

Durham Research Online

Deposited in DRO:

01 April 2019

Version of attached file:

Published Version

Peer-review status of attached file:

Peer-reviewed

Citation for published item:

Faraci, David (2019) 'Groundwork for an explanationist account of epistemic coincidence.', *Philosophers' imprint.*, 19 (4). pp. 1-26.

Further information on publisher's website:

<http://hdl.handle.net/2027/spo.3521354.0019.004>

Publisher's copyright statement:

© 2019 David Faraci. This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 3.0 License. <www.philosophersimprint.org/019004/>

Additional information:

Use policy

The full-text may be used and/or reproduced, and given to third parties in any format or medium, without prior permission or charge, for personal research or study, educational, or not-for-profit purposes provided that:

- a full bibliographic reference is made to the original source
- a [link](#) is made to the metadata record in DRO
- the full-text is not changed in any way

The full-text must not be sold in any format or medium without the formal permission of the copyright holders.

Please consult the [full DRO policy](#) for further details.

Groundwork for an Explanationist Account of Epistemic Coincidence

David Faraci

Durham University

© 2019 David Faraci

*This work is licensed under a Creative Commons
Attribution-NonCommercial-NoDerivatives 3.0 License.
<www.philosophersimprint.org/019004/>*

Many philosophers hold out hope that some final condition on knowledge will allow us to overcome the limitations of the classic “justified true belief” analysis. The most popular intuitive glosses on this condition frame it as an absence of *epistemic coincidence* (accident, luck).¹ In this paper, I lay the groundwork for an *explanationist* account of epistemic coincidence — one according to which, roughly, beliefs are non-coincidentally true if and only if they bear the right sort of explanatory relation to the truth. More specifically, I defend a sufficient explanationist condition for epistemic coincidence and explore avenues for development of a sufficient condition for *avoiding* such coincidence.²

This paper contains both positive arguments for explanationism and negative arguments against its competitors. But the relationship between these elements is tighter than typical. I aim to show not only that explanationism is independently plausible, and superior to its competitors, but also that it helps make sense of both the appeal and the failings of those competitors. In service of this, §1 provides a roadmap of the paper within an overarching narrative on which theorizing about epistemic coincidence has trended in the right direction — towards explanationism — but where success has been blocked by a series of understandable missteps.

1. Narrative Roadmap

Causal theories (e.g., Goldman 1967) were amongst the earliest post-Gettier (1963) attempts to analyze knowledge. Though they are not typically presented as such, we can easily draw from them an account of epistemic coincidence. Such *causationism* holds, roughly, that beliefs are non-coincidentally true if and only if they bear the right sort of *causal* relation to the truth.

1. I am inclined to think that the final condition just is an anti-coincidence condition, but nothing here rests on that claim.
2. I phrase it this way, rather than in terms of a necessary condition for epistemic coincidence, because I find it more intuitive, but obviously the two are equivalent.

If coincidences are causal phenomena, cases cannot differ in *coincidence-status* without differing causally. This anticipates two problems for causationism. First, there are *coincidence contrasts* — pairs of cases, one intuitively coincidental, the other non-coincidental — where there are no causal relations at all between the beliefs and the truth. This shows that an absence of causal connection is neither sufficient for epistemic coincidence nor sufficient for avoiding it. Second, there are *arguably* coincidence contrasts where the causal relations in both cases are the *same*. If so, then no particular causal relation allows us to avoid epistemic coincidence. This takes us through §2.

My view is that the first of causationism's problems is a result of its *narrowness*.³ Causation is but one kind of explanation, and I claim that focusing on the broader class of explanatory relations allows us to develop a superior sufficient condition for epistemic coincidence.⁴ I introduce such a condition in §3 and argue that it avoids the problem in question in §4.

The literature has not followed me in this. Rather, the most popular accounts of epistemic coincidence have been forms of *modalism*. Modalism holds, roughly, that beliefs are non-coincidentally true just in case they track the truth across some appropriate set of metaphysically possible worlds.⁵ The primary focus has been two (families of)

3. It is not hard to see how this narrowing might have occurred: in everyday life, we tend to focus on causal relations, and this can make it tempting for non-philosophers (and some philosophers) to think of all explanation as causal explanation.
4. I do not here offer an account of the boundary between causal and non-causal explanation. For our purposes, all that matters is that there is an intuitive distinction here, and that at least some explanatory relations are *hyperintensional*. The latter helps explain the failings of modalism exposed in §5: differences in coincidence-status outstrip modal differences because extensional and intensional equivalents, like 89's being prime and its being a Fibonacci number, can differ in their explanatory relations to our beliefs.
5. Proponents of modal conditions include Black (2008), Black and Murphy (2007), Clarke-Doane (2012, 2014, 2015, 2016), DeRose (1995), Dretske (1971), Ichikawa (2011), Luper-Foy (1984), Nozick (1981), Pritchard (2007, 2009), Roush (2005), Sainsbury (1997), Sosa (1999a, 1999b, 2007, 2009), and Williamson (2002), among others. It is not always clear whether these authors

modal conditions: *sensitivity* considers whether our beliefs would have tracked the truth had it been different;⁶ *safety* considers whether our beliefs track the truth at nearby (i.e., similar) worlds.⁷

As I discuss in §5.1, there are striking similarities between sensitivity (the earliest modal condition) and simple counterfactual theories of causation. Given this, it is fruitful to think of at least early modalism as the result of replacing explicitly causal conditions with modal conditions adapted from causal *models*.

The problem here is simple: if causationism fails because it is too narrow, and modal conditions began as adapted models of causal relations, we should expect modalism to fail for the same reasons of narrowness. Indeed it does: there are coincidence contrasts where there are no differences in the *modal* relations between the beliefs and truth, as I show in §5.2. What's more, as we'll see, there are important affinities between my arguments for explanationism in §§3–4 and this failing of modalism.

A natural question at this point is whether modalism's narrowness is a result of the appeal to counterfactuals *per se* or merely of a modal semantics *for* counterfactuals. If the former, this would further support explanationism. But defending this would require an argument that some explanatory relations cannot be modeled counterfactually. While I raise some concerns in §6.2, I offer no such argument. Instead, in §6.1 I examine the counterfactual conditions required to systematize our judgements about epistemic coincidence (to whatever extent they can). I argue that the nature and variety of these conditions suggests that the intuitive roots of our judgements concern explanation rather

take meeting their preferred conditions to be sufficient for avoiding epistemic coincidence, but all take it to be necessary.

6. The original sensitivity condition is Nozick's (1981). Note that Nozick rejected the relevance of sensitivity to knowledge of necessary truths, a point whose significance will become clear in §5.
7. There are a number of different notions of "safety" in the literature. This framing echoes Justin Clarke-Doane's (2016), whose arguments will be important in §§4–5. It is closer — though not identical — to Williamson's (2002) than to Sosa's (1999b) original formulation.

than counterfactuals directly. (I refer to the view that the relevant intuitions do concern counterfactuals directly as “counterfactualism”.)

Again, the literature has not followed me in this. Many philosophers treat counterfactual conditions as direct representatives of the intuitions behind our judgements about epistemic coincidence. Indeed, the literature has shifted towards conditions, like safety, that look less like adapted explanatory models and more like representatives of a directly counterfactual notion of coincidence.

This shift can be – and I suspect has been to some extent, though the issue is not typically framed this way – motivated by the second problem for causationism and, by extension, explanationism: the existence of coincidence contrasts where all explanatory relations between beliefs and truth appear to be the same. The most famous example here is Goldman’s (1976) fake barn case, which he himself takes to undermine his earlier causal theory: an agent *actually sees a barn*, but the presence of barn-façades in the area renders her belief coincidentally true. The problem for both causationism and explanationism is that this agent’s belief seems to be explained by the barn in exactly the same way that it would be in a *non*-coincidental case where there are no barn-façades around. This helps motivate the idea that the fundamental problem in such cases isn’t an absence of explanatory connection, causal or otherwise, but rather (in keeping with safety) that the relevant beliefs *almost* failed to be true.

In §7, I argue that, despite initial appearances, there are promising explanationist strategies for distinguishing cases like Goldman’s from non-coincidental cousins. This leaves open the possibility that explanationists can develop a sufficient condition for avoiding epistemic coincidence. What’s more, I argue that explanationism is well-positioned both to solve certain puzzles about cases like Goldman’s and to explain why those puzzles have seemed insoluble given counterfactualism – explanations that echo my arguments against counterfactualism from §6.1.

In §8, I very briefly consider how my arguments relate to two supposed reasons for skepticism about the analysis of knowledge, and to

issues beyond epistemology, then conclude with a brief discussion of how they relate to where, autobiographically, they began: with a fundamental epistemological challenge in metaethics.

2. Two Failures of Causationism

Begin with a classic Gettier case:⁸

Bad Clock Bertie wants to know what time it is. She consults her kitchen clock, which she has been using for years, and which has typically been accurate. The clock reads “10:00”. And it is indeed 10:00. But the clock reads this because it stopped exactly twelve hours ago.

It is common to explain the import of **Bad Clock** as follows: It seems clear that knowledge requires more than true belief; a lucky guess is not knowledge. It is tempting to think the missing element is doxastic justification: it needs to be *reasonable* for Bertie to form her belief the way she does. But cases like **Bad Clock** show that this isn’t enough. It is perfectly reasonable to form beliefs by consulting a historically accurate kitchen clock. Yet, as in this case, it can be a mere *coincidence* that a justified belief is true; a stopped clock is right only twice a day, and Bertie just *happened* to consult it at one of those moments.⁹

What precisely makes this and others cases of epistemic coincidence? It is important to note that ‘coincidence’ is not meant to be a term of art here, but rather serves to reflect common, pretheoretical intuitions about what’s gone wrong in Gettier cases. Given this, it is appropriate to begin our philosophical theorizing with a dictionary definition: a coincidence is “a remarkable concurrence of events

8. That is: a case of justified true belief that fails to be knowledge. Note that not only justified beliefs can exhibit epistemic coincidence; merely true beliefs can as well. I focus on Gettier cases to avoid concerns that the intuitive failures of knowledge I focus on are non-coincidental failures of justification.
9. This is a variation on a case from Russell (1948), which (as I am not even vaguely close to being the first to note) is a far more elegant case of justified true belief that fails to be knowledge than those offered by Gettier himself, but which Russell did not frame as such.

or circumstances without apparent causal connection".¹⁰ And, indeed, this isn't a bad start for distinguishing **Bad Clock** from non-coincidental cousins. Bertie's belief is caused by the fact that her clock reads "10:00". But the fact that it is 10:00 does not cause the clock to read this; whatever caused it to stop at 10:00 last night does. By contrast, in a version of the case where the clock is still working, there is surely *some* connection¹¹ between the fact that it is 10:00 and the clock's reading "10:00", which in turn causes Bertie to believe — now, seemingly, *know* — that it is 10:00. This makes it both fitting and unsurprising that causal theories were amongst the first deployed in efforts to solve the Gettier problem — though these were typically offered as theories of knowledge itself, rather than of epistemic coincidence (e.g., Goldman 1967).

Unfortunately, causal theories of knowledge fail. One of their clearest failings stems from the existence of causally impotent, mind-independent truths — e.g., on many accounts, those of mathematics and ethics.¹² If causal connection to the truth is required for knowledge, and causal connection to some truths is impossible, then knowledge of those truths is impossible.

10. This definition comes from Google's in-engine dictionary. Other definitions serve my rhetorical aims less well, but in no way threaten them. Dictionary.com's definition appeals to *chance*, which might itself be accounted for modally or explanatorily: "a striking occurrence of two or more events at one time apparently by mere chance". Merriam-Webster's definition similarly appeals to *accident*, though it also — tellingly, I think — appeals to *connection*: "the occurrence of events that happen at the same time by accident but seem to have some connection".

11. One might doubt that the time *causes* the clock to read "10:00" in the good case, but surely there is some explanatory connection between the two, causal or otherwise. (Consider how natural it is to say that a working clock reads "10:00" at 10:00 *because* it is 10:00.) So, at worst, this ultimately supports explanationism over causationism, which falls nicely in line with my aims.

12. The mind-independence ensures that a causal connection cannot run the other way: our beliefs cannot cause the truth. Causal inefficacy and mind-independence are contentious in both metaethics and the philosophy of mathematics, but so long as we have — or even just wish to theorize about the *possibility* of — knowledge in some domains of causally inefficacious, mind-independent truth, the problem stands.

This is a serious enough problem as it stands, but for our purposes it will be useful to adapt it as a threat to causationist accounts of epistemic coincidence in particular. To begin, note that one *could* claim that where causal connections are impossible, coincidences are impossible or questions of coincidence simply don't apply, and thus all relevant cases are *non*-coincidental. (This anticipates a problematic modalist strategy discussed in §5.1.) But this won't do, because we intuitively mark coincidence *contrasts* involving truths that bear no causal relations to our beliefs: sometimes our mathematical and ethical beliefs are coincidentally true; sometimes they aren't. For example:

Bad Math Leo comes to believe that 89 is a prime number because he looks at a list labeled "Some Prime Numbers" in a historically accurate mathematics textbook and sees "89". As it happens, this is a mislabeled list of some Fibonacci numbers. [89 is a Fibonacci prime.]

Good Math Lisa comes to believe that 89 is a prime number because she goes through its possible factors and, through accurate calculation, determines that 89 has precisely two factors: 1 and itself.

Intuitively, **Bad Math** is a case of epistemic coincidence, while **Good Math** is not.¹³ Given the common assumption that facts about which numbers are prime are causally impotent, there is simply no way for causationists to vindicate both judgements.

I will call contrasts like that between **Bad Math** and **Good Math** "no-causal-connection coincidence contrasts", or "no-cause contrasts" for short. The existence of no-cause contrasts illuminates a fundamental problem for causationism: differences in coincidence-status

13. One could claim that **Bad Math** is a case of unjustified belief, but this surely need not be so; indeed, I stipulated that Leo's textbook was historically accurate precisely to help alleviate this concern. Perhaps one could also build details into **Good Math** to make it seem coincidental — say, if Lisa thought that any number that has 1 as a factor is a prime number; again, this is irrelevant, since the point here is just to show that relevant contrasts are possible.

outstrip causal differences, and thus no causationist account can accommodate all of our judgements about epistemic coincidence.

There is a second, related problem for causationism. In addition to coincidence contrasts where there are *no* causal connections, there are coincidence contrasts where the causal connections appear to be the *same*. I mentioned one example earlier, involving Goldman's fake barn case. Here is a somewhat different example:

Bad Sheep Mary sees a sheep-façade in a field and judges there to be a sheep in the field. Unbeknownst to Mary, there is a sheep hiding behind the sheep-façade, which is there because it was attracted by the façade.

Good Sheep Bo sees a sheep-façade in a field and judges there to be a sheep in the field. She does so because she knows that what she is seeing is either a sheep-façade or the one local sheep, and that whenever the former is present, the latter is hiding behind it.

Intuitively, **Bad Sheep** is a case of epistemic coincidence, while **Good Sheep** is not. Yet arguably Mary's and Bo's beliefs bear the same causal connection to the truth. The apparent existence of such *same-cause* contrasts seems to show yet again that differences in coincidence-status outstrip causal differences. I address cases like these in §7. For now, I focus on the issues raised by no-cause contrasts.

3. A Sufficient Condition for Epistemic Coincidence

The existence of no-cause contrasts is predictable given that non-philosophers distinguish coincidences from non-coincidences in other contexts involving causally inefficacious truths. Mathematicians, for example, describe some sets of mathematical truths as coincidental, others as non-coincidental. Yet there are no differences in causal relation between sets of pure mathematical truths.¹⁴ (There are likewise no

14. They are also not "concurrency[s] of events or circumstances" — another overly narrow aspect of the dictionary definition.

modal differences: pure mathematical truths are necessary, and therefore all track one another perfectly across modal space.¹⁵) Helpfully, Marc Lange (2010) develops an explanatory account of coincidence, *precisely* to capture this practice of distinguishing mathematical coincidences from non-coincidences. In this section, I adapt his account to provide a sufficient explanationist condition for epistemic coincidence.

Begin with a mathematical coincidence contrast, using two of Lange's examples:

Calculator Using a standard calculator (or keyboard) 1–9 number pad, one can create palindromic numbers by moving back and forth across rows (e.g., 789987), up and down columns (e.g., 369963), and along diagonals (e.g., 159951). There are 16 such numbers. All of them are divisible by 37. (Lange 2010, 308–9; drawn from the December 1986 issue of *The Mathematical Gazette*)

Diophantine Here are two Diophantine equations (ones where the variables can take only integer values): $2x^2(x^2 - 1) = 3(y^2 - 1)$ and $x(x - 1)/2 = 2n - 1$. These two equations have the same five positive solutions: $x = 1, 2, 3, 6,$ and 91 . (Lange 2010, 309; drawn from Guy 1988, 704)

Diophantine is widely regarded as a coincidence. **Calculator** is not, because of the following proof:

[L]et $a, a + d, a + 2d$ be any three integers in arithmetic progression. Then

$$a \cdot 10^5 + (a + d) \cdot 10^4 + (a + 2d) \cdot 10^3 + (a + 2d) \cdot 10^2 + (a + d) \cdot 10 + a \cdot 1 = a(10^5 + 10^4 + 10^3 + 10^2 + 10 + 1) + d(10^4 + 2 \cdot 10^3 + 2 \cdot 10^2 + 10) = 1111111a + 12210d = 1221(91a + 10d).$$

15. Like the claim of causal impotence, the necessity claim is contentious (in metaethics as well — e.g., Rosen forthcoming), but innocent here (compare note 12).

So not only is the number divisible by 37, but by 1221 (= $3 \times 11 \times 37$). (Nummela 1987, 147; as quoted by Lange 2010, 310)

How does this proof show that **Calculator** is not a coincidence? It is not merely in virtue of *being a proof*. After all, we can prove **Diophantine**. Rather, the proof shows that **Calculator** is not a coincidence because it enables us to provide a *unified explanation* of the sixteen results (i.e., of the fact that 789987, 369963, 159951, etc. are all divisible by 37). There is reportedly nothing like this for **Diophantine**.

To get at the relevant sense of unification, note that for any apparent coincidence between the members of a set Γ , it may be possible to develop a *joint* explanation by conjoining the respective explanantia of each member of Γ .¹⁶ For example, it might seem quite the coincidence if you and I were in Minsk at the same time. We can offer the explanation: you are spending your sabbatical in Minsk, and I am on vacation in Minsk. Clearly, this does nothing to eliminate the coincidence.

What separates such merely conjunctive explanations from appropriately unified ones? In the Minsk example, we can offer just as good an explanation of *one* explanandum, but not the other, by isolating a portion of the explanans on offer. There is a coincidence between *your being in Minsk* and *my being in Minsk*. The first conjunct in the proposed explanans — you are spending your sabbatical in Minsk — explains the former incident just as well as the total, conjunctive explanans does, and does not explain the latter at all. This motivates:

16. I say “may” because it is not clear that all such conjunctions constitute explanations. Relatedly, Lange distinguishes unified explanations from unified deductions. Consider, for example, the fact that the decimal expansion of e begins 2.718281828. The chances of this early repetition of ‘1828’ are one in several thousand. This is widely regarded as a coincidence (Lange 2010, 324; drawn from Gowers 2007, 34). The fact that we can construct a unified proof that there is this repetition clearly provides no *explanation* of it. How to understand such mathematical explanation is a difficult question (one Lange tackles elsewhere, e.g., in his 2016), but, for our purposes, the intuitive distinction will suffice.

UNIFIED E is a unified explanation for the members of Γ if and only if no isolable part of E explains some members of Γ at least as well as E but fails to explain other members of Γ at least as well as E.¹⁷

UNIFIED accounts for the contrast between **Calculator** and **Diophantine**. We can prove that the two equations in **Diophantine** have the relevant positive solutions. And thus we can prove that *both* do by conjoining those proofs. But this is not a unified explanation: we can prove that one of the equations, but not the other, has the relevant positive solutions using a proper subpart of that joint explanation. By contrast, the proof offered for **Calculator** shows that all numbers with certain properties — ones shared by numbers formed in the relevant way on a number pad — will be divisible by 37 (and 1221).

Lange takes mathematical coincidence to obtain where there is no unified explanation for a set of mathematical truths.¹⁸ Can the preceding be adapted as a sufficient condition for coincidence generally? Consider the conditions under which the Minsk case would either cease to seem coincidental, or at least seem less coincidental, *if* we think of coincidence as an explanatory phenomenon. First, our being in Minsk at the same time would seem no (or less of a) coincidence if

17. Lange notes some complications that we can safely set aside. First, unification “may be vague at the margins — for instance, in whether a given proof explaining one component can be expanded to cover another component merely by removing an otiose restriction, or only by adding some slight further resource” (Lange 2010, 322). There, he thinks, the notion of coincidence will be correspondingly vague. This is a problem only if our intuitions about epistemic coincidence are never vague at the margins, a claim there is some evidence against (see §7). Second, there may be ways of developing disunified proofs so that their elements cannot be disentangled. I don’t know whether this problem can impact the issues we are talking about here, but it seems clear that this is a technical issue, not a substantive one. Third, Lange ultimately weakens his account of coincidence, allowing that a unified explanation need not explain *all* members of Γ , but may merely explain why each is true if *any* are. We can safely accept this amendment.
18. At least where the members of the set share some common feature that calls out for unified explanation. It is not necessarily a coincidence that $2+2=4$ and 2 is the only even prime, even if there is no unified explanation for these facts.

your presence explained mine, or vice versa — say, if I followed you to Minsk. Second, our both being in Minsk would seem no (or less of a) coincidence if some third factor explained both of our presences — say, if we were both attending a conference being held in Minsk that day.¹⁹

The latter, third-factor explanation is a unified explanation.²⁰ The former, where one of us follows the other, may be as well.²¹ But even if not, we can accommodate all relevant possibilities by adding a well-motivated second conjunct to our sufficient condition: a coincidence obtains if there is no unified explanation for all elements of the set in question *and* no explanatory chain linking all elements of that

19. As Lange argues, coincidences appear to be gradable. Certainly, there is still some coincidence left here: perhaps it is a coincidence that we both attended this conference. But it should be clear that the explanation on offer makes our meeting *less* of a coincidence. I will not address here *how* coincidental belief-truth correspondence has to be to undermine knowledge, though I will gesture in what I take to be the right direction in §7. Nevertheless, this is worth noting because it heads off a common objection: that *no* physical events are coincidences on an explanationist account, because all physical events have a common cause: the Big Bang. As Lange points out, this more plausibly suggests that which explanatory connections serve to eliminate coincidence is a contextual matter; it does not threaten the claim being relied on here, that a total absence of explanatory connection is sufficient for coincidence.
20. Again, at least as long as we keep in mind that coincidence is gradable (see previous note). For example, in order to explain why we are both in Minsk, we may need to appeal to the conference as well as psychological facts about each of us. The conference is a unified explanation for our presences. But the full explanation that includes our independent intentions to attend the conference will be partially disunified, since we may be able to explain your presence just as well without appealing to my intention. This is no objection. It simply raises the question of whether our intentions are coincidental. If there is some unified explanation for them — such as our both being members of an association for whose members the conference is mandatory — perhaps they are not, in which case a stronger unified explanation for our presence is available. (Then, of course, there is the question of whether our membership is coincidental....)
21. If I am there because of you, then by the transitivity of explanation, whatever explains your presence explains mine. But the view should not turn on whether there is such transitivity. The unified-explanation account also won't work in cases where at least one element of the apparent coincidence is a fundamental fact, unless fundamental facts explain themselves — again, something the view should not turn on.

set — e.g., in the case where the set has two members, neither explains the other. Thus:

COINCIDENCE It is a coincidence that the members of Γ are all true if (a) there is no unified explanation for the members of Γ and (b) no explanatory chain links all members of Γ .

The addition of (b) is well-motivated, because (b) is clearly recommended by the same underlying thought as (a). They represent the two ways in which there can be an *explanatory connection* between the members of a set: (a) through a shared relation to something outside the set or (b) through internal relations within it.²² Coincidence obtains where there is no such connection. In the epistemic case, this gives us:

EXPLANATIONIST For any true belief B and truth it concerns T, B is *coincidentally true* if (a) there is no unified explanation for B and T; (b) T does not explain B; and (c) B does not explain T.²³

22. Lange anticipates this development: “[S]uppose that one component [of a potential mathematical coincidence] is a mathematical axiom. Perhaps an axiom has no explanation. But the fact that all of those components are true is not then obviously coincidental — *especially in a case where the axiom explains the other component’s truth*. ... [I]f F is an axiom and has no explanation, whereas G is explained by F, then it is no coincidence that F and G both hold ...” (Lange 2010, n. 11, emphasis mine). (In this same note, he also mentions the possibility that axioms explain themselves, allowing for unified explanations of sets that include axioms.)
23. I offer this definition in terms of a single belief, rather than a set of beliefs, merely for the sake of simplicity. Once we move to sets, there is (for one) a question about how many of the beliefs need to be explanatorily connected to their attendant truths in order to avoid epistemic coincidence. Since EXPLANATIONIST is, again, merely a sufficient condition, I could sidestep this by noting that a sufficient condition would be when there are no connections between *any* elements of the sets. But this seemed needlessly wordy, and the simplification will make no difference in what follows.

This is our sufficient condition for epistemic coincidence. The next question is whether it avoids causationism's problem with no-cause contrasts.

4. Explanationist and No-Cause Contrasts

EXPLANATIONIST can accommodate no-cause contrasts if, in all relevant *non-coincidental* cases, there are no *causal* connections but there are still *explanatory* ones. For instance, while there may be no *causal* connection between the fact that 89 is prime and Lisa's belief in **Good Math**, there must be some *explanatory* connection — one absent in **Bad Math**.

Indeed, I do not think there are any *non-coincidental* cases without explanatory connections. The best evidence for this, I contend, is that in cases where it is *unclear* what the connection is, we tend to raise epistemological worries about the beliefs in question. One might naturally be puzzled, for example, about *how* the fact that 89 is prime is connected to Lisa's belief. If we begin to suspect that no such connection is possible, we are likely to wonder whether her being right is a coincidence after all, or even whether she *is* right that 89 is prime, since we may well have arrived at this conclusion by her same method.

This line of thought is given philosophical treatment within several massive, overlapping literatures on a set of related epistemological challenges, the most famous of which is the Benacerraf Problem (or "Benacerraf-Field Challenge") in the philosophy of mathematics (Benacerraf 1973; Field 1989). My view is that these challenges are rooted in concerns about epistemic coincidence, ones motivated most easily, and arguably *only*, by explanationism. The challenges' framing is certainly suggestive — there is frequent talk, for instance, of "links" and "connections". What's more, modalism renders these challenges incomprehensible in domains of purportedly necessary truth like mathematics and ethics, a claim argued for — strikingly, *championed* — by some modalists. Consider the conclusion of the last in a series of recent, influential papers by Justin Clarke-Doane (2012, 2014, 2015, 2016), wherein he understands the Benacerraf Problem as a challenge

to *explain the reliability* of our mathematical beliefs. He begins with his titular question:

What is the Benacerraf Problem? There does not seem to be a satisfying answer. There does not seem to be a sense of "explain the reliability" in which it is plausible both that it appears in principle impossible to explain the reliability of our mathematical beliefs and that the apparent in principle impossibility of explaining their reliability undermines them. The problem is quite general, infecting [many] arguments with the structure of the Benacerraf Problem (Clarke-Doane 2016, 36)

He ends the paper shortly thereafter:

[M]any philosophers would hold that a justified true belief which is both safe and sensitive qualifies as knowledge Perhaps the present discussion helps to explain why. "Gettiered" beliefs — justified and true beliefs which fail to qualify as knowledge — are plausibly beliefs whose truth is coincidental in a malignant sense. What is that sense? It is arguably precisely the sense in which learning that the truth of one's beliefs is coincidental would undermine them. If this is correct, then there is a "translation scheme" between the claim that it is impossible to relevantly explain the reliability of our [beliefs], given their truth, and the claim that those beliefs are Gettiered. (Clarke-Doane 2016, 36)

Obviously, I think Clarke-Doane is right that Gettiered beliefs are those "whose truth is coincidental in a malignant sense". I also think he is right that there is a "translation scheme" between the impossibility of a certain kind of explanation and the presence of epistemic coincidence, and that this is the worry behind the Benacerraf Problem. But I think he is wrong about what *needs explaining*. He takes the relevant explanandum to be "the reliability of our [beliefs], given their truth,"

where reliability is understood modally. But it is clear that proponents of the Benacerraf Problem take the relevant explanandum to be something *actual*, not something modal given something actual. Here is Field:

[T]he phenomenon that our beliefs about (say) electrons are reliable is not *simply* that our “electron” beliefs counterfactually depend on the facts about electrons: it is that our beliefs depend on the facts about electrons *in such a way that* the correlation of our believing the sentence ‘p’ and its being the case that p would be maintained given a variation in the facts about electrons. It is *this type of* counterfactual dependence that needs explaining, not counterfactual dependence by itself. But now, if the intelligibility of talk of “varying the facts” is challenged ... it can easily be dropped without much loss to the problem: there is still the problem of explaining the actual correlation between our believing ‘p’ and its being the case that p. (Field 1989, 238, underlining mine)

What kinds of explanation would do the trick? Here is David Enoch, discussing Field:

There is ... a striking correlation between mathematicians’ mathematical beliefs (at least up to a certain level of complexity) and the mathematical truths. Such a striking correlation calls for explanation. ... Platonists cannot explain [it] in any of the standard ways of explaining such a correlation — by invoking a causal (or constitutive) connection from the first factor to the second, or from the second to the first, or from some third factor to both. (Enoch 2011, 158–9)

Field claims that we need to explain the *actual* correlation between our beliefs and the truth. He also offers an implicit explanation for modalism’s appeal: modal conditions provide an intuitive and powerful

test for such explanatory connections. If we want to know whether I followed you to Minsk, it is natural to ask whether, had you instead gone to Helsinki, I’d be there, too. The answer is telling: if so, this looks like evidence that I’m following you (or that there is some other connection between us). But if it is *impossible* for you to have gone to Helsinki, the test doesn’t work; even if we accept that the impossibility of the antecedent entails “if you had gone to Helsinki, I would have followed you there”, we learn nothing at all about whether I followed you to Minsk.

Enoch cites three ways of explaining belief-truth correlations: the truth might explain the beliefs; the beliefs might explain the truth; or some third factor might explain both.²⁴ The affinities with EXPLANATIONIST are beyond striking; these are precisely the ways EXPLANATIONIST offers for avoiding (or lessening) epistemic coincidence.²⁵ These framings retain the intuitive force of the Benacerraf Problem and its relatives. And they vindicate our puzzlement about **Good Math**: it *seems* like no coincidence that Lisa gets the right answer, but if there could in principle be no explanatory connection between her belief and the fact that 89 is prime, it would be a coincidence after all.

I submit that all cases involving true beliefs, where there is no explanatory connection between those beliefs and the truth, are cases of epistemic coincidence. I can think of no counterexamples, and further submit that the intuitive force of the Benacerraf Problem and its relatives rests on the impossibility of such counterexamples.

In the next section, I argue that there are coincidence contrasts where all modal relations between beliefs and truth are the same — “same-modality contrasts” — and that modalism therefore cannot accommodate all judgements about epistemic coincidence. This was predicted, first, by my framing of modalism as a misguided

24. Enoch goes on to propose a solution to the challenge for normative realism. This solution fails, as argued in Elliott and Faraci (m.s.), because the explanation he offers is not unified.

25. And this isn’t merely an artifact of my authorship; EXPLANATIONIST was motivated as an adaptation of Lange’s wholly independent work on mathematical coincidence!

cleanup of causationism and, second, by Clarke-Doane. The arguments to come follow these predictions.

5. Same-Modality Contrasts and the Failure of Modalism

5.1 *The Lewis and Clarke-Doane Expedition*²⁶

Clarke-Doane's argument begins with sensitivity. Beliefs are sensitive just in case they are true and, had the relevant truths been different, those beliefs would have been correspondingly different. His point about sensitivity is widely recognized: beliefs in necessary truths "are vacuously sensitive on a standard semantics", because counterfactuals with necessarily false antecedents are necessarily true (Clarke-Doane 2016, 26). This point is most famously made by David Lewis, who raises it as a *problem* for applying modal conditions to beliefs in necessary truths. Ironically, however, Lewis is often quoted out of context, giving the false impression that he, like Clarke-Doane, takes this point to undercut the force of the Benacerraf Problem.²⁷ Here is the oft-quoted passage, except the underlined portion is frequently left out:²⁸

Probably the right thing to say is that the demand for an infallible method does not make very good sense for

26. As will become clear, this is something of a misnomer; but I couldn't resist.

27. The explanation may be that this passage does come from a section in which Lewis challenges the Benacerraf Problem, and some of the reasons he gives for doing so do concern the necessity of mathematical and modal truth. As I read Lewis, his central reason for rejecting it is that "[o]ur knowledge of mathematics is ever so much more secure than our knowledge of the epistemology that seeks to cast doubt on mathematics" (Lewis 1986, 109). Lewis bolsters this by suggesting that we should have different standards for knowledge of contingent and necessary truths, anyway, though he ultimately acknowledges that we should hope for an overarching theory that encompasses knowledge of both the contingent and the necessary. Perhaps explanationism will point the way!

28. Clarke-Doane (2016, 26) does this, but let me not pick on him. The same truncated passage appears in several other papers, including ones that are *critical* of trivial sensitivity, such as Schechter (2010, 443). I find this particularly surprising given that many, I'd think, wouldn't want to give up a chance to show that Lewis is on their side!

knowledge of non-contingent matters, because it is too easily trivialised. For if it is a necessary truth that so-and-so, then believing that so-and-so is an infallible method of being right. If what I believe is a necessary truth, then there is no possibility of being wrong. That is so whatever the subject matter of the necessary truth and no matter how it came to be believed. (Lewis 1986, 114–5, underlining mine)

We can reinforce Lewis' rejection of such "trivial infallibility" by considering the similarities between sensitivity and simple counterfactual models of causation. For example:

[W]e may define a cause to be *an object, followed by another ... where, if the first object had not been, the second never had existed.* (Hume 1748, sec. VII)

Imagine a simple causationist view on which *any* causal connection rules out coincidence and causation is understood as above: the truth causes our beliefs, precluding epistemic coincidence, just so long as it is the case that, if the truth "*had not been*", the belief "*never had existed*". It follows that necessary truths cause *all* of our beliefs, and therefore cannot be coincidental with them. This is doubly mistaken. It is implausible that necessary truths cause all of our beliefs. More importantly for our purposes, this view is undermined by the existence of no-cause contrasts like that between **Bad Math** and **Good Math**. This is just to reiterate the first problem for causationism raised in §2. The parallels with sensitivity are obvious.

Modalists who share these concerns about sensitivity will be quick to remind us of a major development: modal conditions that attend to variations in both the truth *and* our beliefs, rather than just the former. The most popular such condition is *safety*: beliefs are safe just in case they are true and could not easily have been false.

Safety improves on sensitivity by allowing us to consider whether our beliefs in necessary truths could easily have *diverged* from those

truths. This brings us to what is arguably Clarke-Doane's most significant insight: the safety of our beliefs in necessary truths is a direct function of the *modal stability* of those beliefs — how nearby the worlds are in which they are *different*. So long as our belief-forming method would give the same results at nearby worlds, our beliefs are safe.

Ironically, help may come from the challengers here. Clarke-Doane, like Enoch and others, interprets evolutionary debunking arguments in metaethics (e.g., Street 2006) as close relatives of the Benacerraf Problem. These arguments begin with the premise that there is an evolutionary explanation for our ethical beliefs. Assuming there is no reason to believe that evolution tracks the ethical truth, it seems it would be a “cosmic coincidence”²⁹ if our beliefs corresponded to that truth. But, Clarke-Doane argues, the robustness of this evolutionary explanation may well ensure that our ethical beliefs couldn't easily have been different, and thus that they are safe.

Modalists unfriendly to Clarke-Doane's conclusion may try to resist by developing an account of proximity allowing for nearby worlds where our beliefs are different, either because evolutionary forces produce different beliefs, or because our beliefs are not explained by evolutionary forces (e.g., Warren and Waxman m.s.).³⁰ Unfortunately, this strategy cannot avoid modalism's fundamental problem. Modal

29. I borrow this phrase from Matt Bedke (2009), though others have put things similarly; e.g., William Kneale (1950, 123) talks of “historical accidents on the cosmic scale” (though in a slightly different context).

30. Or they may challenge Clarke-Doane's claim that it is legitimate to assume the truth of our beliefs here. There is much debate over the circumstances under which one may assume the truth of our beliefs in addressing the Benacerraf Problem (e.g., Christensen 2011; Kelly 2013; Locke 2014; Morton forthcoming; Vavova 2014, 2018). But denying this assumption doesn't avoid the fundamental problem: our actual beliefs *could* be true, and therefore both safe and sensitive, and yet there might remain epistemic coincidence. I do think, however, that there are affinities between explanationism and views about the conditions under which assuming the truth of our beliefs *is* question-begging. Justin Morton (forthcoming), for example, argues that assuming the truth is question-begging when, given that assumption, “our beliefs within the relevant domain are probabilistically independent of their truth”. But he also raises concerns about modalism that would seem to undermine his own proposal if ‘probabilistic dependence’ were interpreted modally. My strong

conditions like sensitivity that attend only to variations in the truth fail to account for coincidences involving necessary truths. In exactly the same way, modal conditions that attend to variations in both the truth *and our beliefs* fail to account for coincidences involving *necessarily held beliefs in necessary truths*.

As we'll see in the next section, this final point allows for development of same-modality contrasts: pairs of cases — one intuitively coincidental, the other non-coincidental — that differ in coincidence-status but not in the modal relations between the beliefs and truth. The existence of such contrasts demonstrates that differences in coincidence-status outstrip modal differences. It follows that modalism cannot accommodate all judgements about epistemic coincidence — as predicted, for much the same reasons of narrowness as causationism.

5.2 A Same-Modality Contrast

In this section, I construct a same-modality contrast. I do so slowly, to avoid worries that the ultimate failure is about truth or justification, rather than coincidence. Begin with:

TB Eula consults the Source to form some beliefs about which numbers are prime. All of Eula's resultant beliefs are true.

This may or may not be a case of epistemic coincidence.

Next, we need to make Eula defeasibly justified in consulting the Source. But there also need to be no *defeaters* for her justification. There must be no available evidence that her beliefs are false — i.e., no *rebutting* defeaters. There must also be no available evidence that the Source is not a legitimate source of information — i.e., no *undercutting* defeaters. All of this can simply be stipulated, but the issue of undercutting defeat raises an issue worth addressing.

Since Eula's beliefs are true, it is easy to accept that there is little to no evidence that they are false. However, if the evidence always points

suspicion is that he is banking on an alternative account of such dependence that would capture explanatory connections.

to the truth, then if there are defeaters, there will be evidence of defeaters. I will be assuming that the first antecedent is false — that there can be misleading evidence.³¹ But little hangs on this. If you hold that evidence of epistemic coincidence is an undercutting defeater (which I am inclined to accept³²), but also that if there is epistemic coincidence, then there will always *be* such a defeater available (which I am inclined to deny), then our interest here is in beliefs for whom the *only* potential defeater is evidence of epistemic coincidence.³³ I include the relevant addendum in brackets in:

JTB Eula is defeasibly justified in forming beliefs about which numbers are prime by consulting the Source, and there is no available evidence that the Source is untrustworthy [except possibly for evidence of epistemic coincidence]. Eula consults the Source to form some beliefs

31. Or, at least, misleading evidence *available to the agent*, and thus relevant to whether the agent is justified. One can, of course, insist that even unavailable evidence is relevant to whether the agent is justified, but this makes it difficult to distinguish justification from coincidence. On such a view, for instance, Bertie would presumably be unjustified in **Bad Clock**. In any case, it should be clear that nothing substantive hangs on this.
32. Because this paper is already quite long, I won't say much about this here, but I think it is a crucial part of the dialectic. I have the sense that many epistemologists are becoming dubious about the importance of epistemic coincidence, roughly following the thought that if one reasons well and arrives at the truth, saying that this somehow doesn't rise to the level of Knowledge seems a bit precious. But while I have been framing things in terms of Gettier cases to avoid confusion with other elements of justification, I think that ultimately epistemic coincidence is most significant as a defeater for justification, rather than for knowledge (as per Field, rather than Benacerraf). If I have good evidence that there cannot possibly be an explanatory connection between my beliefs and the truths I took them to be about, that is excellent reason to doubt the reasonableness of forming beliefs in the relevant domain, at least in the ways I have been. Crucially, this is meant to be compatible with the idea that it is permissible to assume the truth of our beliefs in accounting for their connection to the truth (see note 30). Indeed, explanationism helps vindicate this thought: one cannot expose an explanatory connection between the members of a set without assuming those members exist!
33. As well as, of course, everything that entails. If evidence is never ultimately misleading, then there will also be evidence that some such defeater exists, etc.

about which numbers are prime. All of Eula's resultant beliefs are true, and there is no available evidence to the contrary.

You might worry that without more information about the Source, you shouldn't accept that Eula is justified in using it. But we could just stipulate, say, that the Source was recommended to Eula by a typically trustworthy friend, or even that the Source has given Eula independently verified information in the past. With or without such stipulations, it remains indeterminate whether **JTB** is a case of epistemic coincidence.

The next step is to develop the case so that Eula meets any potentially relevant modal condition. I've already explained how we can do this: we just need to stipulate that the relevant truths are necessary — I'm assuming which numbers are prime qualifies — and that Eula necessarily believes what she believes.³⁴ This brings us to:

J□TB Eula is defeasibly justified in forming beliefs about which numbers are prime by consulting the Source, and there is no available evidence that the Source is untrustworthy. Eula consults the Source to form some beliefs about which numbers are prime. All of Eula's resultant beliefs are true, and there is no available evidence to the contrary. At every possible world, Eula's counterpart forms beliefs about which numbers are prime by consulting the Source's counterpart, and the Source's counterpart delivers the same answers as at the actual world.³⁵

34. Of course, she might fail to meet a modal condition that requires her *not* to track the truth at certain worlds. But this suggests, implausibly, that Eula might lack knowledge because she tracks the truth *too well*.
35. You might think that it is not even *in principle* possible for an agent to necessarily believe something. If so, allow me to press you as follows. First question: How modally stable can a belief in a necessary truth be (without a connection between them)? Second question: How close does a world need to be for it to be epistemologically relevant that you fail to track the truth at that world? If your answers to these questions are such that someone could believe a necessary truth with sufficient modal stability that they could only

In **J□TB**, Eula's beliefs are justified and true, and they track the truth across modal space. Hopefully you already share my view that it remains an open question whether this is a case of epistemic coincidence. Either way, please consider the following.

Our final step is to add details to contrast coincidental and non-coincidental versions of **J□TB**. According to **EXPLANATIONIST**, we can generate coincidence by eliminating any potentially relevant explanatory connections; I'll do this by stipulating that the Source is outputting numbers at random.

One might think it also matters whether the modal stability of Eula's beliefs bears an explanatory connection to the truth. My view is that this alone makes no difference. A knowledge-loving demon cannot eliminate epistemic coincidence by modally stabilizing Eula's beliefs about which numbers are prime only when they are true — much as, in **Bad Sheep**, a sheep-façade cannot eliminate epistemic coincidence by attracting real sheep whenever Mary is around.³⁶ Again, we can harmlessly alleviate such worries with a bracketed addendum. Here, then, is our case of epistemic coincidence:

Bad Necessity Eula is defeasibly justified in forming beliefs about which numbers are prime by consulting the Source, and there is no available evidence that the Source is untrustworthy. In fact, the Source is outputting numbers at random. Eula consults the Source to form beliefs about which numbers are prime. The numbers the Source outputs at random are all prime numbers. Eula's resultant beliefs are therefore true; and there is no good evidence to

fail to believe it at worlds too far to be epistemologically relevant, then my argument goes through. If not, then perhaps your preferred version of modalism can avoid the objection raised in this section, though it would still be susceptible to related objections to counterfactualism raised below.

36. Of course, if Eula *knew* that the demon was doing this, she could infer from the modal stability of her beliefs to their actual truth, but then that would be among her sources of information, in addition to the Source. This would make her like Bo in **Good Sheep**, as opposed to Mary in **Bad Sheep**. More on this in §7.

the contrary. At every possible world, Eula's counterpart forms beliefs about which numbers are prime by consulting the Source's counterpart, and at every possible world, the Source's counterpart delivers the same answers as at the actual world. [There is no explanatory connection between this modal stability and the facts about which numbers are prime.]

And we can contrast this with a variation on **Good Math**:

Good Necessity Lisa is defeasibly justified in forming beliefs about which numbers are prime by consulting the Source. "The Source" is what Lisa calls dividing numbers by their possible factors and believing they are prime if and only if she determines that they have exactly two factors: 1 and themselves. There is no available evidence that this is an untrustworthy method. Lisa consults the Source to form beliefs about which numbers are prime. All of Lisa's resultant beliefs are true; and there is no good evidence to the contrary. At every possible world, Lisa's counterpart forms beliefs about which numbers are prime by consulting the Source, and the Source's counterpart delivers the same answers as at the actual world.

It seems to me, and I hope to you, that **Bad Necessity** is a case of epistemic coincidence, while **Good Necessity** is not. Of course, one could claim that this is not really a matter of epistemic coincidence. Certainly, it seems that Eula lacks *knowledge* in **Bad Necessity**, but perhaps this is due to some other aspect of the final condition on knowledge, or perhaps I failed to show that the knowledge-failure here isn't primarily about justification or truth. But note that the adjustments made to get from **J□TB** to **Bad Necessity** were motivated entirely by **EXPLANATIONIST**, an independently motivated, sufficient condition for epistemic coincidence. Denying that this is about coincidence seems unpromising.

Here is a related worry I suspect some readers will have: **Bad Necessity** and **Good Necessity** might seem too schematic, convoluted, bizarre, or precious for readers to have any (probative) intuitions about them. My reply is that most of what goes on in these cases is irrelevant to our judgements about epistemic coincidence. The stipulations about justification serve merely to stave off worries that the contrast is a justificatory one. And if EXPLANATIONIST is true, the stipulations of modal stability are irrelevant (at least in the bad case).

Following these claims, I submit that the move from **Good Math** to **Good Necessity** has no effect on our judgements about epistemic coincidence: more is stipulated about Lisa's justification, but justification is a separate issue; and the increased modal stability of her judgement doesn't make us any more inclined to judge her beliefs non-coincidentally true.³⁷ Lisa's beliefs seem non-coincidentally true because she forms them in a way that seems to *get at* the truth and which, as discussed in §4, must therefore bear some explanatory connection to it.

Similarly, suppose we remove the relevant stipulations from **Bad Necessity**:

Simply Bad Eula consults the Source to form some beliefs about which numbers are prime. The Source is outputting numbers at random. These numbers are all prime. Eula's resultant beliefs are therefore true.

It seems to me, and I hope to you, that **Simply Bad** is a case of epistemic coincidence. Eula may or may not be justified in forming her beliefs as she does, but again this is a separate issue. And it is completely irrelevant how modally stable her beliefs are. There is epistemic coincidence here because beliefs formed on the basis of randomly output numbers bear no connection to the truth about which numbers are prime, and thus can never be more than coincidentally true. **Bad**

37. One might claim that the modal stability of her using the method is best explained by its being connected to the truth. That poses no threat to my position; it is squarely in line with the idea that modal conditions provide evidence of explanatory connections.

Necessity should seem coincidental for precisely the same reason; the rest is window-dressing.

The above speaks against modalism, but does not yet undermine it entirely. What it entails is that epistemic coincidence cannot be understood in terms of a modal condition *on arbitrarily defined sets of beliefs*. The possibility remains that we can salvage modalism by picking out sets of beliefs in some particular way — say, by examining the modal status of beliefs *in a domain or formed using a certain method*.³⁸

It should be clear, however, that my case-based argument can be extended to undermine nearly all such versions of modalism. Nothing prevents me, for instance, from changing the case so that the Source outputs answers to *all* of Eula's mathematical questions at random.³⁹ The only ways out, so far as I can see, would be to define the set so as to rule out the truths' being necessary and/or the beliefs' being necessarily held. But unless there is some independent reason for thinking such a restriction would apply to all relevant sets of beliefs, this amounts to capitulation. Such modalists would at best be *disjunctive* modalists, allowing that something non-modal (perhaps an absence of explanatory connection!) is doing the work in cases involving necessarily held beliefs/beliefs in necessary truths.

Unfortunately, such disjunctive modalism is theoretically unstable. 'Epistemic coincidence' is not merely equivocal between modal and explanatory conceptions; it is *not* like river 'bank' and financial 'bank'. A successful account — disjunctive or otherwise — must accommodate, if not explain, this deeper relation; the view cannot be that contingent coincidences are modal phenomena, necessary coincidences are

38. One could instead try to salvage modalism by appealing to modal variation in something other than beliefs and truth, but it is very hard to see what this would be, and why my case-based strategy couldn't be extended to undermine it. (I am also taking the most obvious candidates, things like belief-forming methods or bases for belief, to fall within the bounds of the suggestion in the main text: the modal variation would be in beliefs formed by the relevant method or on the relevant basis.)

39. Of course, the larger the domain, the less likely it will seem that the Source could consistently get things right by chance. But that is neither here nor there; the point is that if it *did*, Eula's beliefs would be coincidentally true.

explanatory phenomena, *and that's an end to the matter*. I can think of no plausible modalist account of this relation.

For the simple causationist introduced above, where there is no causation, there are no coincidences. For modalists, “where there is no *contingency*, there are no coincidences” (Wielenberg 2010, 461, emphasis mine). The former is a bug because it fails to accommodate no-cause contrasts. The latter is a bug because it fails to accommodate intimately related, same-modality contrasts. Yet Clarke-Doane, Wielenberg, and others mistake it for a feature. This mistake should be rectified; modalism should be rejected.

6. Beyond Modality

Modalism fails because it cannot accommodate same-modality contrasts. My view is that this is because intuitions about coincidence are fundamentally explanatory, and some explanatory relations are hyperintensional and therefore cannot be captured by looking at possible worlds. If I'm right, the next question is whether this exposes a problem with counterfactual models of explanation, or merely with a modal semantics for counterfactuals. If the latter, we may be able to salvage counterfactual conditions' role in testing for or even defining explanatory connections, even as we embrace explanationism as the correct account of the intuitive roots of our judgements about epistemic coincidence. I take no official position on this possibility here, though I raise some concerns in §6.2.

Some readers may be tempted by an alternative view. They may take my arguments to show, as just suggested, that a modal semantics for counterfactuals is too limiting. But they may remain insistent that intuitions about coincidence are fundamentally about counterfactuals. In §6.1, I argue that the counterfactual conditions required to accommodate our judgements about epistemic coincidence (to whatever extent they can do so) support explanationism over such counterfactualism. But it is crucial to be clear both *that* and *why* this argument will be different from those against causationism and modalism. I will *not* show that counterfactualism fails to accommodate one or more coincidence

contrasts. This is because if all explanatory connections *can* be modeled counterfactually, then both explanationists and counterfactualists should expect that some set of counterfactual conditions can accommodate all of our judgements about epistemic coincidence. The issue here will be the comparative strengths of these views' framings of the intuitive roots of our judgements about epistemic coincidence.

6.1 Against Counterfactualism

Begin by contrasting our original case of **Bad Clock** with:

Okay Clock Russ wants to know what time it is. He consults his kitchen clock, which he has been using for years, and which has typically been accurate. The clock reads “10:00” because it is 10:00. However, the clock breaks thirty seconds after Russ consults it, just before 10:01.

Intuitively, **Okay Clock** is not a case of epistemic coincidence.⁴⁰ Suppose we try to capture this using sensitivity. This requires us to locate the closest world where the truth is different. Arguably, the smallest relevant difference would be a change of one minute, leaving us with a tie between worlds where Russ looks at his clock at 9:59 and 10:01.⁴¹ The former gives us the right results; the latter does not, since by 10:01 Russ' clock is broken and he would falsely believe it to be 10:00.

What could motivate focusing on the 9:59-world rather than the 10:01-world? Counterfactualists must claim that the former is closer. But on what grounds? They could argue that the 9:59-world is closer simply because the 10:01-world has the additional difference of the clock's being broken. But we can easily suppose that some much *larger*

40. Perhaps some will be tempted to deny this, but I am confident I could build the case up in various more complicated ways to make the points to come. I also make similar points regarding cases introduced by others in §7.

41. This follows the standard idea that world-proximity is a function of world-similarity.

change took place between 9:59 and 10:00; it is unclear how the counterfactualist can account for the irrelevance of that change.⁴²

By contrast, the explanationist's answer is simple. The thought behind the sensitivity *test* is that if Russ wouldn't have gotten things right if the truth were minimally different, the best explanation is that he isn't *actually* connected to the truth. But no such explanation is required for Russ' getting things wrong at 10:01; that can be fully explained by the fact that the clock broke just before 10:01. The 9:59-world has no such failing, so it is the one to go with.

Counterfactualists may be unimpressed, however, for they may agree with my narrative up to a point: sensitivity is indeed a misguided adaptation of a counterfactual causal model. *Safety* has been gaining ground precisely because it is a direct representative of a far more plausible pretheoretical notion of coincidence: correlations are coincidental insofar as the correlates *almost* weren't correlated.

I agree that this is *more* plausible, but still think it ultimately misguided. First, it is unclear whether safety can account for **Okay Clock** at all, especially once we add further details. Suppose both Bertie and Russ are deeply engrossed in a book, and look up at the clock only because the phone rings (an old desk phone that doesn't display the time). It's a friend calling with the exciting and unexpected news that she's won the lottery. Bertie and Russ offer congratulations, chat for a few minutes, and hang up. At 10:10, their mothers call to check in. This strongly suggests that there is a close world — equally close in both cases, and arguably even closer than the 9:59-world in terms of overall similarity — where the friend doesn't win the lottery and doesn't call, and Bertie and Russ don't answer the phone until their mothers call at 10:10. In that nearby world, they both get things wrong.

Second, as we've seen, safety is a modal condition, and therefore cannot accommodate same-modality contrasts. This brings us finally to counterfactualist strategies for overcoming the limitations of modal

42. Note that a counterfactualist who disagrees with me and takes this to be a case of epistemic coincidence would similarly need to explain why the 10:01-world is closer.

semantics. By far the most popular and natural strategy here is to develop *hypermodal* conditions that look at impossible worlds as well as possible ones. Field anticipates this:

Lewis is assuming a controversial connection between counterfactuals and necessity. ... [E]ven those who think that there is some sort of "absolute necessity" to mathematics may find counter-mathematical conditionals perfectly intelligible in certain contexts. (Field 1989, 237)

Here is a recent discussion of a *hypersensitivity* condition, from Gideon Rosen:

The truths of pure mathematics are presumably metaphysically necessary truths, but we can coherently suppose many of them to be false by considering worlds in which there are no mathematical objects of any sort, worlds in which all sets are finite, and so on. Many of our mathematical beliefs will then fail the sensitivity test: if there had been no numbers (or infinite sets), these beliefs would have been just as they are. (Rosen forthcoming)

Consider how this fits with our judgements about **Bad Math** and **Good Math**. In the former, Leo believes that 89 is a prime number because he sees it on a mislabeled list of Fibonacci numbers. It is natural to think that if (*per impossibile*) 89 weren't prime, it would still appear on the mislabeled list, and Leo would still believe it to be prime. His belief is *hyperinsensitive*. It is also natural to think that if 89 weren't prime, it would have more or fewer factors than 1 and itself, Lisa's calculations would reveal this, and she wouldn't believe it to be prime. Her belief is *hypersensitive*.⁴³

43. These counterfactual judgements are natural but not required. Perhaps if 89 weren't prime, the conditions for life wouldn't obtain, and so neither Leo nor Lisa would believe anything at all. Or, more relevantly to our discussion, suppose it turns out that it is no mathematical coincidence that 89 is both prime and a Fibonacci number, that 89 is a Fibonacci number in part because it is prime. In that case, arguably the closest impossible world where

As I've argued, however, sensitivity doesn't fit well with counterfactualism, because determinations of the closest world at which the truth is different are motivated by the need to isolate the impact of the truth on our beliefs (or vice versa), much as Field anticipated.

The obvious alternative is to develop a *hypersafety* condition. But what would such a condition look like? If the intuitive idea is supposed to be that coincidences are correlations that *almost* weren't correlations, we'd need a sense in which *necessary* correlations *almost* weren't correlations. I can think of only one sense in which this is true: they *almost* weren't if there is no explanatory connection between the correlates.

Here is a related issue: Given the variety of explanatory relations, in both form and particular detail, it is predictable under explanationism that the particular counterfactuals and accounts of proximity required to capture various cases will vary, perhaps quite widely. By contrast, assuming the pretheoretical notion of coincidence is at least *somewhat* unified, counterfactualists should expect a fairly stable set of conditions. Now suppose counterfactualists claim in some case that some impossible world is close enough to the actual world to generate coincidence. They will need to square this with the claim that, in other cases, *quite* close worlds seem too *far* to generate coincidence — for instance, the world in which Russ doesn't look at the clock until 10:10. It is hard to see how to do this while maintaining a stable sense of 'almost'.⁴⁴ (This issue will come up again at the end of §7.)

As anticipated, there is no impossibility proof in any of the above. My goal has been to expose how difficult it is for counterfactualists to account for both the nature and variation in the counterfactuals and accounts of proximity required to systematize our judgements. The

89 is not prime is also one in which it is not a Fibonacci number and therefore does not appear on the list of Fibonacci numbers in Leo's book! (There are in fact mathematical relations between primeness and the Fibonacci sequence [see, e.g., "Relationship between Primes and Fibonacci Sequence" n.d.], but I confess I do not fully understand them, and am certainly unclear on how the relevant counterpossibles would fall out.)

44. If you were tempted by the objection discussed in note 35, I ask you to revisit the questions asked there with this worry in mind.

explanationist has what is by comparison a clear, simple story: our goal is to determine whether our beliefs are connected to the truth; a natural way to test for this is to vary the truth and see if our beliefs change to match; the variations required may be highly context-sensitive; when it comes to necessary truths, the smallest change required may take us to an impossible world.

6.2 Hypermodals and Hope

In this section, I raise two methodological concerns about the use of counterfactual, and specifically hypermodal, conditions given explanationism, and say a bit about how I think we should proceed.

First, given explanationism, we can rely on counterfactual conditions only where all relevant explanatory relations can be modeled counterfactually. Whether this will always be the case is a point of contention amongst metaphysicians and philosophers of science working on explanation. It seems to me that those of us not working in the relevant areas should be wary of sticking our necks out further than necessary.

The second concern stems from a hypothesis: in standard cases, people tend to make accurate counterfactual judgements only because they have a decent intuitive or theoretical grasp of relevant explanatory relations — e.g., the ones that explain why, had Bertie and Russ not looked at the clock at 10:00, they would have done so at 10:10. In the absence of any sense of the explanatory connections between our mathematical beliefs and the mathematical facts, hypermodal tests are meant to provide evidence of (or perhaps even define) the presence or absence of such connections, and thus to help either alleviate or vindicate worries about epistemic coincidence. But there is tension here. For these tests to be useful, we need to be good at making judgements about counterpossibles; if my hypothesis is true, this likely requires our having a decent grasp of relevant non-causal explanatory relations. Yet it is our lack of such a grasp that generates a need for these tests in the first place.

Combining these concerns: if developing hypermodal conditions requires counterfactual models of all relevant forms of explanation — the availability of which is far from certain — and developing such conditions requires an implicit or explicit account of non-causal explanation anyway, relying too heavily on these conditions seems both theoretically and dialectically inadvisable.⁴⁵ This is not just because such conditions might trivialize matters as modal conditions have, but because they may in fact lead us towards unwarranted pessimism. Recall Rosen's remarks above. He claims without argument that "if there had been no numbers (or infinite sets), these beliefs would have been just as they are". But whether this is the case depends precisely on whether the nonexistence of numbers or infinite sets would have led to changes in our beliefs. Perhaps if we had a good account of the possible explanatory connections between our mathematical beliefs and the mathematical truths, their hyperinsensitivity wouldn't seem a foregone conclusion!

This brings me to the intended *hopefulness* of my defense of explanationism. I believe we stand the best chance of solving the Benacerraf Problem and its relatives by expanding our views about explanation, perhaps to places counterfactual conditions cannot follow. I'll close this section with a *very* inchoate gesture in this direction.⁴⁶ As noted in §3, Lange has views about explanatory relations between

45. Inadvisable for me, at least; if you're deploying hypermodal conditions because you have a relevant favored theory of non-causal explanation, have at it!

46. The one account of this kind in the literature I know of comes from John Bengson (2015), whose view implies that in **Good Math**, the fact that 89 is prime *partially constitutes* Lisa's belief, but that it fails to similarly constitute Leo's belief in **Bad Math**. Bengson's motivating discussion is phenomenal, and a number of the points I make here echo his. I find his positive proposal unattractively limited, however, as it *names* an explanatory relation (partial constitution) but offers no account whatsoever of how the connection is made, or why we should expect it. He tells us nothing, for instance, about how accurate calculation gets 89's primeness to partially constitute Lisa's belief in it, while Leo's consulting a mislabeled list does not, or why we should expect this to be the case.

mathematical facts. But Lange *also* has views about mathematical explanations of quotidian facts. For example:

The fact that 23 cannot be divided evenly by 3 explains why Mother fails every time she tries to distribute exactly 23 strawberries evenly among her 3 children without cutting any (strawberries — or children!). (Lange 2016, 6)

Very roughly, Lange's view is that such mathematical explanations are one kind of "explanation by constraint", wherein a pure mathematical fact — here, that 23 cannot be divided evenly by 3 — serves as a constraint on the possible causal relations that might obtain, ruling out Mother's even distribution of the uncut strawberries to her uncut children.

This raises a possible solution to the Benacerraf Problem, if the causal forces that explain our beliefs are amongst those constrained by the mathematical facts. Perhaps Mother *believes* that 23 cannot be divided evenly by 3 because that very fact has constrained her experiences — possible and actual — in ways that lead her to think this! I am not endorsing this here, nor insisting that it cannot be expressed counterfactually.⁴⁷ I am simply offering the hopeful suggestion that focusing directly on accounts *like* Lange's may open avenues for meeting the Benacerraf Problem head-on.

47. Though Lange (2016, 86–7) himself raises the worry that his view may be inconsistent with counterfactual accounts of explanation: "Some of the 'explanations by constraint' that I have drawn from scientific practice are deemed to be explanatorily impotent by some accounts of scientific explanation ... consider, for example, Woodward's [(2003)] manipulationist account of scientific explanation, according to which an explanans must provide information about how the explanandum would have been different under various counterfactual changes to the variables figuring in the explanans ... These criteria rule out many typical explanations by constraint [T]here are no obvious variables to be changed ... in the fact that 23 is not divided evenly into whole numbers by 3"

7. Towards a Complete Explanationist Account of Epistemic Coincidence

I have now completed my defense of EXPLANATIONIST as a sufficient condition for epistemic coincidence. I motivated it as an adaptation of an account of mathematical coincidence (§3); argued that it undergirds the Benacerraf Problem (§4); and defended its superiority to causationism (§§2,4), modalism (§5), and counterfactualism (§6).

However, if explanationists are to accommodate all of our judgments about epistemic coincidence, they must also offer a sufficient condition for *avoiding* it. This means addressing apparent *same-cause* contrasts, like that between **Bad Sheep** and **Good Sheep**. As noted in §1, I believe that such contrasts have provided fuel for counterfactualism and, more specifically, for safety. In this section, I aim to show both that explanationists have promising avenues for dealing with apparent same-cause — or, more worryingly for them, *same-explanation* — contrasts, while competitors face problems paralleling those raised in §6.1.

To begin, it will be useful to mark John Bengson's distinction between *source coincidence* and *doxastic coincidence* (he says "accidentality", but the terminological shift is harmless):

In veridical hallucination, sensory or intellectual, what is accidentally correct is a potential source of belief (a "source state"), such as a perceptual experience or intuition. Such *source accidentality* can be contrasted with *doxastic accidentality*, where what is accidentally correct is not the source state but a subsequent belief. (Bengson 2015, n. 10)

Most of the coincidences we've looked at so far are clear cases of source coincidence: in **Bad Clock**, the source of Bertie's belief is the clock; in **Bad Math**, the source of Leo's belief is the appearance of "89" on the mislabeled list of Fibonacci numbers; in **Bad Necessity** and **Simply Bad**, the source of Eula's belief is the randomly outputting

Source. None of these bear any explanatory connection to the truth; their correctness is coincidental.

The one unclear case is **Bad Sheep**. There is an explanatory connection between the source of Mary's belief — the sheep-façade — and the truth: the façade explains the fact that there is a sheep in the field. This might be taken to suggest that the correctness of the source is non-coincidental, and thus that this is not a case of source coincidence. But this is too quick. **Bad Sheep** shows that not all explanatory connections eliminate coincidence between beliefs and the truth. It may likewise show that not all connections eliminate coincidence between *sources* and the truth.⁴⁸

In cases of source coincidence, belief-truth coincidences obtain because there are *source-truth* coincidences. The explanationist might naturally suspect that some *source-truth* coincidences likewise obtain because of *further* coincidences. If those further coincidences are explanatory — e.g., if they obtain because of the absence of some other required explanatory connection — it may yet be possible to develop a thoroughlygoing explanationist account.⁴⁹

48. Notice that we can illuminate the same phenomenon by altering Bengson's own "veridical hallucination" example of source coincidence. For instance: A brain injury causes Joanna to hallucinate that there is an anvil present. There *is* an anvil present, but Joanna does not see it. The anvil present is the anvil that fell on her head and caused the brain injury that caused her to hallucinate that there is an anvil present.
49. This is an instance of one of two broad avenues open to explanationists: deny relevant contrasts or deny that the explanatory connections are the same. Here, they could deny the contrast by insisting either that **Bad Sheep** is not a case of coincidence, or that **Good Sheep** is. Neither seems promising. They could deny that the explanatory connections are the same by holding either that the belief-truth connections are different, or that some further important connection is missing. Obviously I think the latter is promising, but the strategy could potentially be reframed to be of the former kind. Roughly, one might claim not that one connection fails to eliminate coincidence because of the absence of a further connection, but rather that one connection is *severed* by the presence or absence of some further connection. I won't pursue this further here, and I don't think it's plausible in this case, but I think it might be more promising with respect to doxastic coincidence.

This is not ad hoc; in fact, it sits well with independently motivated positions in epistemology. Consider, for example, Marc Alsepector-Kelly's proposal:

S knows that P iff S's belief that P is produced in such a way as to contain the information that P, and S's belief is produced that way precisely because its being produced that way contains the information that P (Alsepector-Kelly 2006, 292–3).⁵⁰

We may adapt this as an explanationist account by holding that avoiding epistemic coincidence requires not only (i) an explanatory connection between beliefs and the truth, but also (ii) an explanatory connection between the source of the belief and the truth, as well as (iii) an explanatory connection between *that* explanatory connection and the fact that the agent consults the source she consults.

This gets the right results in **Bad Sheep** and **Good Sheep**. In both cases, there is (i) an explanatory connection between the beliefs and the truth. In **Good Sheep**, Bo's source is (inference from) the sheep-façade. There is (ii) an explanatory connection between her source and the truth: roughly, the sheep-façade explains her inference, and the fact that things that look like sheep either *are* sheep or have sheep hiding behind them explains why the inference is a good one. What's more, (iii) Bo relies on this inference from experience precisely because she knows about the connection just mentioned (and is therefore *ex hypothesi* connected to it).

In **Bad Sheep**, Mary's source is the sheep-façade. There is (ii) an explanatory connection between her source and the truth: the sheep-façade explains the presence of the sheep. But there is no connection between this and Mary's relying on her source; she does so because things that look like sheep typically *are* sheep, not because things that look like sheep typically *are or attract* sheep (and the latter disjunct is the "active" one here). Condition (iii) is not met.

50. Matt Lutz (m.s.) offers a similar theory, but his is internalist, requiring that the source-truth explanatory connection be as the agent "takes it to be".

I am not endorsing this view, but I think it nicely illustrates that there are potential explanationist strategies for accommodating contrasts like that between **Bad Sheep** and **Good Sheep**: if there is an explanatory connection that fails to eliminate coincidence, this is because avoiding epistemic coincidence requires *further* explanatory connections. As we've seen, at least one such strategy draws on an independently motivated account of knowledge.⁵¹

Turn now to doxastic coincidences. Bengson's primary example of doxastic coincidence is Goldman's fake barn case, which I mentioned earlier and now adapt as half of a coincidence contrast:

Bad Barn Allie sees a barn in a field and thereby comes to believe there is a barn in the field. But she's in fake barn country, where there are barn façades everywhere. The barn she sees is the only real barn for miles around.

Good Barn Vin sees a barn in a field and thereby comes to believe there is a barn in the field. That's the whole story.

Intuitively, **Bad Barn** is a case of epistemic coincidence, while **Good Barn** is not. The worry, as before, is that the explanatory relations between the beliefs and truth are the same in both cases, precluding an explanationist account of our judgements.

In response, explanationists *may* be able to deploy the strategy explored above. In both **Bad Barn** and **Good Barn**, there is (i) an explanatory connection between the belief and the truth and (ii) an explanatory connection between the source of the belief and the truth: the belief is explained by the barn itself, which is obviously connected to the fact that there is a barn present. Is there (iii) an explanatory

51. One might naturally wonder whether a parallel strategy could be used to salvage modalism or counterfactualism. But the fundamental problems remain. First, so long as the explanatory relations in question can be modally stabilized (either because they are necessary relations or through the use of demons, genetic determinism, etc.), modalism will sometimes fail to get the right results. Second, while these further relations *may* be expressible counterfactually, the fundamental intuitions remain explanatory.

connection between *that* explanatory connection and the fact that the agents consult the sources they consult?

We may presume that both Allie and Vin treat the barn as a source (much as anyone would) because things that look like barns tend to be barns. In **Good Barn**, this may well meet condition (iii): perhaps, for instance, the fact that Vin is having an experience of a barn while looking at an actual barn is partly constitutive of the fact that barn-experiences tend to be caused by barns. In **Bad Barn**, however, this connection is arguably severed. In fake barn country, barn-experiences *don't* tend to be caused by barns; they tend to be caused by barn-façades.⁵²

This is all inchoate, and there are many lingering questions. Why does the context of belief-formation matter? Why is the right context "fake barn country" as opposed to "this particular field"?⁵³ Suppose Allie and Vin actually drive through the same area, and were meant to do so on the same day, but Vin is running late and just happens to be travelling the day after all the façades have been replaced with real barns; would that make **Good Barn** a case of coincidence, too?

There may be answers to these questions, in which case something like the above may work for the explanationist. But either way, it is important that these are *precisely* the sorts of questions that have led some to worry that our intuitions about doxastic coincidence are inconsistent, or at least vague, and that there may be no way to capture them all on *any* account of epistemic coincidence.

Consider a progression of cases from Gendler and Hawthorne (2005). They discuss a case much like **Bad Barn** where a character named Always walks around wearing a real diamond ring, along with a bunch of people wearing fake ones. Observer happens to look at Always, and forms the belief that Always is wearing a diamond ring.

52. Compare: "Since no more of the object is seen than its presenting surface, where the belief induced concerns the kind of object whose surface it is, condition [iii] requires that the agent's environment be one in which such surfaces are, at least typically, of objects of the sort the agent perceptually judges it to be (which is false in Goldman's example)" (Alspecter-Kelly 2006, n. 14).

53. This, like a number of the issues raised herein, is related to "the generality problem" for reliabilism (e.g., Conee and Feldman 1998).

Most judge this to be a case of epistemic coincidence. (Indeed, perhaps Always need only walk around with a single fake-diamond-wearer to generate coincidence.)

Next, suppose Observer sees Sometimes wearing a real diamond ring on the one day per week she doesn't wear a fake one. Observer forms the belief that Sometimes is wearing a diamond ring. Gendler and Hawthorne tell us that many think this is likewise a case of epistemic coincidence, though my intuitions here are somewhat less clear. But now suppose Always and Sometimes are walking around together on the one day Sometimes is wearing her real ring:

If the casual observer would not know that Sometimes was wearing a diamond ring, then presumably she would not know that Always was. After all, there might be no intrinsic difference between the two rings, and minimal differences between their wearers' fingers, hands, clothes, etc. But if so, then something remarkable is going on. Can you really prevent a casual observer from knowing that someone is wearing a diamond ring by walking around beside her, wearing a real diamond, with the habit of wearing fakes on other days? Could epistemic contagion really be so easy? (Gendler and Hawthorne 2005, 336)

Gendler and Hawthorne tell us that theorists are split on the answers to these questions: (1) some claim that Observer can know that Always is wearing a diamond, but not that Sometimes is; (2) some claim that Observer cannot know that Always is wearing a diamond while she is with Sometimes; (3) some claim that Observer can know that both are wearing diamonds.

I find (1) and (3) tempting. It seems to me that Observer can know that Always is wearing a diamond, but (as before) I am less clear about Sometimes. However, as Gendler and Hawthorne point out, there is a pressure of *symmetry* pushing us towards (2). The similarities between Observer's experiences of Always and Sometimes push away from (1).

The similarities between Observer's experiences of Sometimes and Always-accompanied-by-fake-ring-wearers push away from (3).

My hope, obviously, is that some condition can account for these and further asymmetries. Either way, I submit once again that the avenues typically explored for developing such a condition speak in favor of explanationism over counterfactualism. As evidence, consider one final passage:

Advocates of (3) differed on what might explain this asymmetry. Some subscribed to a version of what they called the GAZE PRINCIPLE. According to that principle, candidate-defeaters are relevant in cases where we leave the world as it is, altering only the observer's perceptual orientation within it, and irrelevant in cases where we leave the observer's perceptual orientation as it is, altering only features of the world around her. In the first sort of case, one might say, the defeaters are there, but the observer's gaze happens not to fall upon them; in the second sort of case, her gaze is there, but the defeaters on which it might have fallen happen not to be around. (Opponents objected that the principle was *ad hoc*, contending that there are plenty of cases where non-present but eminently possible fakes clearly do seem to destroy knowledge.) (Gendler and Hawthorne 2005, 337)

This echoes concerns raised about counterfactualism in §6.1. It is unclear how counterfactualists can explain why only one of these counterfactuals is relevant here, especially if this isn't so in other contexts. Once again, explanationism has resources counterfactualism lacks. Explanationists claim that we are interested in whether there is some relevant explanatory connection in these cases; perhaps in this context, if we alter things one way, we are likely to expose the presence or absence of that connection, but if we alter things another way, this would mask, rather than test for, that connection (as looking at the 10:01-world would with respect to **Okay Clock**).

At the end of the day, explanationists may not be able to capture all of our judgements about doxastic coincidences. But this is a far smaller bullet than many of those counterfactualism has been left to bite, and may well be among them, too. In any case, we as yet have no clear same-explanation contrasts; a complete explanationist account of epistemic coincidence remains possible.

8. Conclusion

8.1 *Skepticism About the Analysis of Knowledge*

As noted at the outset, many philosophers hold out hope for a solution to the Gettier problem. But it is becoming increasingly popular to give up this hope, concluding that knowledge is unanalyzable. I obviously cannot address all relevant views here, but it is worth briefly noting how my discussion relates to the two major reasons Williamson (2002) — arguably the most prominent figure in this camp — gives for such skepticism (and for his “knowledge-first” program).

Williamson's first reason is *inductive pessimism*. We have been trying and failing to solve the Gettier problem for over half a century. Williamson thinks that we've failed because knowledge is unanalyzable. I think it at least as likely that we have failed because modalism and counterfactualism have led us in the wrong direction.

Williamson's second reason is that knowledge is *prime*: it cannot be analyzed as a conjunction of internal and external conditions. This falls squarely in line with my arguments. We are interested in the nature of coincidence between something internal (belief) and something external (truth). One might reframe my argument that there are same-modality contrasts (in §5) as an argument that modal conditions are composite: at least in some cases, a modal condition may hold because of the conjunction of something internal — e.g., Eula's necessary belief that certain numbers are prime — and something external — e.g., the necessary fact that those numbers are prime. Explanatory relations, by contrast, are prime: whether there is an explanatory connection

between a belief and the truth is never a function of independent facts about them.

Given these points, explanationists find themselves in the enviable position of pursuing an analysis of knowledge that would meet Williamson's reasons for doubting the possibility of such analyses head-on.

8.2 *Beyond Epistemology*

In my view, the problems that beset modalism (and counterfactualism), and speak in favor of explanationism, are not limited to accounts of epistemic coincidence, nor even to epistemology. Modalist accounts are popular across philosophy, and I believe that many of them fall prey to concerns similar to those discussed here. I also think it is no surprise that these problems largely go unnoticed until their implications for domains like mathematics and ethics are laid bare. Modal tests are elegant, intuitive, and powerful, while explanation is exceedingly difficult to pin down.

Rather than needlessly stepping on toes with quick dismissals of various modalisms, I will briefly discuss a positive development in the area where modality has arguably been most influential: semantics. An alternative form of *truthmaker* semantics has recently been gaining ground, due largely to the work of Kit Fine (e.g., 2014, 2017a, 2017b). I won't go into the complex details here, but just offer three brief comments. First, there are parallels between my contrast-based argument against modalism and the fact that truthmaker semantics is in part motivated by the need to draw distinctions that classical modal semantics cannot capture.⁵⁴ Second, my claim that appeals to impossible worlds

54. Here is a simple example from the logic of prescriptions: if Robert instructs Kit to teach ethics *and* teach metaphysics, it seems to follow that he has also instructed Kit to teach ethics; but if Robert instructs Kit to teach ethics, it does not seem to follow that he has also instructed Kit to teach ethics *or* teach metaphysics. Classical modal semantics cannot capture this difference, because entailment is typically understood in terms of subsets: A entails B if the B-worlds are a subset of the A-worlds. This captures the first judgement: every world where Kit follows an instruction to teach ethics and teach metaphysics is a world where he teaches ethics. But it runs afoul of the second, because the same relation holds: every world where Kit follows an instruction

are often motivated by explanatory intuitions is reinforced by Fine's (m.s.) argument that a number of puzzles about impossible worlds (including some about proximity) can be resolved through a natural extension of his truthmaker framework. Third, it is no coincidence that 'truthmaker' has a decidedly explanatory flavor. Indeed, a good deal of recent work aims to get clear on the relationship between truthmaking and *grounding* — contemporary metaphysicians' favorite form of non-causal explanation.⁵⁵

8.3 *Closing Remarks*

In this paper, I have laid the groundwork for an explanationist account of epistemic coincidence as (at least one aspect of) the final condition on knowledge. I have defended EXPLANATIONIST, a sufficient explanationist condition for epistemic coincidence, and argued that there is hope for a sufficient explanationist condition for *avoiding* such coincidence. I now conclude where my interest in this topic began: with the Benacerraf Problem's relatives in metaethics.⁵⁶

Especially (though not exclusively) those who take ethical truths to be necessary and mind-independent are understandably puzzled about how we gain epistemic access to those truths. A helpful way to frame their puzzlement is by asking: If our ethical beliefs are true, how could this be anything other than a massive coincidence? Modalists reframe this as the question of whether our true beliefs would remain true across a sufficient portion of modal space. But this is not the same question, as Clarke-Doane's arguments forcefully show. In ethics, the answer to *this* question may well be "Yes, because if we somehow get

to teach ethics is a world where he teaches ethics or teaches metaphysics. Truthmaker semantics, by contrast, captures the difference by formalizing the thought that every option that fully satisfies ("makes true") an instruction to teach ethics partly satisfies an instruction to teach ethics and teach metaphysics, but *not* every option that fully satisfies a command to teach ethics or teach metaphysics even *partly* satisfies a command to teach ethics, since one such option is to just teach metaphysics (Fine m.s.).

55. For references, see Bliss and Trogdon (2016, §6.3).

56. For a useful overview of such relatives, see Schechter (2017).

the right answers, we can rest assured that those were bound to be the right answers, and that we were bound to get them". This is *no answer at all* to a question about the nature of our *access*. A better representative is: What explanatory connection is there between our ethical beliefs and the ethical truth, or what evidence that such a connection obtains? Different metaethical views have different answers to these questions; some, as I endeavor to show in other work, have none (Elliott and Faraci m.s.).

Those with no good answers will perhaps fall back on a parallel to Lewis' response to the original Benacerraf Problem: "Our knowledge of mathematics is ever so much more secure than our knowledge of the epistemology that seeks to cast doubt on mathematics" (Lewis 1986, 109). But this is a claim about the relative weakness of a defeater, not an argument that our access to ethical and mathematical truths isn't puzzling.⁵⁷ It *is* puzzling. Only explanationism both illuminates this puzzle and offers hope of solving it.

Acknowledgements

My deepest thanks to Matthew Bedke, Aaron Elliott, Matt Lutz, Daniel Nolan, Joshua Schechter, Keshav Singh, Jacob Sparks, Teemu Toppinen, Vilma Venesmaa, and Daniel Waxman for discussion and comments. Thanks especially to Justin Clarke-Doane and Marc Lange for their work and for taking the time to discuss it with me. Thanks also to the organizers and participants of the 2015 Rocky Mountain Ethics Congress and of the Moral and Political Philosophy Research Seminar

57. This response involves a bit of dialectical sleight-of-hand on Lewis' part. The Benacerraf Problem and its relatives are not typically raised as skeptical challenges, but rather as challenges to tenets of *realism* (e.g., mind-independence). Given this, evidence of the presence of coincidence needn't be strong enough to defeat our first-order mathematical beliefs, but only our belief that mathematical truths are (say) mind-independent yet necessary and explanatorily inert. This may be even easier to see given that Lewis is actually defending *modal* realism. Perhaps the strength of my justification for believing certain counterfactuals is stronger than any coincidence-based defeater. But I don't think my justification for believing that possible worlds are *real* is (and I'm sure I'm not alone in this).

at the University of Helsinki, as well as to the editors and two anonymous referees at *Philosophers' Imprint*. Finally, Extra Super Thanks to Tristram McPherson and Daniel Wodak, who provided comments on an unreasonable number of drafts and discussed this project with me at length over the (hopefully not equally unreasonable) number of years I've been working on it.

References

- Alspector-Kelly, M. 2006. "Knowledge Externalism." *Pacific Philosophical Quarterly* 87 (3): 289–300.
- Bedke, M. S. 2009. "Intuitive Non-Naturalism Meets Cosmic Coincidence." *Pacific Philosophical Quarterly* 90 (2): 188–209.
- Benacerraf, P. 1973. "Mathematical Truth." *The Journal of Philosophy* 70 (19): 661–79.
- Bengson, J. 2015. "Grasping the Third Realm." In *Oxford Studies in Epistemology*, Vol. 5, edited by T. S. Gendler and J. Hawthorne, 1–38. Oxford University Press.
- Black, T. 2008. "Defending a Sensitive Neo-Moorean Invariantism." In *New Waves in Epistemology*, edited by V. F. Hendricks and D. Pritchard, 8–27. Palgrave Macmillan.
- Black, T., and P. Murphy. 2007. "In Defense of Sensitivity." *Synthese* 154 (1): 53–71.
- Bliss, R., and K. Trogon. 2016. "Metaphysical Grounding." In *The Stanford Encyclopedia of Philosophy*, edited by E. N. Zalta. <https://plato.stanford.edu/archives/win2016/entries/grounding/>.
- Christensen, D. 2011. "Disagreement, Question-Begging and Epistemic Self-Criticism." *Philosophers' Imprint* 11 (6): 1–22.
- Clarke-Doane, J. 2012. "Morality and Mathematics: The Evolutionary Challenge." *Ethics* 122 (2): 313–40.
- . 2014. "Moral Epistemology: The Mathematics Analogy." *Noûs* 48 (2): 238–55.
- . 2015. "Justification and Explanation in Mathematics and Morality." In *Oxford Studies in Metaethics*, Vol. 10, edited by R. Shafer-Landau, 80–103. Oxford University Press.

- . 2016. "What Is the Benacerraf Problem?" In *New Perspectives on the Philosophy of Paul Benacerraf: Truth, Objects, Infinity*, edited by F. Pataut, 17–43. Springer.
- Conee, E., and R. Feldman. 1998. "The Generality Problem for Reliabilism." *Philosophical Studies* 89 (1): 1–29.
- DeRose, K. 1995. "Solving the Skeptical Problem." *The Philosophical Review* 104 (1): 1–52.
- Dretske, F. 1971. "Conclusive Reasons." *Australasian Journal of Philosophy* 49 (1): 1–22.
- Elliott, A., and D. Faraci. m.s. "Non-Naturalism and the 'Third-Factor' Gambit."
- Enoch, D. 2011. *Taking Morality Seriously: A Defense of Robust Realism*. Oxford University Press.
- Field, H. 1989. *Realism, Mathematics, and Modality*. Blackwell.
- Fine, K. m.s. "Constructing the Impossible." https://www.academia.edu/11339241/Constructing_the_Impossible.
- . 2014. "Truth-Maker Semantics for Intuitionistic Logic." *Journal of Philosophical Logic* 43 (2/3): 549–77.
- . 2017a. "A Theory of Truthmaker Content I: Conjunction, Disjunction and Negation." *Journal of Philosophical Logic* 46 (6): 625–74.
- . 2017b. "A Theory of Truthmaker Content II: Subject-Matter, Common Content, Remainder and Ground." *Journal of Philosophical Logic* 46 (6): 675–702.
- Gendler, T., and J. Hawthorne. 2005. "The Real Guide to Fake Barns: A Catalogue of Gifts for Your Epistemic Enemies." *Philosophical Studies* 124 (3): 331–52.
- Gettier, E. L. 1963. "Is Justified True Belief Knowledge?" *Analysis* 23 (6): 121–3.
- Goldman, A. I. 1967. "A Causal Theory of Knowing." *The Journal of Philosophy* 64 (12): 357–72.
- . 1976. "Discrimination and Perceptual Knowledge." *The Journal of Philosophy* 73 (20): 771–91.
- Gowers, W. T. 2007. "Mathematics, Memory, and Mental Arithmetic."

- In *Mathematical Knowledge*, edited by M. Leng, A. Paseau, and M. Potter, 33–58. Oxford: Oxford University Press.
- Guy, R. K. 1988. "The Strong Law of Small Numbers." *The American Mathematical Monthly* 95: 697–712.
- Hume, D. 1748. *An Enquiry Concerning Human Understanding*. <https://www.gutenberg.org/files/9662/9662-h/9662-h.htm>.
- Ichikawa, J. 2011. "Quantifiers, Knowledge, and Counterfactuals." *Philosophy and Phenomenological Research* 82 (2): 287–313.
- Kelly, T. 2013. "Disagreement and the Burdens of Judgment." In *The Epistemology of Disagreement: New Essays*, edited by D. Christensen and J. Lackey, 31–53. Oxford University Press.
- Kneale, W. 1950. "Natural Laws and Contrary-to-Fact Conditionals." *Analysis* 10 (6): 121–5.
- Lange, M. 2010. "What Are Mathematical Coincidences?" *Mind* 119 (474): 307–40.
- . 2016. *Because Without Cause: Non-Causal Explanations in Science and Mathematics*. Oxford Studies in Philosophy of Science. Oxford University Press.
- Lewis, D. 1986. *On the Plurality of Worlds*. Cambridge University Press.
- Locke, D. 2014. "Darwinian Normative Skepticism." In *Challenges to Moral and Religious Belief: Disagreement and Evolution*, edited by M. Bergmann and P. Kain, 220–36. Oxford University Press.
- Luper-Foy, S. 1984. "The Epistemic Predicament: Knowledge, Nozickian Tracking, and Scepticism." *Australasian Journal of Philosophy* 62 (1): 26–49.
- Lutz, M. m.s. "The Matched Explanations Theory of Knowledge."
- Morton, J. forthcoming. "When Do Replies to the Evolutionary Debunking Argument Beg the Question?" *Australasian Journal of Philosophy*.
- Nozick, R. 1981. *Philosophical Explanations*. Belknap Press of Harvard University Press.
- Nummela, E. 1987. "No Coincidence." *The Mathematical Gazette* 71 (456): 147.

- Pritchard, D. 2007. "Anti-Luck Epistemology." *Synthese* 158 (3): 277–97.
- . 2009. "Safety-Based Epistemology: Whither Now?" *Journal of Philosophical Research* 34: 33–45.
- "Relationship between Primes and Fibonacci Sequence." n.d. Mathematics Stack Exchange. Accessed June 14, 2018. <https://math.stackexchange.com/questions/913287/relationship-between-primes-and-fibonacci-sequence>.
- Rosen, G. forthcoming. "Normative Necessity." In *Metaphysics, Meaning and Modality: Themes from Kit Fine*, edited by M. Dumitru. Oxford University Press.
- Roush, S. 2005. *Tracking Truth: Knowledge, Evidence, and Science*. Oxford University Press.
- Russell, B. 1948. *Human Knowledge: Its Scope and Limits*. London: Allen & Unwin.
- Sainsbury, R. M. 1997. "Easy Possibilities." *Philosophy and Phenomenological Research* 57: 907–19.
- Schechter, J. 2010. "The Reliability Challenge and the Epistemology of Logic." *Philosophical Perspectives* 24 (1): 437–64.
- . 2017. "Explanatory Challenges in Metaethics." In *The Routledge Handbook of Metaethics*, edited by T. McPherson and D. Plunkett, 443–58. Routledge.
- Sosa, E. 1999a. "How Must Knowledge Be Modally Related to What Is Known?" *Philosophical Topics* 26 (1/2): 373–84.
- . 1999b. "How to Defeat Opposition to Moore." *Noûs* 33 (s13): 141–53.
- . 2007. *A Virtue Epistemology: Apt Belief and Reflective Knowledge*. Vol. I. Oxford University Press.
- . 2009. *Reflective Knowledge: Apt Belief and Reflective Knowledge*. Vol. II. Oxford University Press.
- Street, S. 2006. "A Darwinian Dilemma for Realist Theories of Value." *Philosophical Studies* 127 (1): 109–66.
- Vavova, K. 2014. "Debunking Evolutionary Debunking." In *Oxford Studies in Metaethics*, Vol. 9, edited by R. Shafer-Landau, 76–101. Oxford University Press.

- . 2018. "Irrelevant Influences." *Philosophy and Phenomenological Research* 96 (1): 134–52.
- Warren, J., and D. Waxman. m.s. "Reliability, Explanation, and the Failure of Mathematical Realism."
- Wielenberg, E. J. 2010. "On the Evolutionary Debunking of Morality." *Ethics* 120 (3): 441–64.
- Williamson, T. 2002. *Knowledge and Its Limits*. Oxford University Press.
- Woodward, J. 2003. *Making Things Happen: A Theory of Causal Explanation*. Oxford University Press.