

Midterm Exam

You have until November 2nd to complete the questions below. Some of these questions can be answered very quickly, while others will require more thought (and writing). Please bear this in mind when planning how to make the most effective use of your time.

You may talk with me in person or over e-mail about any questions you might have on any of these problems (within reason).

1) Why Are We Doing This?

In a few sentences, please explain why we should be interested in a system that derives T-conditions for every (declarative) sentence of a natural language?

2) Our Theory of Semantic Types

Please explain in your own words what the following are:

- a. $\langle ee, \langle tt, eet \rangle \rangle$
- b. $D_{\langle e \langle te \langle et \rangle \rangle \rangle}$

3) A Few Exercises on Our Lambda Notation

a. Please explain in your own words what the following functions are:

- (i) $[\lambda f_{\langle e \langle et \rangle \rangle} : [\lambda x_e : f(x)(\text{Dave})]]$
- (ii) $[\lambda f_{\langle et \rangle} : [\lambda g_{\langle et \rangle} : [\lambda x_e : f(x) = T \text{ or } g(x) = T]]]$

b. Please calculate the values of the following expressions (show your work):

- (i) $[\lambda x : x \text{ is a linguist }](\text{George Bush})$
- (ii) $[\lambda f_{\langle eet \rangle} : [\lambda x : f(\text{Joe})(x) = T]]([\lambda y : [\lambda z : y \text{ dated } z]])$
- (iii) $[\lambda f_{\langle et \rangle} : [\lambda g_{\langle et \rangle} : \text{there is an } x \text{ such that } f(x) = T \text{ and } g(x) = T]]([\lambda x : x \text{ smokes }]]$

4) Computing T-Conditions

Please compute the T-conditions of the following sentence.

a. The young doctor loves the male nurse.

Your answer should include an explicit syntax for the sentence, as well as an explicit statement of the semantics you assume for each lexical item.

(For the purposes of this assignment, you may assume that there is exactly one young doctor, and exactly one male nurse.)

5) **An Exercise on the Definite Article *The***

Review the discussion of definite DPs on pages 80-81 of Heim & Kratzer 1998, as well as on page 18 of our handout “Expanding our Formalism, Part 2”.

Let us attempt to formalize more concretely the theory sketched in those readings of how the meaning of a definite DP depends partly upon the context.

a. Background Ingredients

(i) *A New Contextual Parameter*

In addition to our variable assignment g , let us introduce a new superscript C onto our semantic valuation function:

$$[[XP]]^{g,C} = \text{The extension of } XP, \text{ relative to the variable assignment } g \text{ and the 'contextual restriction' } C$$

(ii) *The Nature of This New Parameter*

The ‘contextual restriction’ C is some subset of D_e .

We can take C to be ‘the individuals under consideration’, or the ‘contextually salient individuals’.

b. Question 1

Please review our current semantics for “the”, under (55) on the handout “Expanding our Formalism, Part 2”. Please augment this semantics so that the extension of “the” depends upon the contextual parameter C in the proper way.

c. Question 2

Given your answer to Question 1, please calculate the T-conditions of sentence (i) within the context in (ii) and then within the context in (iii).

(i) *Sentence:* The dog is hungry.

(ii) *Context:* We are in a room with the following entities:
{Seth, Rajesh, Scooby-Doo}

(iii) *Context:* We are in a room with the following entities:
{Seth, Rajesh, Scooby-Doo, Scrappy-Doo}

6) **Binding and Gender**

a. Question 1:

Please show how our system predicts that (i) can have the T-conditions in (ii).

(i) *Sentence:* “He loves her”

(ii) *T-Conditions:* Sentence (i) is T iff John loves Mary.

b. Question 2:

Please explain why our system predicts that (i) can't have the T-conditions in (iii).

(iii) *T-Conditions:* Sentence (i) is T iff Mary loves John.

c. Question 3:

In light of your answer to Question 2, please show how our system can generate for sentence (iv) the T-conditions in (v).

(iv) *Sentence:* John is a man who loves himself.

(v) *Sentence:* John is a man and John loves John.

- Note: For the purposes of this problem, assume that ‘himself’ is simply semantically equivalent to ‘him’

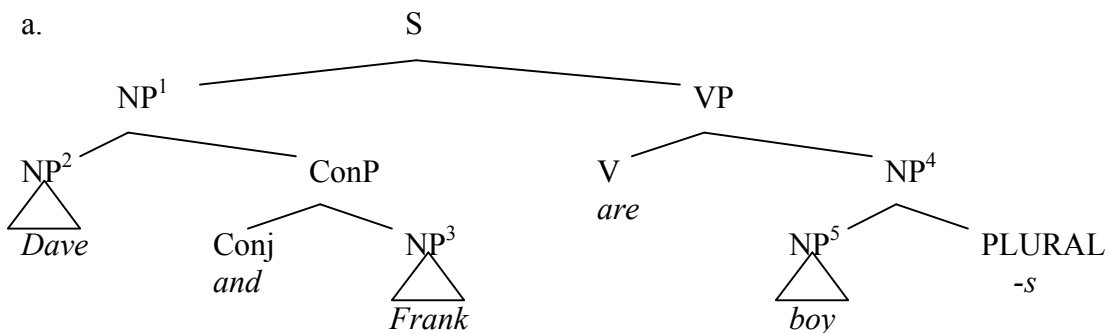
d. Question 4:

In light of your answer to Questions 2 and 3, is our system able to assign T-conditions to the following sentence? Why or why not?

(vi) *Sentence:* John is a man who loves herself.

7) **An Initial Foray into Plurals**

Please review our semantics for sentences like “Dave is a boy” and “The boy smokes”. Now, consider the sentence “Dave and Frank are boys”, which we will assume has the following syntax (*the numeric superscripts simply serve to distinguish different nodes of the category ‘NP’*)



- b. Question 1:
Assume that the copula *are* in sentence (7a) is no different in meaning from the copula *is* in a sentence like “Dave is a boy”. Given our analysis of the sentence “Dave is a boy”, what must the semantic **type** of V, VP and NP⁴ in (7a) be?
- c. Question 2:
Assume that the N *boy* in (7a) is no different in meaning from the N *boy* in a sentence like “Dave is a boy”. Given our analysis of “Dave is a boy”, what must the semantic **type** of NP⁵ and PLURAL in (7a) be?
- d. Question 3:
Given your answer to the preceding two questions, what must be the semantic **type** of the conjoined subject *Dave and Frank* in (7a)?
- e. Question 4:
Given your answer to Question 3, please develop a semantics for the conjunction “and” as it appears in sentence (7a).

HUGE HINT:

It’s not too crazy to suppose that, in addition to the entities Dave and Frank, there is also the **entity** which is the **group** (not ‘set’, but **group**) formed from Dave and Frank. We can even maybe introduce a new notation into our metalanguage for talking about such ‘plural entities’ or ‘groups’.

- (i) *Notation:*
If ‘x’ and ‘y’ are entities, then ‘x+y’ is also an entity, the group formed from x and y.
- (ii) *Illustration:*
‘Frank+Dave’ = *the group formed from Frank and Dave*
- f. Question 5:
Given your answer to Question 4, please provide an extension for PLURAL in (7a). Aim to capture something like the following T-conditions:
- (iii) *T-Conditions:* Sentence (7a) is T *iff* Frank+Dave are a group formed from the members of { x : x is a boy }
- g. Question 6:
Consider the following sentence:
- (iv) The boys smoke.

Given your semantics for PLURAL, and our semantics for the definite article *the*, is our system able to interpret this sentence? If so, what T-conditions does it assign? If not, why not?