QUANTIFICATION I

ENGLISH SEMANTICS · LECTURE 5

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The Saarland Lectures on Formal Semantics

RECAP

(1) $[\![$such$_2$ that Mary reviewed the book wh$_1$ he$_2$ wrote t$_1]\!]$

QUANTIFIERS & INDIVIDUALS

- Quantifiers are words like **every**, **some**, and **no**, as well as words like **few**, **many**, or **most**.

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  - proper names
  - definite descriptions
  - traces
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- The only DPs we've analysed are
  - proper names
  - definite descriptions
  - traces
  - pronouns
- The question we ask now is **how do we treat quantifiers?**

- DPs may move around in a sentence:

(2) a. I answered Question #7.
    b. Question #7, I answered.

(3) a. John saw Mary.
    b. Mary is such that John saw her.
    c. John is such that Mary saw him

- Do these have identical meaning?

- Now consider these transformations:

(4) a. Almost everybody answered at least one question.
    b. At least one question, almost everybody answered.

(5) a. Nobody saw more than one policeman.
    b. More than one policeman is such that nobody saw him.
    c. Nobody is such that he or she saw more than one policeman.

- Quantificational DPs change meaning when moved around.
- How do we treat such structures? As individuals? Sets of individuals?

GENERALISED QUANTIFIERS

- Quantificational DP like **something**, **everything**, and **nothing** are not proper names, and not sets of individuals.
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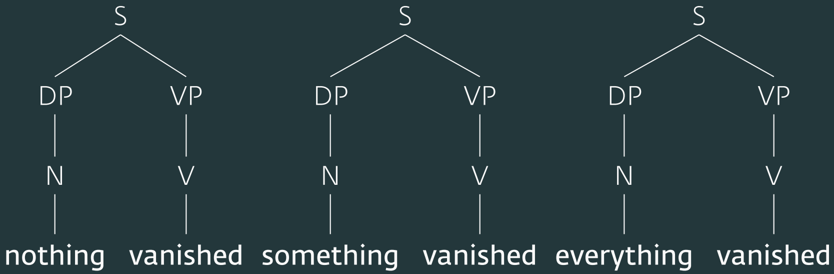
  - $\exists$ there is **some** $x \in D$ such that ...
  - $\forall$ there is **all** $x \in D$ such that ...
  - $\neg\exists$ there is **no** $x \in D$ such that ...

GENERALISED QUANTIFIERS

TOWARDS A TYPE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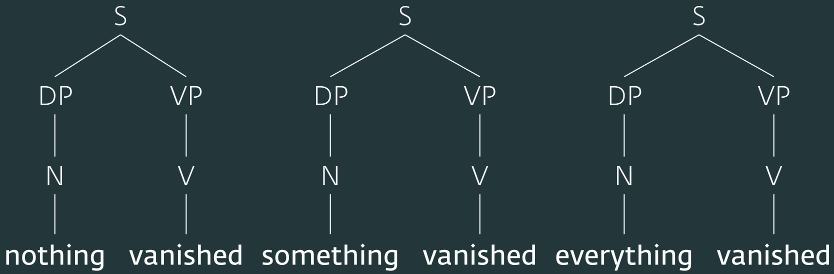

- What type are these QPs? (3mins)

- These could be treated as functions from $D_{\langle \mathbf{e},\mathbf{t} \rangle}$ to $D_{\mathbf{t}}$.
- This treatment is a.k.a. **Generalised Quantifiers**, or "second-order" properties – e.g.:
    - The 2nd order property ⟦**nothing**⟧ applies to the 1st order property ⟦**vanished**⟧ and yield truth just in case ⟦**vanished**⟧ does not apply to any individual.

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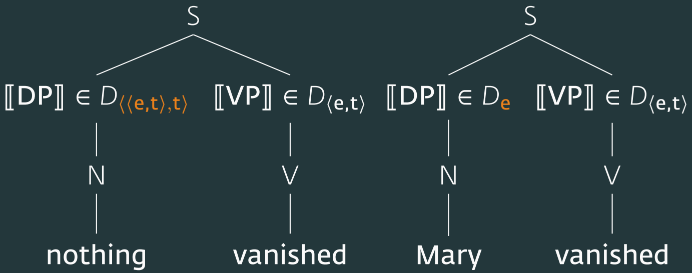
- Now try formalising the lexical entries for **everything**, **something**, and **nothing**. (3mins)

(6) $[\![\text{nothing}]\!] = \lambda f \in D_{\langle e,t \rangle} \,.\, \big[\neg\exists x \in D_{e}[f(x) = 1]\big]$

(7) $[\![\text{something}]\!] = \lambda f \in D_{\langle e,t \rangle} \,.\, \big[\exists x \in D_{e}[f(x) = 1]\big]$

(8) $[\![\text{everything}]\!] = \lambda f \in D_{\langle e,t \rangle} \,.\, \big[\forall x \in D_{e}[f(x) = 1]\big]$

WE NOW HAVE A UNIFORM TYPE-TREATMENT



- Let's calculate the truth-conditions of the following:

(9) Something is empty

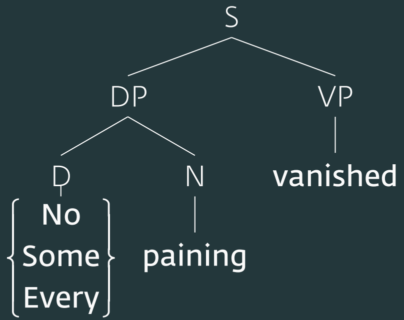
QUANTIFYING DETERMINERS

- We now have a meaning for **everything**, **something**, and **nothing**.
- What about quantifying determiner versions of those? Such as **every student**, **some duck**, or **no photo**?

- Assume the sentence associates with the tree and try to determine the type and, then, meaning of the Quantifying Determiner.

(10) a. {**No** / **Some** / **Every**} painting vanished.

b.



BACK TO SOME SET-THEORETIC RELATIONS IN QUANTIFICATION

- The 3 quantifiers we worked with can be represented set-theoretically. [BLACKBOARD]

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- Can you now also determine set-theoretic meanings for the following Quantifying Determiners?

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(11) **every**

(12) **some**

(13) **no**

(14) **at least two**

(15) **at most three**

(16) **most**

EXERCISES

(17) a city in Texas

(18) Denver is a city in Texas

(19) Denver is not a city in Texas