

Exercices

Consider the following abstract syntax together with its associated Montague-like semantics:

ALICE : np
 SOMEONE : np
 LEFT : $np \rightarrow s$
 THINK : $cc \rightarrow np \rightarrow s$
 THAT : $(np \rightarrow s) \rightarrow (np \rightarrow cc)$

$\llbracket \text{ALICE} \rrbracket = \lambda P. P \text{alice}$
 $\llbracket \text{SOMEONE} \rrbracket = \lambda P. \exists x. P x$
 $\llbracket \text{LEFT} \rrbracket = \lambda S. S (\lambda x. \text{left } x)$
 $\llbracket \text{THINK} \rrbracket = \lambda C. \lambda S. S (\lambda x. C (\text{think } x))$
 $\llbracket \text{THAT} \rrbracket = \lambda P. \lambda s. \lambda f. P (\lambda p. s (\lambda x. f (p x)))$

where:

alice : ι
left : $\iota \rightarrow o$
think : $\iota \rightarrow (o \rightarrow o)$

1. Compute the semantic representation of the sentence *Alice thinks that someone left*, whose abstract syntax is given by the following term:

THINK (THAT LEFT SOMEONE) ALICE

2. The syntactic category assigned to the complement clause *that someone left* is cc . What is the corresponding semantic category?

3. The semantic recipe assigned to THINK induces the *de re* reading. Give an alternative recipe that leads to the *de dicto* reading.

4. Consider the three following sentences:

Alice thinks that every man is mortal (1)

Alice thinks that Socrates is a man (2)

Alice thinks that Socrates is mortal (3)

Give a postulate on the modality **think** that would allow (3) to be inferred from (1) and (2).

5. Does the postulate you have given allow you to infer *Someone thinks that Socrates is mortal* from *Someone thinks that every man is mortal* and *Someone thinks that Socrates is a man* ? Discuss.

Solutions

1. $\llbracket \text{THINK}(\text{THAT LEFT SOMEONE}) \text{ ALICE} \rrbracket \rightarrow_{\beta} \exists x. \mathbf{think\ alice}(\mathbf{left\ } x)$
2. $(o \rightarrow o) \rightarrow o$
3. $\llbracket \text{THINK}_{\text{dicto}} \rrbracket = \lambda C. \lambda S. S(\lambda x. \mathbf{think\ } x(C(\lambda y. y)))$
4. $\forall ab. \forall x. (\mathbf{think\ } x(a \rightarrow b)) \rightarrow (\mathbf{think\ } x a) \rightarrow (\mathbf{think\ } x b)$
5. No. What we would need to infer that *Someone thinks that Socrates is mortal* is that *Someone thinks that every man is mortal and that Socrates is a man*. But we cannot infer this from the facts that *Someone thinks that every man is mortal* and that *Someone thinks that Socrates is a man*. Indeed, there might be two different persons.