

KNOWLEDGE, NECESSITY AND DEFEAT

David Faraci

For us to *know*, our beliefs must correspond to the truth. In certain domains, such correspondence can seem troublingly mysterious. It calls out for explanation; yet none seems available, even in principle. Many have taken this to generate an epistemological challenge: If it is in principle impossible to explain belief-truth correspondence in a domain, this threatens either our knowledge or justification in that domain.¹ Call this the Intuitive Challenge.

The most famous version of the Intuitive Challenge is the Benacerraf-Field Challenge in the philosophy of mathematics. Paul Benacerraf (1973) offers a challenge to knowledge of realistically construed mathematical facts; Hartry Field (1989) shifts to justification, contending that we need to

explain how our beliefs about these remote [mathematical] entities can so well reflect the facts about them . . . [I]f it appears in principle impossible to explain this, then that tends to *undermine* the belief in mathematical entities, *despite* whatever reason we might have for believing in them. Of course, the reasons for believing in mathematical entities . . . still need to be addressed . . . (Field 1989, 26)²

A staggering amount of work in the philosophies of apparently necessary, a priori domains like mathematics, logic, ethics and philosophy itself concerns this challenge and its relatives. But for the past four decades, there has been a general worry about the challenge's legitimacy in *any* of these domains lurking in the background. David Lewis apparently suggested that in domains of necessary truth, our belief-forming methods are infallible when accurate. If that's so, it may be hard to see how

¹ I remain agnostic herein on whether the challenge is to knowledge or justification.

² Benacerraf and Field—like many proponents of the Intuitive Challenge—deploy it to defend anti-realism, not skepticism. Often when this passage is quoted, the final sentence is left out. I leave it in to highlight the fact that the Intuitive Challenge is not meant to be a magic bullet (as discussions of it sometimes suggest); for Field it merely identifies a defeater, which (like all defeaters) is itself defeasible.

an inability to explain their correspondence with the truth in any other sense could threaten them.

Here is the oft-cited passage:

[I]f 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, 114–15)

In fact, Lewis is not arguing that our mathematical beliefs are unassailable here; these remarks are meant as a *reductio*.³ But intentions aside, the question remains whether as these remarks are commonly read, they threaten the Intuitive Challenge. Does the fact that the relevant truths are necessary, and thus that our beliefs in them are guaranteed to meet certain modal conditions, inoculate them against the Intuitive Challenge? In this paper, I argue that the answer is no.

I begin, in §1, with an argument from Justin Clarke-Doane (forthcoming),⁴ defending our mathematical beliefs' *safety* and *sensitivity*, and thus their immunity to the Intuitive Challenge. This is

³ Note the lead-in: “Probably the right thing to say is that the demand for an infallible method does not make very good sense for knowledge of non-contingent matters, *because it is too easily trivialised*. For if it is a necessary truth that so-and-so, then . . .” (Lewis 1986, 114, emphasis mine). My own arguments are in much this same spirit; they concern the triviality of establishing certain modal statuses for our beliefs in the domains in which the Intuitive Challenge is typically raised. This means that, ironically, Lewis may best be read as sowing the seeds for my arguments *against* the “Lewisian” objection.

That being said, Lewis does resist the Intuitive Challenge, and some of the reasons he gives for doing so concern the necessity of mathematical (and modal) truth. Lewis addresses Benacerraf's original challenge, which explicitly depends on the causal theory of knowledge. As I read Lewis, his central reason for rejecting it is his belief 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. Nevertheless, he acknowledges that we should hope for an overarching theory of knowledge that encompasses knowledge of both the contingent and the necessary. He notes that that is not a task he can accomplish in that context, but makes some remarks suggesting that such a general theory of knowledge will vindicate knowledge of the mathematical and the modal (the latter, of course, being his real concern).

⁴ Earlier versions of the argument appear in Clarke-Doane (2012) and (2015).

arguably the most sophisticated development of the “Lewisian” objection to date. In §§2-3, I lay out what I take to be the intuitive underpinnings of the Intuitive Challenge. I argue that even beliefs that are safe and sensitive (in Clarke-Doane’s sense) can fail with respect to these epistemological intuitions—specifically, where these conditions are met *trivially*, as they are in the domains with which we are concerned. My conclusion is disjunctive: If we understand the relevant modal conditions as Clarke-Doane does, or in any other way such that our beliefs meet them trivially, those beliefs still face the Intuitive Challenge. If we instead understand these conditions such that our relevant beliefs do *not* meet them trivially (e.g., by looking to counterpossible counterfactuals; see §3.3), then it is an open question whether our beliefs meet those conditions at all. Either way, the Intuitive Challenge remains a threat in the domains in which it has typically been raised.

1. The Lewis and Clarke-Doane Expedition

Suppose our mathematical beliefs are by-and-large true. Beliefs are *safe* (in Clarke-Doane’s sense⁵) just in case they are true and could not easily have been false. Since the (fundamental) mathematical truths are necessary, we needn’t be concerned that modal variations in the truth could make our beliefs unsafe. Thus, the question of whether there are nearby metaphysically possible worlds where we have false mathematical beliefs becomes the question of whether there are nearby worlds where we have *different* mathematical beliefs.⁶ The more robust the explanation for our mathematical beliefs, the further away the possible worlds in which they are different, and thus the safer they are.⁷

⁵ There are a number of slightly different notions of “safety” in the literature. Clarke-Doane’s is closer—though not identical—to Williamson’s (2002) than to Sosa’s (1999) original formulation.

⁶ How we understand the “nearby” here depends on how we understand the “easily” in the demand that our beliefs “could not easily have been false.” More precision is unnecessary for our purposes.

⁷ I grant this for the sake of argument. But see Warren and Waxman (m.s.) for important worries about Clarke-Doane’s argument for our mathematical beliefs’ safety.

Ironically, help may come from the challengers here. Clarke-Doane, like many others, interprets so-called “evolutionary debunking arguments”⁸ as relatives of the Intuitive Challenge. These arguments begin with the premise that there is an evolutionary explanation for our beliefs in a domain. Assuming there is no reason to believe that evolution tracks the truth in that domain, it seems it would be a “cosmic coincidence”⁹ if our beliefs corresponded to that truth. But, Clarke-Doane argues, the robustness of this evolutionary explanation may well ensure that our mathematical beliefs couldn’t easily have been different, and thus that they are safe. To be clear, Clarke-Doane is not *committed* to their being safe. Rather, his point is that this argument for their safety seems promising, regardless of our ability to explain their correspondence with the truth in any other sense.¹⁰

Beliefs are *sensitive* (also in Clarke-Doane’s sense, though more standardly) just in case they are true and, had the relevant truths been different, those beliefs would have been correspondingly different.¹¹ Since our true mathematical beliefs are *necessarily* true (de re), the relevant

⁸ The primary focus as of late has been Sharon Street (2006). But Street’s challenge follows a long line of what Russ Shafer-Landau (2012) calls “genealogical challenges.” Famous examples include Nietzsche (1887) and Mackie (1977).

⁹ 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).

¹⁰ “This argument for the safety of our mathematical beliefs obviously turns on speculative empirical hypotheses. . . . But the key point is simply that there is a promising argument — one that certainly does not appear ‘in principle impossible’ to make” (Clarke-Doane forthcoming).

¹¹ See, e.g., Nozick (1981). To make sense of both sensitivity and safety conditions, we need some account of beliefs’ counterparts (with different contents) at various worlds. For our purposes, we need speak about such counterparts only at the level of domains. Assuming a (at least partially) content-independent account of domains can be given, this will be fairly simple. For example, suppose that mathematical beliefs are beliefs about relations between numbers. (This is not meant to be plausible, only illustrative.) Our mathematical beliefs (e.g., 2 and 2 is identical to 4) would fail to be safe if at nearby worlds where the mathematical truth is

counterfactual—if the truth had been different, our beliefs would have been correspondingly different—is trivially true across metaphysically possible worlds. Thus, our mathematical beliefs are sensitive whether or not there is an explanation for their correspondence to the truth in any other sense.

With these arguments in hand, Clarke-Doane proposes:

Modal Security: Information, E, cannot undermine our beliefs of a kind, D, without giving us some reason to believe that our D-beliefs are not both safe and sensitive. (Clarke-Doane forthcoming)

His defense of Modal Security is largely intuitive. He says “it is hard to see” how information could undermine our beliefs without challenging their safety or sensitivity. After all, if our beliefs are modally secure—are both safe and sensitive—then they “were (all but) bound to be true” (Clarke-Doane forthcoming).

Clarke-Doane recognizes that some may object to his assuming that our mathematical beliefs are by-and-large true in order to establish their modal security. However, it is widely accepted that one may assume the truth of one’s beliefs in responding to certain epistemological challenges.¹² Clarke-Doane maintains that this applies to the Intuitive Challenge. His evidence is that if we were required *not* to assume the truth of our beliefs, we would not even be able to meet the Intuitive Challenge when it comes to our perceptual beliefs:

Notoriously, it appears in principle impossible (for us realists) to offer an explanation of the reliability of our perceptual beliefs *that would convince a perceptual skeptic*. What we can arguably offer is an explanation of the reliability of our perceptual beliefs *that assumes the reliability of our perceptual beliefs*. We can arguably offer an evolutionary explanation of how we came to have reliable cognitive mechanisms for perceptual belief, and a neurophysical explanation of how those mechanisms work such that they are reliable. (Clarke-Doane forthcoming)

the same, we have different beliefs about relations between numbers (e.g., 2 and 2 is identical to 5). Thanks to Daniel Waxman for highlighting the need to address this.

¹² See, e.g., Berker (2015) and Vavova (2014).

Given the apparent legitimacy of assuming the truth of our beliefs, the apparent modal security of our mathematical beliefs on that assumption, and his rejection of certain alternative interpretations of the challenge (some of which are discussed in what follows), Clarke-Doane concludes that there is no real challenge here:

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. (Clarke-Doane forthcoming)

How does this argument relate to the passage from Lewis? Clarke-Doane takes that passage to show that “our mathematical beliefs are vacuously sensitive on a standard semantics” (Clarke-Doane forthcoming).¹³ This makes sense. The claim that “there is no possibility of being wrong” about a necessary truth is naturally read as the claim that there is no *counterfactual* where an *actual* belief in a necessary truth is false. Clarke-Doane can be read as building on this point. Following a good deal of epistemological progress since the 1980s, we now recognize that while the belief that $2+2=4$ would be *sensitive* “no matter how it came to be believed,” its origins still matter, for it might fail to be *safe*. If we came to believe that $2+2=4$ (as opposed to 5) by flipping a coin, then our belief could easily have been false (had the coin come down the other way). But just as the necessity of the mathematical truths guarantees the *sensitivity* of our beliefs in them, so the necessity of those truths plus the stability of our mathematical beliefs’ origins guarantees their *safety*. If we should accept

¹³ Lewis addresses sensitivity directly in an earlier passage: “If I know by seeing, for instance, my visual experience depends on the scene before my eyes; *if the scene had been different*, within limits, my experience and *my subsequent belief would have been correspondingly different* . . . But nothing can depend counterfactually on non-contingent matters. Nothing sensible can be said about how our opinions would be different if there were no number seventeen . . . All counterfactuals with impossible antecedents may indeed be vacuously true. But even so, *it is seldom sensible to affirm them?*” (Lewis 1986, 111, emphasis mine). Note that here, again (see note 3), Lewis’ point is that the trivial sensitivity of our beliefs in necessary truths is epistemologically *irrelevant*, not vindicating.

Modal Security, it follows that nothing—including any version of the Intuitive Challenge—can threaten our mathematical beliefs. The same goes for our beliefs in the other domains in which the Intuitive Challenge is typically raised.

2. The Intuitive Roots of the Intuitive Challenge

If we take the Intuitive Challenge to be a challenge to establish our beliefs' modal security, Clarke-Doane has argued that it can be easily met. But this is not what the challenge's champions have had in mind. Field is explicit that he takes the modal status of our beliefs to be significant only insofar as it helps illuminate an explanation for belief-truth correspondence *at the actual world*¹⁴:

[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 in the mathematical case, 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, bolding mine)

We can understand the motivations for the Intuitive Challenge by asking why we should understand the problem this way. Why do we need to explain “the *actual* correlation between our believing 'p' and its being the case that p?” A common answer is that brute belief-truth correspondence is highly improbable (at least in large quantities, such as across a domain like

¹⁴ I remain agnostic here on whether 'explanation' itself is best understood modally. What matters is that the intuitions that undergird the Intuitive Challenge are about explanation, and so responses to that challenge should be judged against those intuitions, not directly against modal statuses like safety and sensitivity that are (I argue) meant to capture such intuitions themselves, and may well fail to do so (as, I argue, they do in relevant cases).

mathematics). Thus, in domains where there is no possible explanation for belief-truth correspondence, it is highly unlikely that our beliefs are by-and-large true.¹⁵

This seems right. But I think there is another important motivation for the challenge.

Consider two cases:

Weather Donald is (presumptively) justified in forming beliefs on the basis of Method M. Donald uses Method M to determine next week's weather. There is a highly stable explanation for the particular outputs of Method M, and for Donald's using it. All of Donald's resultant beliefs are true.

Prime Donald is (presumptively) justified in forming beliefs on the basis of Method M. Donald uses Method M to determine whether certain high numbers are prime. There is a highly stable explanation for the particular outputs of Method M, and for Donald's using it. All of Donald's resultant beliefs are true.¹⁶

In both cases, Donald has some true, justified beliefs. Nevertheless, intuitively, he might fail to have knowledge. For either or both might be *Gettier cases*. My argument in this section relies heavily on my (and I hope your) intuitive sense that **Weather** and **Prime** are on a par in this respect. The fact that Donald's beliefs in **Weather** are about a contingent matter, while his beliefs in **Prime** concern necessary truths, makes no difference to our intuitions about the possibility that his beliefs are Gettiered.

I submit that there is an important link between our intuitions about Gettier cases and the motivations for the demand to explain belief-truth correspondence at the actual world. Consider the

¹⁵ E.g.: "If it was accidental that we came to have a reliable deductive mechanism, it was presumably highly unlikely for us to have ended up with a reliable mechanism; there are far more ways to be unreliable than to be reliable. Accepting that our reliability came about by accident would therefore put pressure on our overall view of the world" (Schechter 2010, 446–47).

¹⁶ I don't specify the nature of Method M because I don't want to run up against intuitions about what methods Donald might be presumptively justified in using, or how such justification is arrived at. If it helps to make things more concrete, simply imagine that Donald is consulting a crystal ball (and it was highly determined that he would do so and that he would see what he saw). Imagine, further, that Donald is justified in using the crystal ball because it was recommended to him by a generally reliable testifier.

language we use to describe what's gone wrong in Gettier cases. We refer to the *presence of something bad*: some beliefs are justified, but true only as a matter of *luck, accident, or coincidence*.¹⁷ Yet these notions are themselves naturally understood in terms of an *absence of explanation*. A coincidence is “a remarkable concurrence of events or circumstances without apparent causal connection.” And an accident is “an event that happens by chance or that is without apparent or deliberate cause.” One might object to my use of dictionary definitions here (they're from Google). But the defined words are not typically deployed as terms of art, at least not at first; rather, they are used *suggestively* to help us get an intuitive sense of what's gone wrong in Gettier cases.

Further evidence that there is a link between the Intuitive Challenge and our intuitions about Gettier cases comes from the fact that early attempts both to solve the Gettier problem and to develop the challenge explicitly appeal to explanations—e.g., via the causal theory of knowledge.¹⁸ No such attempt has been successful (or at least agreed upon); but it is not at all clear that the broad line of thought has been or ought to be abandoned, especially for purposes of developing the Intuitive Challenge, which demands significantly less than an analysis of knowledge.

If I'm right, it is natural to think of Gettier cases as involving the absence of some “right kind” of explanation. The present goal is not to identify this kind; it is the much more modest goal of identifying a *minimally necessary* explanatory condition for knowledge beyond true, justified belief. This condition should capture *some* of our intuitions about *some* Gettier cases. And it should reflect

¹⁷ E.g., not long after the original Gettier (1963) paper, Peter Unger argues that “[f]or any sentential value of *p*, a man's belief that *p* is an instance of knowledge only if it is not an accident that the man's belief is true” (Unger 1967, 172). For a more recent proposal of a non-accidentality condition and further references, see Jenkins (2006).

¹⁸ Benacerraf's original formulation explicitly appealed to the causal theory of knowledge. My position is that while the causal theory of knowledge is false, the intuitions that made it appealing—intuitions about the need for an explanatory connection between epistemically successful beliefs and the truth—undergird the Intuitive Challenge.

the worry that, even assuming our justified beliefs are by-and-large true, there is some knowledge-undermining sense in which their correspondence to the truth might be inexplicable.

It is tempting to claim that the relevant condition is simply the existence of *some* explanation for the relevant belief-truth correspondence. Unfortunately, things are not so simple. There *is* an explanation: the relevant correspondence is explained by the conjunction of the origins of the relevant beliefs and the fact that those beliefs are true.

This is clearly not the sort of explanation we're looking for. For one thing, such explanations are trivial, in that they are available for *any* true belief. If they could be used to meet the demand posed by the Intuitive Challenge, we could bypass Clarke-Doane's discussion of modal security entirely and simply argue as follows:

(P1) Our mathematical, logical, ethical and philosophical beliefs are by-and-large true.

(P2) If our beliefs are by-and-large true, this can be explained by the conjunction of the origins of those beliefs and the fact that they are true.

(C) Therefore, there is an explanation for the correspondence between our beliefs and the truth in mathematics, logic, ethics and philosophy.

I submit that our rejection of this argument, our sense that there might still be *luck*, *accident* or *coincidence* in these domains, stems from the *merely conjunctive* nature of the explanation offered in P2. The conjunction of the origins of our beliefs and those beliefs' being true is an explanation of the wrong kind because it fails to illuminate an explanatory *connection* (as opposed to a mere correlation) between our beliefs and the truth. This language is still largely suggestive; I haven't said what it is for there to be such a connection, except that it requires more than mere correlation.¹⁹ But it is sufficient to motivate our necessary condition:

¹⁹ I am far from the first to use such language; many have framed the Intuitive Challenge in terms of finding a "connection" or "link" between our beliefs and the truth, including Benacerraf himself: "[I]f I know that Cleveland is between New York and Chicago, it is because there exists a certain relation between the truth

Explanatory Connection Beliefs constitute knowledge only if there is an explanation for their correspondence to the truth at the actual world, beyond a trivial explanation such as that provided by the mere conjunction of the origin of those beliefs and the fact that they are true.

I submit that Explanatory Connection captures one way in which true, justified beliefs can fail to be knowledge. It is also a central motivation for the Intuitive Challenge: If an explanatory connection between beliefs and truth in a domain is in principle impossible—i.e., there is in principle no non-trivial explanation for their correspondence—then even if our beliefs in that domain are true, they are Gettiered *at best*.²⁰

On one reading of Clarke-Doane, he would reject my claim that the intuitions undergirding the Intuitive Challenge are about explanatory connections. Rather, he would maintain, in a Gettiered version of **Weather**, the ultimate problem is only that Donald would fail to believe the truth were it

conditions for that statement and my present ‘subjective’ state of belief (whatever may be our accounts of truth and knowledge, they must **connect** with each other in this way). Similarly, in mathematics, it must be possible to **link up** what it is for p to be true with my belief that p ” (Benacerraf 1973, 667, bolding mine). For a promising account of such explanatory connections, see Lutz (m.s. b).

²⁰ If you find out that some beliefs of yours are Gettiered, this gives you a new avenue to knowledge, since learning that your beliefs are Gettiered means learning that they are true. And Clarke-Doane claims that you are permitted to *assume* the truth of your beliefs in responding to the Intuitive Challenge. Does this provide an answer to the challenge? No. The assumption of truth is legitimate only because in order to explain X, one must assume that X obtains. This is why, for instance, in the case Clarke-Doane mentions, it is legitimate to claim that *if* our perceptual beliefs are by-and-large true, *then* it is explained by the relevant evolutionary/neurophysical story. But the assumption that our beliefs are true cannot be used as *evidence* of an explanatory connection. For instance, you cannot legitimately reply to the Intuitive Challenge by agreeing that brute belief-truth correspondence is highly improbable, and thus holding that the assumed truth of your beliefs provides probabilistic evidence that they are *explicably* true. Whether Clarke-Doane’s argument is question-begging in this way depends on how it is interpreted. If the modal security of our beliefs is offered as evidence of an explanatory connection, and any of the evidentiary weight is placed on the assumed actual truth of those beliefs (as opposed to the modal aspects of their safety and sensitivity), that would amount to objectionable question-begging (see §3.1). Thanks to Aaron Elliott for helpful discussion on this point.

different (sensitivity), or that he might easily have believed something false (safety). All it is for beliefs to be *non-accidentally true* is for them to remain true across a sufficiently broad set of counterfactual worlds: “The key idea behind Modal Security is that there is no such thing as a ‘non-modal underminer’” (Clarke-Doane forthcoming).²¹

Prime provides intuitive evidence against these claims. For if we accept them, along with Clarke-Doane’s arguments from §1, Donald’s beliefs in **Prime** are both safe and sensitive, and therefore cannot be Gettiered. The relevant truths are necessary, guaranteeing his beliefs’ sensitivity; this and the stability of the explanation for those beliefs guarantees their safety.²² Yet surely Donald *might* still be Gettiered in **Prime**. Nothing about the change in subject matter from contingent truths in **Weather**, to necessary truths in **Prime**, should lead us to dismiss the possibility that Donald’s are “beliefs whose truth is coincidental in a malignant sense” (Clarke-Doane forthcoming).²³ I therefore conclude that the Intuitive Challenge is based in Gettier-relevant intuitions about the need for an explanatory connection between our beliefs and the truth, one which minimally requires a non-trivial

²¹ Clarke-Doane is explicit that he takes modal security to satisfy both Gettier intuitions and those undergirding the Intuitive Challenge: “[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 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 F-beliefs, given their truth, and the claim that those beliefs are Gettiered” (Clarke-Doane forthcoming).

²² There are possible complications concerning the nature of a ‘domain’, but this should make no difference here.

²³ There may well be epistemologically significant differences between the cases that would move these judgements apart. For instance, there may be more ways to be wrong about prime numbers than about next week’s weather. This is irrelevant to the issue at hand.

explanation for belief-truth correspondence. **Prime** provides intuitive evidence that modally secure beliefs can fail to meet this criteria.

Clarke-Doane might instead be read as acknowledging these intuitions, but seeking to undermine them in order to defend Modal Security. The first way to do this would be to argue that, counterintuitively, the modal security of Donald's beliefs in **Prime** really *does* suggest that they bear an explanatory connection to the truth. He might do this (or be read as having done this) by arguing that modal security either *provides evidence for* or *constitutes* such an explanatory connection. Alternatively, he might grant that modal security is insufficient to meet the Intuitive Challenge, but argue that there is simply no way to flesh out this intuitive notion of and/or test for an "explanatory connection," beyond establishing beliefs' modal security. In the next section, I consider each of these strategies.

Before moving on, let me sum up my position on the intuitive roots of the Intuitive Challenge. My discussion to this point suggests that because brute belief-truth correspondence is highly improbable, evidence that a non-trivial explanation for actual belief-truth correspondence is in principle impossible is, further, evidence that the relevant beliefs are highly unlikely to be true. It is also evidence that even if those beliefs *are* true, they are so only accidentally, and thus are Gettiered at best. The further claim of the Intuitive Challenge is that this either threatens our *knowledge* or constitutes an *undercutting defeater* for relevant beliefs, reducing justification by undermining an agent's evidence for her beliefs.²⁴ I remain agnostic here on which way the Intuitive Challenge should be developed.

²⁴ Undercutting defeaters are standardly contrasted with *rebutting defeaters*, which are evidence that an agent's beliefs are false.

3. Three Avenues of Defense for Modal Security

3.1 *Modal Security as Evidence of an Explanatory Connection*

In **Weather**, Donald justifiably believes (say) that it will rain next week. And it will, in fact, rain next week. But we aren't sure if he is really *connected* to that truth, or if he is just getting lucky. A natural way to test this is to ask what would happen to Donald's belief if it were to snow next week instead. Would he now believe it will snow? This is just to ask whether Donald is *sensitive* to the truth about next week's weather. We might also ask whether Donald could easily have had false beliefs, whether his beliefs are *safe*. If his beliefs are indeed safe or sensitive, the best explanation is almost certainly that he is connected to the fact that it will rain. After all, if the only possible explanation for his beliefs' correspondence to the truth were trivial—the conjunction of their origins and their being true—it is highly unlikely that correspondence would persist counterfactually.

The naturalness of this line of thought suggests that the claim that modal security provides evidence for a connection between beliefs and the truth is on the right track. Specifically, the modal security of Donald's beliefs in **Weather** is *abductive* evidence. If Donald's beliefs in **Weather** are safe and sensitive, the best explanation seems to be that there is an explanatory connection between the outputs of Method M and the truth.²⁵

The problem is that in **Prime**, as in the domains in which the Intuitive Challenge is typically raised, this evidence is defeated. Begin with the sensitivity-relevant status: *at nearby worlds where the truth is different, Donald's beliefs are correspondingly different*. In **Prime**, this follows from the necessity of the relevant truths, and thus will be the case regardless of whether there is a connection between

²⁵ This helps make sense of Field's claim (in the passage quoted at the start of §2) that "counterfactual dependence . . . *needs explaining*" (emphasis mine). He recognizes that sensitivity is not an *explanans* for belief-truth correspondence (as Clarke-Doane might be read as suggesting; see §3.2); it is an *explanandum* for which a connection between beliefs and truth might be the best explanation.

Donald's beliefs and those truths at the actual world. We therefore cannot infer to the best explanation that Donald's beliefs are connected to the truth.

Next consider the safety-relevant status: *at nearby worlds where the truth is the same as at the actual world, Donald's beliefs are also the same*. Again, in many cases, a belief's having this modal status is evidence of its being connected to the truth. But *precisely the point* of the evolutionary debunking arguments Clarke-Doane draws on is that the best explanation for our beliefs' having this modal status is *not* their being connected to the truth. Rather, the explanation for our beliefs' being the same at nearby worlds is that they are explained by stable evolutionary forces (and are therefore true at those worlds given the necessity of the relevant truths). Such beliefs will be safe regardless of whether they are connected to the truth.²⁶ The same goes for **Prime**, given that prime numbers are necessarily prime and the "highly stable explanation for the particular outputs of Method M, and for Donald's using it." The abductive evidence safety provides is therefore defeated.

In **Prime**, as in the domains in which the Intuitive Challenge is typically raised, beliefs' modal security can be fully explained by (a) their actual truth, (b) the stability of the explanation for those beliefs; and (c) the fact that the relevant truths are necessary. Neither (b) nor (c) provide any evidence that beliefs are connected to the truth. Starting with (c): Surely there can fail to be a

²⁶ Some might worry that necessary truths' connection to contingent ones can't vary. But this is neither intuitive nor clear upon reflection. It is natural to think that the fact that $2+2=4$ bears a stronger connection to what happened when I put these two coins with those two coins than it is to what happened when I put a coin on the table by itself. One possible line on this stems from a recent view that mathematical truths can explain contingent facts by constraining the causal order so as to make those facts more inevitable. See Lange (2012). If the mathematical truths don't make it more inevitable that evolution guides us as it does—or, say, do so only to the minimal extent that they make *all* contingent facts more inevitable—this may allow us to clarify the intuitive sense in which evolutionary forces fail to connect us to those facts. Of course, if the mathematical truths *do* make it more inevitable that evolution guides us as it does, this may provide a potential avenue for *responding* to the Intuitive Challenge.

connection between beliefs and necessary truths just as easily as contingent ones—hence the intuition that Donald is no more likely to have knowledge in **Prime** than in **Weather**. And surely the modal stability of a belief-forming mechanism alone does nothing to guarantee that it connects us to the truth. A misleading belief-forming method is no better for our being guaranteed to use it; indeed, arguably, just the opposite. As Clarke-Doane says, if our mathematical beliefs are true, then they “were (all but) bound to be true.” But it is equally the case that if they are false, then they were (all but) bound to be false. This illuminates the sense in which the safety or sensitivity of a belief can be *trivial*: when it is guaranteed by something epistemologically irrelevant, such as the necessity of the relevant truths or the stability of the beliefs’ explanation.

It follows that the only evidence Clarke-Doane has provided that there is an explanatory connection here is *the assumption that our beliefs are actually true*. But such an assumption cannot be used to provide abductive evidence in this way. This would just be to argue that because brute belief-truth correspondence is improbable, the best explanation for *assumed* belief-truth correspondence is that it is connected to the truth. That is baldly question-begging.²⁷ If modal security is to provide evidence here, it must do so in virtue of its *modal* features. As just argued, those modal features provide no evidence of a connection between beliefs and truth in the relevant cases.

3.2 Modal Security as Constituting an Explanatory Connection

One might claim that Donald’s beliefs’ modal security *constitutes* a non-trivial explanation in **Prime**—one that is absent in **Weather**—rather than merely providing evidence that such an explanation exists. Unfortunately, this is a dead end. Recall that, in **Prime**, Donald’s beliefs’ modal security can be fully explained by: (a) the actual truth of his beliefs; (b) the stability of the explanation for those beliefs; and (c) the fact that the relevant truths are necessary. According to the present line of

²⁷ See note 20.

thought, the mere conjunction of the origins of Donald's beliefs and (a) their actual truth is a trivial explanation. But the conjunction of the former and (a)-(c) is *non-trivial*. This suggests that either (b), (c) or their conjunction with each other or with (a) constitutes a non-trivial explanation for the correspondence between Donald's beliefs and the truth.

I argued above that (b) and (c) provide no evidence of an explanatory connection; surely they do not *constitute* one. Again, the stability of the explanation for one's beliefs alone seems to have nothing to do with their accuracy. That stability explains why, if one's beliefs correspond to necessary truths, they will continue to do so counterfactually. It does *not* explain how they came to correspond to those truths at the actual world. As for (c): Again, it seems possible to be Gettiered when one believes something necessary-if-true no less than when one believes something contingent-if-true. A belief's being *necessarily* true (de re) isn't a non-trivial explanation for its correspondence to the truth any more than its simply *being true* is (and the latter is trivial). Finally, if neither (b) nor (c) constitutes a non-trivial explanation of belief-truth correspondence, there is no reason to think their conjunction with each other or with (a) does.²⁸

²⁸ This line of thought is related to the current debate in normative epistemology over the (il)legitimacy of so-called "third-factor explanations." For example, David Enoch (2011) argues that if survival is good, then evolution (which 'tracks' survival) might give us by-and-large true moral beliefs, since the causal explanation for our beliefs (evolution) is necessarily correlated with the moral truth (goodness). Does this constitute a non-trivial explanation for our normative beliefs' correspondence to the truth at the actual world? Some think so. For instance, Eric Wielenberg anticipates Clarke-Doane's argument, suggesting that if our beliefs' correspondence to the truth is necessary, there is no threat here, for "where there is no contingency, there are no coincidences" (Wielenberg 2010, 461). The roots of my response can be found in my arguments in this section: The modal security of Donald's beliefs in **Prime** provides only a trivial explanation because it reduces to the explanation provided by his beliefs' actual truth, the stability of their explanation, and their necessity. The first is only trivially explanatory; the second two are not explanatory at all. The question is whether it would make a difference if correspondence between Method M and the prime numbers were *itself* necessary. I (we) argue that it does not in Elliott & Faraci (m.s.). See also Lutz (m.s. a).

3.3 Modal Security as the Best We Can Do

I have argued that establishing the modal security of our beliefs is insufficient to meet the Intuitive Challenge. But the lesson to draw from Clarke-Doane's discussion might not be that modally secure beliefs always meet our intuitive criteria for knowledge, but rather that there is no way, in practice, to demand more. This is suggested by some of what Clarke-Doane says in response to two possible avenues for development of the challenge. The first comes from Joshua Schechter, who characterizes the challenge in terms of two questions,²⁹ the relevant one here's being:

The Etiological Question: How is it that we have a cognitive mechanism for deductive inference that is reliable? (Schechter 2010, 444)

Schechter is explicit that this is *not* simply "the question of how we came to have" our deductive mechanism (Schechter 2010, 444). We can in theory explain why we have the mechanism we do. And we grant that that mechanism is reliable. Thus, in one sense, we can explain our reliability. Our mechanism, which we have because of [insert causal explanation] is reliable. But this is just the sort of trivial explanation Explanatory Connection rules out.

In response, Clarke-Doane claims that in order to develop the Intuitive Challenge along these lines, Schechter will need to distinguish our being "selected to have a reliable mechanism for mathematical belief" from our "being selected to have a mechanism for mathematical belief with *property F which is in fact reliable*." But, Clarke-Doane charges, in order to do this, "we would seem to need to have to decide what mechanism it would have benefited our ancestors to have had had *the mathematical truths been different*" (Clarke-Doane forthcoming). In other words, Clarke-Doane suggests that any attempt to show that we are reliable will have to proceed by showing that our beliefs are not

²⁹ Schechter (2010, 443) quotes the same passage from Lewis discussed in the introduction and develops his version of the challenge with the aim of responding to it.

modally secure. But we can't do that, says Clarke-Doane, so there's no way to develop the Intuitive Challenge along these lines.

Clarke-Doane offers no argument for the claim that the only way to make the distinction Schechter needs is by appealing to counterfactuals. And it is far from obvious that he is correct. One might alternatively seek to directly characterize legitimate form(s) of explanation, and then look for evidence that these do (not) obtain in some relevant domain.³⁰ For example, Schechter suggests that in general, explanations of belief-truth correspondence take one of three forms: the facts explain the beliefs, or vice versa, or some third-factor explains their correspondence. Perhaps *all* explanations that can meet the Intuitive Challenge take one of these three forms, but in some domains such explanations are impossible.³¹

Even if counterfactuals are required, not everyone agrees that it is impossible to establish “what mechanism it would have benefited our ancestors to have had *had the mathematical truths been*

³⁰ Of course, if explanation is best understood modally, this will end up being a modal strategy of some sort.

³¹ The current dialectic concerning “third-factor explanations” (see note 28) follows roughly this line of thought. Most agree that non-naturalism rules out explanations of the first two forms, which is why the focus has been on third-factor explanations. This is also related to the popular view that the Intuitive Challenge is a demand to show that the truth factors into the best explanation of our beliefs. Clarke-Doane rejects this reading of the challenge for three reasons: (1) Arguments that mathematics is indispensable for empirical theories suggest that the challenge, thus stated, might easily be met; (2) Field himself apparently rejects this reading; and (3) even if it turns out that the challenge so stated cannot be met, the relevant beliefs might still be modally secure. Because discussing (1) would require a significant digression into the literature on indispensability, I have ignored this reading until now. Three brief comments: First, if my arguments herein are successful, (3) is irrelevant. Second, dialectically, the relevant question would seem to be whether the Intuitive Challenge's champions *believe* indispensability arguments can address the challenge, not whether they actually can. It might turn out that this really *is* the challenge, and it just so happens it can be met in the mathematical case. Third, as Clarke-Doane notes, this reading of the challenge is frequently raised in ethics. It is noteworthy that that is precisely the area in which indispensability arguments seem least plausible (again, especially for non-naturalists, against whom the Intuitive Challenge is most frequently raised; though see Enoch (2011)).

different.” (Clarke-Doane recognizes that this point is contentious.) Many have suggested that the set of metaphysically possible worlds is not the relevant one within which to consider such counterfactuals. Field has precisely this reaction to Lewis’ claim that “nothing can depend counterfactually on non-contingent matters”:

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)

Following this line of thought, a promising strategy may be to consider what beliefs or belief-forming mechanisms we would have had at certain *counterpossible* worlds.³²

Though I will not develop either strategy further here, it is instructive to consider the motivations for the latter, “hypermodal” strategy, as I take this to bolster both my view on the intuitive underpinnings of the Intuitive Challenge and my view that modal security is best understood as providing (defeasible) abductive evidence for explanatory connections between beliefs and truth. One potential barrier to development of hypermodal tests is the need to show that the counterpossible worlds appealed to by the test are closer to the actual world than those possible worlds that are too far to be relevant (or argue that the standards are different for counterpossible worlds).³³ This is a more technical way of putting an obvious worry. If it shouldn’t concern me that I

³² In this context, this is more frequently proposed to test for sensitivity, rather than to answer Schechter’s etiological question—e.g., “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 m.s.).

³³ For discussions regarding modal distance and counterpossible worlds see, e.g., Lange (2009) and Nolan (1997).

would fail to track the truth at some distantly possible worlds, why should it concern me that I would fail to track the truth at some *impossible* ones?

Field tells us the answer. The point of looking to counterfactuals is to find out what happens to our beliefs *at worlds where the truth differs*. If those are only counterpossible worlds, then that's where we need to look. But *why* is that the point? Indeed, what motivates *any* choice of worlds when developing (hyper)modal tests? The answer, I submit, is their role providing abductive evidence for the presence of an explanatory connection. I have already explained why Clarke-Doane's merely modal tests fail to provide such evidence in the domains with which we are concerned. Surely the intuitiveness of turning to counterpossible worlds (at least once one is already used to thinking in modal terms) is rooted in the fact that counterpossible worlds are the next obvious place to look for evidence about what's going on at the *actual* world: connection or coincidence. If, instead, concerns about accidentality were really just concerns about local counterfactuals themselves, there would be no motivation for looking to counterpossible worlds at all.

Again, I will not pursue these strategies further here. This is not because I don't think them promising—I do—but because either's further development is a large project in itself. For our purposes, what matters is that neither strategy's viability has been successfully challenged (by Clarke-Doane or, to my knowledge, anyone else). Clarke-Doane offers little reason to think a non-modal strategy will fail, and no reason to think the hypermodal strategy will. Instead, he falls back on the claim that even if these strategies *can* be developed to avoid his worries, they would fail to threaten the modal security of our beliefs:

[E]ven if Schechter were correct, it is hard to see how the apparent in principle impossibility of explaining the reliability of our mathematical beliefs in his sense could undermine them. For all that has been said, we might still be able to show that our mathematical beliefs are safe and sensitive. (Clarke-Doane forthcoming)

Even if there is some hyperintensional sense of "explanation" according to which one can intelligibly request an explanation of the "merely actual correlation" between

our mathematical beliefs and the truths, it is unclear how the apparent in principle impossibility of offering that could undermine those beliefs — given that we may still be able to show that they are safe and sensitive. (Clarke-Doane forthcoming)

This is just a return to the idea that safety and sensitivity, as he has conceived of them, are the intuitive end of the line. I have already responded to this, by arguing that the Intuitive Challenge is motivated by a demand for an explanatory connection between our beliefs and the truth—minimally, a non-trivial explanation for the relevant correspondence, as per Explanatory Connection—and that *trivially* safe and sensitive beliefs can fail to be connected to the truth in the relevant way.

4. Conclusion

Typically, the reason beliefs are “bound to be true” is that our method of arriving at them successfully *connects us* to the truth. Counterfactuals provide powerful evidence for such connections. Unfortunately, in the domains that matter here, that evidence is defeated when it comes to the modal conditions Clarke-Doane discusses. The problem, as Lewis himself recognizes, is that when it comes to necessary truths, modal conditions on knowledge can be “too easily trivialised.” This may mean that we need to move beyond modal conditions. Or it may just mean that we have not identified the right ones. Perhaps, as discussed in the previous section, a hypermodal sensitivity test—which our beliefs in these domains would not pass trivially—can still provide abductive evidence that those beliefs are (not) connected to the truth.³⁴

If these are dead ends, there may be no challenge here. But much more would need to be said to show that this is the case. Instead, champions of the “Lewisian” objection, like Clarke-Doane, aim to render these strategies irrelevant by maintaining that our beliefs’ modal status

³⁴ Or perhaps safety does the trick after all, even as a merely modal condition. See Warren and Waxman (m.s.).

obviates the need to explain their correspondence with the truth in any other sense, even when that modal status is trivially secured. I've argued that, at least intuitively, this is false.³⁵

I conclude that there are good grounds for pursuing development of the Intuitive Challenge. There may well be good responses to it, once it is properly explicated. But for now, the Intuitive Challenge remains a potentially serious threat in the domains in which it has typically been raised.

Acknowledgements

My thanks to Justin Clarke-Doane, Aaron Elliot, Marc Lange, Matt Lutz, Tristram McPherson, Daniel Nolan, Josh Schechter, Jacob Sparks, Teemu Toppinen, Vilma Venesmaa, Daniel Waxman and Daniel Wodak for indispensable discussion. Thanks also to the organizers and participants of the 2015 Rocky Mountain Ethics Congress and of the Moral and Political Philosophy Research Seminar at the University of Helsinki.

References

- 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*, 661–679.
- Berker, S. 2015. "Does Evolutionary Psychology Show That Normativity Is Mind-Dependent?" In *Moral Psychology and Human Agency: Philosophical Essays on the Science of Ethics*, edited by J. D'Arms and D. Jacobson, 215–52. Oxford University Press.
- Clarke-Doane, J. forthcoming. "What Is the Benacerraf Problem?" In *New Perspectives on the Philosophy of Paul Benacerraf: Truth, Objects, Infinity*, edited by F. Pataut.
- . 2012. "Morality and Mathematics: The Evolutionary Challenge." *Ethics* 122 (2): 313–40.
- . 2015. "Justification and Explanation in Mathematics and Morality." In *Oxford Studies in Metaethics*, edited by R. Shafer-Landau. Vol. 10. Oxford University Press.
- Elliott, A., and D. Faraci. unpublished manuscript. "Normative Non-Naturalism and the 'Third-Factor' Gambit."
- Enoch, D. 2011. *Taking Morality Seriously: A Defense of Robust Realism*. Oxford University Press.

³⁵ And that's assuming they are true in the first place. That assumption is legitimate—even necessary—in some contexts. But it cannot question-beggingly provide evidence for itself. See note 20.

- Field, H. 1989. *Realism, Mathematics, and Modality*. Oxford, UK ; New York, NY, USA: Blackwell.
- Gettier, E.L. 1963. "Is Justified True Belief Knowledge?" *Analysis*, 121–123.
- Jenkins, C. S. 2006. "Knowledge and Explanation." *Canadian Journal of Philosophy* 36 (2): 137–163.
- Kneale, W. 1950. "Natural Laws and Contrary-to-Fact Conditionals." *Analysis* 10 (6): 121–25.
- Lange, M. 2009. *Laws and Lawmakers: Science, Metaphysics, and the Laws of Nature*. Oxford; New York: Oxford University Press.
- . 2012. "What Makes a Scientific Explanation Distinctively Mathematical?" *The British Journal for the Philosophy of Science*, October.
- Lewis, D.K. 1986. *On the Plurality of Worlds*. Cambridge University Press.
- Lutz, M. unpublished manuscript. "Moral Non-Naturalism's Gettier Problem."
- . unpublished manuscript. "What Makes Evolution a Defeater?"
- Mackie, J.L. 1977. *Ethics: Inventing Right and Wrong*. Penguin.
- Nietzsche, F. 1887. *On the Genealogy of Morals*.
- Nolan, D. 1997. "Impossible Worlds: A Modest Approach." *Notre Dame Journal for Formal Logic* 38 (4): 535–72.
- Nozick, R. 1981. *Philosophical Explanations*. Belknap Press of Harvard University Press.
- Rosen, G. unpublished manuscript. "Normative Necessity."
- Schechter, J. 2010. "The Reliability Challenge and the Epistemology of Logic." *Philosophical Perspectives* 24 (1): 437–464.
- Shafer-Landau, R. 2012. "Evolutionary Debunking, Moral Realism and Moral Knowledge." *Journal of Ethics and Social Philosophy*.
- Sosa, E. 1999. "How to Defeat Opposition to Moore." *Noûs* 33: 141–53.
- Street, S. 2006. "A Darwinian Dilemma for Realist Theories of Value." *Philosophical Studies* 127 (1): 109–166.
- Unger, P. 1967. "Experience and Factual Knowledge." *Journal of Philosophy* 64 (5): 152–173.
- Vavova, K. 2014. "Debunking Evolutionary Debunking." In *Oxford Studies in Metaethics*, edited by R. Shafer-Landau, 9:76–101.
- Warren, J., and D. Waxman. unpublished manuscript. "Reliability, Explanation, and the Failure of Mathematical Realism."
- Wielenberg, E. J. 2010. "On the Evolutionary Debunking of Morality." *Ethics* 120 (3): 441–464.
- Williamson, T. 2002. *Knowledge and Its Limits*. Oxford; New York: Oxford University Press.