Fatalism and the Logic of Unconditionals

I consider a new variant of the classic “Idle Argument” for fatalism (Cicero’s De Fato from 44BC, Dummett 1964; Stalnaker 1975) involving “unconditionals” with wh-adjuncts. By integrating and extending ideas from inquisitive semantics (Ciardelli et al., 2013, 2015; Ciardelli, 2016a,b,c) and related research, I defuse the argument and draw some new lessons for the logic of unconditionals.

The New Idle Argument. Context: London during WWII just as sirens sound warning of an approaching air raid. As you deliberate about whether to go take shelter, the Fatalist argues:

(1) If you are going to be killed, then you are better off staying where you are than taking precautions. (...after all, you are going to be killed whether or not you take precautions.)

(2) If you are not going to be killed, then you are better off staying where you are than taking precautions. (...after all, you aren’t going to be killed even if you neglect to take precautions.)

(3) So, whether or not you are going to be killed, you are better off staying where you are.

(4) So look, you are better off staying where you are than taking precautions.

Possible Escape Routes. The Fatalist applies the CA rule for unconditionals below to (1) & (2) to derive (3) and then applies the CE rule (endorsed by Rawlins 2008, 2013, a.o.) to detach (4):

CA for or not unconditionals

<table>
<thead>
<tr>
<th>If $\varphi$, $\psi$</th>
<th>If not-$\varphi$, $\psi$</th>
<th>Whether or not $\varphi$, $\psi$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\varphi$</td>
<td>$\psi$</td>
<td>$\psi$</td>
</tr>
<tr>
<td>$\varphi$</td>
<td>$\psi$</td>
<td>$\psi$</td>
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Anybody looking to escape the fatalistic conclusion thus has the following options: (i) reject one or both of the premises, (ii) reject or restrict CA, (iii) reject or restrict CE, (iv) play around with logical form (i.e., take the argument not to involve a genuine instance of CA and/or CE), (v) take a more drastic measure, such as denying the transitivity of entailment. I set (iv) and (v) aside here.

Defending the Premises. Given standard Lewis-Kratzer-Heim-style treatments of indicatives (Lewis 1975; Heim 1983; Kratzer 1986), (1) and (2) are hard to deny. There are also structurally parallel arguments to my Idle Argument with innocuous premises but bad conclusions. These alternative arguments suggest that the culprit is one of the unconditional rules CA or CE.

Missing Cat. Context: Grandma Rose has two orange tabbies and one gray shorthair. Grandma Pearl has two gray shorthairs and one orange tabby. Alas, one of these cats has gone missing.

(5) If Grandma Rose lost one of her cats, then it is not equally likely that an orange or gray cat went missing. Likewise for Grandma Pearl. So, whether it was Grandma Rose that lost one of her cats or Grandma Pearl, it is not equally likely that an orange or gray cat went missing. So, it is not equally likely that an orange or gray cat went missing.

Defending CA. Some might want to reject the unconditional “whether it was Grandma Rose...” in (5) and pin the blame on CA. But then the burden is on them to explain why sentences like (6) sound terrible. In such examples, the unconditional seems to be evaluated by pointwise considering its consequent against each of the multiple alternatives contributed by its wh-antecedent (Rawlins, 2008, 2013; Ciardelli, 2016b), supporting that Whether or not $\varphi$, $\psi$ is equivalent to the conjunction of If $\varphi$, $\psi$ and If not-$\varphi$, $\psi$ (i.e., that CA and its converse SDA are valid for unconditionals).

(6) *Whether Hugo is in Canada or not, he might be in Toronto.

My Diagnosis. Pace Rawlins 2008, 2013 who claims that any adequate analysis of unconditionals must predict that they entail their consequents (main clauses), the Idle Argument shows that CE is not unrestrictedly valid. Expressions like (3) reveal that “unconditional” is a bit of a misnomer.

Formal Analysis. I develop a new decision-theoretic semantics that validates CA (and SDA) but allows for failures of CE. This semantics is defined over a sentential language including a better operator ‘$\star$’, conditional operator ‘$>$’, and question operator ‘?’, with the following grammar:

(7) Language $L$. $\varphi := \varphi_{\text{Atom}} | \neg \varphi | \varphi \land \varphi | \varphi \lor \varphi | \star (\varphi, \varphi) | \varphi > \varphi | ? \varphi$
The Idle Argument can be translated as: $K > \Diamond (S, P), \neg K > \Diamond (S, P), ?K > \Diamond (S, P) \vdash \Diamond (S, P)$. I interpret $\mathcal{L}$ in a bilateral semantics where the meaning of an expression is given by its support $|+|$ and reject $|-|$ conditions relative to a decision state $s = (DP, R)$ consisting of a decision problem $DP$, which represents an agent’s options, beliefs, and desires, together with a decision rule $R$ (see Hawke & Steinert-Threlkeld 2016, Willer forthcoming, and Aloni’s InqBnB1 slides for related bilateral systems; see Carr 2012, Charlow ms. for related decision-theoretic semantics).

(8) Decision Problems. A decision problem $DP = \langle A, S, U, C \rangle$ over $W$ consists of partitions $A \subseteq \mathcal{P}(W)$ (the action set) and $S \subseteq \mathcal{P}(W)$ (the state space), utility function $U : A \times S \rightarrow \mathbb{R}$, and (credence) function $C : \mathcal{P}(W) \rightarrow [0, 1]$ (Assume here that $C$ is a probability measure.)

<table>
<thead>
<tr>
<th>Air Raid</th>
<th>big bomb</th>
<th>small bomb</th>
<th>no bomb</th>
</tr>
</thead>
<tbody>
<tr>
<td>take precautions</td>
<td>-11 ($\frac{1}{6}$)</td>
<td>9 ($\frac{1}{6}$)</td>
<td>9 ($\frac{1}{6}$)</td>
</tr>
<tr>
<td>stay where you are</td>
<td>-10 ($\frac{1}{6}$)</td>
<td>-10 ($\frac{1}{6}$)</td>
<td>10 ($\frac{1}{6}$)</td>
</tr>
</tbody>
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(9) Decision Rules. A decision rule is a (partial) function $R$ mapping a decision problem $DP$ to a partial order over its action set, where $a_1 \leq_{R(DP)} a_2$ iff $a_2$ is at least as preferred as $a_1$.

Given a model $\mathcal{M} = (W, V)$ where $V$ maps each atomic sentence $\varphi_{Atom}$ to the set of $\varphi_{Atom}$-worlds in $W$, the entries for atoms and Boolean connectives are straightforward (the support conditions for $\land$ and $\lor$ are from Ciardelli et al. 2013, 2015; I present only required clauses here):

(10) $s \models^+ \varphi_{Atom}$ iff $C_s(V(\varphi_{Atom})) = 1$ $s \models^- \neg \varphi$ iff $s \models^- \varphi$

Turning to the remaining operators, action-guiding better off sentences of the form $\Diamond(\varphi, \psi)$ are evaluated by checking whether the action expressed by $\varphi$ is in fact better than that expressed by $\psi$ according to the rule $R_s$. Letting $|\varphi| = \{ v \in W : \exists s(s \models^+ \varphi \land C_s(\{w\}) > 0) \}$ (cf. truth sets):

(11) $s \models^+ \Diamond(\varphi, \psi)$ iff $|\varphi| \triangleright_{R_s(DP_s)} |\psi|$, Presupposition: $|\varphi|, |\psi| \in AD_{P_s}$

As for conditionals, $\varphi \triangleright \psi$ is supported by a decision structure when any way of minimally updating it with new information so as to support $\varphi$ delivers a structure that also supports $\psi$ (cf. Yalcin 2007; Kolodny & MacFarlane 2010). Given a proposition $P \subseteq W$, $DP_{+}P = (AD_P, S_{DP}, U_{DP}, C_{DP}(-P))$ is obtained by conditionalizing $C_{DP}$ on $P$. We then have:

(12) $s \triangleright P \land Q$ iff $\forall s' \in S \triangleright (s' \models^+ P)$

Lastly, we set $?\varphi := \varphi \lor \neg \varphi$, as in Ciardelli et al. (2013, 2015).

How does the Idle Argument play out w.r.t. (Air Raid, MaxEU) where MaxEU is the rule to maximize expected utility? First, we have (Air Raid, MaxEU) $\models^+ K > \Diamond (S, P)$ because it is better to stay put after conditionalizing on $|K|$: $\models^+_{\text{MaxEU}(\text{Air Raid} \downarrow \{K\})} |P|$. Likewise, (Air Raid, MaxEU) $\models^+ \neg K > \Diamond (S, P)$. Moreover, because the unconditional $?K > \Diamond (S, P)$ is evaluated by considering whether its consequent holds after conditionalizing on either $|K|$ or $\neg |K|$ (these are both ways to come to support $?K$), we also have (Air Raid, MaxEU) $\models^+ ?K > \Diamond (S, P)$. However, (Air Raid, MaxEU) $\not\models^+ \Diamond (S, P)$ because it is better to take precautions in the original setup: $\models^+_{\text{MaxEU}(\text{Air Raid})} |S|$. CE fails because while $\Diamond (S, P)$ holds in the strengthened states that settle whether you will be killed, it doesn’t hold when you remain ignorant about the future.

Is Modus Ponens Valid for Unconditionals? Charlow ms. argues on the basis of similar arguments that MP is invalid. But though the adjunct of (3) appears to be tautological, it is wrong to think we have a failure of MP here. Crucially, the antecedent of (3) is the interrogative sentence $?K$. And, in fact, if we grant $?K$ to the Fatalist as an extra premise, his argument goes through—$?K, ?K > \Diamond (S, P) \vdash \Diamond (S, P)$ preserves support (Ciardelli 2016a,c). Note, however, that a decision state supporting $?K$ contains information that settles whether you are going to be killed, so the extended argument establishes only that you are better off staying put when it is known what will come to pass—hardly a result that will lead the youth to a life of idleness!
References


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