Final exam

Team Semantics: Linguistic and Philosophical Applications

July 2024

Exercise 1 [BSML] (25p)

(a) As discussed in class plainly adding the free choice principle ($\Diamond(\alpha \vee \beta) \rightarrow \Diamond\alpha$) to classical modal logic would allow us to derive any $\Diamond b$ from $\Diamond a$ as shown in (1):

(1)

1.	$\Diamond a$	[assumption]
2.	$\Diamond(a \vee b)$	[from 1, by classical reasoning]
3.	$\Diamond b$	[from 2, by free choice principle]

Explain how BSML's account of free choice inferences avoids this collapse result.

(b) One of the crucial feature of BSML is that it predicts that free choice effects disappear under negation:

(2) Dual Prohibition: $[\neg\Diamond(a \vee b)]^+ \models \neg\Diamond a \wedge \neg\Diamond b$

Give a proof of this fact.

(c) In BSML we can define different notions of contradiction:

$\bot_1$: NE $\wedge$ ¬NE

$\bot_2$: $p \wedge \neg p$

Prove that $\bot_1 \not\equiv \bot_2$

Exercise 2 [BSML & BSEL] (25p) Dr. Yan discussed 3 ways to analyse epistemic MIGHT (see dr. Yan's slides for definitions):

1. $\Diamond_e$ (with R state-based from BSML)
2. $\Diamond_b$ (the black diamond from BSEL)
3. $\Diamond_s$ (like in BSML but using Goldstein's generalised R_s)

(a) Let α be a flat formula. Check whether $\Diamond_e\alpha$, $\Diamond_b\alpha$, and $\Diamond_s\alpha$ are downward closed, union closed and have the empty team property.

(b) Determine for each of the three $\Diamond$s whether the following claims are correct:

   (a) $\Diamond p \wedge \neg p \models \bot_1$
   (b) $\Diamond p \wedge \neg p \models \bot_2$
   (c) $(\Diamond p \wedge \neg p) \vee (\Diamond q \wedge \neg q) \models \bot_1$
   (d) $(\Diamond p \wedge \neg p) \vee (\Diamond q \wedge \neg q) \models \bot_2$

Exercise 3 [Inquisitive Semantics] (25p) Exercises 4.1 (only items 1-3), 4.2, 4.3 and 8.1 from the book:

`https://academic.oup.com/book/35968`

Assume: $!\phi := \neg\neg\phi$

Exercise 4 [Dependence Logic and Indefinites] (25p) Consider the following ambiguous sentence:

(3) Ali must hire a philosopher.

(i) Provide translations of the readings of (3) first in (a) classical quantified modal logic and then (b) using Degano and Aloni's dependence atoms (for the latter you should translate the modal in terms of quantification over worlds).

(ii) Consider now the following variant of (3) involving a marked indefinite determiner IND_x triggering the activation of the variation atom $var(v, x)$. Which one of the readings of (3) do Degano and Aloni predict for (4)?

   (4) Ali must hire IND_x philosopher.

   Motivate your answer.

Exercise 5 [qBSML] (bonus) Experimental work discussed by Gotzner, Romoli & Santorio (2020), showed that the following two sentences should receive the following interpretations:

(5) ALL-OTHERS-DUAL-PROHIBITION
Exactly one girl can take Spanish or Calculus $\Leftrightarrow$ One girl can choose between the two and each of the others can take neither of them

(6) ALL-OTHERS-FREE-CHOICE
Exactly one girl cannot take Spanish or Calculus $\Leftrightarrow$ One girl can take neither of the two and each of the others can choose between them

Provide translations of these sentences in the language of qBSML, and check whether qBSML predicts the correct interpretations. In your translations you can use implication ($\rightarrow$) with the following support clause:

$$M, s \models \phi \rightarrow \psi \iff \text{for all } t : M, t \models \phi \Rightarrow M, s \cap t \models \psi$$