

Small Steps and Great Leaps in Thought: The Epistemology of Basic Deductive Rules^{*}

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1 Introduction

On a widespread and plausible picture, reasoning is a rule-governed activity.¹ In our reasoning, we employ various rules of inference. Some of the rules we employ are deductive rules of inference – presumably including versions of Modus Ponens, Reasoning by Cases, Reductio ad Absurdum and the like. Other rules we employ are ampliative rules of inference – presumably including some version of Enumerative Induction or Inference to the Best Explanation.

This general picture of reasoning raises an important explanatory question: What explains the fact that we are epistemically justified in employing some rules of inference but not others?

Why, for instance, are we justified in employing Inference to the Best Explanation (if indeed we are) but not Inference to the Third Worst Explanation?

This question is particularly pressing for those rules of inference that we employ as *basic* in our thought – the rules that we employ but not on the basis of having any beliefs about the rules or employing any other rules.² The difficulty here is in explaining how it can be that we are justified in employing a rule of inference where this justification does not stem from a justified belief that the rule preserves truth, that the rule preserves justification, or that the rule otherwise has some positive epistemic status.

A few years back, David Enoch and I wrote a paper called “How Are Basic Belief-Forming Methods Justified?”³ In it, we argued for an answer to this question. The answer we gave, in broad outline, is that the justification thinkers have for employing a rule of inference as basic

^{*} This is the penultimate version of a paper forthcoming in Magdalena Balcerak Jackson and Brendan Balcerak Jackson (eds.) *Reasoning: Essays on Theoretical and Practical Thinking*. Oxford: Oxford University Press.

¹ This claim is endorsed by Boghossian (2003), Field (2000), Peacocke (2004), Pollock and Cruz (1999), and Wedgwood (2002), among many others.

² See Field (2000) and Wedgwood (2002) for discussions of basic rules.

³ Enoch and Schechter (2008).

stems from its importance to their thought. A rule of inference is epistemically justified when it is pragmatically indispensable to one of the central projects of rationality.

I like this view. It's the best view I've been able to come up with. But I'm much more confident of its overall shape than I am about all of the details and refinements that appear in that paper.

What I'd like to do here is to provide something like a prequel to that paper. I don't want to argue for the specific account that appears in my paper with Enoch, but rather for the claim that we should endorse a view in the general ballpark. In explaining the justification of our basic rules of inference, we should appeal (in part) to features like usefulness or conduciveness or indispensability to important or required cognitive projects.

In this paper, I will focus on the case of deductive rules of inference. This is an interesting special case, one that enables me to sharply raise some tricky issues. I will also get at the topic a bit sideways. I won't be directly focusing on the question of how thinkers are justified in employing certain deductive rules as basic. Rather, I'll be focusing on a slightly different question. To make this question salient, it helps to tell a (somewhat goofy) story:

A Story

The aliens have landed. They have descended on the capitals of the world and asked to be shown examples of human accomplishments. Since they seem friendly, we've decided to comply. We show them tall buildings and grand engineering projects. We explain our great discoveries in physics, chemistry, and the other sciences. We present them with masterworks of literature, art, and music. They are appreciative of all that we show them. Then we turn to mathematics. We show them Andrew Wiles's proof of Fermat's Last Theorem.⁴ Here is their response:

“Hmmm... We see that a lot of work went into this. And it certainly highlights some interesting connections between different areas of mathematics. But it's difficult to see the point of all this work. After all, there is a simple four-line proof:

⁴ Wiles (1995).

Suppose x , y , z , and n are positive integers with $n > 2$.

Under this supposition, $x^n + y^n \neq z^n$.

So if x , y , z , and n are positive integers with $n > 2$ then $x^n + y^n \neq z^n$.

Therefore, for no positive integers x , y , z , and n with $n > 2$ is $x^n + y^n = z^n$.

So why did you go to all this bother?"⁵

This story can be used to raise several interesting questions: What is it to prove a claim? In what way is coming up with a proof a genuine accomplishment? What is the nature of mathematical understanding? And so on.

I'd like to focus on a different issue. A natural reaction to the story is that something is wrong with the aliens. One problematic feature of the aliens is that they don't appreciate the value of Wiles's proof. But there is a deeper problem.

Let's suppose that the aliens really do employ the following rule of inference:

(FLT) From the belief that x , y , z , and n are positive integers with $n > 2$, infer that $x^n + y^n \neq z^n$.

For instance, this rule licenses directly inferring from the claim that 13, 16, 17, and 5 are positive integers with $5 > 2$ to the claim that $13^5 + 16^5 \neq 17^5$.

Let's suppose that the FLT rule is basic in their thought – or at least, that it is as basic in their thought as simple deductive rules are in ours. In employing the rule, the aliens don't do any rapid mathematical calculations. They don't survey all of the natural numbers or quickly prove Fermat's Last Theorem before moving from the premise to the conclusion. They simply infer from the premise directly to the conclusion.

⁵ I borrow the idea of using Wiles's proof of Fermat's Last Theorem from Boghossian (2003), which uses it for a related purpose. For my purposes here, any substantive logical or mathematical result would do. What is particularly nice about Boghossian's example is that Fermat's Last Theorem is relatively easy to state but not at all easy to prove. Berry (2013) and Dogramaci (2015) also make use of Boghossian's example.

Let's also suppose that the aliens have a psychology similar to our own, and that they employ the very same rules of inference as we do – with the sole exception being the addition of the rule FLT.

The alien's reasoning in their "proof" does not yield a justified belief. While the aliens have a true belief that Fermat's Last Theorem is true, and they have come to believe this claim on the basis of employing necessarily truth-preserving rules of inference that are basic in their thought, they are not justified in so believing. Their belief lacks an important positive normative status. As it is tempting to say, the aliens are making *giant leaps* in their thinking. In their applications of FLT, their movements in thought are *simply too big* to yield a justified belief.

Now contrast the following rule:

(MP) From the beliefs that P and that if P then Q, infer that Q.

We employ this rule, or one much like it. In contrast to the aliens, our employment of this rule does seem justified.⁶ Typically, if we are justified in believing P and in believing if P then Q, and we come to infer that Q by employing this rule, the resulting belief is justified. The step from P and if P then Q to Q is small enough to yield a justified belief.

The question I'd like to discuss in this paper, then, is this: What explains the fact that we are justified in employing MP but we would not be justified – and the aliens in my story are not justified – in employing FLT?⁷

The reason this question is vexing is that there is a great deal in common between MP and FLT. They both preserve truth. They both necessarily preserve truth. Indeed, both rules are logically valid. (Or, at least, FLT is logically valid if we add a suitably strong theory of arithmetic as an

⁶ One might claim that the aliens have *some* justification for employing FLT. But it seems clear that, at the very least, there is a significant difference in degree. So even if one were to claim that the aliens are somewhat justified in employing FLT, there would remain the question of what explains this difference.

⁷ After I wrote the first draft of this paper, I discovered two papers that raise essentially the same problem – Berry (2013) and Dogramaci (2013). Dogramaci (2013) makes use of a different mathematical example – inferring that the first 10 decimal digits of Π have more odd digits than even digits – to raise what he calls the "easy/hard question". I find this example harder to think about than FLT. That is because when we imagine a thinker believing the correct answers to some range of questions about decimal expansions, it is tempting to attribute to the thinker a sub-personal reasoning mechanism that works out the answers. This can affect our judgments about cases. In any case, my thinking about the issues discussed here benefitted from reading those two papers.

additional premise.)⁸ MP is basic in our thought. FLT is basic in theirs. We treat MP as obviously correct. They treat FLT as obviously correct. And so on. The difficult question, then, is this: What breaks the symmetry between these two rules?⁹

I should concede that some aspects of my science fictional story may be a bit misleading about this question. Generating or possessing a mathematical proof is not simply a matter of reasoning deductively. But the story helps to throw into sharp relief the difference between rules like MP and rules like FLT, which is the contrast that I'm really interested in.

My discussion will proceed as follows. First, I'll make a few necessary clarifications about the question that I'm asking and the background assumptions that I'm making. Then I'll canvass several ways of trying to answer the question. In particular, I'll spend a fair bit of space discussing the idea that the crucial disanalogy between MP and FLT is that MP is built into one of our concepts – namely, the concept of the conditional – and FLT is not. I will argue that this account cannot explain the difference in epistemic status between the two rules. Instead, I will argue, we should appeal to usefulness, indispensability, or a closely related property in explaining this difference. Finally, I'll conclude by making a few remarks about how a view in this ballpark should be developed.

The overall structure of my argument is perhaps the least satisfying kind of argument in philosophy: “There is a very difficult problem here. Every view has its problems. The problems for all the other views are devastating. But the problems for my preferred view – while serious – can potentially be answered.” It would be nice to have something better to say in support of my view. But the issues here are difficult and this may be the best we currently can do.

⁸ If logical validity is understood in model-theoretic terms, by the categoricity of second-order Peano Arithmetic, second-order Peano Arithmetic will suffice. If logical validity is understood in proof-theoretic terms, it may turn out that we need to use a stronger theory. But here, too, there are good reasons to think that second-order Peano Arithmetic will (more than) suffice. Indeed, Macintyre has argued that first-order Peano Arithmetic will suffice. Friedman has conjectured that Exponential Function Arithmetic, which is relatively weak finitely axiomatizable subtheory of first order Peano Arithmetic will suffice. See McLarty (2010) for discussion of the technical situation.

⁹ The symmetry can be further enhanced by making a small modification to the story. Suppose that the aliens do not employ MP but instead employ the following rule: (MP-) From the beliefs that P, that if P then Q, and that FLT is truth-preserving, infer that Q. (Suppose that they also endorse rules strong enough to get from the rule FLT to the claim that FLT is truth-preserving.) From our point of view, the aliens are taking a large leap in employing the rule FLT. From their point of view, we're taking a large leap in employing MP. Why are we right and they wrong?

2 Clarifications

Before I discuss candidate accounts, let me first briefly make a few clarifications.

The first clarification concerns the rule MP. There are several reasons to think that we do not (and should not) employ a Modus Ponens-like rule that is as simple as the rule MP stated above.

As Gilbert Harman has argued, we do not and should not routinely infer what logically follows from our beliefs.¹⁰ One reason is that doing so would *clutter our minds* with irrelevancies. A second reason is that, when we notice that some implausible conclusion follows from premises we accept, sometimes the thing to do is to *give up a premise* rather than adopt the conclusion.¹¹ These considerations do not only apply to the logical consequence of our beliefs in general. They also apply to the specific case of Modus Ponens.

There are additional reasons to think that Modus Ponens-like rule we employ is more complicated than the simple rule stated above. One important consideration involves the existence of *graded beliefs*. I'm sympathetic to the idea that we don't merely have all-or-nothing beliefs, but also degrees of confidence in various propositions. Our deductive rules of inference presumably take these degrees of confidence somehow into account. A different consideration concerns *permission and obligation*. In some cases, it seems, we are mandated to draw the relevant deductive inference. In other cases, we are permitted but not required to do so. Our deductive rules of inference presumably somehow register the difference between such cases. A third consideration concerns suppositions. We can draw deductive inferences *within the scope of suppositions*, so the deductive rules we employ do not only govern the inference of beliefs from beliefs.

These complications notwithstanding, it is plausible that we employ a rule of inference that closely resembles the rule MP. We find Modus Ponens inferences extremely natural to make. When we report or rehearse trains of thought, it seems evident that we make use of a Modus

¹⁰ Harman (1986).

¹¹ Harman provides two additional arguments for why we should not always infer the logical consequences of our beliefs: (i) It can be rational to have inconsistent beliefs, such as when confronted by the liar paradox. But it would not be rational in such cases to infer arbitrary claims. (ii) We do not have the computational power to recognize all of the logical consequences of our beliefs, even in principle.

Ponens-like rule. In what follows, then, I will assume that we employ a deductive rule of inference that resembles the rule MP stated above.

A second clarification concerns the normative notion at issue in the central question of this paper. The relevant difference between the rules MP and FLT is a normative one. What exactly is this normative notion?

One might think that the core phenomenon here concerns knowledge: MP typically preserves knowledge and FLT does not.¹² That is, we typically come to know the conclusion of a MP inference applied to known premises, whereas the aliens don't even typically come to know the conclusion of a FLT inference applied to a known premise.

I agree with the claim that we typically come to know the conclusion of a MP inference applied to known premises and the aliens do not typically come to know the conclusion of a FLT inference applied to a known premise. But that is not the central normative difference. If the premises of a MP inference are justified – whether or not they are known – the conclusion will typically also be justified. The analogous claim is not true for FLT. So a more general and more fundamental difference is that MP typically preserves justification and FLT does not.¹³

There is a still more fundamental difference. Consider a thinker who forms a belief by applying MP to confidently held but unjustified beliefs. The resulting belief is epistemically problematic – it is an unjustified belief. But the thinker has not done anything wrong in *drawing the inference*. She has only made one mistake in her reasoning. By contrast, suppose one of the aliens applies FLT to a confidently held but unjustified belief. The alien will have made two mistakes in its reasoning – it will have applied an unjustified rule of inference to an unjustified belief. What this suggests is that a still more fundamental contrast concerns the normative status of inferences and rules of inference rather than beliefs: We are justified in employing the rule MP whereas the aliens are not justified in employing the rule FLT.

¹² The “typically” is needed to deal with the ways in which the closure of knowledge (or justification) may fail under competent deduction. See Schechter (2013b).

¹³ Some epistemologists distinguish between justification and entitlement. See, for instance, Burge (1993), Dretske (2000), and Wright (2004b). These philosophers may claim that we are not strictly speaking justified in employing basic rules but merely have an entitlement to employ them. In this paper, I use the word “justified” broadly, so as to include entitlement.

It is worth saying just a bit about how I am using the term “justified”. One of the lessons of contemporary epistemology is that there may be several different notions of justification. The relevant notion for my purposes here is the one that undergirds the intuitions we have about the aliens in the story. The intuitive contrast concerns *epistemic responsibility*: MP is an epistemically responsible rule (for us or the aliens) to employ. By contrast, FLT is an epistemically irresponsible rule (for us or the aliens) to employ.

These intuitions about responsibility are connected to the “size” of an inferential step. MP makes only a small step in reasoning. That is part of why it is a responsible rule for us to employ. By contrast, FLT rule makes a giant leap. That is why it is an irresponsible rule for the aliens to employ.

It is an important part of the setup of the case that the aliens are employing FLT as a *basic* rule in their thought. If, for instance, the aliens were to employ FLT on the basis of possessing a proof that the rule is truth-preserving, they would not count as epistemically irresponsible. What is irresponsible is employing FLT as a basic rule in thought. The challenge at the heart of this paper is to explain what breaks the symmetry between valid rules employed as basic.

Given these clarifications, the central question of this paper can be restated as follows:

What explains the fact that thinkers (or at least, thinkers broadly like us) are epistemically responsible in employing MP as a basic rule in thought but are not epistemically responsible (or at least, are significantly less responsible) in employing FLT as a basic rule in thought?

In answering this question, one needn’t present a justification of MP. We’re not looking for some argument that will make thinkers justified in employing MP when they weren’t already. We’re also not looking for considerations that will convince a skeptic (or an agnostic) about deductive reasoning. Rather, what we’re looking for is an *explanation* of the epistemic difference between the rules. In particular, we’re looking for a necessary condition on justification (or a necessary part of a sufficient condition or ...) that can distinguish between MP and FLT. And this condition had better be one that is normatively relevant.

It is worth noting that there is the same kind of phenomenon for non-deductive rules as there is for deductive rules. For instance, a rule of inference that takes a large collection of experimental data as its input and generates a scientific theory as its output *in a single step* is not one that we are justified in employing as basic. This is so even if the scientific theory that is output by the rule is the theory that we would ultimately come to upon careful reflection on the experimental data. It is simply too big a leap to go from data to theory in a single step. One needs to *work out* the theory. The same phenomenon also arises in other cases – for instance, in the generation of our everyday empirical beliefs and our moral judgments about difficult cases.¹⁴

In the end, we’re going to want a unified answer to the question of why thinkers are justified in employing certain rules of inference (and belief-forming methods more generally) as basic – an answer that applies to deductive and inductive rules as well as to the belief-forming methods that govern perception, the imagination, memory, and so on. In particular, we’re going to want a unified theory of when a step in thought counts as “too large”, and an explanation of why belief-forming methods that involve steps that are too large are unjustified. In what follows, however, I will largely restrict my attention to the case of deductive reasoning.

3 Candidate Views

Those clarifications made, let me now discuss candidate views of the normative difference between MP and FLT. I won’t be discussing specific accounts so much as general approaches.

To get a sense of the difficulties involved with finding a plausible view, consider the following three accounts of the justification of rules of inference employed as basic in thought.

The first view appeals to truth-conduciveness. This is a natural place to look for a normatively-relevant property. After all, in some important sense, truth is the goal (or, at least, *a* goal) of inquiry.

¹⁴ Schechter (2017).

Reliabilism. Thinkers are *pro tanto* justified in employing a rule of inference as basic in thought if (and by virtue of the fact that) the rule is conditionally reliable in the sense that it tends to yield truths from truths.¹⁵

If one is interested in knowledge instead of justification, one might appeal to a different truth-related property – for instance, safety. One might say that a rule of inference (employed as basic) is knowledge-preserving if it is safe in the sense that it couldn't easily lead from truth to falsity.¹⁶ Given my focus on justification rather than knowledge, I'll focus on reliability rather than safety, but the main problem for Reliabilism will apply to safety-based accounts, too.¹⁷

The second view appeals to a psychological notion, namely, psychological unavoidability:

Psychological Unavoidability. Thinkers are *pro tanto* justified in employing a rule of inference as basic in thought if (and by virtue of the fact that) reasoning with the rule is psychologically unavoidable for the thinkers.¹⁸

This view may be motivated by appeal to an epistemic ought-implies-can principle. Given that a thinker cannot avoid employing some particular rule of inference, one might claim that the thinker is not unjustified – that is, epistemically irresponsible – in employing the rule in reasoning.

The third view appeals to phenomenology:

Phenomenology. Thinkers are *pro tanto* justified in employing a rule of inference as basic in thought if (and by virtue of the fact that) applications of the rule are accompanied by the appropriate phenomenology.¹⁹

¹⁵ An influential version of Reliabilism appears in Goldman (1979). Reliabilist views have also been endorsed by Alston (1988) and Swain (1981), among many others.

¹⁶ Safety-based accounts of knowledge have been endorsed by Pritchard (2005), Sosa (1999), and Williamson (2000), among others.

¹⁷ Many forms of virtue epistemology understand epistemic virtue in reliabilist terms and so face the very same difficulty. See, for instance, Sosa (2007). There are forms of virtue epistemology that emphasize responsibility rather than reliability. But I am not aware of any proposal within the virtue responsibilist tradition that offers an answer to the guiding question of this paper.

¹⁸ A version of this view is defended in Dretske (2000).

For instance, one might claim that thinkers are justified in employing a rule as basic if applications of the rule are accompanied by feelings of obviousness, clarity, or rational compulsion.

The idea here is that just as we (plausibly) are justified in forming beliefs about our immediate surroundings by taking how things perceptually appear to us as a guide to how things are,²⁰ so too are we justified in reasoning in certain ways by taking feelings of obviousness (or clarity or rational compulsion, or the like) as a guide to how to reason. After all, one might ask, what else do we have to go on but how things seem to us?

These three views are very different from one another. And each of them faces difficulties specific to the view in question. For instance, against Reliabilism, there are plausible counterexamples to reliability as either necessary or sufficient for epistemic justification.²¹ More generally, reliability has no intuitive connection with epistemic justification (when understood as epistemic responsibility) – the mere fact that a rule of inference tends to be truth preserving does not make it responsible to employ.²² A difficulty facing Psychological Unavoidability is that it makes epistemic justification much too cheap – on this view, a thinker can be justified in employing any rule whatsoever, so long as the thinker has the right kind of psychological incapacity. Finally, against Phenomenology, I'm suspicious of the claim that there is any such phenomenology that typically accompanies our reasoning. Most of the time, our reasoning doesn't come along with an accompanying feeling of obviousness, clarity, or rational compulsion. Sometimes, there is such a feeling – for instance, when one is carefully reflecting on a simple inference – but such feelings are certainly not as common as philosophical folklore would suggest.

These problems are pressing. But for present purposes we don't need to go into all of that. There is a straightforward problem that applies to all three views. Namely, none of the proposals can

¹⁹ See Bengson (2015), Chudnoff (2013), and Huemer (2005) for views on which phenomenology is relevant to the justification of basic beliefs. See Dogramaci (2013) for a view on which phenomenology is relevant to the justification of basic inferential steps.

²⁰ Pryor (2000).

²¹ The New Evil Demon problem is plausibly a counterexample to necessity. See Lehrer and Cohen (1983) and Cohen (1984). BonJour's case of the reliable clairvoyant and Lehrer's case of Mr. Truetemp are plausibly counterexamples to sufficiency. See BonJour (1980) and Lehrer (1990).

²² Boghossian (2003, p. 228).

distinguish between MP and FLT. Both rules are perfectly reliable. They do not merely have a tendency to move from truths to truths, but are necessarily truth preserving. So appealing to reliability cannot be used to distinguish between the two rules. (And *mutatis mutandis* for safety.) Similarly, we can imagine that our employment of MP and the alien's employment of FLT agree as regards to their psychological unavoidability – the aliens cannot avoid employing FLT any more than we can avoid employing MP. So appealing to psychological unavoidability cannot be used to distinguish between the two rules. And, finally, we can imagine that our employment of MP and the aliens' employment of FLT are alike as regards phenomenology. Applications of the two rules can have the same accompanying feelings of obviousness, clarity, and rational compulsion. So appealing to phenomenology cannot be used to distinguish between the two rules, either.

These three views do not exhaust the range of options. There are many other accounts of the justification of employing rules as basic in thought. Here, for instance, are four more accounts:

Acquaintance. Thinkers are *pro tanto* justified in employing a rule of inference as basic in thought if (and by virtue of the fact that) the thinkers are acquainted with (or have cognitive contact with, or are otherwise “in touch with”) the validity of the rule.²³

Evolution. Thinkers are *pro tanto* justified in employing a rule of inference as basic in thought if (and by virtue of the fact that) the rule is part of a cognitive mechanism that (i) has an evolutionary function that is appropriately epistemic and (ii) is well suited for performing that function.²⁴

Simplicity. The logical consequence relation has fine structure in the sense that some logical entailments count as direct and others count as indirect. Thinkers are *pro tanto* justified in employing a rule of inference as basic in thought if (and by virtue of the fact that) the rule corresponds to a direct entailment.

²³ This view is sometimes discussed under the heading of “rational insight” or “intuition”. However, those terms are also applied to views that appeal to phenomenology instead. (Indeed, the two kinds of views are not always carefully distinguished.) Gödel (1964) can be read as providing a rational insight-based view of our knowledge of set theory. Bonjour (1997) proposes such a view of *a priori* knowledge more generally.

²⁴ See Millikan (1984) for an evolutionary account of knowledge. See Plantinga (1993) for a view of warrant that makes use of the notion of the proper function of a cognitive system. Plantinga, however, explicitly rejects evolutionary accounts of proper function. See Bergmann (2006) for a proper function-based view of justification.

Brute Fact. There is no explanation of why thinkers are *pro tanto* justified in employing certain rules of inference as basic in thought and not others. It is a brute normative fact.²⁵

I don't have the space to discuss these views in any real detail. But it is worth briefly gesturing at some of the problems that arise for them.

There are a number of serious problems facing Acquaintance.²⁶ It is not clear what acquaintance (or cognitive contact or "being in touch") with facts about validity could come to. It is mysterious how we could come to be in touch with such facts. How is this supposed to work – noetic rays? Even if we can make sense of what cognitive contact is and how we could have it, it is not clear that such contact provides justification. After all, being in *causal* contact with (e.g.) elementary particles in our environment does not by itself provide any justification for having beliefs about the particles. Finally, it is not clear that this view can explain the normative difference between MP and FLT. If we can be in cognitive contact with the validity of MP, why can't the aliens be in cognitive contact with the validity of FLT?

Against Evolution, we can imagine creatures that are just like us except that they are not the products of evolution. For instance, consider a swamp civilization – an advanced society of creatures physiologically like us, but which was created *en masse* by a powerful bolt of lightning striking swamp gas roughly a hundred years ago.²⁷ Despite not being the product of an evolutionary process, the swamp creatures seem just as justified as we are in employing MP as basic in their reasoning. Indeed, the creatures seem justified in just the same way as we are, whatever that is. A second issue is that, once again, it is not clear that this view can explain the normative difference between MP and FLT. One can imagine scenarios in which the aliens evolved to employ FLT as part of a cognitive mechanism that has an appropriately epistemic aim.

The Simplicity view faces the problem of explaining the difference between direct and indirect logical entailments. (If the direct entailments are the ones built into the logical concepts, the view

²⁵ Horwich (2005). Dogramaci (2015) and Field (2009) also end up committed to a brute fact view. In part to make the view seem less implausible, Dogramaci puts forward an account of the function of epistemic predicates and Field puts forward an expressivist account of epistemic justification.

²⁶ See Boghossian (2001) for discussion.

²⁷ Swamp man was originally introduced in Davidson (1987) for a different purpose.

ends up collapsing into a version of the conceptual approach discussed below.) But a more serious problem concerns the epistemic part of the proposal. Why should reasoning in accord with direct entailments have a different normative status than reasoning in accord with indirect entailments? Compare the case of physics. Some of the truths of physics are more fundamental than others. Indeed, one of the tasks of microphysics is to look for the fundamental laws – the physical laws that ground the rest. But it is not plausible to claim that a thinker is justified in believing the fundamental laws or in “reasoning in accord” with them merely because they are fundamental. Nomological or metaphysical fundamentality doesn’t bestow any special epistemic status on beliefs or rules. So there is reason to think that logical fundamentality doesn’t bestow a special epistemic status, either.

Finally, against the Brute Fact view, there are three main concerns. First, there are very many rules that we are justified in employing and many rules that we would be unjustified in employing. It is intuitively implausible that there is no feature that distinguishes between the two classes. Second, there is a dialectical concern: If we are challenged to explain why we are justified in employing one of our rules of inference, on this view there is absolutely nothing we can say in response. This is unpalatable. To be sure, to be justified in employing a rule one needn’t be in a position to have something to say in defense of the rule. And one certainly needn’t be in a position to convince a committed opponent. But, surely we as *theorists* should be able to say something in response to the challenge that *we ourselves* would find reassuring. Finally, MP and the other deductive rules that we are responsible in employing have a feature in common that is not shared by FLT. In particular, reasoning in accord with these rules involves taking a “small step”. By contrast, reasoning in accord with FLT involves taking a “giant leap”. This suggests that there is some theory to be had that explains the difference in normative status. It is not just a brute fact.

4 Conceptual Competence

Let me now turn to the main target of this paper – the idea that we should appeal to the nature of concepts or meanings.²⁸ I find the view concerning mental concepts more attractive than the view concerning linguistic meanings, so I will focus on it. (The same issues will arise for linguistic meanings, *mutatis mutandis*.)

A natural thought is that a deductive inference counts as a small step if it is built into one of our logical concepts, and not otherwise. MP is a small step because it is built into the concept of the conditional. In contrast, FLT is not built into any concept.

That's all well and good, but the question we're really interested in is the normative question about the difference in their epistemic statuses. What explains this difference? The natural suggestion to make here is that any rule built into a concept is justified for a thinker to employ as basic.

This view involves two main claims. The first is a claim about the nature of concepts:

- (i) There are rules of inference “built into” concepts.²⁹

The second is a claim about epistemic justification:

- (ii) If a rule of inference is built into a concept that a thinker possesses, the thinker is *pro tanto* justified in employing that rule as basic in thought.

Why think this? It is an extension of the notion of an analytic truth. Consider the claim that all bachelors are unmarried. What explains our justification for believing this claim? A natural idea is that it is somehow built into the concept *bachelor* that all bachelors are unmarried, and this is what explains our justification for believing the claim. The proposal here is that we extend this line of thought beyond beliefs to rules of inference.

²⁸ Versions of this approach can be found in Gentzen (1934/5), Prawitz (1965), Belnap (1962), Dummett (1978; 1991), Tennant (1978), Peacocke (1992; 1993; 2004), Boghossian (2000; 2001; 2003), and the papers collected in Hale and Wright (2001). See Horwich (1997; 2000; 2005), Schechter and Enoch (2006), and Williamson (2003) for objections to concept-based accounts of justification and knowledge.

²⁹ This thesis naturally fits with a conceptual-role semantics (or meta-semantics). See Fodor and Lepore (1991) and Williamson (2003) for objections to that view.

Given this line of thought, the obvious suggestion to make is that MP is built into the concept of the conditional. FLT is not built into any genuine concept. This is what explains the difference in their normative status. And this is what explains why a MP inference counts as a small step and a FLT inference counts as a large step. Problem solved!

Well, not so fast.

On claim (i), one might well ask: What does “built into” come to?

One suggestion is that a rule is built into a concept just in case employing the rule as basic is part of what’s needed to count as thinking thoughts that use (as opposed to mention) the concept. Employing the rule is required to “possess” the concept in some minimal sense.

This suggestion won’t quite work. It is very easy to use a concept in thought. Compare the case of names. I can pick up a new name by overhearing a conversation about someone with that name and then come to think thoughts about the person with that name. For instance, if I overhear someone using the name “Jocko”, I can come to have thoughts about Jocko – for instance, I can wonder whether Jocko is good at darts. Similarly, I can pick up a new concept just by hearing a word that expresses the concept.³⁰ I can then deploy that concept in thought. For instance, even if all I’ve heard is the phrase “Lie group”, I can still think thoughts involving the concept of a Lie group – for instance, I can wonder what a Lie group is.

The typical response to this problem is to move to a different account of what “built into” comes to and a more stringent account of concept possession. On this second view, possessing a concept requires having sufficient competence with or mastery of the concept.³¹ On this proposal, a rule is built into a concept if employing the rule as basic is part of what’s needed to count as having sufficient mastery of the concept.

I’m not completely clear on what mastery of a concept is supposed to be. And, as Timothy Williamson has argued, there are problems with the claim that MP is built into the concept of the

³⁰ There are some constraints. For instance, presumably one needs to have some sense of the syntactic category of the relevant expression. But such constraints are minimal.

³¹ See Peacocke (1992, ch. 1).

conditional in even this sense.³² To repeat his example, the logician Vann McGee has mastered the concept of the conditional if anyone has. But he does not endorse MP in its full generality. A theorist might master the concept of the conditional (in any reasonable sense of “master”) but refrain from employing MP – and perhaps even lack the disposition to employ MP – on the basis of (perhaps mistaken) theoretical considerations.³³

So there are problems with making sense of the idea that there are rules that are built into concepts, and with the claim that MP is built into the concept of the conditional. (There is also the question of why FLT cannot be built into a genuine concept.) But let me put these issues aside. What I want to focus on is the normative claim, claim (ii). The problem with this claim is that it is false. Thinkers are not justified in employing every rule built into the concepts they possess.³⁴

The most striking examples of this are pejorative concepts and other “thick” normative concepts that involve false claims. Consider, for instance, Dummett’s example of the xenophobic concept *boche*.³⁵ “Boche” was a derogatory term used during World War I by French soldiers to refer to Germans. (I don’t use a contemporary racist or xenophobic term for the obvious reasons.) Plausibly, the constitutive rules for *boche* are something like the following.

From so-and-so is German, infer that so-and-so is a boche.

From so-and-so is a boche, infer that so-and-so is brutish and uncivilized.

Racist and xenophobic concepts like *boche* plausibly count as genuine concepts. Surely, thinkers have had thoughts involving them. But by employing these rules, thinkers can infer that arbitrary Germans are brutish and uncivilized. Thinkers are not justified in employing such rules merely because they are concept-constituting.

³² Williamson (2003).

³³ See Fodor and Lepore (1991) for related worries.

³⁴ Prior (1960) famously introduced the logical constant “tonk” to try to demonstrate this point. However, it is plausible that “tonk” does not stand for a genuine concept.

³⁵ Dummett (1973, p. 454).

One might quibble over this particular example,³⁶ but there are many others. Consider, for instance, the thick normative concepts involved in Victorian sexual morality or in medieval conceptions of honor. These concepts involve problematic normative claims, claims that thinkers are not justified in believing merely in virtue of possessing the relevant concepts.

For examples that are less normatively loaded, we can look at the concepts involved in failed physical theories. For instance, consider the concept of *phlogiston*, which includes a commitment to some substance being released during combustion. Similarly, consider the concept of *caloric* which includes a commitment to there being a fluid that is responsible for heat. Indeed, we can also look at the concepts involved in successful physical theories – such as the concept of *entropy* or the concept of *rest mass*. At least given a conceptual role-based treatment of concept possession, these concepts involve commitments to substantive claims about the world.

I'm not claiming that no thinker has ever been justified in employing the rules built into these concepts. Indeed, I think that we are justified in employing the rules built into the central concepts of our current physical theories and that some of our predecessors were justified in employing the rules built into the central concepts of past theories. What my point is, rather, is that possessing these concepts comes with substantive commitments about the world. In such cases, thinkers are not justified as employing the relevant rules as basic in their thought *just because* they possess the relevant concepts. They may be justified in employing the rules because they have some theoretical reason to think that the rules are acceptable (or on the basis of reasonably trusting relevant authorities). But they have to somehow earn the right to endorse the relevant theories and possess the relevant concepts. They are not justified in employing the rules merely because they possess the concepts in question.

Very generally, it is easy for arbitrary unjustified rules to be built into concepts. So we should not think that thinkers are *pro tanto* justified in employing as basic any rule that is concept-constituting. The explanation for why MP is justified and FLT is not cannot just be because MP is concept-constituting and FLT is not.

³⁶ Williamson (2009).

Harmony

To handle this problem, a natural thought is to somehow restrict the rules that thinkers are justified in employing in virtue of there being concept-constituting. More specifically, we can restrict the rules that are justified to those rules that are built into “good” concepts.

It is not clear how to distinguish between good and bad concepts in general. For the specific case of logical concepts, however, there have been several proposals. Such proposals are often discussed using Dummett’s term “harmony”.³⁷ A good concept is a harmonious concept. On the new proposal, then, we replace claim (ii) with the following normative claim:

If a rule is built into a harmonious concept that a thinker possesses, the thinker is *pro tanto* justified in employing that rule as basic in thought.

When is a concept (or conceptual role) harmonious? Proposed accounts of harmony have been used for several different purposes. Sometimes the aim is to *demarcate the logical* – that is, to specify which concepts are logical concepts. Sometimes the aim is to specify which (broadly logical) conceptual roles *yield a genuine concept*. In the current context, harmony is not being used to do either of those jobs. Rather, it is being used to specify which concepts *bestow a positive epistemic status* on their constitutive rules.

Keeping that in mind, the most promising idea is to understand harmony as (something like) Conservativeness.

Conservativeness. Adding the concept and its constitutive rules to one’s pre-existing inferential practice does not license any new inferences from premises that only contain concepts from the pre-existing practice to a conclusion that only contains concepts from the pre-existing practice.³⁸

This constraint can be motivated by a natural picture of the justification of rules. On this picture, certain packages of rules are “epistemically innocent”. In some sense, they cannot lead us astray. Conservativeness captures this idea – if a concept is conservative over a pre-existing inferential

³⁷ Dummett (1991). See Steinberger (2011) for discussion of various kinds of harmony.

³⁸ See Belnap (1962). Dummett (1991, p. 252) calls this “total harmony”.

practice, adding the concept does not disturb the pre-existing practice. The normative status of the rules that help to constitute harmonious concepts derives from the fact that they are epistemically innocent rules, where innocence is cashed out as (something like) Conservativeness.³⁹

This picture fits with the notion of a basic analytic rule. The original idea behind analyticity was that analytic truths are epistemically innocent. They are “relations among ideas” rather than “matters of fact”. They are “explicative” rather than “ampliative”. They are “merely verbal propositions” rather than “real propositions”. And so on. The background thought is that analytic truths impose no substantive requirements on the world. They are trivial, harmless, and innocuous. And that is what explains their normative status.

On this view, the normative claim (ii) can be restated as:

If a rule is built into an epistemically innocent concept that a thinker possesses, the thinker is *pro tanto* justified in employing that rule as basic in thought.

If this is the right picture, the fundamental normative principle here presumably doesn't merely apply to rules that are concept-constituting. There is no motivation for thinking that concept-constitution is normatively relevant either by itself or in combination with epistemic innocence. What is doing the real epistemic work in justifying a rule is its epistemic innocence. So the restriction of the normative claim to concept-constituting rules is *ad hoc*.

Taking this line of thought seriously, then, the fundamental normative principle is something like the following:

If a rule of inference is epistemically innocent (or is part of an epistemically innocent package of rules), the thinker is *pro tanto* justified in employing that rule as basic in thought, whether or not it is built into a concept.

This is an attractive view.

³⁹ Indeed, even theorists who claim that we don't need to restrict a concept-based account of justification to harmonious concepts will presumably endorse a similar picture. They will presumably claim that the rules built into concepts are automatically epistemically innocent, because it is a constraint on genuine concepts that they are (something like) conservative.

There are a couple of technical concerns that one might have here, at least assuming that epistemic innocence is identified with Conservativeness. First, one might worry that Conservativeness is too weak a requirement. There can be rules that are individually conservative over a background inferential practice but that are jointly inconsistent over the background practice. Which of these rules would the relevant thinkers be justified in adding to their practice? This may not be a problem in the end. We might say that thinkers are justified in adding either of the rules, but not both.

Second, one might worry that Conservativeness is too strong a requirement. There are logical concepts (presumably with justified constitutive rules) that are not conservative over the relevant background inferential practice. For instance, classical negation is not conservative over the inferential practice that includes the usual rules for the conditional. Adding a truth predicate or second-order quantifiers to first-order Peano arithmetic does not yield a conservative extension.⁴⁰ Adding third-order quantifiers to second-order logic also does not yield a conservative extension.⁴¹ This may not be a problem in the end, either. We might say that Conservativeness is sufficient for epistemic innocence but not necessary for it.

There is, however, a much bigger problem with the proposal. The rule FLT is epistemically innocent, too. If we add FLT to our background inferential practice, we get a conservative extension. That is, after all, part of what Andrew Wiles showed in proving that Fermat's Last Theorem was true. So this proposal cannot distinguish between MP and FLT.

More generally, the proposed view cannot distinguish between small steps and giant leaps in thought. In many cases, a giant leap is simply a *shortcut* – it is a way of skipping many small steps. And if each of the small steps is conservative, any shortcut will be, too.

Perhaps, then, Conservativeness is the wrong way to understand epistemic innocence. Perhaps a different understanding of epistemic innocence is called for? I don't think that pursuing this line of thought will help, at least if MP and other deductive rules are supposed to count as innocent. No matter how we understand the notion of epistemic innocence, taking a shortcut will

⁴⁰ Peacocke (2004, pp. 18–21).

⁴¹ I owe this observation to Marcus Rossberg.

presumably count as innocent. If each of a sequence of steps cannot lead us astray, skipping from the beginning to the end in one step cannot lead us astray, either.⁴²

The trouble with this entire line of thought, then, is that FLT is just as innocent as MP. Epistemic innocence cannot be used to distinguish between the two cases.

So what then? It seems to me that there is a better idea to pursue. An advocate of the concept-constitution view should appeal to a different normatively-relevant feature – not innocence, but *importance*. The concept of the conditional is not just some run-of-the-mill concept. What is distinctive about *the conditional* is just how important it is in our thinking. Certain concepts are important – they are useful or indispensable for central cognitive projects. The conditional is such a concept. Negation is such a concept. And so on. This explains the normative status of their constitutive rules.

On this view, we should replace (ii) with the following normative principle:

If a rule is built into an important concept that a thinker possesses, the thinker is *pro tanto* justified in employing that rule as basic in thought.⁴³

MP is such a rule. FLT is not. This is what explains the difference between the two rules.

This strikes me as an attractive approach. It looks promising as a way of distinguishing between MP and FLT. And importance is a plausible candidate for a normatively relevant feature.

Again, we should presumably generalize this idea beyond concept-constituting rules.⁴⁴ The fundamental normative principle in the ballpark does not concern concepthood but importance. It is something like the following:

⁴² It is plausible that we are justified in believing simple analytic truths, such as the truth that bachelors are unmarried, because such claims are in some sense epistemically innocent. Even if this is correct, however, the relevant notion of epistemic innocence is extremely restrictive, and cannot play a role in explaining our justification for employing deductive rules such as MP. One of the morals of this paper is that MP does not pattern with simple analytic truths.

⁴³ There are accounts in the literature that seem to rely on something like this principle. Boghossian (2003) explains the fact that MP transmits justification by claiming that MP is concept-constituting of *the conditional*, which is a concept that plays an important role in inquiry by enabling us to formulate concepts that are appropriately hedged. Hale (2002) argues that certain minimal inference rules are justified because they constitute the concepts with which we can investigate doubts about the validity of rules. Wedgwood (2011) claims that basic rules of inference are justified if possessing certain basic cognitive capacities requires that we employ the rules. (Wedgwood includes the possession of concepts among the relevant cognitive capacities.)

If a rule of inference is important (or is a necessary part of an important package of rules), the thinker is *pro tanto* justified in employing that rule as basic in thought, whether or not it is built into a concept.⁴⁵

Notice that this view does not face the problem that the epistemic innocence view faces. FLT is a shortcut – it is a way of skipping many small steps. If each of the small steps is an application of an epistemically innocent rule, the shortcut would itself seem to be epistemically innocent. But the same does not hold true of importance. Even if each of the small steps is an application of an important rule, the shortcut itself need not be important. Being able to take a shortcut may not be important if one can take the long way around.

So this is the direction that I suggest that we take.

5 Developing the Account

Let's take stock. There are several strategies one might explore in trying to explain why we are epistemically responsible in employing MP as basic but the aliens in my story are not epistemically responsible in employing FLT as basic. There are two constraints on such a view. First, the view must appeal to a normatively-relevant feature of the rules. Second, the view must be able to explain the normative difference between MP and FLT. As we have seen, satisfying these constraints is no easy feat. All of the approaches I discussed turned out to either be implausible or to violate the two constraints, with the sole exception of the view that thinkers are epistemically responsible in employing as basic those rules that are important or part of an important package of rules.

To determine whether this approach is viable, there are two questions that must be answered. First, are our fundamental deductive rules really so important, and if so, in what ways are they

⁴⁴ If we make this generalization, there is some hope that we will be able to explain the normative status of our basic ampliative rules. Such rules are important in our thought but they are not built into any of our concepts. Notice, too, that ampliative rules are not epistemically innocent – they can lead us astray. See Schechter and Enoch (2006).

⁴⁵ Besides the accounts mentioned in footnote 43, there are other accounts in the literature that tie justification (or a related status) to something like importance. See, for instance, Reichenbach's (1938; 1949) pragmatic justification of induction, Wright's (2004a; 2004b) accounts of our entitlement to claim knowledge of cornerstone propositions and basic logic, and Shapiro's (2009) account of the epistemic status of mathematical axioms.

important?⁴⁶ Second, how exactly should the account be further developed? What are the principal challenges for the account, and how should they be answered? In the remainder of this paper, I'll briefly discuss the second of these questions. The main point of this paper is to advertise a general approach, not to provide a specific account. But I do want to gesture in the direction of some of the issues that arise. My hope is to convince you that, while there are difficulties, they are much less worrisome than the problems facing other approaches.

I will consider six issues. For each of these issues, I'll propose at least one line of response. The proposals I will make are not the only possible responses. But they are what I currently take to be the most plausible suggestions.

The first issue is this: I've described the "important" rules as useful or indispensable. What are they useful or indispensable for? For rules to gain normative status on the grounds that they are useful or indispensable, they had better be useful or indispensable for something important. They can't just be useful or indispensable for any old project. That is because the normative status of the relevant projects is in some way transmitted to the rules. The normative status of the projects comes first.

In response, I suggest that we understand "useful or indispensable" as being useful or indispensable to a *rationaly required project* – a cognitive project that is rationally required for all thinkers broadly like us to engage in.⁴⁷ Plausible examples of such projects are explaining the world around us, predicting important phenomena, planning for future contingencies, deliberating over how to act, and evaluating our own behavior and patterns of thinking. A thinker like us who is not engaging in one of these projects in at least some small way is rationally defective.

This raises the question of what makes a project rationally required. Why are some projects rationally required – for instance, explanation, prediction, and deliberation – and others not – for instance, creating a large stock of knock-knock jokes, concocting the best recipe for cheese soufflés, or becoming a world-class athlete, musician, or philosopher? I don't have an answer to

⁴⁶ See Brandom (2000, ch. 1), Evnine (2001), and Schechter (2013a) for relevant discussions.

⁴⁷ On a variant view, one might restrict the relevant cognitive projects to those that are epistemic – e.g., explaining, predicting, and evaluating one's thinking.

this question. Perhaps it is a brute fact. But notice that it is much more plausible that it is a brute fact that we have a rational obligation to explain the world around us than it is that we are epistemically responsible in employing the rule MP as basic in our thought.

The second issue is that there are counterexamples to the view if we construe usefulness or indispensability in purely causal terms. Suppose that someone will thwart my pursuit of an important cognitive project if I don't employ a certain rule. For instance, suppose that a tobacco company will thwart my efforts at explaining the world around me if I don't employ the following rule:

(T) From the belief that such-and-such is a tobacco product, infer that such-and-such is harmless.

Surely, this doesn't bestow any epistemic justification on my employment of the rule T.

Alternatively, suppose that someone will substantially aid one of my important cognitive projects if I employ a certain rule. For instance, suppose that a (slightly more benevolent) tobacco company will give me an enormous research grant – enabling me to further my project of explaining the world – if I employ rule T. This also doesn't bestow any epistemic justification on my employment of the rule. Perhaps I ought, in some sense, to employ the rule. Perhaps I don't count as practically irresponsible if I employ it. But I don't count as *epistemically* responsible in employing the rule.

In response to this concern, we had better provide an account of usefulness or indispensability that is not purely causal. We had better say something like the following: To yield epistemic justification, a rule has to be useful or indispensable to a rationally required project in the sense that by employing the rule the thinker can successfully engage in the project. It is *by* employing the rule, and not merely as a causal consequence of employing the rule, that the thinker can successfully engage in the project.

The third issue is that there are useful rules of inference that take what intuitively count as large steps in thought. Such rules should not count as epistemically justified in virtue of their usefulness. One illustration of this is the following variant of Modus Ponens:

(MP+) From the beliefs that P and that if P then Q, infer both that Q and that FLT is truth-preserving.

This rule is stronger than MP (assuming the presence of Conjunction Elimination). So it is at least as useful as MP. Why doesn't it end up epistemically justified according to my account?

The answer has to be that we should make use of a notion closer to indispensability than to usefulness. MP+ is at least as useful as MP. But MP is indispensable in a way that MP+ is not. One way to develop this thought is to note that in employing MP+ one takes on additional commitments. MP is a more minimal rule. A good rule is one that makes a minimal set of commitments (or a sufficiently minimal set of commitments) for the job it is supposed to do.

The fourth issue concerns a different kind of variant of Modus Ponens. In particular, there are variants of Modus Ponens that are only useful given powerful auxiliary rules. Consider, for instance, the following rule:

(MP-) From the beliefs that P, that if P then Q, and that FLT is truth-preserving, infer that Q.

This rule is weaker than MP. In the presence of this rule, employing FLT (or believing that FLT is truth-preserving) is highly useful and perhaps even indispensable. But we certainly don't want to say that a thinker has justification for employing FLT in virtue of employing MP-.

The answer to this worry is presumably that we should not compare rules one at a time. Rather, we should compare entire *packages of rules*. The package of rules containing MP- and FLT takes on more commitments than does the package of rules that contains MP. That is why the package containing MP is epistemically justified and the package containing both MP- and FLT is not.

The fifth issue concerns yet another kind of variant of Modus Ponens. There are useful variants of Modus Ponens that have *ad hoc* restrictions. Consider, for instance:

(MP*) From the beliefs that P and that if P then Q, infer that Q – but only if Q does not concern narwhals.

This rule is (nearly) as useful as MP is. If employing MP can enable one to successfully engage in a rationally required project, employing MP* can do so, too. Moreover, this rule is more minimal than MP – it is not committed to Modus Ponens working when reasoning about narwhals. The worry, then, is that MP will not count as indispensable to a rationally required project. I suggested above that MP+ is not indispensable since we could employ the more

minimal MP. So why shouldn't we say that MP is not indispensable since we could employ the still more minimal MP*?

The natural response to this worry is to point to the fact that MP* is an *ad hoc* rule. According to this suggestion, there is a tradeoff between minimality and *ad hocness*. MP is less minimal but more principled. That is why employing MP is epistemically justified. This response raises the challenge of providing a principled account of *ad hocness*. It also requires providing an explanation of the connection between *ad hocness* and epistemic responsibility. But this strikes me as a plausible line of thought to develop.

The final issue that I'd like to raise is that it may be that no individual rule or package of rules is strictly speaking indispensable to a rationally required project. Rather, what may be indispensable is to employ one out of some set of alternatives. For instance, in classical propositional logic, we can take conjunction and negation as primitive. Alternatively, we can take the conditional and negation as primitive. Or we can make use of the Sheffer stroke. But we do not want to say that the existence of these alternatives entails that we are not justified in using any deductive rule as basic.

The natural response to this worry is to say that using any one of the packages of rules would be epistemically responsible. So long as the package of rules is sufficiently minimal and non-*ad hoc*, thinkers are *pro tanto* justified in employing the rules in the package as basic.

There are several more issues that one could raise besides. But this provides a flavor of the difficulties that arise in developing the view. These difficulties, while pressing, strike me as much less severe than the difficulties besetting the other approaches.

Putting this all together, here is one way to develop the view:

- Thinkers like us are rationally required to engage in certain cognitive projects irrespective of their goals and desires. Such projects include explaining the world around them, predicting important phenomena, deliberating over what to do, planning for the future, and evaluating their own behavior and patterns of reasoning.
- A thinker is *pro tanto* epistemically justified in employing as basic each rule of inference in a package of rules if (and by virtue of the fact that) the package of rules is

“pragmatically indispensable” for successfully engaging in a rationally required cognitive project, irrespective of whether the thinker is aware of this fact.

- A package of rules is pragmatically indispensable for successfully engaging in a cognitive project just in case it is possible (in the relevant sense) to successfully engage in the project by employing the rules and the package of rules is sufficiently minimal and *non-ad hoc*.

These clauses presumably need further refinement. And there are several clarifications of key terms that are needed. For instance, what exactly do “successfully engage,” “possible (in the relevant sense),” “minimal,” and “non-*ad hoc*” come to?⁴⁸ But I suggest that we adopt a view in the ballpark. It is the most promising way to explain the difference in normative status of MP and FLT.

6 Conclusion

Recall the central motivating question of this paper:

What explains the fact that thinkers (or at least, thinkers broadly like us) are epistemically responsible in employing MP as a basic rule in thought but are not epistemically responsible (or at least, are significantly less responsible) in employing FLT as a basic rule in thought?

The answer I propose is that thinkers are (*pro tanto*) epistemically responsible in employing rules that are indispensable to rationally required projects. MP is such a rule. FLT is not. This explains the difference in their epistemic status.

In arguing for this view, I leaned heavily on the difference between small steps and big leaps of thought. On my view, then, whether an inferential step is a small step depends on whether the relevant rule is pragmatically indispensable to a rationally required project. This will depend, at least in part, on broad facts about the constitution of the relevant agent and broad facts about the

⁴⁸ See Enoch and Schechter (2008) for some of the needed clarifications. That paper gives a somewhat different account of pragmatic indispensability.

nature of the world. So, perhaps surprisingly, whether a step is small depends on the agent and the world.

Of course, there is much more to say about how exactly to develop this account. But I hope that I've convinced you that this is a promising approach to take.⁴⁹

References

- Alston, William. (1988) "An Internalist Externalism," *Synthese* 74: 265–283.
- Belnap, Nuel. (1962) "Tonk, Plonk, and Plink," *Analysis* 22: 130–134.
- Bengson, John. (2015) "The Intellectual Given," *Mind* 124: 707–760.
- Bergmann, Michael. (2006) *Justification without Awareness: A Defense of Epistemic Externalism*, Oxford: Oxford University Press.
- Berry, Sharon. (2013) "Default Reasonableness and the Mathoids," *Synthese* 190: 3695–3713.
- Boghossian, Paul. (2000) "Knowledge of Logic," in Boghossian and Peacocke (2000), pp. 229–254.
- Boghossian, Paul. (2001) "How are Objective Epistemic Reasons Possible?" *Philosophical Studies* 106: 1–40.
- Boghossian, Paul. (2003) "Blind Reasoning," *Proceedings of the Aristotelian Society, Supplementary Volume* 77: 225–248.
- Boghossian, Paul and Christopher Peacocke (eds.) (2000) *New Essays on the Apriori*, Oxford: Clarendon Press.
- BonJour, Laurence. (1997) *In Defense of Pure Reason*, Cambridge: Cambridge University Press.
- Brandom, Robert. (2000) *Articulating Reasons: An Introduction to Inferentialism*, Cambridge, Mass.: Harvard University Press.
- Burge, Tyler. (1993) "Content Preservation," *Philosophical Review* 102: 457–88.
- Chudnoff, Elijah. (2013) *Intuition*, Oxford: Oxford University Press.
- Cohen, Stewart. (1984) "Justification and Truth," *Philosophical Studies* 46: 279–295.
- Davidson, Donald. (1987) "Knowing One's Own Mind," *Proceedings and Addresses of the American Philosophical Association* 60: 441–58.

⁴⁹ Earlier versions of this paper were presented at a workshop on the epistemology of logic at the Arché Centre at the University of St. Andrews, a workshop on epistemology at Queen's University, Belfast, a graduate seminar led by Maria Lasonen Aarnio at the University of Michigan, a workshop on human reasoning at the University of Notre Dame, a workshop on knowledge and skepticism at UNAM, Mexico City, a conference on reasoning at the University of Konstanz (where my commentator was Alex Worsnip), a conference on logic and inference at the Institute of Philosophy at the University of London, a conference on pluralism at the Inter University Centre in Dubrovnik, the Humanities Center at the University of Connecticut, and at departmental colloquia at UCLA, the University of Texas at Austin, MIT, and Virginia Tech. I'm very grateful to the participants at these events for their helpful questions. Thanks to Brendan Balcerak Jackson, Magdalena Balcerak Jackson, Philip Bold, David Christensen, Dylan Dodd, Sinan Dogramaci, Ned Hall, Jonathan Jenkins Ichikawa, Ben Jarvis, Julien Murzi, Ram Neta, David Plunkett, and Alex Worsnip for helpful comments and discussion. I'd also like to thank Paul Boghossian, Paul Horwich, Christopher Peacocke, and Crispin Wright, each of whom greatly influenced my thinking about this topic. This paper is something like a prequel to Enoch and Schechter (2008). I'd like to thank David Enoch for the collaboration that led to that paper.

- Dogramaci, Sinan. (2013) "Intuitions for Inferences," *Philosophical Studies* 165: 371–399.
- Dogramaci, Sinan. (2015) "Communist Conventions for Deductive Reasoning," *Noûs* 49:776–799.
- Dretske, Fred. (2000) "Entitlement: Epistemic Rights without Epistemic Duties?" *Philosophy and Phenomenological Research* 60: 591–606.
- Dummett, Michael. (1973) *Frege: Philosophy of Language*, London: Duckworth. Second edition, 1981.
- Dummett, Michael. (1978) "The Justification of Deduction," in his *Truth and Other Enigmas*, Cambridge, Mass.: Harvard University Press, pp. 290–318.
- Dummett, Michael. (1991) *The Logical Basis of Metaphysics*, Cambridge, Mass.: Harvard University Press.
- Enoch, David and Joshua Schechter. (2008) "How Are Basic Belief-Forming Methods Justified?" *Philosophy and Phenomenological Research* 76: 547–579.
- Evine, Simon. (2001) "The Universality of Logic: On the Connection between Rationality and Logical Ability," *Mind* 110: 334–367.
- Field, Hartry. (2000) "Apriority as an Evaluative Notion," in Boghossian and Peacocke (2000), pp. 117–149.
- Field, Hartry. (2009) "Epistemology without Metaphysics," *Philosophical Studies* 143: 249–90.
- Fodor, Jerry, and Ernie Lepore. (1991) "Why Meaning (Probably) isn't Conceptual Role," *Mind and Language* 6: 328–34.
- Gentzen, Gerhard. (1934/5) "Untersuchungen über das Logische Schließen," *Mathematische Zeitschrift* 39, 176–210.
- Gödel, Kurt. (1964) "What is Cantor's Continuum Problem?" revised and expanded version of a 1947 paper with the same name, in Solomon Feferman, *et al.* (eds.), *Collected Works of Kurt Gödel*, Volume II, Oxford: Oxford University Press, pp. 254–270.
- Goldman, Alvin. (1979) "What is Justified Belief?" in George Pappas (ed.), *Justification and Knowledge*, Dordrecht: Reidel, pp. 1–23.
- Hale, Bob. (2002) "Basic Logical Knowledge," in Anthony O'Hear (ed.) *Logic, Thought and Language*, Cambridge: Cambridge University Press, pp. 279–304.
- Hale, Bob and Crispin Wright. (2001) *The Reason's Proper Study*, Oxford: Oxford University Press.
- Harman, Gilbert. (1986) *Change in View: Principles of Reasoning*, Cambridge, Mass.: The MIT Press.
- Horwich, Paul. (1997) "Implicit Definition, Analytic Truth, and Apriori Knowledge," *Noûs* 31: 423–440.
- Horwich, Paul. (2000) "Stipulation, Meaning and Apriority," in Boghossian and Peacocke (2000), pp. 150–169.
- Horwich, Paul. (2005) "Meaning Constitution and Epistemic Rationality," in his *Reflections on Meaning*, Oxford: Oxford University Press, pp. 134–173.
- Huemer, Michael. (2005) *Ethical Intuitionism*, New York: Palgrave Macmillan.
- Lehrer, Keith. (1990) *Theory of Knowledge*, Boulder: Westview.
- Lehrer, Keith and Stewart Cohen. (1983) "Justification, Truth, and Coherence," *Synthese* 55: 191–207.
- McLarty, Colin. (2010) "What Does it Take to Prove Fermat's Last Theorem? Grothendieck and the Logic of Number Theory," *Bulletin of Symbolic Logic* 16: 359–377.

- Millikan, Ruth. (1984) "Naturalist Reflections on Knowledge," *Pacific Philosophical Quarterly* 65: 315–334.
- Peacocke, Christopher. (1992) *A Study of Concepts*, Cambridge, Mass.: The MIT Press.
- Peacocke, Christopher. (1993) "How Are A Priori Truths Possible?" *European Journal of Philosophy* 1: 175–199.
- Peacocke, Christopher. (2004) *The Realm of Reason*, Oxford: Oxford University Press.
- Plantinga, Alvin. (1993) *Warrant and Proper Function*, Oxford: Oxford University Press.
- Pollock, John and Joseph Cruz. (1999) *Contemporary Theories of Knowledge*, second edition, Lanham: Rowman & Littlefield.
- Prawitz, Dag. (1965) *Natural Deduction: A Proof-Theoretical Study*, Stockholm: Almqvist and Wiksell.
- Pritchard, Duncan. (2005) *Epistemic Luck*, Oxford: Clarendon Press.
- Prior, Arthur. (1960) "The Runabout Inference Ticket," *Analysis* 21: 38–39.
- Pryor, James. (2000) "The Skeptic and the Dogmatist," *Noûs* 34: 517–549.
- Reichenbach, Hans. (1938) *Experience and Prediction*, Chicago: University of Chicago Press.
- Reichenbach, Hans. (1949) *The Theory of Probability*, 2nd edition. Translated by E.H. Hutten and M. Reichenbach. Berkeley: University of California Press.
- Schechter, Joshua. (2013a) "Could Evolution Explain Our Reliability about Logic?" in Tamar Szabo Gendler and John Hawthorne (eds.), *Oxford Studies in Epistemology* 4: 214–239.
- Schechter, Joshua. (2013b) "Rational Self-Doubt and the Failure of Closure," *Philosophical Studies* 163: 529–452.
- Schechter, Joshua. (2017) "Difficult Cases and the Epistemic Justification of Moral Belief," *Oxford Studies in Metaethics* 12.
- Schechter, Joshua and David Enoch. (2006) "Meaning and Justification: The Case of Modus Ponens," *Noûs* 40: 687–715.
- Shapiro, Stewart. (2009) "We Hold These Truths to Be Self-Evident: But What Do We Mean by That?" *Review of Symbolic Logic* 2: 175–207.
- Sosa, Ernest. (1999) "How Must Knowledge Be Modally Related to What is Known?" *Philosophical Topics* 26: 373–384.
- Sosa, Ernest. (2007) *A Virtue Epistemology: Apt Belief and Reflective Knowledge*, Volume 1, Oxford: Oxford University Press.
- Steinberger, Florian. (2011) "What Harmony Could and Could Not Be," *Australasian Journal of Philosophy* 89:617–639.
- Swain, Marshall. (1981) *Reasons and Knowledge*, Ithaca, NY: Cornell University Press.
- Tennant, Neil. (1978) *Natural Logic*, Edinburgh: Edinburgh University Press.
- Wedgwood, Ralph. (2002) "Internalism Explained," *Philosophy and Phenomenological Research* 65: 349–369.
- Wedgwood, Ralph (2011). "Primitively Rational Belief-Forming Processes," in Andrew Reisner and Asbjørn Steglich-Petersen (eds.) *Reasons for Belief*, Cambridge: Cambridge University Press, pp. 180–200.
- Wiles, Andrew. (1995). "Modular Elliptic Curves and Fermat's Last Theorem," *Annals of Mathematics*, 141: 443–551.
- Williamson, Timothy. (2000) *Knowledge and Its Limits*, Oxford: Oxford University Press.
- Williamson, Timothy. (2003) "Understanding and Inference," *Proceedings of the Aristotelian Society, Supplementary Volume* 77: 249–293.

- Williamson, Timothy. (2009) "Reference, Inference, and the Semantics of Pejoratives," in Joseph Almog and Paolo Leonardi (eds.), *The Philosophy of David Kaplan*, Oxford: Oxford University Press, pp. 137–158.
- Wright, Crispin. (2004a) "Intuition, Entitlement and the Epistemology of Logical Laws," *Dialectica* 58: 155–175.
- Wright, Crispin. (2004b) "Warrant for Nothing (and Foundations for Free)?" *Proceedings of the Aristotelian Society, Supplementary Volume* 78: 167–212.