Sample calculations

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1 Calculation #1

We calculate the the truth-conditions of the sentence *Ali ~~is a~~ caring doctor*.

We assume a high-type meaning for *caring*.

1.1 The meanings of the terminal elements

(1) For any world w,

a. $[\![\text{Ali}]\!]^w = \text{Ali}$

b. $[\![\text{caring}]\!]^w = \lambda f :\ f \in D_{\langle e,t\rangle}.\ \lambda x :\ x \in D_e.\ f(x) = 1$ and x is caring in w

c. $[\![\text{doctor}]\!]^w = \lambda x :\ x \in D_e.\ x$ is a doctor in w

1.2 Step by step calculation

We use abbreviated type specifications to make the notation more concise.

(2) For any world w,

$[\![\text{Ali caring doctor}]\!]^w$
$= [\![\text{caring doctor}]\!]^w([\![\text{Ali}]\!]^w)$
$= [\![\text{caring doctor}]\!]^w(\text{Ali})$
$= ([\![\text{caring}]\!]^w([\![\text{doctor}]\!]^w))(\text{Ali})$
$= (\lambda f_{et}.\ \lambda x_e.\ f(x) = 1$ and x is caring in $w)([\![\text{doctor}]\!]^w)(\text{Ali})$
$= (\lambda x_e.\ ([\![\text{doctor}]\!]^w)(x) = 1$ and x is caring in $w)(\text{Ali})$
$= (\lambda x_e.\ (\lambda y_e.\ y$ is a doctor in $w)(x) = 1$ and x is caring in $w)(\text{Ali})$
$= (\lambda x_e.\ x$ is a doctor in w and x is caring in $w)(\text{Ali})$
$= 1$ iff Ali is a doctor in w and Ali is caring in w

2 Calculation #2

We calculate the truth-conditions of *Pat ~~is an~~ Italian violinist*.

We assume Predicate Modification as an additional composition principle.

2.1 The meanings of the terminal elements

(3) For any world w,

a. $[\![\text{Pat}]\!]^w = \text{Pat}$

b. $[\![\text{Italian}]\!]^w = \lambda x :\ x \in D_e.\ x$ is Italian in w

c. $[\![\text{violinist}]\!]^w = \lambda x :\ x \in D_e.\ x$ is a violinist in w

2.2 Step by step calculation

(4) For any world w,

$[\![\text{Pat Italian violinist}]\!]^w$
$= [\![\text{Italian violinist}]\!]^w([\![\text{Pat}]\!]^w)$
$= [\![\text{Italian violinist}]\!]^w(\text{Pat})$
$= (\lambda x_e.\ [\![\text{Italian}]\!]^w(x) = 1 \text{ and } [\![\text{violinist}]\!]^w(x) = 1)(\text{Pat})$
$= (\lambda x_e.\ (\lambda y_e.\ y \text{ is Italian in } w)(x) = 1 \text{ and } [\![\text{violinist}]\!]^w(x) = 1)(\text{Pat})$
$= (\lambda x_e.\ x \text{ is Italian in } w \text{ and } [\![\text{violinist}]\!]^w(x) = 1)(\text{Pat})$
$= (\lambda x_e.\ x \text{ is Italian in } w \text{ and } (\lambda z_e.\ z \text{ is a violinist in } w)(x) = 1)(\text{Pat})$
$= (\lambda x_e.\ x \text{ is a violinist in } w \text{ and } x \text{ is Italian in } w)(\text{Pat})$
$= 1$ iff Pat is a violinist in w and Pat is Italian in w

3 Recommendations

1. Go through both calculations and annotate the steps by what justifies each one of them.
2. Go to the TA session on Friday and try a few calculations with Omri

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We will do a sample or two in Tuesday's class as well.