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The Spectre of Triviality

Nate Charlow

Abstract

A spectre haunts the semantics of natural language—the spectre of Triviality. Semanticists (in particular Rothschild 2013; Khoo & Mandelkern 2018a,b) have entered into a holy alliance to exorcise this spectre. None, I will argue, have yet succeeded.

1 Triviality

Here is a well-known and, if not for its catastrophic consequences, extraordinarily plausible thesis about degreed belief. C represents a (possibly partial) function from propositions into degrees of belief for an (if you like, rational) agent.

> **Stalnaker's (1970) Thesis (ST)**
>
> When $C(X) > 0$, $C(X \to Y) = C(Y|X)$

On a neutral gloss, ST says, roughly, that the degree to which an agent believes a conditional proposition $X \to Y$ equals their degree of belief in Y conditional on X. Of special interest in this paper is this corollary of ST:

> **Extended Preservation Condition (EPC)**
>
> If $C(X) > 0$: $C(Y) = 0$ implies $C(X \to Y) = 0$; and $C(Y) = 1$ implies $C(X \to Y) = 1$.

EPC is an extension of Bradley (2000)'s very plausible Preservation Condition, according to which an agent's degree of belief in the conditional $X \to Y$ is 0 when they are in a position to rule out Y: when they are in such a position, after all, Y must be false, and so, *a fortiori*, Y must be false *if* X is true. To this very plausible thesis, EPC adds another: that an agent's degree of belief in the conditional $X \to Y$ is 1 when they are in a position to fully believe Y: when they are in such a position, after all, Y must be true, and so, *a fortiori*, Y must be true *if* X is.[1]

Triviality results in the mold of Lewis (1976, 1986) and Bradley (2000) present an existential threat to these seemingly innocent principles. A sampling:

> **T1.** EPC implies that, when $X \nvDash Y$, $X \to Y \vDash Y$.
> **T2.** ST implies that $C(Y|X) = C(Y)$

The live options for advocates of theses like ST/EPC, in light of the Triviality theorems, are relatively few: if you want to retain any of these theses, in spite of Triviality's spectre, you typically find yourself in the uncomfortable position of relinquishing an assumption that has as strong a case in its favor as ST/PC.

[1] Bradley (2007) argues for extending PC to EPC on similar grounds.

Consider this incredibly simple derivation of T1–T2 from ST/EPC. Assume that $C(X|Y) > 0$ and $C(X|\neg Y) > 0$. Then:

$$\begin{aligned} C(X \to Y) &= C(X \to Y|Y)C(Y) + C(X \to Y|\neg Y)C(\neg Y) && \text{(1) LTP} \\ &= 1 \cdot C(Y) + 0 \cdot C(\neg Y) = C(Y) && \text{(2) EPC} \\ &= C(Y|X) && \text{(3) ST} \end{aligned}$$

The derivation relies on these assumptions:

i. $X \to Y$ is subject to the Law of Total Probability (LTP). But this is simply forced by the assumption that $X \to Y$ is a proposition.
ii. EPC applies to $C(\cdot|Y)$ and $C(\cdot|\neg Y)$. This is forced by reading ST/EPC as a claim about credal measures, a fortiori as about conditional credal measures.

To many philosophers, the culprit responsible for deriving absurdities like T1 and T2 has seemed to be ST (and, occasionally, EPC; see Weatherson 2004; Khoo & Mandelkern 2018a). But, I will now argue, rejecting ST (perhaps by way of rejecting EPC) raises its own explanatory concerns, and—more significantly—is anyways *simply insufficient* for exorcising Triviality's spectre.

2 Denial

In this vein, Rothschild (2013: 62) (see also Kaufmann 2004) suggests rejecting assumption (ii). Suppose a car has a defect that reliably causes its airbag to deploy in a 35mph crash. Consider this conditional.

(1) If the car crashes at 35mph, the airbag will deploy.

Rothschild asks us to consider an analysis of this conditional, on which $X \to Y$ is an epistemic strict conditional, glossable as "S knows that $X \supset Y$" (for some contextually salient S).

> What is the probability that [S knows that $X \supset Y$, conditional on $\neg Y$]? According to [assumption (ii)] it is 0. However, this is clearly not the case: even if the airbag does not go off, we may still think that [S] knew it would have gone off if the car had crashed (since [S] may have known the car had the defect). So it is clear in this case that [$C(X \to Y|\neg Y) \neq 0$]. What this amounts to, then, is a denial of [ST] applying... in the probability function reached by conditionalizing on [$\neg Y$]. (62)

The argument establishes this: if a conditional $X \to Y$ expresses the proposition that S knows that $X \supset Y$ (for some contextually salient S), then one's degree of belief in $X \to Y$, given $\neg Y$, can diverge from one's degree of belief in Y, given $\neg Y$.

Alas, the argument can be turned, with even greater plausibility, on itself. If one's degree of belief in $X \to Y$, given $\neg Y$, *may not* diverge from one's degree of belief in Y, given $\neg Y$, then this, together with Rothschild's argument, establishes that $X \to Y$ does not express the proposition that S knows that $X \supset Y$ (cf. Charlow 2016: §4.4). Utterances that, it would seem, *express such degrees of belief* do tend strongly to be heard as equivalent:

(2) Given that the airbag doesn't deploy, there's no chance that the airbag will deploy if the car crashes at 35mph. ⇔

(3) Given that the airbag doesn't deploy and the car crashes at 35mph, there's no chance the airbag will deploy.

By design, the epistemic analysis of the conditional that Rothschild entertains does not endeavor to explain such equivalences. (Actually, it seems that we should read Rothschild as committed to denying this particular equivalence.) This points to a more general difficulty afflicting theories, like Rothschild's, that try to make palatable failures of ST across a class of cases: residual linguistic data—in particular, felt entailments—that seem to render denials of ST in such cases puzzling.

3 Ambiguity

Khoo & Mandelkern (2018a,b) develop a new version of this strategy that aims to be responsive to this sort of concern. They propose to distinguish two, we might say, "readings" of principles like Bradley's Preservation Condition, one of which would establish a Triviality theorem like T2 (but which says something false), the other of which would not (but which says something true). The false, Triviality-inducing reading of PC is accessed by treating variables over credence functions as universally bound:

Unrestricted Preservation Condition (UPC)

$\forall C : C(X \to Y) = 0$ if $C(Y) = 0$ and $C(X) > 0$

The true, Triviality-obviating reading of PC is, they argue, accessed by treating these variables as contextually bound, along these lines:

Local Preservation Condition (LPC)

For all contexts of utterance c : $C_c([\![X \to Y]\!]^c) = 0$ if $C_c([\![Y]\!]^c) = 0$ and $C_c([\![X]\!]^c) > 0$

LPC states, roughly, "that Preservation always holds as viewed from the context of assertion, but leaves it open that it fails as viewed from other contexts."

UPC is argued to fail on the basis of an intuitive counterexample:

> **Fundraiser**: It is Thursday night at the company fundraiser. 100 scratch card tickets are being sold; 99 of the tickets grant the ticket-holder Friday off, while one is worthless. Ginger arrives at the fundraiser late, and there is only one ticket left to purchase.
>
> Mark and Jim know all this, and they are wondering whether Ginger will buy the last ticket and whether she will win (i.e., get permission to take Friday off). They know that Ginger would take Friday off if she won. But they also know that the tickets are expensive and so Ginger probably won't buy the last ticket. Jim makes a prediction, saying:
>
> (1) If Ginger buys the last ticket, she will win.
>
> Mark thinks about Jim's claim. Since Mark knows that almost all of the tickets are winning tickets, he concludes that what Jim says is very likely, but not certainly, true. On Friday, Jim and Mark see that Ginger is at work. They now know that it's not the case that Ginger bought the ticket and won. Two possibilities remain open: (i) Ginger bought the ticket and lost; and (ii) Ginger didn't buy the ticket. Since Mark knows that almost all of the tickets were winners, and since he thought from

the start that it was unlikely Ginger would buy a ticket, he thinks it is much more likely that Ginger simply declined to buy the ticket than that she bought it and lost.

In this case, Khoo & Mandelkern claim that "Mark may rationally have non-zero credence in the claim that Ginger bought the last ticket, zero credence in the claim that Ginger won the fundraiser, and non-zero credence in Jim's claim in (1)." Notice that this is no counterexample to LPC: the proposition that *would be* expressed by Jim's utterance in Mark's context c—a proposition which, according to LPC, would receive probability 0 in c—is, they claim, distinct from the proposition that *is* expressed by Jim's claim in Jim's context.

3.1 Denying the Data

I do not yet see clear evidence that, in Khoo & Mandelkern's case, Jim has said something that can be appraised by Mark as possible. If we are careful in constructing our report of Jim's speech—"Jim expressed the proposition that, if Ginger bought the last ticket at t, she won at t'"—it seems relatively clear that Jim expressed something Mark knows there's no chance of. Mark *knows* that Ginger did not win at t'. Jim said something that, given that Ginger might have bought the last ticket at t, *entails* that she might have won at t'. Mark cannot, *strictly speaking*, appraise what Jim said as possible: given his information, it entails something he knows to be false, i.e., that Ginger might have won at t'.[2]

On the other hand, Mark can, it seems, reason impeccably:

(4) There's no chance that Ginger won at t'. So, there's no chance that Ginger won at t' if she bought the last ticket at t. So, there's no chance Jim was right.

Scrutinizing their case in this way, it seems that it is not as easy to be confident in Khoo & Mandelkern's fulcrum intuition as we might expect.

3.2 Denying the Relevance

The following constraints on an agent's degree of belief in an indicative conditional—direct corollaries of EPC—were essential to the derivation as run above.

C1. $\forall C : C(X \to Y|Y) = 1$ (when $C(X|Y) > 0$)
C2. $\forall C : C(X \to Y|\neg Y) = 0$ (when $C(X|\neg Y) > 0$)

In line with their LPC, Khoo & Mandelkern (2018a) could be read as suggesting that only restricted versions of these constraints are plausible, thereby undermining derivations of Triviality theorems which depend on the universal quantificational force of C1 and/or C2.

Even if they are right, however, the utility of this type of response in exorcising Triviality's spectre is, I'll show, limited. Here are two triviality theorems that follow for *any* conditionals and contexts witnessing either C2 alone, or else C1+C2+ST.

Definition 1. *A conditional $X \to Y$ and context c* ***witness***

[2] This argument relies on the (perhaps controversial) claim that $\Diamond X, X \to Y \vDash \Diamond Y$ (compare the "Chancy Modus Ponens" rule validated by Moss 2015: 57, 76). But it need not. On the dominant theory of the syntax and semantics of indicative conditionals (Kratzer 1986, 2012), an unembedded indicative $X \to Y$ is equivalent to a restricted epistemic necessity claim $\Box(X)(Y)$; observe that, uncontroversially, $\Box(X)(Y) \vDash \Diamond(X)(Y) \vDash \Diamond Y$. Competitor accounts to Kratzer's (e.g. Gillies 2010) also tend to validate the inference in question.

– *C1 iff* $C_c([\![X \to Y]\!]^c | [\![Y]\!]^c) = 1$
– *C2 iff* $C_c([\![X \to Y]\!]^c | [\![\neg Y]\!]^c) = 0$
– *ST iff* $C_c([\![X \to Y]\!]^c) = C_c([\![Y]\!]^c | [\![X]\!]^c)$

Theorem 1. *If* $X \to Y$ *and* c *witness C2,* $C_c([\![Y]\!]^c | [\![X \to Y]\!]^c) = 1$ *(if defined).*

Proof. Suppose $X \to Y$ and c witness C2, and that $C_c([\![Y]\!]^c | [\![X \to Y]\!]^c)$ is defined. Note: since $C_c([\![Y]\!]^c | [\![X \to Y]\!]^c)$ is defined, $C_c([\![X \to Y]\!]^c) \neq 0$.

$$\begin{aligned} C_c([\![X \to Y]\!]^c | [\![\neg Y]\!]^c) = 0 = & \frac{C_c([\![\neg Y]\!]^c | [\![X \to Y]\!]^c) \cdot C_c([\![X \to Y]\!]^c)}{C_c([\![\neg Y]\!]^c)} \\ 0 = & C_c([\![\neg Y]\!]^c | [\![X \to Y]\!]^c) \cdot C_c([\![X \to Y]\!]^c) \\ 0 = & C_c([\![\neg Y]\!]^c | [\![X \to Y]\!]^c) \\ 0 = & 1 - C_c([\![Y]\!]^c | [\![X \to Y]\!]^c) \\ 1 = & C_c([\![Y]\!]^c | [\![X \to Y]\!]^c) \end{aligned}$$

□

Theorem 2. *If* $X \to Y$ *and* c *witness C1, C2, and ST,* $C_c([\![Y]\!]^c | [\![X]\!]^c) = C_c([\![Y]\!]^c)$.

Proof. Consider any $X \to Y$ and c such that $C_c([\![X \to Y]\!]^c | [\![Y]\!]^c) = 1$, $C_c([\![X \to Y]\!]^c | [\![\neg Y]\!]^c) = 0$, and $C_c([\![X \to Y]\!]^c) = C_c([\![Y]\!]^c | [\![X]\!]^c)$.

$$\begin{aligned} C_c([\![X \to Y]\!]^c) &= C_c([\![X \to Y]\!]^c | [\![Y]\!]^c) C_c([\![Y]\!]^c) + C_c([\![X \to Y]\!]^c | [\![\neg Y]\!]^c) C_c([\![\neg Y]\!]) \\ &= 1 \cdot C_c([\![Y]\!]^c) + 0 \cdot C_c([\![\neg Y]\!]^c) = C_c([\![Y]\!]^c) \\ &= C_c([\![Y]\!]^c | [\![X]\!]^c) \end{aligned}$$

□

To be sure, concrete instances of these schematic derivations will only work to establish what I will call a *trivializing consequence*—that the likelihood of a particular Y conditional on $X \to Y$ in c must equal 1, or that the likelihood of Y is independent of the likelihood of X in c—for appropriate $X \to Y$ and c. The schematic flavor of this type of Triviality result—showing us how to establish a trivializing consequence for appropriate $X \to Y$ and c—stands in obvious contrast to the universally quantified Triviality theorems typically demonstrated (and assessed as problematic) in this literature.

While the contrast is worth noting, it is philosophically inconsequential: the trivializing consequences of such derivations, no less than the (admittedly more pervasive) trivializing consequences of standard Triviality theorems, still amount to a reductio of one of their assumptions. The trivializing consequences of Theorems 1 and 2 for appropriate $X \to Y$ and c should be regarded as absurd (and for effectively the *same reasons* that instances of T1 and T2 are typically adjudged absurd). By Theorem 1, whenever $X \to Y$ and c witness C2, Y is certain conditional on $X \to Y$—something that is ordinarily contrary to fact (since c is typically *not* such that an agent in c is in a position to conclude Y from the information $X \to Y$ in c). By Theorem 2, whenever $X \to Y$ and c witness C1 and C2, if $X \to Y$ and

c also witness ST—as, it seems, is at least ordinarily the case[3]—C_c must treat X and Y as independent (ordinarily, they aren't).

So: for the strategy of Khoo & Mandelkern to succeed in sidestepping the pathologies of Triviality, they must show that, *in general*, contexts and conditionals do not witness these sorts of triviality-inducing features. That is to say, just like Rothschild, they must show that, for all (or at least the preponderance of) $X \to Y$ and c:

NC2. $C_c(\llbracket X \to Y \rrbracket^c | \llbracket \neg Y \rrbracket^c) \neq 0$
NC1. $C_c(\llbracket X \to Y \rrbracket^c | \llbracket Y \rrbracket^c) \neq 1$ (when $X \to Y$ and c witness C2 and ST)

On the basis of alleged counterexamples to PC (Fundraiser), Khoo & Mandelkern claim that a condition like Bradley's Preservation Condition is "*not always valid* when we are thinking about a conditional from a different context [than the context of assertion]" (my emphasis). Supposing that $C_c(\cdot | \llbracket \neg Y \rrbracket^c)$ represents a probability measure for a "different context" than the context of assertion, I have suggested that "not always valid" just isn't what is needed here: individual cases like Fundraiser are not up to the job of establishing the type of *systematic failure* of the Preservation Condition (as in NC2) that would be needed to really exorcise the spectre of Triviality.

3.3 Witnessing C2/C1

Let's now ask outright: *do* NC2 (or NC1) hold at the requisite level of generality? Let us start with some data from probability judgments. Consider this (truncated) famous case:

> Sly Pete and Mr. Stone are playing poker on a Mississippi riverboat. It is now up to Pete to call or fold. My henchman Zack sees Stone's hand, which is quite good, and signals its content to Pete... A few minutes later, Zack slips me a note. (Gibbard 1981: 231)

On Zack's note is this conditional (hereafter abbreviated *call* $\to$ *win*):

(5) If Pete called, he won.

Suppose I then learn that the fix is in, and, although Pete might have called, he couldn't have won the hand. In this new context, is it possible for me to have non-zero credence

[3] Consider this argument from Ellis (1978). Consider any conditional $X \to Y$ and context c such that $X \to Y$ is Strongly Centered at c and is independent of its antecedent at c:

Strong Centering. $\llbracket X \wedge Y \rrbracket^c = \llbracket (X \to Y) \wedge X) \rrbracket^c$
Independence. $C_c(\llbracket X \to Y \rrbracket^c | \llbracket X \rrbracket^c) = C_c(\llbracket X \to Y \rrbracket^c)$

Theorem 3. *If $X \to Y$ and c witness Strong Centering and Independence,* $C_c(\llbracket Y \rrbracket^c | \llbracket X \rrbracket^c) = C_c(\llbracket X \to Y \rrbracket^c)$.

Proof. Suppose $\llbracket X \wedge Y \rrbracket^c = \llbracket (X \to Y) \wedge X) \rrbracket^c$ and $C_c(\llbracket X \to Y \rrbracket^c | \llbracket X \rrbracket^c) = C_c(\llbracket X \to Y \rrbracket^c)$. Then:

$$C_c(\llbracket X \to Y \rrbracket^c) = \frac{C_c(\llbracket (X \to Y) \wedge X \rrbracket^c)}{C_c(\llbracket X \rrbracket^c)} = \frac{C_c(\llbracket X \wedge Y \rrbracket^c)}{C_c(\llbracket X \rrbracket^c)} = C_c(\llbracket Y \rrbracket^c | \llbracket X \rrbracket^c)$$ □

While Strong Centering and Independence may have counterexamples, they would seem to be witnessed by the preponderance of conditionals and contexts: typically the truth of the conjunction $X \wedge Y$ at c suffices for the truth of $X \to Y$ at c, and typically an agent's assessment of the likelihood of a conditional does not depend on their assessment of the likelihood of its antecedent (cf. Charlow 2016: §3.5) that what Zack said is true? It seems that it is not. Assessing the likelihood of what Zack said at c with (5) thus appears to be subject to the following constraint: if we increment c with the information that Pete lost, what Zack said at c is certainly false, as assessed from the incremented context. That is to say: (5) and c witness C2. (By similar reasoning, if we increment c with the information that Pete won, what Zack said at c is certainly true, as assessed from the incremented context. That is to say: (5) and c witness C1.) Assuming (5) and c witness C2, we can derive the following trivializing consequence of Theorem 1:

$$C_c([\![win]\!]^c | [\![call \to win]\!]^c) = 1$$

And this is absurd: if you happen to learn that what Zack said in c is true, you are in no position to conclude that Pete won.

Similarly, let us assume, as seems correct, that (5) witnesses, in addition to C1 and C2, Strong Centering and Independence at c, and therefore witnesses ST at c (by the reasoning in fn3). These facts in hand, we have this consequence of Theorem 2:

$$C_c([\![win]\!]^c | [\![call]\!]^c) = C_c([\![win]\!]^c)$$

Again, this is absurd: it is obvious that the likelihood of Pete having won the hand depends on whether or not he called (after all, he couldn't have won if he didn't call).

Examples like this multiply: *many* conditionals $X \to Y$ and contexts c seem to witness C2 (in addition to witnessing C1 and ST). For any c and $X \to Y$ witnessing C2, $C_c([\![Y]\!]^c | [\![X \to Y]\!]^c) = 1$; and for any c and $X \to Y$ witnessing, in addition, C1 and ST, $C_c([\![Y]\!]^c) = C_c([\![Y]\!]^c | [\![X]\!]^c)$.

3.4 The Logic of Indicative Conditionals

It is reasonable to worry that we are approaching questions about what value to assign the conditional, *conditional on* (the negation of) its consequent, in a suspect way—i.e., via probability judgments. These values are, after all, *defined* (in the usual way, via the Ratio). Given the Ratio, moreover:

$$\begin{aligned} C_c([\![call \to win]\!]^c | [\![\neg win]\!]^c) = 0 &\text{ iff } C_c([\![\neg win \wedge (call \to win)]\!]^c) = 0 \\ C_c([\![call \to win]\!]^c | [\![win]\!]^c) = 1 &\text{ iff } C_c([\![win \wedge (call \to win)]\!]^c) = C_c([\![win]\!]^c) \\ &\text{ iff } C_c([\![win \wedge \neg(call \to win)]\!]^c) = 0 \end{aligned}$$

Presented this way, these might seem like strange conditions even to entertain for $call \to win$ and c. If one begins from the assumption that $call \to win$ expresses a (possible worlds) proposition, I can see why you would think that: it seems obvious that if Pete did not win at w, this would not ordinarily have any bearing on whether (say) the nearest-to-w worlds where Pete called are worlds where he won; a context in which Pete's not winning at w was represented as incompatible with the truth of $call \to win$ at w would, on the face of things, be a strange context indeed.[4]

[4] Recall (§2) Rothschild (2013)'s observation: if $X \to Y$ and c are such that (letting S_c designate the c-relevant knowledge source)

$$[\![X \to Y]\!]^c = \{w : S_c \text{ knows that } X \supset Y \text{ in } w\}$$

And yet the data seems to tell a different story. In particular, observe that utterances of the form $\neg win \wedge (call \to win)$ or $win \wedge \neg(call \to win)$ are ordinarily unacceptable (particularly stipulating a presupposition that Pete might have called).

(6) #Pete didn't win, but if he called he won.

(7) #Pete won, but it's not true that if he called he won.

There are two ways to think about acceptability judgments like these—both of which make it difficult to avoid the conclusion that $call \to win$ and c witness C2. (A similar argument makes it difficult to avoid the conclusion that $call \to win$ and c witness C1.)

- Semantic: (6) is semantically inconsistent (more precisely: it is, on its default reading, semantically inconsistent). In a "classical" semantic setting, however, if (6) is semantically inconsistent, then for any context c such that C_c is *defined* for $[\![\neg win \wedge call \to win]\!]^c$, $C_c([\![\neg win \wedge call \to win]\!]^c) = 0$, in which case $call \to win$ and c witness C2.[5]
- Non-semantic: a sentence like (6) is not semantically inconsistent. But, even if that is so, there are evidently contexts c—e.g., any context that does not admit (6)—such that $C_c([\![(6)]\!]^c) = 0$. Any such context witnesses C2.

Using the Ratio to think about the likelihood of the conditional, *conditional on* (the negation of) its consequent, in fact strengthens the case for thinking that many conditionals $X \to Y$ and contexts c witness C2 (as well as C1).

4 Conclusion

The "trivializing consequences" for context-conditional pairs witnessing conditions like C2 amount to absurd instances of the sorts of universally quantified Triviality Results that are typically assessed as problematic in this literature. Yet such universal generalizations are generally thought to be problematic *because* they have *evidently absurd instances*. Khoo & Mandelkern (2018a) give a theory that is supposed to obviate the theorist's apparent commitment to these absurd instances: by denying UPC, they eliminate the *deductive guarantee* allowing the theorist to derive arbitrary (absurd) instances of Triviality Results,

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then $C_c([\![X \to Y]\!]^c | [\![\neg Y]\!]^c) \neq 0$ if $C_c(\{w : S_c \text{ knows that } X \supset Y \text{ in } w\} | [\![\neg Y]\!]^c) \neq 0$. But remember that this observation can be used to support an arguably more plausible modus tollens: if $C_c([\![X \to Y]\!]^c | [\![\neg Y]\!]^c) = 0$ and $C_c(\{w : S_c \text{ knows that } X \supset Y \text{ in } w\} | [\![\neg Y]\!]^c) \neq 0$, then $[\![X \to Y]\!]^c \neq \{w : S_c \text{ knows that } X \supset Y \text{ in } w\}$. (Of course, this modus tollens can be repeated for any semantics for $X \to Y$ according to which $C_c([\![X \to Y]\!]^c | [\![\neg Y]\!]^c) \neq 0$, whenever it is independently guaranteed that $C_c([\![X \to Y]\!]^c | [\![\neg Y]\!]^c) = 0$.)

[5] Argument that (6) is inconsistent. Assume that $\Diamond win \wedge \neg win$ is an "epistemic contradiction," hence inconsistent (Yalcin 2007; cf. Veltman 1996). Recall that $\Diamond call, call \to win \vDash \Diamond win$. Thus, $\{\Diamond call, call \to win, \neg win\}$ is inconsistent (because it implies an epistemic contradiction). Semantically, this appears to indicate that, when $C_c([\![call]\!]^c) > 0$, $C_c([\![\neg win \wedge call \to win]\!]^c) = 0$. Notice that, given the consequences of witnessing C2, modeling sentences like (6) as semantically inconsistent, *commits* the theorist to jettisoning "classical" semantic theories according to which the semantic content of an indicative conditional is a proposition over which probability measures are defined (for extensive discussion, see Charlow Forthcoming). The strategy here is roughly akin to Veltman (1996); Yalcin (2007), both of which use data from epistemic contradictions to motivate a non-classical semantics for epistemic modalities, on which they do not express propositions (as well as a non-classical logical consequence relation, on which local consequence does not, in general, amount to preservation of truth with respect to any world of evaluation).

by universal elimination. And, by endorsing LPC, they provide an explanation of the core intuitions that motivate someone like Bradley to endorse UPC.

This, to be clear, represents real progress in the philosophical dialectic that surrounds Triviality. As I've argued here, however, this sort of progress doesn't ultimately resolve any of the Big Questions about the indicative conditional that Triviality results are used to pose. In particular: *how could* a semantics for the indicative conditional avoid the theoretical pathologies associated with Triviality results? A satisfying answer to this question still eludes us (although I have intimated that the answer to this question lies in a semantics for the conditional on which it does not mean a proposition[6]). Triviality's spectre remains in dire need of exorcism.[7]

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[6] For extant treatments of the semantics of the indicative conditional along these lines, see (a.o.) Adams (1975); Edgington (1995); Bennett (2003); Bradley (2012). See Charlow (Forthcoming) for my own attempt.

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