Presupposition P-Set

24.954: Pragmatics in Linguistic Theory

Patrick D. Elliott

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1. Propositional logic

1.1. Exercise i

Prove the following:

$$\vdash A \lor B \Leftrightarrow \neg(\neg A \land \neg B)$$

2. A compositionalisation of multi-dimensional semantics

Let's get a little more precise about the compositional assumptions underlying a multi-dimensional semantics.

We can write *pair types*, i.e., the type of a pair of as and bs, where a is type a and b is type b, as $\mathsf{a} * \mathsf{b}$. The type of a pair of propositions is therefore: $\mathsf{st} * \mathsf{st}$.

Presuppositional expressions are of type $\mathsf{a} * \mathsf{st}$ (where a is a variable over types).

In the lecture we defined "quit smoking" as a function from an individual to a presuppositional proposition, i.e.,

(1) a. $[\![\text{quit smoking}]\!] = \lambda x \,.\, \dfrac{x \text{ used to smoke}}{x \text{ doesn't smoke now}}$

b. $[\![\text{quit smoking}]\!] :: \langle \mathsf{e}, \mathsf{st} * \mathsf{st} \rangle$

2.1. Exercise i

Define a type-shifter that takes any *uni*-dimensional meaning, and returns a *trivially* presuppositional meaning (i.e., a multi-dimensional meaning which will not give rise to a contentful pragmatic presupposition). Give both (a) the entry for the type-shifter, and (b) its type.

2.2. Exercise ii

We can assign a definite description the following multi-dimensional meaning:

(2) $[\![\text{the dog}]\!] = \dfrac{\lambda w \,.\, \exists! x[\mathsf{dog}_w\ x]}{\lambda P \,.\, \lambda w \,.\, \exists x[\mathsf{dog}_w\ x \land P\ x\ w]}$

What is the type of (2)?

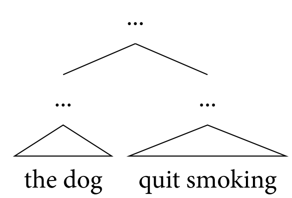
2.3. Exercise iii

Recall the rule for composing multi-dimensional meanings:

(3) $\left[\!\!\left[\begin{array}{c} \ldots \\ \text{X} \quad \text{Y} \end{array} \right]\!\!\right] = \dfrac{\mathbb{P}\ [\![\text{X}]\!] \land \mathbb{P}\ [\![\text{Y}]\!]}{\mathsf{FA}\ (\mathbb{A}\ [\![\text{X}]\!])\ (\mathbb{A}\ [\![\text{Y}]\!])}$

Point out what goes wrong when attempting to compute the meaning of the following:

(4)



Suggest a fix.

2.4. Exercise iv

Instead of formalising multi-dimensional semantics using *pairs*, we could also have gone a different route. We'll explore that route in this exercise.

Just for this exercise, let's assume that $[\![.]\!]$ always returns an ordinary, *uni*-dimensional at-issue meaning.

Let's supply an additional interpretation function $(\!|.|\!)$ that returns the *presupposition* of an expression.[1]

(5) $[\![\text{Paul quit smoking}]\!] = \text{Paul doesn't smoke now}$

(6) $(\!|\text{Paul quit smoking}|\!) = \text{Paul used to smoke}$

Fill in the definitions of the following composition rules:

(7) $\left[\!\!\left[\begin{array}{c} \ldots \\ \wedge \\ X \quad Y \end{array} \right]\!\!\right] = ???$ (8) $\left(\!\!\left| \begin{array}{c} \ldots \\ \wedge \\ X \quad Y \end{array} \right|\!\!\right) = ???$

2.5. Exercise v

Recall that a multi-dimensional theory of presupposition faces the *binding problem*.

Suppose that we assign the presuppositional predicate "quit smoking" the following entry:

(9) $[\![\text{quit smoking}]\!] = \lambda x\,.\,\dfrac{x \text{ used to smoke}}{x \text{ used to smoke} \wedge x \text{ doesn't smoke now}}$

Does the binding problem still arise? Assume that *someone* has the following meaning, in order to bootstrap compositionality:

(10) $[\![\text{someone}]\!] := \lambda P.\,\dfrac{\exists x[\mathbb{P}\ (P\ x)]}{\exists x[\mathbb{A}\ (P\ x)]}$

[1] If you're familiar with Roothian focus semantics, this should be familiar.

A. Solutions

A.1. Compositionalisation

A.1.1. Exercise iii

The most obvious fix is to redefine "the dog" as a function from an individual to a presuppositional proposition, to a presuppositional proposition.

(11) $[\![\text{the dog}]\!] := \lambda P\,.\,\dfrac{\text{there is a unique dog} \wedge \exists x[\text{dog } x \wedge \mathbb{P}\ (P\ x)]}{\exists x[\text{dog } x \wedge \mathbb{A}\ (P\ x)]}$

(12) type: $\langle\langle \text{e}, \text{st} * \text{st}\rangle, \text{st} * \text{st}\rangle$