

# A Priority, and the Doctoroids

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## 1 Introduction

In this essay, I will will argue that we can't draw a *principled* distinction between what can and can't be known a priori, which doesn't wind up simply equating the domain of a priori knowable facts with the necessary truths. As a result, either the notion of a priori justification turns out to be an unprincipled reflection of highly contingent facts our psychology (as I personally believe), or all necessary truths are trivially knowable a priori.

I will describe apparently possible creatures - the 'doctoroids' - who seem to count as knowing contingent medical facts a priori, if they know them at all. If we allow that the doctoroids do know, it will follow that all true propositions are a priori. (If this case works, example can easily be generalized to show that, for *any* proposition we can know, there could be creatures with a faculty which delivers knowledge of that proposition a priori). Thus, a defender of the a priori will need to explain why the doctoroids' reliable true beliefs fail to count as knowledge. But (as I will then argue) this can't be done in any really principled way - short of simply stipulating that only cognitive systems

which reliably produce true beliefs about *necessary* subject matter, count as conferring a priori knowledge.

We are, certainly, inclined to make more restrictive judgements about what it's epistemically permissible to do in an armchair. We say that it's OK to believe  $2+2=4$  when that seems obvious to you, without any appeal to further evidence, but *not* to believe that smoking causes cancer or  $P \neq NP$ , should these proposition seem equally (immediately) obvious to you, in advance of any relevant experience. But does this intuitive distinction reflect anything of deeper interest than contingent facts about human psychology?

I will suggest that we draw a distinction between propositions that are and aren't knowable a priori, not because there is any distinctive faculty of 'a priori learning' which, by its nature, can't deliver verdicts about certain subject matters, but (ultimately) just because actual humans happen to be hardwired with equipment that leads us to reliably form true beliefs about certain areas of math and logic from the armchair, rather than the (exactly analogous) equipment that would lead us to true beliefs about other areas of mathematics (or even medicine or physics).

## 2 Permissible starting points, and proof

I will assume my audience agrees, that it's sometimes possible to get mathematical knowledge by going through a mathematical argument. In some cases, not knowing the premises of an argument, means that you won't count as knowing the conclusion (even if you do happen to accept the conclusion because, say, you were convinced to accept the premises by a fallacious argument). So, what kind of relationship do you need to have to the premises of the argument, and the

inference rules which connect one line of the proof to another? In many cases, you might need to know (or at least know of the existence of) another argument - one which proves that the relevant statements are true, or the relevant inference methods are valid. But does this come to an end?

By **permissible starting points**, I will mean, simply, those statements (if any) which can be used in a proof without your needing to already accept some further proof of them, together with those methods of inference which you can use, without having to know of a proof that they are truth-preserving (with one important caveat to be mentioned in the next paragraph). That is, if something is an acceptable starting point, you can use it to produce proofs which give you knowledge, even if you don't have any further argument that it is true/truth preserving.

Now, must there be permissible starting points (as defined above), if there is knowledge gained from mathematical arguments? Some coherentists and infinitists will deny this. Perhaps, in order to gain mathematical knowledge from a proof you need to already accept an infinite regress of other arguments, some supporting each of the premises and inference methods used in the proof, and then others supporting each of the premises and inferences used in those and so on. Or maybe you need to have some kind of circle, or web of beliefs. Thus, I want to introduce the caveat that if this is the case, then the whole circle or infinite set of proofs (together with whatever inference methods are associated with it) is to count as a permissible starting point.

In what follows, I will be pressing on the issue of why we take certain logical and mathematical starting points (which contain only true claims and valid inferences) to be permissible and others not. We will imagine creatures for whom the psychology (confidence, feelings of brute obviousness, lack of demands

for external justification) which we typically associate with permissible starting points, are associated with *other* true proposition and valid inference procedures instead.

So, if you think there are certain propositions that it's OK to assume in an argument (i.e. even if you don't have a further argument for them, you can still count as knowing the conclusion), the question will be why it's OK to assume these true statements but not others. If you think that you can only learn from a proof if you have a suitable web of circular arguments, supporting all the inferences you made in the proof and all the inferences you made while making the arguments to support those inferences etc. then the question will be why reasoning within *this kind of web* is OK, but other (equally self-supporting) webs wouldn't be. Similarly, if you think that rationality requires that we have an infinite regress of arguments, the question at hand will be why believing *certain infinite regresses of true claims, and truth preserving inferences*, counts as having mathematical knowledge, while others don't.

Because the foundationalist view that single propositions can be acceptable starting points is the most popular, I will focus on that in what follows. But (so far as I can tell), nothing hangs on this choice.

Let me also stress that a permissible starting points need not be, in any way, unquestionable. Nor does one always have justification for assuming them. For example, it might be that the proposition  $2+2=4$ , is a permissible starting point for proofs, but if you were given good evidence that you had just taken some drug that distorts your judgment in this regard, this would defeat your justification for believing  $2+2=4$ .

### 3 The doctoroids

Suppose that, in order to save people 6 years of medical school we engineer ‘doctoroids’.

That is: We neurologically alter certain people, to find certain true propositions of organic chemistry and medicine immediately compelling - in much the same way the way that we find the claim  $2+2=4$  immediately compelling. So, for example, they don’t ask for any further justification of these claims before accepting them. Also, they don’t wind up doing anything that looks like empirically checking the accuracy of their medical intuitions. They find it perfectly obvious, in advance of doing any tests, that smoking causes cancer. And if they were to have some kind of course of experience which seemed to suggest that smoking *didn’t* cause cancer, they would respond the way we respond to experiences of counting fruit which seem to suggest that 22 apples and 23 oranges jointly constitute 43 fruit: they would take this as evidence that their observations had somewhere gone wrong.

Now, *if* these creatures know the relevant chemical and medical facts, I claim that their knowledge does not depend on experience for justification, (indeed it seems not to depend on experience at all). They aren’t disposed to cite any other propositions in defense of the claim that smoking causes cancer (any more than a normal person would be able to cite further considerations in favor of the claim that  $2+2=4$ ). And, in many cases, they will not have **had** any experiences which could justify the claim that smoking causes cancer.

And, it’s tempting to think that the Doctoroids *do* know, for the following reason.

According to Descartes, God (not being a deceiver) engineered us to find certain true propositions and valid inference methods obvious - when we thought about them carefully enough <sup>1</sup>. God was supposed to have put the dispositions to form true beliefs into us, ‘like sparks in a tinder’. Now, one might not buy Descartes’ arguments that there really was such a benevolent creator. But it’s pretty intuitive to think that, *if Descartes really was the beneficiary of this kind of divine benevolence*, he would count as having various kinds of a priori knowledge.

Next, consider ‘math androids’. Imagine that, in order to save time in gradschool, we neurologically alter certain people, in such a way that they find certain true mathematical claims (ones which most normal people would not accept without proof) obvious - in much the same way the way that we find the claim  $2+2=4$  immediately compelling. So, for example, they don’t ask for any further justification of these claims before accepting them. Also, they generally don’t wind up finding (what we would accept as) proofs for these claims. Rather, they find it perfectly obvious, that e.g. every map is four-colorable, as soon as they have the treatment. Or, if they have the treatment as children, they are disposed to find this claim obvious as soon as they are giving normal training in the use of these terms.

Intuitively, Descartes (in the scenario above) would count as having a priori knowledge. And (it seems that) the only thing which differentiates divinely-assisted-Descartes from the math androids and the doctoroids, is that he has cognitive faculties that reliably generate unthinking acceptance of true propositions about **fewer things**.

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<sup>1</sup>Descartes, Ren. *Meditations on First Philosophy*, translated by John Cottingham (Cambridge: Cambridge University Press, 1996). Book IV

However, if we allow that the doctoroids know, we must give up the distinction between a priori and a posteriori propositions. All true claims are a priori <sup>2</sup> because, for any true claim, we can imagine rigging up a creature with a faculty that reliably leads them to form true beliefs about that subject, in just the way we rigged up the doctoroids. Rather than uploading textbooks on medicine, we could put in Renaissance art history or geography. If the doctoroids know, the notion of a priority is completely trivial.

## 4 The challenge

So, if you think that any knowable propositions *aren't* a priori, you should resist the conclusion that the doctoroids know. But how? If the doctoroids are possible, why doesn't what they have amount to knowledge?

### 4.1 Denying that the doctoroids are possible

One strategy, is to simply deny that the doctoroids are possible. Perhaps there just *couldn't be* creatures who systematically found medical statements obvious, in the way that we find some mathematical statements obvious. But, even false and/or contingent statements can feel a priori obvious (think of the generations of people who believed that two parallel lines in space necessarily intersected at most once, or of what happens when you 'add' 2+3 and get 6). So why would it metaphysically impossible for some creatures to systematically have the same feeling about true medical propositions?

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<sup>2</sup>Or, more strictly, all knowable truths are a priori - there might be some true statements which are too complicated to be believed by any "finite" creature/creature remotely like ourselves.

Well, you might say that certain kinds of causal contact are required for a person's thoughts of 'smoking' to be about smoking. In this case there's a bit of difficulty about how the doctoroids (or anyone else) could form beliefs about smoking in advance of relevant experience of smoking. But, if you have this kind of intuition, let me just tweak the doctoroids scenario a little. Suppose that we take normal, english speaking (but medically ignorant) teenagers who have had some experiences related to smoking<sup>3</sup>, and then *alter* their brains so that they find many more propositions about "smoking" brutally obvious than they did before the operation.

Alternatively, you might say that being disposed to (normally)<sup>4</sup> ask for certain kinds of justification and draw certain inferences, is requirement for having the concepts 'smoking' or 'cancer'. In this case, a doctoroid who just found it obvious that "Smoking causes cancer" wouldn't count as thinking that smoking causes cancer.

While this blocks the immediate question about the doctoroids, it raises an immediate question. For it seems that the doctoroids *do* find accept some sentence, from which they are willing to infer all the same sentences, and draw all the same practical consequences, which we draw from 'Smoking causes cancer' (even if for the reason above, they wouldn't count as finding it obvious *that smoking causes cancer*). But what is the status of this sentence? If words used in this way would have to be meaningless, why? On the other hand, if the doctoroids' sentence "Smoking causes cancer" does express a proposition, it would presumably one that justifies all the same inferences, and motivates all the same actions, as the proposition that smoking causes cancer - but is

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<sup>3</sup>though not ones which would justify them in believing that smoking causes cancer

<sup>4</sup>You'd have to fine-tune the sense of 'normally' here to account for the fact that much of humanity seems to have reliably found the false claim that parallel lines in space necessarily meet at most once obvious for hundreds of years

knowable a priori. And in this case, we seem to be *undermining* rather than defending the idea that there's a principled difference between the a priori and the a posteriori. For, each proposition will have an a priori/a posteriori twin - a distinct proposition, which licenses all the same inferences as the proposition in question, and differs only in whether or not it can be assumed a priori.

## 4.2 Rational intuition as something more than what the doctoroids have

A second strategy is to say that - regardless of its subject matter - the **kind of faculty** which the doctoroids and the math androids have, does not grant one a priori knowledge. Merely being hardwired with some mechanism that reliably produces true beliefs about P (and related subject matter), does not count as knowing that P. Instead, there's a special faculty called rational intuition, which produces true beliefs in advance of experience. *And* by its nature this faculty can only produce true beliefs about *certain kinds of things*. Thus, there are non-trivial facts about what's a priori, because: only rational intuition counts as granting one knowledge independent of experience, and there are limits to what rational intuition can grant one knowledge **of**.

This is might be the best strategy, for someone who wants to keep a principled conception of a prioricity, as something distinct from necessity. But, one would need to account for the following: How is having a faculty of rational intuition supposed to *differ* from merely having the disposition to form true beliefs (while experiencing a suitable feeling of obviousness) hardwired into you by some reliable process (like a benevolent deity or a scientist uploading results from current math journals)? What more could you want? What further feature

does our relationship to mathematical facts have - such that one can plausibly say that what **we** have counts as rational intuition, whereas what the doctoroids can be designed to have, would not?

All the versions I'm aware of try to give a special process which accounts for our access to some a priori knowledge, at the cost of admitting that mathematical knowledge is a mystery.

### 4.3 Appeal to Analyticity

For example, one might propose that the relevant faculty is some kind of 'concept inspection' which gives one insight into analytic truths. So, the reasons why we are permitted to assume tautologies, but the doctoroids can't assume things about smoking is that one can only assume propositions which are "analytic". Taking this route means we must either deny mathematical knowledge or accept the (widely rejected) logicist thesis that all our mathematical knowledge is knowledge of analytic truths <sup>5</sup>. However, even if you accept this conclusion, Quine's famous arguments that there is no principled distinction between analytic and synthetic (if they work) <sup>6</sup> yield the same result I am arguing for - that there is no principled distinction between a priori and a posteriori - by a different route.

Note that, although there are popular responses to Quine, these largely aim to show that we are able to draw *some* distinction between analytic and synthetic sentences (e.g. there are obvious cases like 'a 5 month old child is not an adult'). But establishing this conclusion does nothing to show that there is a special epistemology associated with analytic sentences, or how such an episte-

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<sup>5</sup>Though one could still allow that there are unknowable synthetic mathematical facts

<sup>6</sup>which I won't try to argue for here

mology could work. Until we have some story about how “concept inspection” could work, what reason do we have for thinking that whatever faculty let’s us ‘see’ meaning facts (e.g. ‘if “vixen” means something then all vixens are female’ and “vixen” does mean something’) can’t let us see other mathematical facts as well? In fact the ability to ‘see’ which meaning stipulations corresponded to possible meanings would require some (not necessarily conscious) ability to track mathematical facts about consistency, by systematically reject syntactically inconsistent stipulations (as no genuine meanings can correspond to these)<sup>7</sup>.

#### 4.4 Appeal to the Fundamentality of Logic

Another such math-abandoning strategy, is to say that only ‘logical’ truths can be assumed - because these have the special property of being ‘requisite for any thinking at all’, and hence so fundamental that they cannot be rationally questioned.

Here, I take it, the idea is that the Doctoroids could “retreat” from their putative medical knowledge, and rationally evaluate whether they have such knowledge using mathematical and logical reasoning, but we cannot “retreat” from our logical intuitions to question whether they work, because logic is so fundamental that if we retreated from that we wouldn’t be reasoning at all. And (for some reason) one is justified in assuming things without proof/justification if there is no possibility of retreating to a weaker theory in which to prove/justify them (as is the case for logic) but not otherwise (as in the case of medical knowledge).

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<sup>7</sup>See ‘The Problem of a Priori Analytic Knowledge’ for more detail about this argument

I call this a strategy that leaves behind mathematics because, to the extent that one can plausibly understand math as a kind of logic, this would be something like second order logic, which (presumably) it is possible to retreat from and rationally ask questions about.

But, even if we were happy to give up on mathematical beliefs all together, this answer fails to explain why the doctoroids don't know. For, presumably, we can stipulate that the doctoroids feel like the medical, logical, analytic and mathematical facts are all of a piece - they don't feel like 'smoking causes cancer' than 'smoking is an activity' are produced by "different kinds" of reasoning. So, indeed, they could retreat from the medical portion and use the other methods of inference they accept to assess whether their medical reasoning is likely to be reliable. But (in that very same sense) they can **also** retreat from parts of their logical doctrines e.g. to only use logical inferences that the intuitionists accept, or only using modus ponens on sentences that don't talk about infinity or heaps or hamburgers. And so can we. Thus, it's not clear that there is a real difference between their relationship to medical inferences and ours to particular kinds of logical inferences e.g. logical inferences between sentences containing the word "infinite".

What's going on here is that no single sentence, or inference, has the property that you wouldn't count as thinking if you refused to accept that sentence. As Timothy Williamson<sup>8</sup> has recently emphasized, there few if any limits to what intelligent philosophers seem to be able to coherently doubt (or even deny). We think of certain kinds of basic logic as a single unit, so if we try to imagine doubting, say 'if A then A' then we have no idea how to go on. We naturally think of the alternative as giving up all of the propositions and inferences which we consider part of logic. But this is merely a fact about our

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<sup>8</sup>The Philosophy of Philosophy, Timothy Williamson ch 4 Blackwell Publishing 2007

psychology. Mathematically speaking, if you take any single inference we are willing to make (i.e. from one sentence to another) there will be a weaker “logic” which allows most of the inferences we currently make, but not that one. So no *sentence* has the property that it can’t be rationally doubted. There is no set of inferences, or propositions, which all rational thinkers must accept - and hence it can’t be an epistemic requirement that one is only permitted to assume propositions/make inferences which belong to this set.

## 5 Positive picture

So much for the challenge. If the pessimistic arguments above succeed, then we can’t drawing any very a principled distinction between our access to mathematics and the doctoroids’ access to medicine. And if so, we can’t use epistemological considerations to make a principled distinction between propositions which are and aren’t a priori knowable. At this point, we are left with three viable options.

### 5.1 A priori access to all necessary truths

Firstly, we could require that one can only permissibly assume propositions which are necessary truth. In this case, rather than getting the trivializing result that all true propositions are a priori, we get the less stark but still surprising result that a claim is knowable a priori iff it’s a necessary truth. The easily-generalizable example of the doctoroids shows that, for any proposition we can know, there could be creatures which a faculty that reliably leads them to form *true beliefs* with regard to that proposition - without any input from ex-

perience. Even if we have established that the doctoroids don't have knowledge, we must admit that the math-androids do (since the propositions they are inclined to believe are necessary). If we now stipulate that only analytic/necessary propositions count as being known (rather than merely unjustifiably assumed) in such a case, then all and only the analytic/necessary propositions will be knowable a priori.

Accepting this solution has costs - whether we choose to require that the subject matter of a priori beliefs must be analytic or that it must be necessity. If we choose to make a priority coextensive with necessity, we must reject Kripke's examples of a priority without necessity (the meter stick is a meter long), and necessity without a priority (water is H<sub>2</sub>O). We will also need to reject other other intuitive examples of a priority without necessity such as the following:

We seem to know that we aren't in an "induction bubble", where the laws of physics behave one way within a 5 foot radius of us, but then radically change outside that radius in a way that's systematically undetectable. For example, I take it that you think you know the following hypothesis doesn't obtain: everything outside a 5 foot radius around you is pea soup, but the soup forms up into ordinary material objects *in exactly the positions they would have been if in a persisting world governed by the equations of Quantum Mechanics* when you walk by. Presumably, you aren't in an induction bubble, and you know that. But this (apparent) knowledge does not seem to depend on any experience. Thus, we seem to know a contingent fact -that we aren't in an induction bubble surrounded by pea soup - a priori.

## 5.2 Psychological notions of a priority

The other two options, involve wedding the notion of a priority to very specific, contingent, details of human psychology.

One version of this story, says that we should replace the intuitive notion of justification with something more principled, but species-relative. On this account, all *propositions* are indeed a priori. The only interesting property in the neighborhood of the a priority as it is presently conceived, is not a property of propositions, but rather a *relationship* between a proposition and a thinker or a species. If we ask whether some P is a priori (i.e. whether it could be known a priori by someone), the answer to this question will always be yes. *But* there may still be interesting facts about what propositions are knowable a priori **by humans**, or **by some particular person S**. Given this, we can distinguish different notions of what counts as ‘sufficient justification for a claim’ with respect to different kind of creatures. So, for example, an argument that assumes ‘smoking causes cancer’ as a premise might provide sufficient justification for a doctoroid to believe that conclusion, but not for us.

The other, non-relative version, sticks more closely to our ordinary use of the word ‘justification’ and ‘a priori’. But, it says that a proposition’s being a priori is simply a matter of it being (what the view above would label as), “a priori for humans”. On this account, a collection of claims justifies belief that P iff **a normal human** could count as knowing that P merely in virtue of accepting those claims. And, in particular, a proposition is a priori if and only if it can be arrived at by using certain true principles and reliable methods of inference which happen to be hardwired into people.

Thus, on this account, the a priori vs. a posteriori distinction will be not

be species-relative (as on the first version) or in any way subjective. However, this distinction also won't be philosophically principled or interesting in the way that one might have assumed that it was. The distinction between a priori and a posteriori truths will be like the distinction between 'a handful of grapes' and 'less than a handful of grapes'. It's a perfectly objective fact that 10 grapes constitute a handful, while 5 grapes don't. And (as I understand the word 'handful') this is a necessary truth, which wouldn't change if the average adult human hand size became smaller (though perhaps, in such a scenario, people would start using the phrase "handful of grapes" differently). Similarly, it is an objective, necessary truth that someone who brutally assumes that  $2+2=4$  has a justification, and counts as knowing, while someone who brutally assumes the four color theorem or that smoking causes cancer does not. But, we should not suppose that the line that divides a handful of grapes from less than a handful of grapes, or those true propositions which can be assumed without further justification from those which cannot, reflects anything deeper than facts about actual humans can typically hold in their hands/what truths actual humans typically find obvious in advance of experience.

## 6 Conclusion

In this paper, I have tried to show a prima facie problem for the mainstream view that there's a philosophically interesting notion of a priority as distinct from the notion of necessity. If we help ourselves 'sharply distinguish logic from psychology'<sup>9</sup> by considering creatures whose psychology differs from ours, in making different mathematical truths, or even contingent scientific facts feel brutally obvious to them, in the way that certain basic mathematical and logical

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<sup>9</sup>In obedience to Frege's famous dictum

facts feel obvious to us - there seems to be no principled sense in which our beliefs could count as justified and theirs could not. I then sketched a view, on which the intuitive a priori/a posteriori distinction turns out to reflect something deeply *unprincipled* in our notion of justification. Because people are generally *able* to reliably form true beliefs from the armchair on some topics but not others, we have developed a concept of justification which *permits one to assume* certain things but not others.