- $[\![\mathbf{slept}]\!]^c$ is a function, $[\lambda x.x \text{ slept}]$.
- We further know that there are restrictions regarding what kind of argument, the one occupying x in $[\lambda x.x \text{ slept}]$, this function takes
  - $[\![\mathbf{slept}]\!]^c$ only takes entities (i.e. referential expressions)
- Hence $\cancel{[\![\mathbf{slept}]\!]^c([\![\mathbf{everybody}]\!]^c)}$

now what?

We need to find a denotation for **everybody** that allows us to compose it like

$$[\![\mathbf{everybody}]\!]^c([\![\mathbf{slept}]\!]^c)$$

- This agrees with our intuitions: in **everybody slept**, $[\![\mathbf{slept}]\!]^c$ does not predicate a property of anyone in the context of utterance
  - Slept is a property that everybody in the context of utterance has. $[\![\mathbf{everybody\ slept}]\!]^c$ defines $[\![\mathbf{slept}]\!]^c$ (i.e. how $[\![\mathbf{slept}]\!]^c$ behaves and thus something is predicated of $[\![\mathbf{slept}]\!]^c$)

1 iff for all x in the set of entities in c, x slept

$[\![\mathbf{everybody}]\!]^c$ $\quad$ $[\lambda x.x \text{ slept}]$

$[\![\mathbf{everybody}]\!]^c$ $\quad$ $[\lambda x.x \text{ slept}]$

$[\![\mathbf{everybody}]\!]^c$ $\quad$ $[\lambda x.x \text{ slept}]$

$[\![\mathbf{everybody}]\!]^c$

What is the intension of **everybody**?

- $[\![\mathbf{everybody}]\!]^c([\![\mathbf{slept}]\!]^c)$= 1 iff for all x in the set of entities in c, x slept
- $[\![\mathbf{slept}]\!]^c$ is a predicate ($[\![\mathbf{slept}]\!]^c$=$[\lambda x.x \text{ slept}]$)
- if $[\![\mathbf{everybody}]\!]^c$ composes with $[\![\mathbf{slept}]\!]^c$, its argument should be a predicate
  - $[\![\mathbf{everybody}]\!]^c = \lambda P_{\text{predicate}}. \ldots$
  - $[\![\mathbf{everybody}]\!]^c =$ $\lambda P_{\text{predicate}}.\text{for all } x \text{ in the set of entities in } c,\ P(x) = 1$
  - alternatively: $[\![\mathbf{everybody}]\!]^c =$ $\lambda P_{\text{predicate}}.\text{for all } x \text{ in the set of entities in } c,\ P \text{ is true of } x$

- What is the denotation of
  - **nobody**
  - **somebody**