Formale Semantik
06. Quantifikation und Modelltheorie

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Achtung: Folien in Überarbeitung. Englische Teile sind noch von 2007!
Stets aktuelle Fassungen: `https://github.com/rsling/VL-Semantik`

Inhalt

From PC to F1

Back to semantics: F1

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- sentences refer to truth values

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- fixed only within a specific context (SOA)

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- Q evaluation in PC is algorithmic
- variables interpreted like definite pronominal NPs (within a fixed context)

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- Q $\rightarrow \exists, \forall$

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- $\text{var} \rightarrow x_1, x_2, \ldots, x_n$

Phrase structure

- wff $\rightarrow$ pred$_n$ a$_1$ a$_2$ ...a$_n$

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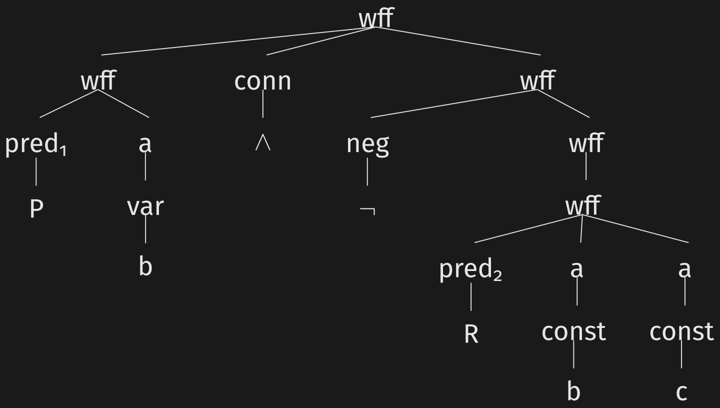
A wff without Q



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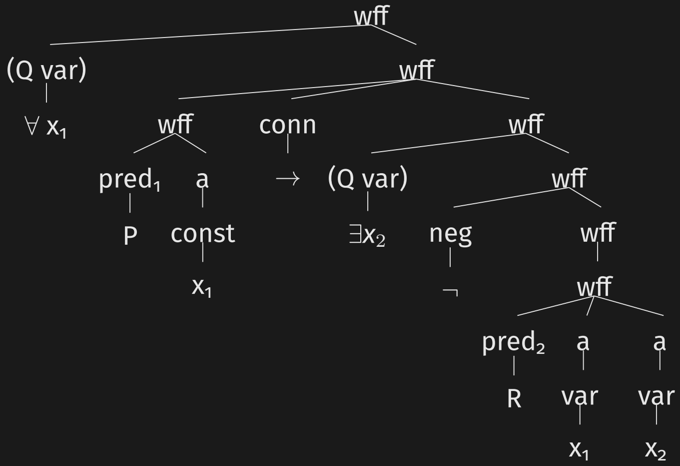
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- The definition in CM allows a node to dominate itself.

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- scope = binding domain

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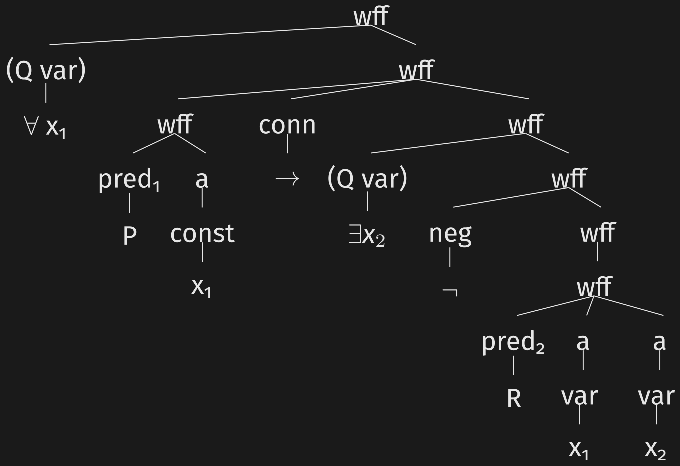
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Model theory

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- *the extension of α relative to $\mathcal{M}_n$ and g_n*

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- Q's require flexible valuation of pronominal matrices
- g_n is like $\mathrm{V_n}$ for constants, only flexible
- it can iterate through $\mathrm{U_n}$
- initial assignment can be anything:

$$g_1 = \begin{bmatrix} x_1 \rightarrow \textit{Herr Webelhuth} \\ x_2 \rightarrow \textit{Frau Eckardt} \\ x_3 \rightarrow \textit{Turm} - \textit{Mensa} \end{bmatrix}$$

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- iff the answer was never 0, then $[\![(\forall x_1)Px_1]\!]^{\mathcal{M}_1,g_1} = 1$

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Problems with natural language

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- For NL: Assume that the checking domain for Q is the set denoted by CN.

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- raising verbs:
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- LF is constructed by syntactic rules!

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Quantification in English: F2

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- QR rule also introduces coindexing of traces

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- assume admissible (reasonable, possible) models $\mathcal{M}$

Semantics for QR output: *every*

$$[\![[\,[every\ \beta]_i\ S]\!]^{\mathcal{M},g} = 1 \textit{ iff for all } u \in U:$$
$$\textit{if } u \in [\![\beta]\!]^{\mathcal{M},g} \textit{ then } [\![S]\!]^{\mathcal{M},g[u/t_i]}$$

A sentence containing the trace t_i with an adjoined NP_i (which consists of *every* plus the common noun β) extend to 1 iff for each individual u in the universe U which is in the set referred to by the common noun β, S denotes 1 with u assigned to the pronominal trace t_i. g is modified iteratively to check that.

Semantics for QR output: *some, a*

$$[\![\,[\,[a\ \beta]_i\ S]\!]^{\mathcal{M},g} = 1 \textit{ iff for some } u \in U : \\ u \in [\![\beta]\!]^{\mathcal{M},g} \textit{ and } [\![S]\!]^{\mathcal{M},g[u/t_i]}$$

(similar)

Literatur I

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