Counterfactuals and Modal Epistemology

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1 The Standard Picture

1.1 Safety and Sensitivity

Counterfactual Sensitivity $\neg A \,\square\!\!\rightarrow\, \neg \mathbf{Bel}A$

Counterfactual Safety $\mathbf{Bel}A \,\square\!\!\rightarrow\, A$

1.2 The Logic of Counterfactuals: Some Invalidities

Strenthening the Antecedent $A \,\square\!\!\rightarrow\, C \not\models A^+ \,\square\!\!\rightarrow\, C$, where $A^+ \models A$

Contraposition $A \,\square\!\!\rightarrow\, C \not\models \neg C \,\square\!\!\rightarrow\, \neg A$

1.3 Implications

1. Counterfactual Sensitivity is not equivalent to Counterfactual Safety.

2. Sensitivity is not closed under entailment.

3. Safety is not closed under entailment.

Proof for 2: Let H be the proposition that I have hands and BIV be the proposition that I am not BIV.

Clearly H entails $\neg BIV$. $\neg H \,\square\!\!\rightarrow\, \neg\mathbf{Bel}H$ is true. But $BIV \,\square\!\!\rightarrow\, \neg\mathbf{Bel}\neg BIV$ is false.

Proof for 3: suppose that I am good at distinguishing between poodles and nonpoodles, but poor at distinguishing between dogs and non-dogs: there are many wolves around, all of which I take to be dogs.

Let P say that there is a poodle in front of me and D say that there is a dog in front of me. P entails D. But **Bel**$P \boxright P$ is true while **Bel**$D \boxright D$ is false.

1.4 Justifications

Nozick ingeniously used this pattern to explain the appeal of scepticism without surrendering to it: the sceptic rightly denies that we know that we are not in the sceptical scenario, but wrongly concludes that we fail to know ordinary truths incompatible with our being in the sceptical scenario, because the sceptic wrongly assumes epistemic closure.

2   An Alternative Semantics for Counterfactual Conditionals

Williamson: indicative and counterfactual conditionals are not distinguished by 'if' but by the modality of verbs: 'would' makes us consider *relevant possibilities*. The counterfactual sentence 'if A were the case then C would be the case' should be understood as $\Box(A \supset C)$, where $A \supset C$ is a material conditional and $\Box$ is a *contextually restricted necessity operator*.

2.1 Argument for Material Conditionals

We usually rely on a heuristic to assess (indicative) conditional:

Suppositional Rule Take an attitude unconditionally to 'If A, C' just in case you take it conditionally to C on the supposition A.

The Suppositional Rule seemingly refute the material interpretation.

Williamson: the SR also *implies* the material interpretation and hence is *incosistent*. The SR implies the standard introduction and elimination rules, *conditional proof* and *modus ponens*. And the rules force its equivalence to the material interpretation.

Question

3 Applications to Modal Epistemology

3.1 Logic

Since 'would' is interpreted as a normal modal, SA and Contraposition are valid according to the proposed semantics.

Why SA and Contraposition seem to be invalid: the contextualist aspect of the semantics.

As a result, Counterfactual Sensitivity and Safety are equivalent according to the semantics.

4 An Epistemic Closure Principle for a Counterfactual Condition

Let $\mathbf{Bel}[C/A]$ mean 'One believes C on the basis of A' and $\mathbf{SafeBel}A$ abbriviate $\Box(\mathbf{Bel}A \supset A)$ and $\mathbf{SafeBel}[C/A]$ abbriviate $\Box(\mathbf{Bel}[C/A] \supset C)$.

SPC-CS If A entails C, then $\mathbf{SafeBel}A$ entails $\mathbf{SafeBel}[C/A]$.

MPC-CS If $A_1, ..., A_n$ jointly entails C, then $\mathbf{SafeBel}A_1, ..., \mathbf{SafeBel}A_n$ jointly entails $\mathbf{SafeBel}[C/A_1, ..., A_n]$.