Semantic Theory 2014 – Exercise Sheet 9

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Exercises are due on Tuesday, July 1, 10:15 a.m.

9.1 Collective and distributive interpretation

Sentence (1) has three possible readings.

(1) *Bill and Mary watched a movie*

(a) Give informal paraphrases of the readings.

(b) Represent the readings of the sentences as standard predicate-logic formulas (no event arguments!), distributive readings with predicate-logic conjunction and collective readings using the summation operator.

(c) Derive the readings compositionally, possibly using Cooper Storage technique. Assume the following representations for the NPs (you need not explicitly derive the NP denotations):

a movie $\Rightarrow \lambda G[\exists x(\text{movie'}(x) \wedge G(x)]$

Bill and Mary $\Rightarrow \lambda F[F(b^*)) \wedge F(m^*)]$ (distributive r.)

Bill and Mary $\Rightarrow \lambda F[F(b^* \oplus m^*)]$ (collective r.)

Hints: Use storage only for the direct object (storing the subject will not given new representations). Treat the sum term $b^* \oplus m^*$ (which is of type e) just as an ordinary atomic type e constant. For the transitive verb *watch*, the type-raised representation should be used, of course.

(d) For Sentence (2), you can also derive three readings, but only two of them make sense. Explain!

(2) *Bill and Mary made a movie*

9.2 Collective predicates and event semantics

Assume now an event-semantic translation for *watch* (three-place relation with an event variable as first argument). Give event semantic representations for the three readings of Sentence (1). No compositional derivation required!

9.3 Meaning postulates for plural and mass terms

Last lecture's slides specify semantic requirements that different kinds of predicates must satisfy, in particular:

Singular and plural (individual) terms:

(a) Singular nouns (student^{sg}) denote atoms, plurals non-atoms (student^{pl}), singular + plural form cover the denotation of the general concept (student').

(b) Distributive predicates (work') have the properties of *distributivity* and *closure under summation*.

(c) Mass terms (water') are *divisive*.

Most of these constraints are given in terms of precise semantic constraints on the model structure. Meaning postulates are formulas that express the constraints in the logical language itself. Write meaning postulates that express all the constraints listed above, using the plural and mass term extensions of our logical language.

Example (MP for collective predicates): $\forall x$ (meet'(x) $\rightarrow \neg$ At(x))

9.4 Cardinalities and plurals

Sentences (3) and (4) can be represented as (3') and (4').

(3) *Two students worked*

(3') $\exists^2 x$ (student'(x) $\wedge$ work'(x))

(4) *Two students met.*

(3') $\exists X$(student'(X) $\wedge$ card(X) = 2)

The representations use $\exists^2 x$ and card(X) = 2 as abbreviations, which are not part of our logical representation language, but can be define in the language. Give either the respective definitions, or reformulate (3') and (4') in their properly expanded versions (or both).

(We have done this in class already, please, do it again.)

9.4 Cardinalities and plurals

(a) Translate the two following sentences into our logic of mass terms. For simplicity, use “the_ring’” and “the_rings’ ” as a type e translation of *the ring* and *the rings*, respectively.

(5) The rings consist of gold and silver

(6) The ring is new, but the gold in the ring is not new.

(b) Compute truth conditions for both representations.