Problem Set 4 – Compositional Semantics

Reading:
Chierchia & McConnell-Ginet, Chapters 1-3.
Partee, ter Meulen & Wall, Chapters 13 + 14 (15?) (Part D)

[due December 18, 2018]

Exercise 1:
In (Partee et al., p. 352), the authors claim that 'and' doesn't behave the same way when coordinating quantified noun phrases vs. names, as in the examples below:

(13-41)	(a) John walks and talks. (b) John walks and John talks.	is equivalent to
(13-42)	(a) Some man walks and talks. (b) Some man walks and some man talks.	is not equivalent to

Using the lexical entry for 'and' (when coordinating one-place predicates), derive the truth conditions for the (a) sentences. Show the derivation tree with denotations on each node!

$[\![\textbf{and}]\!]^w =$ $[\lambda P_{<e,t>}. [\lambda Q_{<e,t>}. [\lambda u_e. P(u) \wedge Q(u)]]]$

Now, define a lexical entry for 'and' that works with entire clauses (as in the (b) sentences) (This 'and' is of type <t,<t,t>>):

$[\![\textbf{and}]\!]^w =$ ...

Using this new lexical entry, derive the truth conditions for the (b) sentences and show that the authors' claim holds. Explain.

Exercise 2: Neo-Davidsonian semantics.
We have assumed that, in the formal translation of a sentence, a predicate combines with its Agent, Patient, Goal, etc., arguments directly, as shown in (9)-(11):

(9) **Bill kissed Ann.**

(10) $[\![\textbf{Bill kissed Ann}]\!]^w = 1$ iff KISS(b,a)

(11) $[\![\textbf{kiss(ed)}]\!]^w = [\lambda x_e.[\lambda y_e.\text{KISS}(y,x)]]$

An alternative view posits that the formal predicate (verb denotation) combines only with its event argument, while the theta roles are introduced as separate formal predicates relating the event to the relevant argument. This approach, called neo-Davidsonian, is exemplified in (12), where *e* is an event variable, which has a new type v. To achieve the truth conditions in (12), we will pursue the compositional approach in (13)-(14). [We will ignore the existential quantifier ∃ in this exercise.]

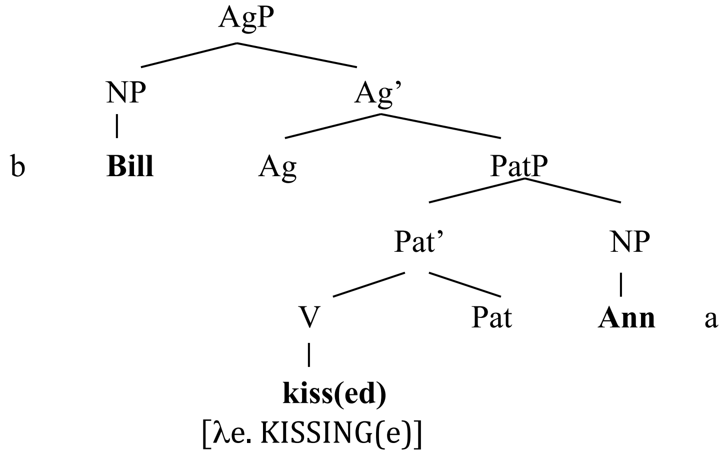
(12) $[\![$**Bill kissed Ann**$]\!]^w = 1$ iff $\exists e_v$ [KISSING(e) ∧ AG(e)=b ∧ PAT(e)=a]

≈ "There is an event *e*, which is a kissing-event, and the agent of *e* is b, and the patient of *e* is a."

(13) $[\![$**kiss(ed)**$]\!]^w$ = [λe_v. KISSING(e)]

(14) **Bill kissed Ann.**

[λe. KISSING(e) ∧ AG(e)=b ∧ PAT(e)=a]



You can see the final denotation for the sentence (AgP) as well as the denotations for the individual words annotated in the tree.

Your tasks are:

(i) spell out the denotations of the functional head Ag and Pat as λ-expressions of type <<v,t>,<e,<v,t>>>, and

(ii) do the semantic computation of (14) step by step, in full detail.

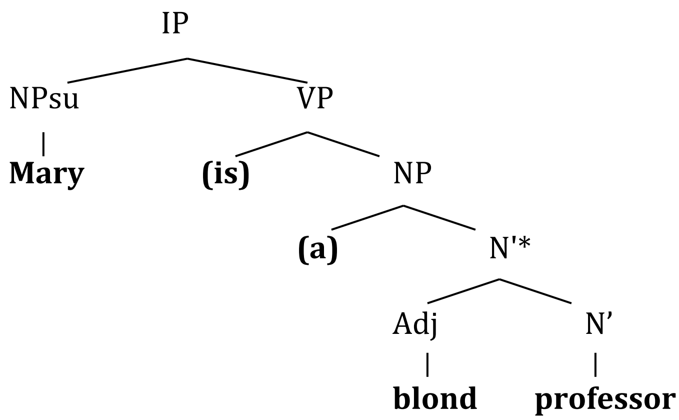
$[\![\text{Ag}_{<<v,t>,<e,<v,t>>>}]\!]^w$ =

$[\![\text{Pat}_{<<v,t>,<e,<v,t>>>}]\!]^w$ =

Exercise 3: Predicate modification.

Do QUESTION 8 from page 16 of the handout (repeated here).

(15)



QUESTION 8: Consider intersective adjectives. Assume that predicates such as adjectives and common nouns denote functions and define the new rule "predicate modification" we need in order to combine them. [HINT: Fill in the blank in "Mary is a blond professor" = "Mary is blond ___ Mary is a professor"]

(16) For any arbitrary N', Adj and w,

$$\left[\!\left[\; [_{N'^*} \ \text{ADJ} \ \ N'] \; \right]\!\right]^{w} = \qquad \ldots$$

Or, more generally:

(17) Predicate Modification:
If α has the form $[_{\alpha} \ \beta_{<e,t>} \ \ \gamma_{<e,t>}]$, then $[\![\alpha]\!]^{w}$ =

Now, do the computation for (15) above for an arbitrary world *w*.