Semantics

Greg Kobele

July 02, 2018

Review

Urgent!!!

Klausur
** NEXT WEEK!!!! **

- not in this room!!!

Location
HSG HS 8

Semantic Interpretation Rules

$$[\![\, [_{\bullet}\ \alpha\,] \,]\!] = [\![\alpha]\!]$$

$$[\![\, [_{\bullet}\ \alpha\ \ \beta\,] \,]\!] = [\![\alpha]\!] \otimes [\![\beta]\!]$$

$$[\![\, [_{\bullet}\ \alpha_i\ \ \beta\,] \,]\!] = [\![\alpha]\!] \otimes (\lambda x_i.\, [\![\beta]\!])$$

$$[\![t_i]\!] = x_i$$

Scope

DPs in DPs

[one [apple [in every basket]]] is rotten

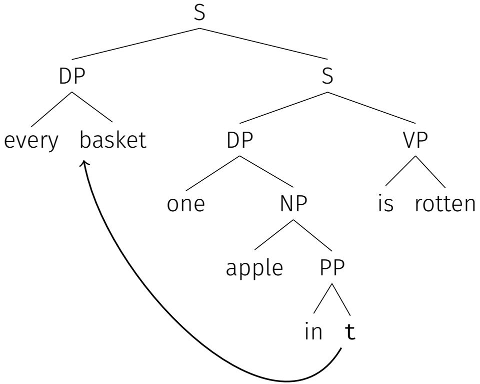
in	eet
basket,apple	et
one,every	(et)(et)t
be	(et)et
rotten	et

compare with:
one apple which was in every basket was rotten

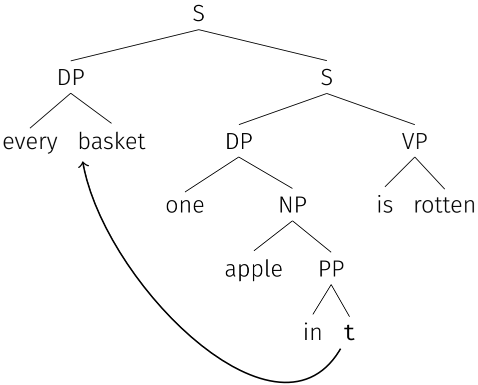
Interpreting this sentence

one apple in every basket is rotten
every(basket)(λx.one(apple $\wedge$ in(x))(rotten))

looks like movement of *every basket* to a higher position



But...



...isn't this an island violation?
∗which basket is one apple in rotten?

Ambiguous?

Usually implausible with a single sentence

1. one apple in every basket is rotten
2. no apple in a basket is rotten

[D [N [P DP]]] VP

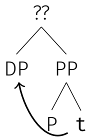
1. for *every basket*, there is *one apple* in *that basket*, such that *that apple* is rotten
   $DP(\lambda x.D(N \wedge P(x))(VP))$
2. for *no apple* which is in *a basket*, is *that apple* rotten
   $D(N \wedge \lambda y.DP(\lambda x.P(x)(y)))(VP)$

How could we build these?

$D(N \wedge \lambda y.DP(\lambda x.P(x)(y)))(VP)$

Focus on $\lambda y.DP(\lambda x.P(x)(y))$

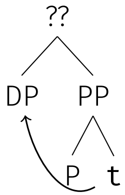
- ignoring the λy for the moment
- $DP(\lambda x.P(x)(y))$ looks like it would come from the following tree:



Putting the λ back

doesn't work!

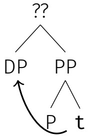
- $P : eet$
- $\lambda x.P(x) : eet$
- $DP : (et)t$



But of course:

- $\lambda x.P(x)(y) : et$

Putting the λ back (II)



$\lambda y.\mathrm{DP}(\lambda x.\mathrm{P}(x)(y))$

$P = \lambda z.\lambda y.P(z)(y)$

a movement construction

- have $[\![DP]\!]$ on one hand,
- and $\lambda x. [\![[_{\mathrm{PP}} \; \mathrm{P} \; \mathtt{t}]]\!] = \lambda x.\lambda y.P(x)(y)$ on the other

how to put them together?

$$\mathrm{DP} \oplus \lambda x.\lambda y.\mathrm{P}(x)(y) = \lambda y.\mathrm{DP}(\lambda x.\mathrm{P}(x)(y))$$

Adding a new mode of composition

$$\begin{aligned} f \oplus g &= f(g) \\ f \oplus g &= \lambda y.f(\lambda x.g(x)(y)) \end{aligned}$$

Types

- $g : abc$
- $f : (ac)d$
- $\lambda y.f(\lambda x.g(x)(y)) : bd$

Putting the λ back (III)

$$\mathrm{DP} \oplus \lambda x.\lambda y.\mathrm{P}(x)(y) = \lambda y.\mathrm{DP}(\lambda x.\mathrm{P}(x)(y))$$

Adding a new mode of composition

$$f \oplus g \quad = f(g)$$
$$f \oplus g \quad = \lambda y.f(\lambda x.g(x)(y))$$

Types

- $g : ebc$
- $f : (ec)d$
- $\lambda y.f(\lambda x.g(x)(y)) : bd$

Putting the λ back (III)

$$\text{DP} \oplus \lambda x.\lambda y.\text{P}(x)(y) = \lambda y.\text{DP}(\lambda x.\text{P}(x)(y))$$

Adding a new mode of composition

$$f \oplus g \quad = f(g)$$
$$f \oplus g \quad = \lambda y.f(\lambda x.g(x)(y))$$

Types

- $g : eec$
- $f : (ec)d$
- $\lambda y.f(\lambda x.g(x)(y)) : ed$

Putting the λ back (III)

$$\mathrm{DP} \oplus \lambda x.\lambda y.\mathrm{P}(x)(y) = \lambda y.\mathrm{DP}(\lambda x.\mathrm{P}(x)(y))$$

Adding a new mode of composition

$$f \oplus g \quad = f(g)$$

$$f \oplus g \quad = \lambda y.f(\lambda x.g(x)(y))$$

Types

- $g : eet$
- $f : (et)d$
- $\lambda y.f(\lambda x.g(x)(y)) : ed$

Putting the λ back (III)

$$\mathrm{DP} \oplus \lambda x.\lambda y.\mathrm{P}(x)(y) = \lambda y.\mathrm{DP}(\lambda x.\mathrm{P}(x)(y))$$

Adding a new mode of composition

$$f \oplus g \quad = f(g)$$
$$f \oplus g \quad = \lambda y.f(\lambda x.g(x)(y))$$

Types

- $g : eet$
- $f : (et)t$
- $\lambda y.f(\lambda x.g(x)(y)) : et$

Bind in the continuation monad

Some notation
write f >>= g for $\lambda y.f(\lambda x.g(x)(y))$

GQ >>= *R*
apply a *GQ* to the first argument of a binary relation

- prepositions
- transitive verbs (!)

Putting everything together

What structure will give us the following term?
$D(N \wedge DP \gg\!= \lambda x.P(x))(VP)$

Avoiding Islands

Can we avoid moving out of the DP?

$DP(\lambda x.D(N \wedge P(x))(VP))$