Fatalism and the Logic of Unconditionals

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Mixing the Ancient with the New

**The Ancient:** The “Idle Argument” (a.k.a. the “Lazy Argument”), which survives in Cicero’s *De Fato* (44BCE) and Origen’s *Contra Celsus* (248CE), resurfacing in the modern era in Dummett (1964), Sobel (1966), Stalnaker (1975), Schlesinger (1980), and Buller (1995).

**The New:** The “Inquisitive Turn” of Ciardelli, Groenendijk & Roelofsen (2013, 2018), where declarative and interrogative sentences are assigned “support conditions” in a single unified semantic framework.

**The Plan:** Consider a new variant of the Idle Argument through the lens of this and related recent developments in formal semantics. The new argument involves so-called “unconditionals” with interrogative antecedents.

The formal analysis integrates recent decision-theoretic approaches to deliberative modality (Carr 2012; Charlow 2016; Lassiter 2017) with ideas from inquisitive semantics (Ciardelli et al. 2013, 2018).
The New Idle Argument

Context: London during WWII just as sirens sound warning of an approaching air raid. The Fatalist (calm as ever) reasons as follows:

(1) If you are going to be killed in the raid, then you’re better off staying where you are than taking precautions. (After all, if you are going to be killed, then you’re going to be killed whether or not you take precautions.)

(2) On the other hand, if you aren’t going to be killed, then you’re also better off staying where you are than taking precautions. (After all, if you aren’t going to be killed in the raid, then 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’re better off staying where you are than taking precautions.

(4) So look, you are better off staying where you are.
The Logic of the Argument

The new Idle Argument relies on two prima facie plausible principles for unconditionals:

(5) **CA for or not unconditionals**

\[
\text{If } \varphi, \psi \quad \text{If not-} \varphi, \psi \\
\hline
\text{Whether or not } \varphi, \psi
\]

(König 1986; Haspelmath & König 1998; Rubinstein & Doron 2014; AnderBois 2014; Kaufmann 2017)

(6) **Consequent entailment (CE)**

\[
\text{Whether or not } \varphi, \psi \\
\hline
\psi
\]

(Zaefferer 1991; Haspelmath & König 1998; Rawlins 2008a,b, 2013; Rubinstein & Doron 2014)
Possible Escape Routes

Anyone looking to escape the fatalistic conclusion must therefore respond in one of the following ways:

(i) Reject one or both of the conditionals (1) and (2).

(ii) Reject or restrict CA for or not unconditionals (of course, this must be done only for readings of the indicative conditional on which the premises (1) and (2) both hold).

(iii) Reject or restrict CE (for any reading of the unconditional (3) on which it follows from the Fatalist’s premises).

(iv) Play around with form. Because the surface form of a sentence isn’t always a reliable guide to its logical form, one might argue that the inference from (1) and (2) to (3) isn’t a genuine instance of CA, or that the inference from (3) to (4) isn’t a genuine instance of CE.

(v) Take a more desperate measure. For instance, one might deny the transitivity of entailment.

I set options (iv) and (v) aside here.
On the Premises

I’m willing to grant the Fatalist his premises, for a couple of reasons.

- **First:** There is at least one way of reading (1) and (2) on which these premises are hard to deny.

  On this “reflecting” reading (Cariani, Kaufmann & Kaufmann 2013), we apply the Ramsey Test quite literally and evaluate (1) and (2) by provisionally updating your knowledge state with the content of their *if*-clauses, and then assess the embedded *better* claims in the resulting subordinate contexts. (Many ways to implement this.)

- **Second:** There are structurally parallel arguments to the Idle Argument with innocuous premises but terrible conclusions. These arguments suggest that even if we accept the premises (1) and (2), we can still block the Fatalist’s deductive progress later on.
The Case of the Missing Cat

Grandma Rose has two orange tabbies and one gray shorthair.
The Case of the Missing Cat (cont.)

Grandma Pearl has two gray shorthairs and one orange tabby.
Unfortunately, one of these cats has gone missing. Each of the cats is as likely to have gone missing as any of the others.
Missing Cat (cont.)

(7) If Grandma Rose lost one of her cats, then it is not equally likely that an orange or a gray cat went missing. (After all, if Rose lost one of her cats, then it is more likely than not that an orange cat went missing.)

(8) Likewise, if Grandma Pearl lost one of her cats, then it is also not equally likely that an orange or a gray cat went missing. (After all, if Pearl lost one of her cats, then it is more likely than not that a gray cat went missing.)

(9) So, whether it was Rose that lost one of her cats or Pearl, it is not equally likely that an orange or a gray cat went missing.

(10) So, it is not equally likely that an orange or a gray cat went missing.

Everybody I asked accepts (7) and (8). Nobody I asked accepts (10). (I hope you share these judgments.) So there is a problem with either CA or CE for alternative unconditionals.
Two Readings of Alternative Unconditionals

Assumption: Interrogatives can be assigned *alternative sets* (Hamblin 1973; Groenendijk & Stokhof 1984; Ciardelli et al. 2013, 2018).

Crucially, the *whether*-adjuncts of alternative unconditionals contribute the same alternative sets as the corresponding root questions (Zaefferer 1991; Rawlins 2008a,b, 2013; Ciardelli 2016; Kaufmann 2017).

The antecedent of (9) introduces \{Rose lost a cat, Pearl lost a cat\}.

(11) **Flattened interpretation of alternative unconditionals**

Whether \(\varphi\ or \psi\), \(\chi\) is evaluated with respect to an information state by first adjusting this state to support the information that at least one of the alternatives contributed by *Whether \(\varphi\ or \psi\)* holds and then evaluating \(\chi\) with respect to the updated state.

Given exhaustivity presupposition, CA can fail but CE trivially holds.
Two Readings of Alternative Unconditionals (cont.)

(12) **Pointwise interpretation of alternative unconditionals**

*Whether* $\varphi$ *or* $\psi$, $\chi$ is evaluated with respect to an information state by updating this state with each of the alternatives for the antecedent in turn. If the consequent $\chi$ holds in each of the subordinate contexts induced by the different alternatives, then the unconditional holds. (Rawlins 2008a,b, 2013; a.o.)

CA falls directly out of this semantics, as does the converse SDA.

König (1986); Haspelmath & König (1998); Rubinstein & Doron (2014); AnderBois (2014); Kaufmann (2017): alternative unconditionals are equivalent to the corresponding conjunction of conditionals.

So long as alternative unconditionals can be interpreted pointwise, the Fatalist can progress further in his argument.
Three Kinds of Evidence for Pointwise Reading

- Alt-unconditionals are commonly used to send stronger messages:
  
  (13) Whether Rodrigo or Brenda is making dinner, we might need
to order takeout.
  
  (14) We might need to order takeout.

- Alt-unconditionals like the following sound terrible (Ciardelli, p.c.):
  
  (15) *Whether Julia is in Rome or Lima, she might be in Rome.

- Contrast when unconditional and if-conditional adjuncts combined:
  
  (16) *Whether or not Alfonso comes to the party, if Alfonso
comes to the party, you should come.
  
  (17) Whether or not there is liquor at the party, if Alfonso comes
to the party, you should come.
Making a Stand

Because what holds relative to each cell of an informational partition needn’t hold relative to the entire set being partitioned, CE can fail!

I am not calling for a blanket rejection of the CE rule for unconditionals on their pointwise reading. Zaefferer (1991); Haspelmath & König (1998); Rawlins (2008a,b, 2013) are not so off the mark. Many unconditionals do entail their consequents (even when unflattened):

(18) Whether it was Grandma Rose that lost one of her cats or Grandma Pearl, there is a fireman on the way.

(19) Whether Julia is in Rome or Lima, she’s likely with Alfonso.

Unlike the consequents that have created trouble for CE, those of (18) and (19) are informationally ‘well-behaved’ in the sense that if they hold relative to each cell of a partitioned set of possibilities, then they hold relative to the full partitioned set as well.
Formalizing the Idle Argument

To make my informal diagnosis precise, I develop a formal system that integrates recent decision-theoretic approaches to deliberative modality (Carr 2012; Charlow 2016; Lassiter 2017) with ideas from inquisitive semantics (Ciardelli, Groenendijk & Roelofsen 2013, 2018).

At a suitable level of abstraction, here is the new Idle Argument:

1. \[ K > \star (S, P) \]  
   Premise
2. \[ \neg K > \star (S, P) \]  
   Premise
3. \[ ?(K \lor \neg K) > \star (S, P) \]  
   CA
4. \[ \star (S, P) \]  
   CE

Formally speaking, the Fatalist employs the following rules:

\[
\begin{array}{c}
(20) \quad \text{CA} \\
\varphi_0 > \psi \\
\neg \varphi_0 > \psi \\
\hline
?(\varphi_0 \lor \neg \varphi_0) > \psi
\end{array}
\]

\[
\begin{array}{c}
\text{CE} \\
?(\varphi_0 \lor \neg \varphi_0) > \psi \\
\hline
\psi
\end{array}
\]
From Information States to Decision States

I evaluate sentences with respect to decision-theoretic structures featuring both informational and bouletic dimensions.

(21) **Decision problems.** A decision problem $DP$ over $\mathcal{W}$ is a tuple $\langle A, S, U, C \rangle$ where

a. $A \subseteq \mathcal{P}(\mathcal{W})$ is a partition of a subset of $\mathcal{W}$ (the action set)
b. $S \subseteq \mathcal{P}(\mathcal{W})$ is a partition of a subset of $\mathcal{W}$ (the state space)
c. $U : A \times S \rightarrow \mathbb{R}$ is the utility function
d. $C : \mathcal{P}(\mathcal{W}) \rightarrow \mathbb{R}[0, 1]$ is the credence function

(22) **Decision rules.** A decision rule $R$ is a function that maps a decision problem $DP$ to a partial order $\leq_{R(DP)}$ over its action set.

(23) **Decision states.** A decision state $d = \langle DP_d, R_d \rangle$ consists of a decision problem together with a decision rule.
Your Decision Problem **Air Raid**

(24) \[ A_{AR} = \begin{cases} 
\lambda w_s. \text{you take precautions in } w, \\
\lambda w_s. \text{you stay where you are in } w 
\end{cases} \]

(25) \[ S_{AR} = \begin{cases} 
\lambda w_s. \text{large bomb dropped in } w, \\
\lambda w_s. \text{small bomb dropped in } w, \\
\lambda w_s. \text{no bomb dropped in } w 
\end{cases} \]

(26) \[ U_{AR}(\lambda w. \text{take precautions in } w, \lambda w. \text{large bomb in } w) = -101 \]
\[ U_{AR}(\lambda w. \text{take precautions in } w, \lambda w. \text{small bomb in } w) = 99 \]
\[ \text{etcetera.} \]

(27) \[ C_{AR}(s|a) = 1/3 \text{ for each } a \in A \text{ and } s \in S. \]

If you implement the classical decision rule **MaxEU**:

(28) \[ \mathcal{V}(S) <_{\text{MaxEU(Air Raid)}} \mathcal{V}(P). \]

So, Expected Utility Theory recommends ignoring the Fatalist.
Support & Reject Conditions

I simultaneously assign support (⊢) and reject (|=) conditions to sentences relative to decision states (over a model \( \mathcal{M} = \langle \mathcal{W}, \mathcal{V} \rangle \)).

(29) **Interpretation of atomic formulae**
\[
\begin{align*}
  d \models \alpha & \text{ iff } C_{DP_d}(\mathcal{V}(\alpha)) = 1 \\
  d \models \lnot \alpha & \text{ iff } C_{DP_d}(\mathcal{V}(\alpha)) = 0
\end{align*}
\]

(30) **Interpretation of negation** (Hawke & Steinert-Threlkeld 2016)
\[
\begin{align*}
  d \models \lnot \varphi & \text{ iff } d \models \varphi \\
  d \models \lnot \varphi & \text{ iff } d \models \varphi
\end{align*}
\]

(31) **Interpretation of conjunction and disjunction**
\[
\begin{align*}
  d \models \varphi \land \psi & \text{ iff } d \models \varphi \text{ and } d \models \psi \quad \text{(cf. Ciardelli et al. 2018)} \\
  d \models \varphi \land \psi & \text{ iff } d \models \varphi \text{ or } d \models \psi \\
  d \models \varphi \lor \psi & \text{ iff } d \models \varphi \text{ or } d \models \psi \quad \text{(cf. Ciardelli et al. 2018)} \\
  d \models \varphi \lor \psi & \text{ iff } d \models \varphi \text{ and } d \models \psi
\end{align*}
\]
How Does the Idle Argument Play Out?

\[ d \models K > \bigstar(S, P) \quad \text{iff} \quad \text{for all } d' \in d \oplus K, \ d' \models \bigstar(S, P) \]

\[ \iff \langle DP_d + \forall(K), R_d \rangle \models \bigstar(S, P) \]

\[ \iff \forall(P) <_{R_d(DP_d + \forall(K))} \forall(S). \]

(33) \[ \langle \text{Air Raid, MaxEU} \rangle \models K > \bigstar(S, P). \]

(34) \[ \langle \text{Air Raid, MaxEU} \rangle \models \neg K > \bigstar(S, P). \]

(35) \[ d \models (K \lor \neg K) > \bigstar(S, P) \]

\[ \iff \text{for all } d' \in d \oplus (K \lor \neg K), \ d' \models \bigstar(S, P) \]

\[ \iff \langle DP_d + \forall(K), R_d \rangle \models \bigstar(S, P) \quad \text{and} \]

\[ \langle DP_d + \forall \backslash \forall(K), R_d \rangle \models \bigstar(S, P) \]

(36) \[ \langle \text{Air Raid, MaxEU} \rangle \models (K \lor \neg K) > \bigstar(S, P). \]

(37) \[ \langle \text{Air Raid, MaxEU} \rangle \not\models \bigstar(S, P). \]
Some Entailment Facts

What you get by crossing a decision-theoretic upgrade of Yalcin’s (2007) “informational consequence” (see also Veltman’s 1996 ‘$|=3$’) with von Fintel’s (1999) “Strawson-entailment”:

(38) **Strawsonian support-preserving consequence**
\[
\{\varphi_1, \ldots, \varphi_n\} \models \psi \iff \text{for any decision state } d \text{ such that } d \models \varphi_1, \ldots, d \models \varphi_n, d \models \psi \text{ are defined, if } d \models \varphi_1, \ldots, d \models \varphi_n, \text{ then } d \models \psi.
\]

(39) **CA is valid.** \(\{\varphi_0 > \chi, \psi_0 > \chi\} \models ?(\varphi_0 \lor \psi_0) > \chi.\)

(40) **CE is invalid.** \(\{? (\varphi_0 \lor \psi_0) > \chi\} \not\models \chi.\)
More Fun Facts

Although CE isn’t unrestrictedly valid, this inference rule still holds in a broad range of cases.

(41) **Coarse distributivity**

The sentence $\varphi$ is *coarsely distributive* iff for any partition $I = \{i_1, \ldots, i_n\}$ over $\mathcal{W}$ and state $d$, if $\langle DP_d + i_1, R_d \rangle \models \varphi, \ldots$, and $\langle DP_d + i_n, R_d \rangle \models \varphi$, then $i \models \varphi$.

(42) **CE is valid for coarsely distributive consequents.**

For any coarsely distributive $\chi$, $\{?(\varphi_0 \lor \psi_0) > \chi\} \models \chi$.

(43) **Flattening operator:** $d \models !\varphi_0$ iff $C_{DP_d}(\bigcup alt(\varphi_0)) = 1$

(44) **CE is valid for flattened unconditionals.**

$\{!(?\varphi_0 \lor \psi_0) > \chi\} \models \chi$. 
The Most Fun Fact of All

Given that the adjunct of (3) appears to be tautological, it might be tempting to think we have a failure of MP for unconditionals on our hands. This would be a mistake.

(45) **MP for or not unconditionals**

\[
\begin{array}{c}
\text{Whether or not } \varphi, \chi \\
\text{Whether or not } \varphi
\end{array}
\begin{array}{c}
\psi
\end{array}
\]

(46) **MP is valid.** \{?((\varphi \lor \psi_0) > \chi), ?((\varphi \lor \psi_0)) \models \chi\}.

In particular, ?(K \lor \neg K) > \star(S, P), ?(K \lor \neg K) .\: \star(S, P). So if we grant the Fatalist the extra premise ‘Whether or not you are going to be killed’, the extended argument goes through.

Note, however, that 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.


Bibliography II


Bibliography III


