Assignment 5

Philosophical Logic 2024/2025

Instructions

- Discussion among students is allowed, but the assignments should be done and written individually.
- Late submissions will be accepted until two days after the original deadline, with a 0.5 penalty per day.
- Please be explicit and precise, and structure your answers in a way that makes them easy to follow.
- Please submit your answers as PDF and use *PL-2024-A5-⟨your-last-name⟩* as the name of your file.
- For any questions or comments, please contact {m.degano, s.b.knudstorp, f.scha}@uva.nl
- **Deadline: Friday 6 December 2024, 9 pm**

Exercise 1 [30 points]

Problem 6.d in the lecture notes:

Consider the objections to a (or Lewis') similarity analysis of counterfactuals. For example, Tichý's (slide 38, section 6.3.1 in Levin's notes). Or the one of Fine (1975, p. 452) that the analysis makes true the intuitively false counterfactual (2) 'If Oswald hadn't shot Kennedy, then someone else would have': "on the grounds that the consequences of supposing that someone else shot Kennedy would make less difference to the world than those of supposing that Kennedy was not shot after all." Do you think these are decisive arguments against similarity-based analyses of counterfactuals (if so, what would be the general, not example-based argument)? Or do you have a reply—e.g., that similarity has to be spelled out more carefully? If so, does the reformulation yield other problems?

Use no more than 400 words

Exercise 2 [15 points]

Define a possibility operator $\Diamond$ as follows: $M, w \vDash \Diamond\phi$ iff $\exists w' \in W_w : M, w' \vDash \phi$

(a) First, assume the limit assumption. Check whether (1) and (2) below hold or not. For each of them, if yes, prove it using the semantic clauses in slide (22) - (26). If not, provide a countermodel and explain why this is so.

1 $\vDash \Diamond p \supset (\neg(p \rightsquigarrow \neg q) \supset (p \rightsquigarrow q))$

2 $\vDash \Diamond p \supset ((p \rightsquigarrow q) \supset \neg(p \rightsquigarrow \neg q))$

(b) Does the limit assumption play a role? Drop the limit assumption, and check whether (1) and (2) hold or not. For each of them, if yes, prove it using the semantic clauses in slides (22) - (24). If not, provide a countermodel and explain why this is so.

(Exercise 3 on the next page)

Exercise 3 [55 points]

- Do Exercise 2 in the lecture notes (Veltman 2016, p. 4) on counterfactuals [Exercise 6.c. - Part 1 in the course lecture notes]

  For clarity, we can rephrase the exercise as follows:

  Let $F = \langle W, \prec \rangle$ be a similarity frame. Show that the limit assumption holds in F iff Δ (as specified in Veltman's ex. 2) is not satisfiable in F.

  Where the notion of satisfiability is given as follows:

  For a similarity frame $F = \langle W, \prec \rangle$ and set of formulas Γ, we say that Γ is satisfiable in F iff there is a model $M = (W, \prec, V)$ over F and a $w \in W$ s.t. $M, w \models \gamma$ for all $\gamma \in \Gamma$.

- Do Exercise 4.(iii) [you do not have to do 4.(i) nor 4.(ii)] in the lecture notes on counterfactuals (Veltman 2016, p. 7).

- Do Exercise 5 in the lecture notes on counterfactuals (Veltman 2016, p. 7).

Please note that Veltman 2016 uses the symbol $\rightarrow$ for the material conditional, while we use $\supset$. Note that you are not allowed to assume the limit assumption, unless stated.