Montague Grammar: 50 years after

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UCI, March 19th, 2018

1 Intensions

Principles of Frege-Carnap Semantics

- The extensions of sentences and individual terms coincide with their (Fregean) referents.
- Compositionality can often be achieved by constructing ever more complex functional extensions to be applied to more basic extensions.
- Whenever extensions do not behave compositionally, they are substituted by corresponding intensions.

(1) |Mary is asleep| = F(|Mary|,|is asleep|)
(2) ⊢ Mary is asleep ⊨ F(m,|is asleep|)
(3) |N is asleep| = F(|N|,|is asleep|)
(4) |is asleep|(x) = ⊨ x is asleep ⊨
(5) |N is asleep| = APP(|is asleep|,|N|)

(6) |N|(|P|) = |P|(x)

(7) |N is asleep|_{w,t} = APP(|[ is asleep]|_{w,t},|[N]|_{w,t})
(8) |N is asleep|_{(w,t)} = APP(|[ is asleep]|_{(w,t)},|[N]|_{(w,t)})

(9) a. Jones seeks a unicorn.
   b. Jones seeks a horse such that it speaks.

(10) |seek a unicorn|_{w,t} = F(|seek|_{w,t},|[a unicorn]|_{w,t})
(11) |seek a unicorn|_{w,t} = F(|seek|_{w,t},|[a unicorn]|)
(12) |seek a unicorn|_{w,t} = |seek|_{w,t}([|a unicorn|])
Types

Montague (1970b)

a) Starting with the basic types e and t, one may form new types by either pairing them (as before) – from given types a and b to a functional type \(\langle a, b \rangle\) – or adding an s to them: from given types a to intensional type \(\langle s, a \rangle\).

b) A more general system adds s as a third basic type (alongside e and t) and keeps the general rule that types are closed under pairs: from given types a and b to a functional type \(\langle a, b \rangle\).

(13) John reports that Mary thinks that every member of the soccer team is red-headed.

(14) \[ \text{think}^w(\{w' | \text{every}^w(\text{m.o.t.s.t.}^w)(\text{red-headed}^w) = 1\})(m) = 1 \]

(15) a. \[ \{w' | \text{every}^w(\text{m.o.t.s.t.}^w)(\text{red-headed}^w) = 1\} \]

b. \[ \{w' | \text{every}^w(\text{m.o.t.s.t.}^w)(\text{red-headed}^w) = 1\} \]

Strategies for overcoming Bäuerle’s problem

i. Nouns and other constituents may be allowed to take intensional scope at LF. Groenendijk & Stokhof (1982)

ii. Compositional contributions to intensional environments may be obtained by locating them higher up in the hierarchy of intensions. Zimmermann (t.a.)

(16) a.

\[ \text{John} \]
\[ \text{report} \]
\[ \text{m.o.t.s.t.} \]
\[ \lambda P \]
\[ \text{Mary} \]
\[ \text{think} \]
\[ \text{every} \]
\[ P \]
\[ \text{be red-headed} \]

b.

\[ (13)^0_1 \]
\[ \equiv A^0(R)(A^1(\wedge T)(A^2(\wedge^2\text{ALL})(\wedge^3\vee^2\text{M})(\wedge^2\text{R}))(\wedge^m))(j) \]
\[ \equiv \text{report}_i'(\text{John}', \lambda j. \text{think}_j'(\text{Mary}', \lambda k. \text{m.o.t.s.t.}_j' \subseteq \text{red-headed}_k')) \]
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2 Types

(17) a. John slept.
    b. John didn’t sleep

(18) a. POS-PAST
     John     sleep

b. NEG-PAST
     John     sleep

(19) a. $PST^+(\mathbb{[N]}(\mathbb{[V]})(w,t)) = 1$
     $\equiv \mathbb{[N]}^w\mathbb{[V]}^t(w,t) = 1$, for some $t'$ before $t$.

b. $PST^-(\mathbb{[N]}(\mathbb{[V]})(w,t)) = 1$
     $\equiv \mathbb{[N]}^w\mathbb{[V]}^t(w,t) = 0$, for all $t'$ before $t$.

(20) a.
     POS-PAST         sleep
     John

b.
     NEG-PAST         sleep
     John

(21) a. $[\text{POS-PAST}]^w\mathbb{[N]}\mathbb{[V]} = PST^+(\mathbb{[N]}(\mathbb{[V]})(w,t))$

b. $[\text{NEG-PAST}]^w\mathbb{[N]}\mathbb{[V]} = PST^-(\mathbb{[N]}(\mathbb{[V]})(w,t))$

(22) a.
     POS-PAST         sleep
     John

b.
     NEG-PAST         sleep
     John

(23) a. $[\text{POS-PAST}]^w\mathbb{[S]} = 1$ iff $\mathbb{[S]}^w\mathbb{[S]}^t = 1$, for some $t'$ before $t$.

b. $[\text{NEG-PAST}]^w\mathbb{[S]} = 1$ iff $\mathbb{[S]}^w\mathbb{[S]}^t = 0$, for any $t'$ before $t$.

3 Models

(24) a. The president of the largest country is asleep.
    b. The author of the longest novel is awake.
Model-theoretic Semantics

Montague (1970b); cf. Zimmermann (2011)

- More and more ‘degenerate’ models are eliminated.
- The Logical Spaces of the remaining ‘realistic’ models offer a wide variation of extensions (albeit within certain limits).

\[ \text{seek a unicorn}^{w,t} = \text{seek}^{w,t}(\text{a unicorn }) \]

1. Mary is asleep \( \vdash = F(m, |\text{is asleep}|) \)
2. \(|N\text{ is asleep}| = F(|N|, |\text{is asleep}|) \)
3. \(|\text{is asleep}|(x) = \vdash x \text{ is asleep} \vdash \)
4. Nobody is asleep.
5. \(|\text{Nobody is asleep}| = F(|\text{nobody}|, |\text{be asleep}|) \)
6. \(|\text{nobody}|(|\text{is asleep}|) = 1 \text{ iff } |\text{is asleep}| = 0, \text{ for any person } x.\)

References


