[Rough sketch for 2013 Wisconsin Metaethics Workshop attendees]

Justification and Explanation in Mathematics and Morality¹

Let the *justificatory challenge* for realism about an area of discourse, D, be the challenge to *explain the justification* of our (epistemically basic) D-beliefs. One answer to the justificatory challenge for mathematical realism is that the fact that the contents of our mathematical beliefs are intuitively evident explains their justification. On this view, our mathematical beliefs are justified *a priori*. Godel writes,

"[D]espite their remoteness from sense experience, we do have a perception... of the objects of [mathematics], as is seen from the fact that the axioms force themselves upon us as being true. I don't see why we should have less confidence in this kind of perception, i.e., in mathematical intuition, than in sense perception, which induces us to build up physical theories and to expect that future sense perceptions will agree with them and, moreover, to believe that a question not decidable now has meaning and may be decided in the future [1947, 271]."

One problem with Godel's answer to the justificatory challenge is that *which if any mathematical contents are intuitively evident* is controversial. Hence, Godel's answer can appear question-begging. For

example, contra Godel, Boolos writes,

"I am by no means convinced that any of the axioms of infinity, union, or power [set]...force themselves upon us or that all the axioms of replacement that we can comprehend do....[T]here is nothing *unclear* about the power set axiom [for example]....But it does not seem to me unreasonable to think that...it is not the case that for every set, there is a set of all its subsets [1999, 130–131]."

But, however compelling Godel's answer to the justificatory challenge for mathematical realism may be,

the moral analog of that answer seems prima facie to be on the same footing. As W.D. Ross writes,

"[B]oth in mathematics and in ethics we have certain crystal-clear intuitions from which we build up all that we can know about the nature of numbers and the nature of duty [1939, 144]."

An alternative answer to the justificatory challenge for mathematical realism is that the fact that the contents of our mathematical beliefs figure into the explanation of our having the observations that we have explains their justification. On this view, our mathematical beliefs are justified *empirically*. Quine writes,

¹ Thanks to Hartry Field and Jennifer McDonald for helpful discussion.

"Objects at the atomic level and beyond are posited to make the laws of macroscopic objects, and ultimately the laws of experience, simpler....Moreover, the abstract entities which are the substance of mathematics...are another posit in the same spirit. Epistemologically these are myths on the same footing with physical objects...neither better nor worse except for differences in the degree to which they expedite our dealings with sense experiences [1951, Section VI]."

Putnam clarifies,

"[Q]uantification over mathematical entities is indispensable for science... therefore we should accept such quantification; but this commits us to...the existence of the mathematical entities [that satisfy our theories]. This type of argument stems, of course, from Quine, who has for years stressed both the indispensability of quantification over mathematical entities and the intellectual dishonesty of denying the existence of what one daily presupposes [1971, 347].

One virtue of Quine's answer to the justificatory challenge is that it does not seem to be question-begging, like Godel's. Godel's answer appeals to intuitions (or judgments of intuitive evidentness), which vary significantly. But Quine's answer appeals to observations, which vary less. Nevertheless, Quine's answer presents a problem of its own. It at most answers the justificatory challenge *under the assumption that we do not believe in higher set theory*. Higher set theoretic truths are clearly superfluous to the explanation of our having the observations that we have. Quine himself was compelled to pronounce them "mathematical recreation and without ontological rights [1986, 400]".

But, however compelling Quine's answer to the justificatory challenge for mathematical realism may be, notoriously, the moral analog of that answer does *not* seem *prima facie* to be on the same footing. Harman writes,

"In explaining the observations that support a physical theory, scientists typically appeal to mathematical principles. On the other hand, one never seems to need to appeal in this way to moral principles. Since an observation is evidence for what best explains it...there is indirect observational evidence for mathematics. There does not seem to be observational evidence...for basic moral principles [1977, 9 - 10]."

Call the argument that the contents of our mathematical beliefs figure into the explanation of our having the observations that we have because they are background assumptions to every empirical explanation at all, the *indispensability argument*. Call the claim that the contents of our moral beliefs do not figure into any such explanation *Harman's Objection* – where, by "observation", Harman means any "immediate judgment made in response to the situation without any conscious reasoning [1977, 208]."² Note that, in Harman's sense, we have both mathematical and moral observations. Finally, following Bonjour, define

 $^{^{2}}$ Harman's objection is sometimes understood as the claim that the contents of our moral beliefs do not figure into the explanation of intuitively "observable phenomena" more generally – including, e.g., the movements of planets. The argument which follows would work equally if this reading of "Harman's objection" were adopted.

radical empiricism as the view that our belief that p is justified *if and only if* p figures into the explanation of our having the observations that we have.³ Then we may conclude that *if the indispensability argument and Harman's objection are both sound, a radical empiricist can answer the justificatory challenge for mathematical realism but she cannot answer the justificatory challenge for moral realism.* Note, however, that the rest of us are free to answer the justificatory challenge for moral realism *a la* Ross, and

to answer the justificatory challenge for mathematical realism *a la* some combination of Godel and Quine (perhaps invoking Godel when seeking to explain the justification of our higher set-theoretic beliefs).

Evolutionary Debunking Arguments

Harman's objection is now widely supposed to show more than – what, again, seems *prima facie* plausible – that a radical empiricist cannot answer the justificatory challenge for moral realism. Harman's objection – or a trivial consequence of it – is now supposed to *undermine* our moral beliefs *even under the assumption that those beliefs are (defeasibly) a priori justified*. Joyce writes,

"Nativism [the hypothesis that moral concepts are evolutionarily innate] offers us a genealogical explanation of moral judgments that nowhere...presupposes that these beliefs are true.... My contention...is that moral nativism...might well...render [moral beliefs] unjustified....In particular, any epistemological benefit-of-the-doubt that might have been extended to moral beliefs...will be neutralized by the availability of an empirically confirmed moral genealogy that nowhere...presupposes their truth [2008, 217]."

The hypothesis of a "moral genealogy that nowhere...presupposes" the truth of our moral beliefs is implied by Harman's objection, so the latter will "render our moral beliefs unjustified" if the former does.

But *how* might this consequence of Harman's objection undermine our moral beliefs under the assumption that they are (defeasibly) *a priori* justified? Joyce never satisfactorily answers this question. He says that moral nativism shows that our moral beliefs are the product of a "non-truth-tracking" process which is "independent of their truth". But by this he means merely that the contents of our moral beliefs do not figure into the explanation of our having them [Forthcoming, 8]. In particular, he does not mean that had the moral truths been different – or had there been no (atomic) such truths – our moral beliefs would have been the same. Nor, evidently, does he mean that we might have easily had different (basic) moral beliefs (more on each claim below). In other words, Joyce simply repeats the relevant consequence of Harman's Objection, and does nothing to explain how it could "render moral beliefs unjustified".

³ See his [1998].

The best answer that I know of to the question at issue is suggested by the work of Street. She writes,

"[T]he realist must hold that an...[inexplicable] coincidence took place -- claiming that as a matter of sheer luck, evolutionary pressures affected our evaluative attitudes in such a way that they just happened to land on...the true [moral] views....[T]o explain why human beings tend to make the [moral] judgments that we do, we do not need to suppose that these...are *true* [2008, 208 – 209]."

Let the *reliability challenge* for D-realism be the challenge to explain the reliability of our D-beliefs (under a realist construal). Then I shall understand debunking arguments aimed at moral realism as follows. Harman's Objection – or a trivial consequence of it – *undermines* our *a priori* justified moral beliefs (under a realist construal) because it shows that the reliability challenge for moral realism is unanswerable. The background assumption is that our beliefs of a kind, D, are undermined (under a realist construal) if it appears impossible to explain the reliability of our D-beliefs (so construed).

Benacerraf's Challenge and Debunking Arguments

The reliability challenge for mathematical realism is also said to be unanswerable. Benacerraf writes,

"[O]n a realist (i.e., standard) account of mathematical truth our explanation of how we know the basic postulates must be suitably connected with how we interpret the referential apparatus of the theory....[But] what is missing is *precisely*...an account of the link between our cognitive faculties and the objects known...We accept as knowledge only those beliefs which we can appropriately relate to our...faculties [1973, 674]."

Benacerraf's concern stemmed from the view that knowledge requires a *causal relation* to obtain between the knower and the subject matter of the knower's knowledge. Benacerraf elaborates,

"I favour a causal account of knowledge on which for X to know that S is true requires some causal relation to obtain between X and the referents of the names, predicates, and quantifiers of S....[But]...combining this view of knowledge with the "standard" view of mathematical truth makes it difficult to see how mathematical knowledge is possible....[T]he connection between the truth conditions for the statements of number theory and any relevant events connected with the people who are supposed to have mathematical knowledge cannot be made out [1973, 671 - 3]."

Note that Benacerraf's concern is independent of that of debunkers, despite common associations with theirs. Benacerraf's concern is that mathematical truths *are about entities to which we could bear no causal relation* – whether or not those truths figure into the explanation of our believing them. Debunkers' concern is that moral truths – while presumably *about* entities to which we *could* bear a causal relation, such as people, actions, and events – *fail to figure into the explanation of our believing those truths*. Benacerraf's concern seems similarly independent of that of Quine, Putnam, and Harman, who all seem to be concerned with the explanation of our having the observations that we have, rather

than with the possibility that there obtains a causal relation between us and the subject matter of our beliefs.

It is now widely agreed that causal constraints on knowledge (and justification) are too stringent. But it is also agreed that the reliability challenge for mathematical realism remains pressing. This is puzzling. If, as debunkers suggest, the impossibility of answering the reliability challenge for D-realism stems from the fact that the contents of our D-beliefs fail to figure into the explanation of our having them, then, by the indispensability argument, *it should not seem to arise for mathematical realism*. As Steiner writes,

"[S]uppose that we believe...the axioms of analysis or of number theory. We can assume that *something* is causally responsible for our belief, and that there exists a theory -- actual or possible, known or unknown -- which can satisfactorily explain our belief in causal style. This theory, like all others, *will contain the axioms of number theory and analysis* [1973, 61]."

Surely Benacerraf's challenge is not *that* easy to evade. What has gone wrong?

Justification, Explanation, and the SS Principle

Debunkers have confused the justificatory challenge with the reliability challenge. Field writes,

"[W]e can formulate [Benacerraf's] challenge so as to make indispensability considerations of questionable relevance to answering it. The way to understand Benacerraf's challenge...is not as a challenge to ...*justify* our mathematical beliefs, but as a challenge to ...*explain the reliability* of these beliefs. We start out by assuming the existence of mathematical entities that obey the standard mathematical theories; we grant also that there may be positive reasons for believing in those entities. These positive reasons might involve...initial plausibility....[or] might...be that the postulation of these entities appears to be indispensable....But Benacerraf's challenge...is to...explain how our beliefs about these remote 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 [1989, 26]."

I take Field's point to imply that even if Steiner's application of the indispensability argument suffices to *explain the justification* of our mathematical beliefs – and, indeed, even if it suffices to do so in a way that is consistent with radical empiricism – it does not suffice to *explain the reliability* of those beliefs.

Consider the following passage from Joyce.

"There is some evidence that natural selection has provided humans with an inbuilt faculty for simple arithmetic...[L]et's interpret this as implying that our belief that 1 + 1 = 2 is innate....So does the fact that we have such a genealogical explanation of our simple mathematical beliefs serve to demonstrate that we are unjustified in holding these beliefs? Surely not, for we have no grasp of how this belief might have been selected for, how it might have enhanced reproductive

fitness, independent of its truth....The truth of "1 + 1 = 2" is a background assumption to any reasonable hypothesis of how this belief might have come to be innate [2006, 182]."

Joyce claims that "the truth of "1 + 1 = 2" is a background assumption to any reasonable hypothesis of how [the belief that 1 + 1 = 2] might have come to be innate". The fact that the contents of our mathematical beliefs figure into the explanation of our having them shows, as per the indispensability argument, that the contents of those beliefs figure into the explanation of our having the observations that we have (in Harman's sense). It thus answers the *justificatory* challenge for mathematical realism – and, indeed, answers it in a way that is consistent with radical empiricism. But the contents of our mathematical beliefs could figure into the explanation of our having the observations that we have despite our failing to have any idea how those beliefs reliably align with the mathematical truths. Indeed, Field's suggestion seems to be that *this is precisely the situation*. The fact that the contents of our mathematical beliefs figure into the explanation of our having the observations that we have here any idea how those beliefs reliably align with the mathematical truths. Indeed, Field's suggestion seems to be that this is precisely the situation. The fact that the contents of our mathematical beliefs figure into the explanation of our having them does not, then, seem to be sufficient for explaining their reliability.

But even if Steiner's application of the indispensability argument is not *sufficient* for answering the reliability challenge for mathematical realism, is it not *necessary*? Field is not clear on this question. But there is an argument for the negative answer.⁴ Consider another sentence from the same passage of Joyce.

"[That 1 + 1 = 2]...is an eternal and necessary truth, and thus by "hard-wiring" such a belief into our brains natural selection takes no risks – it is not as if the environment could suddenly change such that 1 + 1 would equal 3 [2006, 182]."

Here Joyce observes that mathematical truths are "eternal and necessary". The observation that the mathematical truths are necessary *does* help to answer the reliability challenge for mathematical realism. It shows, assuming the (actual) truth of our mathematical beliefs, that our mathematical beliefs could not have been false because the mathematical *truths* were different (the observation that the mathematical truths are eternal is redundant, since, if they are necessary, then they are eternal). As Lewis writes,

"[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...and no matter how it came to be believed [1986, 114-115]."

⁴ In his [2005], Section V, Field appears to commit himself to the negative answer as well, but not for the reasons that I offer. He suggests that Balaguer's Full-Blooded Platonism (FBP) answers Benacerraf's challenge. FBP says, roughly, that every mathematical theory, T, is about its class of models, and, whenever T is consistent, there is such a class (where consistency is a primitive notion and the relevant notion of truth is a standard Tarskian one). But FBP is independent of the indispensability argument. Indeed, Balaguer argues that mathematics is dispensable in his [1998]. My own view is that FBP accomplishes no epistemically significant task that "standard" platonism does not. See Clarke-Doane [Forthcoming A], especially Section III.

Joyce also observes that our (basic) mathematical beliefs are evolutionarily innate, implying that we could not have easily had different ones. This observation also helps to answer the reliability challenge. It shows that our mathematical beliefs could not have (easily) been false because our mathematical *beliefs* were different. But *these observations could both be true even if the contents of our mathematical beliefs failed to figure into the explanation of our having them* – or, indeed, even if the indispensability argument failed systematically. Clearly, the argument for the first claim – just like the argument that the moral truths are necessary – need not assume that the contents of our mathematical beliefs figure into the explanation of our having realism is often taken to be that we were "bound" to have the (basic) moral beliefs that we have *but the explanation for this does not assume the truth of those beliefs*. The key question is, thus, whether showing that the mathematical truths are necessary, and that we could not have easily had different mathematical beliefs, would suffice to "explain their reliability".

The relevant sense of "explain their reliability" is such that the apparent impossibility of explaining the reliability of our beliefs of a kind, D, *undermines* them. *In this sense*, showing that the D-truths are necessary and that we could not have easily had different D-beliefs must be sufficient for explaining their reliability, by the following weak principle.

SS Principle: Information, E, cannot undermine our beliefs of a kind, D, without calling into question our ability to show that our D-beliefs are both *safe* and *sensitive*.⁵

Our D-beliefs are *safe* if they could not have easily been false. They are *sensitive* if, had the D-truths been different, our D-beliefs would have been likewise.⁶ If we can show that our D-beliefs are *both safe and sensitive* then we can show that they enjoy the most exacting kind of intellectual security that our non-indexical beliefs could hope to enjoy. It is hard to imagine how information, E, which in no way calls into question our ability to show that our D-beliefs enjoy such security could show that we ought to them up. To this extent, the SS Principle is banal. But if we can show that those beliefs are both safe and sensitive. Given the (actual) truth of our D-beliefs, then we *can* show that those beliefs are both safe and sensitivity. It also implies their safety, given their (actual) truth and hypothesis that we could not have easily had different D-beliefs. Hence, *if we can show that our D-beliefs are both safe and sensitive*,

⁵ For more on the SS Principle, see Section VI of Clarke-Doane [Forthcoming A].

⁶ The definitions of both safety and sensitivity must be relativized to methods of belief formation.

then the SS Principle guarantees that there is no other sense of "explain the reliability" which is such that the apparent impossibility of explaining the reliability of our D-beliefs could *undermine* those beliefs.

Explaining Reliability

This argument schema requires three qualifications. First, it assumes the (actual) truth of our D-beliefs. Field explicitly grants the truth of our mathematical beliefs, and Street implicitly grants the truth of our moral beliefs in her [2008]. The reason is obvious. If we were not allowed to assume the truth of our D-beliefs, then we could not "explain the reliability" of our paradigmatically reliable beliefs – namely, our perceptual beliefs. The explanation of the reliability of our perceptual beliefs appeals to evolutionary and psycho-physical theories, and both of these theories blatantly assume the truth of our perceptual beliefs.

Second, the argument schema allows that there may be other senses of "explain the reliability" in which it *does* appear impossible to explain the reliability of our D-beliefs – even given that we can show that our D-beliefs are both safe and sensitive. Indeed, one might object that the above argument for the safety and sensitivity of our D-beliefs leaves *the fact that they are safe and sensitive itself* an "inexplicable coincidence". Perhaps there are senses of "explain the reliability" in which this is true. The argument schema denies, on the basis the SS Principle, that the apparent impossibility explaining the reliability of our D-beliefs in any of these other senses could *undermine* them – for it could do nothing to threaten our ability to show that they enjoy extraordinary intellectual security. In other words, the above argument schema assumes that no other sense of "explain the reliability" could serve Street's and Field's purposes.

Finally, while the SS Principle ensures that showing that our D-beliefs are both safe and sensitive suffices for relevantly explaining their reliability, *it may be highly non-trivial to show this*. With regard to safety, we would have to show that there are enough (epistemically basic) mathematical or moral beliefs which could not have easily been different and from whose contents we may abduct our corresponding theories. But it is not clear that we can show this. Even our mathematical theories seem *prima facie* to be seriously underdetermined by the contents of beliefs which are plausibly evolutionarily inevitable. With regard to sensitivity, the orthodox view that the mathematical or moral truths are necessary is, notwithstanding Joyce, badly in need of defense. In neither case can we plausibly argue that the truths are logically or conceptually necessary. This is not *itself* a problem. If we had to establish the sensitivity of our D-beliefs across logically or conceptually possible worlds in order to relevantly "explain their reliability" then it would be impossible to explain the reliability of our relevantly uncontroversial beliefs. As Korman notes,

"we would have believed that there are baseballs even if it were false that atoms arranged baseballwise compose baseballs [Forthcoming, Section 4.2]." The problem is rather that it is hard to see how to argue that the mathematical or moral truths are necessary simpliciter (assuming that there *is* a significant question of what is necessary simpliciter) if not by arguing that those truths are logically or conceptually necessary, and noting that this entails that they are necessary simpliciter.⁷ What matters for the argument schema is merely that an argument that the D-truths are necessary and that we could not have easily had different D-beliefs *need not assume that their contents figure into the explanation of our having them.*

Conclusions

I have distinguished the justificatory and the reliability challenges for mathematical and moral realism, and argued that debunkers confuse them. We may be able to show that the contents of our D-beliefs figure into the explanation of our having the observations that we have – thus answering the justificatory challenge for D-realism, and even doing so in a way that is consistent with radical empiricism – despite our inability to answer the reliability challenge. It follows that blocking Harman's objection – even in a systematic way – does not suffice to answer the reliability challenge for moral realism, just as the indispensability argument does not suffice to answer the reliability challenge for mathematical realism.

In other direction, we may be able to answer the reliability challenge for D-realism despite our inability to show that the contents of our D-beliefs figure into the explanation of our having the observations that we have – and even despite our inability to answer the justificatory challenge for D-realism in a way that is consistent with radical empiricism. It follows that, contrary to what Street's work suggests, Harman's objection cannot undermine our *a priori* justified moral beliefs by showing that the reliability challenge for moral realism is unanswerable, just as blocking the indispensability argument – even in a systematic way – cannot undermine our *a priori* justified mathematical beliefs by showing that the reliability challenge for mathematical realism is unanswerable. Harman's objection and its mathematical analog fail to call into question our ability to show that our relevant beliefs are both safe and sensitive, and, by the SS Principle, information which fails to call into question this ability cannot *undermine* those beliefs.

The general upshot is that Harman's objection and the reliability challenge for moral realism are *independent*, as are the indispensability argument and the reliability challenge for mathematical realism.

⁷ In Clarke-Doane [Forthcoming B], I argue that there is not a significant question of what is necessary simpliciter.

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