General Triviality for Counterfactuals*

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Abstract. On an influential line of thinking tracing back to Ramsey, conditionals are closely linked to the attitude of supposition. When applied to counterfactuals, this view suggests a subjunctive version of the so-called Ramsey test: the probability of a counterfactual *If A, would B* ought to be equivalent to the probability of B, under the subjunctive supposition that A. I present a collapse result for any view that endorses the subjunctive version of the Ramsey test. Starting from plausible assumptions, the result shows that one's rational credence in a *would*-counterfactual and in the corresponding *might*-counterfactual have to be identical.

1 Suppositional credences

On an influential tradition going back to Ramsey, conditionals in natural language are closely related to the attitude of supposition. This view has been widely explored for indicative conditionals (see, among many, Adams 1975; Edgington 1986, 1995). On suppositional views, asserting *If A, then B* amounts to asserting B, in the context of a supposition that A. One simple argument for the suppositional view is that, aside from the obvious syntactic differences, the discourses in (1) seem to update the context in the same way.

(1) a. If Frida danced, Maria danced too.
 b. Suppose that Frida danced. Then Maria danced too.

This claim about assertion of conditionals is naturally paired with a claim about credence. One's degree of rational credence in a conditional *If A, B* should equal one's degree of credence in B, under the supposition that A. Using

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$\ulcorner A > B \urcorner$ as a shorthand for *If A, B*, and $Cr_A(B)$ to stand for one's credence in B, under the supposition that A, this is stated precisely as follows:

Indicative Suppositional Credence (ISC).

For all A, B, and for any rational credence function Cr:

$$Cr(A > B) = Cr_A(B)$$

On standard Bayesian construals, credence under supposition is identified with conditional credence. Plugged into **ISC**, this yields a claim with a long pedigree in philosophy:

Stalnaker's Thesis.

For all A, B, and for any rational credence function Cr:

$$Cr(A > B) = Cr(B \mid A)$$

Stalnaker's Thesis is *prima facie* intuitive, but it has been subjected to an impressive battery of impossibility results (generally known as 'triviality results'), starting from Lewis 1976.[1]

The suppositional view can be naturally generalized to counterfactuals (see e.g. Edgington 2008).[2] As for the case of indicatives, there is an intuitive equivalence between conditionals and discourses involving supposition.

(2) a. If Frida had danced, Maria would have danced too.

b. Suppose that Frida had danced. Then Maria would have danced too.

Notice that the kind of supposition involved in (2) (call this 'subjunctive supposition') is different in kind from the supposition involved in (1) (call this 'indicative supposition'). For illustration, supposing that Shakespeare did not write Hamlet licenses very different results if the supposition is indicative, or subjunctive. In the former case, we will infer that someone else must have written Hamlet. In the latter, we will conclude that probably no one else would have written it. This contrast mirrors well-known contrasts for conditionals (see e.g. Adams 1970).

[1] See also, among many others, Hájek and Hall 1994, Bradley 2000, Bradley 2007, Charlow 2016. For attempts at vindicating the Thesis, see, among others, Van Fraassen 1976, Bradley 2012. The problem seems to go beyond Stalnaker's Thesis, as triviality results can be proven for all statements belonging to epistemic discourse, and not just conditionals. See (Russell and Hawthorne 2016, Goldstein forthcoming).

[2] Both the labels 'counterfactual' and 'subjunctive' are notoriously problematic. Here I use both interchangeably to denote the relevant class of conditionals.

The suppositional view of counterfactuals also yields a claim about credence.[3] Let '$Cr^{\mathsf{A}}(\mathsf{B})$' denote credence in B, on the subjunctive supposition that A, and '$\mathsf{A} > \mathsf{B}$' this time as a shorthand for *If A, would B*:[4]

Subjunctive Suppositional Credence (SSC).
For all A, B, and for any rational credence function Cr:

$$Cr(\mathsf{A} > \mathsf{B}) = Cr^{\mathsf{A}}(\mathsf{B})$$

Like **ISC**, **SSC** can be fleshed out by saying something more specific about the notion of suppositional credence. But there is a difference between **ISC** and **SSC**. In the indicative case, there is a standard way of formalizing the notion of a suppositional credence—i.e., as we saw, via conditional probability. In the counterfactual case, there are a number of proposals, none of which are universally accepted. One option, due to Skyrms 1980b, is to equate subjunctive suppositional credences with expectations of conditional chances. Using Ch_w to stand for the chance function at w:[5]

Skyrms' Thesis.
For all A, B, and for all rational credence functions Cr such that $Cr(\mathsf{A}) > 0$:

$$Cr^{\mathsf{A}}(\mathsf{B}) = \sum_{w_i \in W} Cr(w_i) \times Ch_{w_i}(\mathsf{B} \mid \mathsf{A})$$

But there is no general agreement that Skyrms' Thesis is correct. In fact, the contemporary literature includes an array of alternative ways of cashing out

[3]I am indebted to Williams 2012 for this way of setting up the problem, and in particular for formulating **SSC** (which Williams calls 'Subjunctive Ramsey').

[4]A referee worries that there is an asymmetry between judgments about credences in counterfactuals and judgments about subjunctive suppositional credence. In particular, they consider (i):

(i) If the coin had been flipped, it would have landed heads.

The worry is that one can hear (i) as false, especially if the '*would*' is focused. Two points in response. First, we know that focus has truth-conditional effects; so using focus might change the meaning of *would*, and turn it into a stronger quantifer (see Moss 2013 for an analogous point in response to Hájek). Second, a view that rules (i) as false appears to yield wrong predictions for embeddings (see Higginbotham 1986, Klinedinst 2011, *[reference omitted]* for arguments in this vein). For example, suppose that we are looking at a bunch of fair coins that were never flipped. A theory that predicts that (i) is false also seems to predict, incorrectly, that (ii) is true:

(ii) No coin would have landed heads, if it had been flipped.

[5]A precise statement of Skyrms' Thesis would involve indexing the chance function to suitable times. I skip over this, since I target a view that is more general than Skyrms' Thesis.

subjunctive suppositions. (For some proposals, see Schulz 2017, Khoo 2020, Schultheis 2020, *[reference omitted]*.)

Luckily, for current purposes, it is irrelevant how to cash out **SSC**. This paper presents a triviality result that affects all versions of **SSC**, independently of how we understand suppositional subjunctive credence. This result is a kind of collapse result: it shows that, given initially plausible assumptions, one's credence in a *would*-counterfactual $\mathsf{A} > \mathsf{B}$ should equal one's credence in the corresponding *might*-counterfactual $\mathsf{A} \diamondrightarrow \mathsf{B}$. The assumptions are: (i) **SSC**, (ii) classical Bayesianism about credence, and (iii) plausible principles about credences in counterfactuals, which are presented in §3.

The literature contains several other triviality results for counterfactuals: see e.g. Williams 2012 and Briggs 2017. But these results appeal to specific assumptions about suppositional credence (for Williams, Skyrms' Thesis, for Briggs a similar principle appealing to credences in causal partitions due to Stefan Kaufmann, for which see Kaufmann 2005). Williams's proof also makes crucial appeal to the Principal Principle (Lewis 1980). The present result assumes nothing about the link between credence and chance, or credence in causal partitions. It is important to see that triviality can be achieved with much weaker and less controversial assumptions.

I proceed as follows. §2 presents some warm-up observations. §3 contains the proof of the result. §4 discusses some options for resisting triviality. Throughout the paper, I represent *would*-counterfactuals with the conditional corner '>' and *might*-counterfactuals with the usual '$\diamondrightarrow$' symbol.

2 Warm-up

As a warm-up, I review two simple results, one concerning conditional logic and one concerning credences in counterfactuals. This will help see the structure of the proof in §3.

Warm-up, 1/2. There is a traditional tension between two seemingly intuitive principles of counterfactual logic. On the one hand, a principle of Conditional Excluded Middle seems to hold for *would*-counterfactuals. On the other, *would*- and *might*-counterfactuals seem to be duals.

Conditional Excluded Middle. (CEM) $\vDash (\mathsf{A} > \mathsf{B}) \vee (\mathsf{A} > \neg\mathsf{B})$

Duality. $(\mathsf{A} > \mathsf{B}) \mathrel{\Dashv\vDash} \neg(\mathsf{A} \diamondrightarrow \neg\mathsf{B})$

The choice between these two principles is the central point of contention in the classical debate between Lewis (1973a; 1973b) and Stalnaker (1968; 1981; 1984). Here I won't rehearse the arguments for why they both seem plausible. What matters is observing that, if the background logic is classical, assuming both CEM and Duality yields an unacceptable result: $\mathsf{A} > \mathsf{B}$ and $\mathsf{A} \diamondrightarrow \mathsf{B}$ are logically equivalent. It is uncontroversial that $\mathsf{A} > \mathsf{B}$ entails $\mathsf{A} \diamond\!\!\rightarrow \mathsf{B}$; below is a proof of the other direction.

i.	$\mathsf{A} \diamond\!\!\rightarrow \mathsf{B}$	Assumption
ii.	$\quad \mathsf{A} > \neg\mathsf{B}$	Supposition for conditional proof
iii.	$\quad \mathsf{A} > \neg\mathsf{B} \wedge \mathsf{A} \diamond\!\!\rightarrow \mathsf{B}$	(i, ii, $\wedge$-Introduction)
iv.	$\quad \bot$	(iii, Duality)
v.	$\neg(\mathsf{A} > \neg\mathsf{B})$	(ii-iv, Reductio)
vi.	$(\mathsf{A} > \mathsf{B}) \vee (\mathsf{A} > \neg\mathsf{B})$	(CEM)
vii.	$\mathsf{A} > \mathsf{B}$	(v, vi, Disjunctive syllogism)

This paper proves a probabilistic counterpart of the collapse of *would*- and *might*-conditionals, starting from much weaker assumptions.

Warm-up, 2/2. We can get a credal version of the previous result from Duality alone, if we replace CEM with the following principle about suppositional credence:

Restricted Suppositional Additivity (RSA). $\quad Cr^{\mathsf{A}}(\mathsf{B}) + Cr^{\mathsf{A}}(\neg\mathsf{B}) = 1$

RSA says that one's suppositional credences in B and in $\neg\mathsf{B}$, on the supposition that A, should sum up to 1. It is a minimal assumption of classicality for suppositional credence, and moreover it is an immediate consequence of the standard Kolmogorov axioms. So **RSA** is a given, if we assume a classical treatment of suppositional probability.

Given **RSA**, we can prove:

Simple Collapse.
Assume **Duality** and **SSC**. Then, for any rational credence function Cr and for all A, B:

$$Cr(\mathsf{A} > \mathsf{B}) = Cr(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B})$$

The proof:

i.	$Cr^{\mathsf{A}}(\mathsf{B}) + Cr^{\mathsf{A}}(\neg\mathsf{B}) = 1$	(RSA)
ii.	$Cr(\mathsf{A} > \mathsf{B}) + Cr(\mathsf{A} > \neg\mathsf{B}) = 1$	(i, SSC)
iii.	$Cr(\mathsf{A} > \mathsf{B}) + Cr(\neg(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B})) = 1$	(ii, Duality)
iv.	$Cr(\mathsf{A} > \mathsf{B}) + 1 - Cr(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B}) = 1$	(iii, prob. calculus)
v.	$Cr(\mathsf{A} > \mathsf{B}) = Cr(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B})$	(iv, algebra)

Simple Collapse is unsurprising. It is often remarked that counterfactual semantics that vindicate Duality interact poorly with probability, and theorists who want to vindicate **SSC** use semantics on which Duality fails. (see e.g. Edgington 2008; Schulz 2014, 2017). Simple Collapse just lends further support to existing arguments. This is why I have presented it merely as a warm-up. What is surprising is that, as I show below, the same conclusion can be derived without Duality.

3 General triviality for counterfactuals

My strategy for the proof is simple: I use two principles about credences in counterfactuals to derive the following probabilistic counterpart of Duality.

> **Probabilistic Duality.** For any probability function modeling rational credence Cr and for all A, B:
>
> $$Cr(\mathsf{A} > \mathsf{B}) = Cr(\neg(\mathsf{A} \diamond\!\!\rightarrow \neg\mathsf{B}))$$

Then, I use **Probabilistic Duality** to run the same proof that I used at the end of §2. Before starting, a note about the dialectic. The proof in this section targets accounts of counterfactuals that do not validate **Duality**. This is the best case scenario for supporters of **SSC**—since, as we showed in §2, **Duality** immediately leads to the collapse of probabilities of *would*- and *might*-counterfactuals.

3.1 Assumptions

I assume the following principles about credences in counterfactuals.

> **Nonzero.**
>
> For all A, B, and for all rational credence functions Cr such that $Cr(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B}) > 0$:
>
> $$Cr(\mathsf{A} > \mathsf{B} \mid \mathsf{A} \diamond\!\!\rightarrow \mathsf{B}) > 0$$
>
> **Upper bound.**
>
> For all A, B, and for all rational credence functions Cr:
>
> $$\text{If } Cr(\neg(\mathsf{A} \diamond\!\!\rightarrow \neg\mathsf{B})) = 1, \text{ then } Cr(\mathsf{A} > \mathsf{B}) = 1$$

I will also appeal to the following principle of conditional logic:

> **Conditional Non-Contradiction (CNC).**
>
> If A is metaphysically possible[6]: $\mathsf{A} > \neg\mathsf{B} \vDash \neg(\mathsf{A} > \mathsf{B})$

Finally, I assume:

> **Closure.**
>
> For any A such that $Cr(\mathsf{A}) > 0$: if $Cr(\bullet)$ is rational, then $Cr(\bullet \mid \mathsf{A})$ is rational.

[6]For current purposes, we can think of metaphysical possibility as being defined in the usual way via counterfactuals: $\diamond\mathsf{A} =_{def} \neg(\mathsf{A} > \bot)$

CNC and **Closure** can be motivated quickly. **CNC** is a principle validated by all standard conditional logic, and one that is extremely plausible for natural language counterfactuals. For illustration, observe that (3)-a clearly entails (3)-b.

(3) a. If Frida danced, Maria would not dance.

b. It's not the case that, if Frida danced, Maria would dance.

Closure says that the class of rational credence functions is closed under conditionalization. I.e., if a subject has a rational credence function and conditionalizes on a proposition with positive credence, the resulting credence function is still rational. This assumption is substantial, but it is standardly made in triviality proofs, for example by Lewis 1976 in his original proof for indicatives.

Motivating **Nonzero** and **Upper Bound** requires more extended discussion.

Motivating Nonzero. **Nonzero** says that the probability of *If A*, *would B*, conditional on *If A*, *might B*, has to be greater than zero. **Nonzero** captures the intuition that it seems irrational to be certain of (4)-a, and yet assign zero credence to (4)-b.

(4) a. If Sarah had tossed the coin, it might have landed tails.

b. If Sarah had tossed the coin, it would have landed tails.

Nonzero can be questioned by appealing to the idea that propositions that express live possibilities can still receive probability zero (see e.g. Hájek 2003). In particular, we might grant that, in some cases, a *might*-counterfactual is true while the corresponding *would*-counterfactual has probability zero. As a candidate example, consider:

(5) If Sarah picked a real number at random between 0 and 1, she might pick 0.5.

(6) If Sarah picked a real number at random between 0 and 1, she would pick 0.5.

This is a real concern. Rather than trying to argue against it, I'm happy to simply sidestep it. I grant that **Nonzero** might have limited applicability. We will still be able to derive the collapse result for a large subclass of counterfactuals. The counterfactuals in (4) are exactly cases of this sort. This is bad enough.

A second worry about **Nonzero** is that it is tension with a large family of semantics for counterfactuals, including Lewis's (1973a; 1973b) and Kratzer's (1981). On these semantics, which vindicate **Duality**, when $A \diamondto B$ and $A \diamondto \neg B$ are both true, $A > B$ and $A > \neg B$ are both false. So defenders of these semantics reject **Nonzero**.

The response is that accounts of counterfactuals in the style of Lewis and Kratzer are not the target of the proof—those accounts lead to collapse via a more direct route anyway, as showed in §2. Here I am assuming the most favorable semantic scenario for defenders of **SSC**, i.e. a scenario where **Duality** fails. On non-**Duality** accounts, **Nonzero** appears a plausible minimal principle regulating the relationship between credences in *would*- and *might*-counterfactuals.

Motivating Upper Bound. **Upper Bound** says that, if you are certain of $\neg(\mathsf{A} \diamond\!\!\rightarrow \neg\mathsf{B})$, then you should be certain of $\mathsf{A} > \mathsf{B}$ itself. Given a classical treatment of negation, this is the probabilistic counterpart of the right-to-left direction of **Duality**, namely:

Not-might-to-if $\quad \neg(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B}) \vDash (\mathsf{A} > \neg\mathsf{B})$

As I flagged, I am not assuming **Duality** here. But all theorists about counterfactuals should be happy with this direction of the principle. Theorists who depart from Lewis invariably complain that his semantics is too strong; but it is hard to find any view on which $\mathsf{A} > \mathsf{B}$ is not at least entailed by the negation of $\mathsf{A} \diamond\!\!\rightarrow \neg\mathsf{B}$.[7]. This is also confirmed empirically. Being certain of (7) seems to require being certain of (8).

(7) It's not true that, if Sarah had tossed the coin, it might have landed tails.

(8) If Sarah had tossed the coin, it would not have landed tails.

3.2 The proof

Step 1: incompatibility of $\mathsf{A} > \neg\mathsf{B}$ and $\mathsf{A} \diamond\!\!\rightarrow \mathsf{B}$. The first step establishes that a counterfactual $\mathsf{A} > \neg\mathsf{B}$ and the *might*-counterfactual $\mathsf{A} \diamond\!\!\rightarrow \mathsf{B}$ are incompatible: i.e., their conjunction has probability zero. Assume for *reductio* that, for some metaphysically possible A, $\mathsf{A} > \neg\mathsf{B}$ and $\mathsf{A} \diamond\!\!\rightarrow \mathsf{B}$ are compatible and that hence some probability function Cr assigns positive probability to both of them. Via **Nonzero**, we know:

i. $Cr(\mathsf{A} > \mathsf{B} \mid \mathsf{A} \diamond\!\!\rightarrow \mathsf{B}) > 0$

Assuming that the class of rational credence functions is closed under conditionalization, we have:

ii. $Cr_{\mathsf{A} > \neg\mathsf{B}}(\mathsf{A} > \mathsf{B} \mid \mathsf{A} \diamond\!\!\rightarrow \mathsf{B}) > 0$

Via the definition of conditionalization, (ii) is equivalent to:

[7] As Schulz 2017 puts it: $\neg(\mathsf{A} \diamond\!\!\rightarrow \neg\mathsf{B})$ is equivalent to Lewis-style truth conditions for counterfactuals. There are complaints in the literature that Lewis-style truth conditions are too strong; but it is uncontroversial that Lewis-style truth conditions entail the actual truth conditions of counterfactuals.

iii. $Cr(\mathsf{A} > \mathsf{B} \mid \mathsf{A} \diamond\!\!\rightarrow \mathsf{B} \wedge \mathsf{A} > \neg\mathsf{B}) > 0$

However, via **CNC**, we know that

iv. $Cr(\mathsf{A} > \mathsf{B} \mid \mathsf{A} > \neg\mathsf{B}) = 0$

Hence (iii) and (iv) contradict. We conclude that $\mathsf{A} > \neg\mathsf{B}$ and $\mathsf{A} \diamond\!\!\rightarrow \mathsf{B}$ are incompatible.

Step 2: equivalence of $\mathsf{A} > \neg\mathsf{B}$ and $\neg(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B})$. Take any Cr such that $Cr(\neg(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B})) > 0$. Then we can derive that $Cr(\mathsf{A} > \mathsf{B})$ is equal to $Cr(\neg(\mathsf{A} \diamond\!\!\rightarrow \neg\mathsf{B}))$. We first observe, via total probability:

i. $Cr(\mathsf{A} > \neg\mathsf{B}) = Cr(\mathsf{A} > \neg\mathsf{B} \wedge \mathsf{A} \diamond\!\!\rightarrow \mathsf{B}) + Cr(\mathsf{A} > \neg\mathsf{B} \wedge \neg(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B}))$

Via the previous proof, $Cr(\mathsf{A} > \neg\mathsf{B} \wedge \mathsf{A} \diamond\!\!\rightarrow \mathsf{B}) = 0$. Reorganizing the term on the right-hand side:

ii. $Cr(\mathsf{A} > \neg\mathsf{B}) = Cr(\mathsf{A} > \neg\mathsf{B} \mid \neg(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B})) \times Cr(\neg(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B}))$

Via the closure condition, $Cr(\cdot \mid \neg(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B}))$ is a rational credence function. Since $Cr(\neg(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B}) \mid \neg(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B})) = 1$, via **Upper Bound** we get that $Cr(\mathsf{A} > \neg\mathsf{B} \mid \neg(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B})) = 1$. Hence (ii) simplifies to

iii. $Cr(\mathsf{A} > \neg\mathsf{B}) = Cr(\neg(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B}))$

Assuming that negation is classical, we get:

> **Probabilistic Duality.** For all A, B, and for all rational Cr:
>
> $$Cr(\mathsf{A} > \mathsf{B}) = Cr(\neg(\mathsf{A} \diamond\!\!\rightarrow \neg\mathsf{B}))$$

Step 3: Collapse. At this point, we can run the same proof as in §2, and get an analogous result.

i.	$Cr^{\mathsf{A}}(\mathsf{B}) + Cr^{\mathsf{A}}(\neg\mathsf{B}) = 1$	(RSA)
ii.	$Cr(\mathsf{A} > \mathsf{B}) + Cr(\mathsf{A} > \neg\mathsf{B}) = 1$	(i, SSC)
iii.	$Cr(\mathsf{A} > \mathsf{B}) + Cr(\neg(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B})) = 1$	(ii, Probabilistic Duality)
iv.	$Cr(\mathsf{A} > \mathsf{B}) + 1 - Cr(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B}) = 1$	(iii, prob. calculus)
v.	$Cr(\mathsf{A} > \mathsf{B}) = Cr(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B})$	(iv, algebra)

In summary, we have proved:

> **Generalized Collapse.**
> Assume **Nonzero**, **Upper Bound**, **Subjunctive Suppositional Credence**, **Restricted Suppositional Additivity**, **CNC**, and **Closure**. Then, for any rational credence function Cr and for all A, B such that A is metaphysically possible :
>
> $$Cr(\mathsf{A} > \mathsf{B}) = Cr(\mathsf{A} \diamond\!\!\rightarrow \mathsf{B})$$

4 Discussion

Can we block **Generalized Collapse**? In this section, I survey some options and argue that none of them is immediately attractive.

Denying Upper Bound. This doesn't seem a realistic strategy. **Upper Bound** holds on any combination of plausible truth-conditional semantics for *would*- and *might*-counterfactuals. The only available account of *might*-counterfactuals seem to be variants of Lewis/Krazter-style semantics, on which they are analyzed as existential quantifiers over a set of (closest or close) worlds.[8] As a result, $\neg(\mathsf{A} \mathbin{\Diamond\!\!\rightarrow} \mathsf{B})$ has roughly the truth conditions:

> $\ulcorner\neg(\mathsf{A} \mathbin{\Diamond\!\!\rightarrow} \mathsf{B})\urcorner$ is true iff all closest A-worlds are not B-worlds

These truth-conditions are bound to entail $\mathsf{A} > \mathsf{B}$.[9]

Denying Nonzero. This might seem more promising, in the light of the fact that a number of standard semantic theories, including Lewis's, invalidate **Nonzero** (given plausible assumptions about credence). But these theories do so at the price of validating **Duality**, which leads to equally problematic results.

A better strategy involves arguing that **Nonzero** is only plausible in light of an ambiguity in *might*-counterfactuals. *might have*-statements are generally ambiguous between an epistemic and a non-epistemic reading (see Condoravdi 2002). For example, (9) has two readings, which are roughly glossed in (10).

(9) Frida might have been at the party.

(10)
   a. For all we know, Frida was at the party.
   b. There is a metaphysical/historical possibility where Frida is at the party.

This ambiguity, of course, extends to *might*-counterfactuals. One might argue that the only reading of the latter that validates **Nonzero** is the epistemic one, and that triviality is blocked if *might*-counterfactuals receive an epistemic reading.

The response to this worry is that, if there genuinely is an ambiguity, we should be able to hear a reading of *might*-conditionals on which **Nonzero** fails.

[8] Stalnaker 1984 defends the view that *might*-counterfactuals are simply counterfactuals outscoped by an epistemic *might*. I take it that, in the light of modern theories of modality in the style of Kratzer 2012, that view is outdated.

[9] One account that can elude this constraint is, in principle, the arbitrary selection account in Schulz 2014. If we let $\mathsf{A} > \mathsf{B}$ select an absolutely random world, with no further constraints, and constraint the domain of quantification of $\mathsf{A} \mathbin{\Diamond\!\!\rightarrow} \mathsf{B}$ to a set of close worlds, **Upper Bound** fails. But this version of the view fails to vindicate the obvious principle that *would*-counterfactuals entail *might*-counterfactuals ($\mathsf{A} > \mathsf{B} \vDash \mathsf{A} \mathbin{\Diamond\!\!\rightarrow} \mathsf{B}$), and hence is independently implausible.

But this reading is simply not available. There is no reading of (4) (repeated below) on which we can be certain of (4)-a, and not assign positive credence to (4)-b.[10]

(4) a. If Sarah had tossed the coin, it might have landed tails.

b. If Sarah had tossed the coin, it would have landed tails.

Denying Subjunctive Suppositional Credence (SSC). This option is costly both from an empirical and a conceptual point of view. On the empirical side, it just seems intuitive that, at least in simple examples involving coins and dice, rational credences in counterfactuals should mirror the relevant suppositional credences. On the conceptual side, we give up on the project of vindicating an appealing connection between conditionals and supposition.

Notice also that, given the structure of the proof, even just holding on to *some* instances of **SSC** will be problematic. Given **Probabilistic Duality**, endorsing a particular instance of **SSC** for $A > B$ and for its counterpart with negated consequent $A > \neg B$ will lead to the claim that $A > B$ and $A \diamond\!\!\rightarrow B$ have equal probability. So we need to deny not just that **SSC** holds in general, but also that each particular instance holds.

Invoking context dependence? One longstanding strategy for blocking triviality for epistemic modalities involves invoking the context-dependence of epistemic discourse.[11] A number of triviality proofs involve assigning probability to a conditional both unconditionally and under supposition. One way to respond to the proof is to claim that shifts in what information is assumed involve shifts in the interpretation of the conditional, and that hence the relevant proofs involve equivocation.

Whatever the merits of this response for epistemic conditionals, this strategy doesn't carry over in a straightforward way to counterfactuals. On truth-conditional semantics for epistemic modality, the interpretation of epistemic claims is relativized to the knowledge state of an agent. As a result, it is natural to think that, when the claim is assessed under supposition, it receives a different interpretation than when it is assessed on its own. But this consideration does not extend to counterfactuals. Counterfactuals are not interpreted relative to knowledge states, and in general their interpretation is not expected to shift under supposition. Hence the context-dependence move cannot be straightforwardly replicated for counterfactuals.

[10] A variant of this objection holds that *might*-counterfactuals are invariably epistemic in flavor, as proposed by Stalnaker 1984. On this view, the result presented in this paper would end up being a variant of the triviality results for epistemic modals in Russell and Hawthorne 2016. As mentioned in fn. 8, that view of *might*-counterfactuals appears to be outdated.

[11] For a classical response in this style, see Van Fraassen 1976 and related work.

5 Conclusion

I have presented a proof showing that, on seemingly reasonable assumptions, a subject's rational credence in $\mathsf{A} > \mathsf{B}$ should equal their rational credence in $\mathsf{A} \mathbin{\Diamond\!\!\rightarrow} \mathsf{B}$. This consequence is unacceptable, hence we have a kind of triviality result for counterfactuals. Differently from other similar results (see Williams 2012, Briggs 2017), the result does not rely on any specific way of cashing out suppositional credences for counterfactuals. Hence the result is more general than other results in the literature. Moreover, I have argued that there is no obvious way to block the results. The project of assigning plausible probabilities to conditionals is as challenging for counterfactuals as it is for indicatives.

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