**Semantic Theory 2014 – Exercise Sheet 10**

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**\*\*\* On the Exercises web page, you will find a link to "Exam Materials": two pages with formal definitions, which can be used in the final exam. \*\*\***

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

### 10.1   Basic DRT

Consider the following text:

(T1)   *Mary knows a professor. He recommends a book. She reads it.*

   (a)   Derive a DRS K1 for the text T1 using the DRS construction algorithm from the lecture. You need not spell out every single step of the derivation, but do show some of them.

   (b)   Compute the conditions for a verifying embedding of K1, simplify, and give the truth conditions.

   (c)   Although text T1 introduces several discourse referents that are available for anaphoric reference, the pronouns cannot refer to all antecedents due to their gender. Specify this restriction informally. Then show how it can be incorporated into the DRS representations and construction rules.

### 10.2   Complex Conditions

Consider the following text T2:

   *Mary knows a professor. If he writes a book, she doesn't read it.*

   (a)   Derive a DRS K2 from text T2 using the DRS construction algorithm. You need not spell out every single step of the derivation, but do show some of them.

   (b)   Interpret K2, simplify as much as possible, and give the truth conditions.

**10.3    Equivalence of DRSes, Free Discourse Referents**

Consider the DRSs K3 and K4 for (one-sentence) texts T3 and T4, respectively.

> T3 : *There is a book which Peter does not own.*
>
> K3 : ({x, y}, {x=Peter, book(y), ¬(∅, {own(x, y) })})
>
> T4: *Peter does not own every book.*
>
> K4 : ({x}, {x=Peter, ¬(∅, {(({y}, {book(y)}) ⇒ (∅, {own(x, y)})})})})

(a)    Determine the truth conditions for the two DRSs and compare them. Note: To determine the relation between the truth conditions, you need a bit of general mathematical reasoning.

(b)    Let T3$^+$ and T4$^+$ be continuations of T3 and T4 with the sentence *He buys it*. Give an appropriate DRS K3$^+$ as a meaning representation of T3$^+$.

(c)    Look at K4$^+$ as a candidate DRS for T4$^+$. What is strange about it? Is there any other more appropriate DRS representation? What is the problem with T4$^+$?

> K4+: ({x}, {x=Peter, ¬(∅, {(({y}, {book(y)}) ⇒ (∅, {own(x, y)})}),
>
> u=x,  v=y, buy(u,v) })

**10.3    Mathematical Texts**

Consider the following text T3, which is a theorem of basic geometry:

(T5)    *Given a line g1 and a line g2, let p be a common point of g1 and g2. Then there is a line k which is orthogonal neither to g1 nor g2, and which doesn't go through p.*

Give a DRS K3, which represents the semantic structure of T3. You can write down K3 directly; it need not be generated by applying a construction algorithm. Analyse *line* as one-place, *orthogonal to* and *go through* as two-place, and *common point of* as three-place predicates. *given* and *let* are cues for the discourse structure and should not occur in the DRS as predicates.

Take *a line g1* as a domain- or genre-specific variant of an indefinite NP, which explicitly specifies the name of the new discourse referent to be introduced, and uses of *g1, g2* as in *common point of g1 and g2* as pronoun-like expressions that specify the anaphoric reference to a previously introduced discourse referent directly.