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Two Regions of Verification

This paper will inquire into the legitimacy of *a priori* knowledge. It will do three main things: (1) It will attempt to come up with a plausible conception of *a priori* knowledge. (2) It will attempt to determine whether any such knowledge exists. (3) If we fail to come up with any examples of *a priori* knowledge, it will attempt to account for any other relevant distinction within knowledge. Most importantly, it will attempt to come up with a distinction that accounts for our original intuitions about *a priori* knowledge.

The point of departure is a plausible conception of *a priori* knowledge. In the interests of maintaining the *prior*ness of *a priori*, let's first consider the following concept of *a priori* knowledge: something is known *a priori* if and only if (iff) it is known prior to any experience.

Before we can consider any candidates for this conception of *a priori*, we must recognize an obvious prima facie problem. If we are going to allow something to be known prior to any experience, we must be able to conceive of a human existing prior to experience. But this conception would require a human to be alive and not experiencing anything at the same time. If we assume that conscious life implies having experiences, then it is an absurdity to have a human doing anything prior to experience, let alone knowing something. To consider A existing prior to experience is tantamount to considering A prior to A's birth, in fact, prior to A's presence in the womb.

Because of this obvious problem we must consider a different concept for *a priori* knowledge. Suppose we made the following amendment to our conception: something is known *a priori* iff it *can be* known prior to any experience. We should immediately notice that this amendment leaves us no better off. Since humans *can't exist* prior to experience, nothing *can be known* (by humans) prior to experience.

It seems that if we wish to have any potential *a priori* knowledge we must abandon the *prior*ness of *a priori*. Instead, we shall use the following conception: something is known *a priori* iff our knowing it does not *essentially* rely on experience. This must be explained. For the sake of simplicity, let's assume knowledge to be justified true belief.[1] Let's assume further that in coming to know P, we must first have some sort of understanding of P, and then we judge whether we believe P to be true. Given this assumption, we should understand our conception of *a priori* as permitting experience to be essentially involved in the *understanding* of P, but not in the *reasons for believing* whether P is true. Thus, to be known *a priori* is for P to be known in such a way that experience is not essential to our believing P to be true[2]; to put it another way: P is known *a priori* if we can reasonably believe it to be true just by thinking about it.

Having this conception of *a priori*, we can begin considering candidates for *a priori* knowledge. We will use what seem to be the best candidates: knowledge of mathematics and logic. Let's first consider the following arithmetic claim: 1+2=3. Let's, for now, assume we understand the concepts of 1, 2, 3, +, and =, regardless of the role experience plays in this understanding. Accordingly, now we must determine whether we can reasonably believe this claim to be true just by thinking.

In order to make such a determination, we must first determine how it is that we came to believe it to be true in the first place. It seems that there is not an obvious gap between understanding this proposition and believing it to be true. This seems true because if someone were to get the problem wrong (e.g., add 1 and 2 and get 4), we would think they misunderstood one of the concepts (either 1, 2, 3, 4, +, or =). In other words, it seems that not only is understanding this claim necessary for believing it to be true, it is also *sufficient*. Thus, if this

[1] Personally, however, I would reject such a definition of knowledge. I would want some sort of verification condition on knowledge as well.
[2] BonJour makes this point on page 80.

equality is to count as *a priori* knowledge, it must be the case that understanding this claim does not essentially rely on experience—since our understanding here constitutes our reasons for believing it to be true.

Let's consider what is involved in understanding that 1+2=3. As mentioned before, understanding this claim requires understanding the concepts of 1, 2, 3, +, and =. It seems plausible that understanding all of these concepts requires at least understanding how to count. In order to count, however, it seems necessary that we have objects to be counted. Historically, it seems that these objects are usually body parts, typically fingers.[3] Moreover, counting not only requires things to be counted, but also the ability to exclude all other properties of a thing besides its quantity; i.e., the number one is simply a mental abstraction of pure quantity from material qualities. Once we have mentally excluded all of a thing's taste, touch, smell, shape, etc., and only kept its quantity, we can grasp the abstraction, the concept of one, i.e., one quantity. Likewise for the concept of two: it doesn't seem that we get the concept of two via adding the concept of one to itself, but via representing objects in terms of quantities and then counting them. Thus, understanding that 1+2=3 really is a matter of being able to count to three. We could think of 1+2=3 as follows: first you count to one; and then you count two more from one and arrive at 3.

This description of what goes on when we first begin to understand simple arithmetic seems accurate. Thus, it seems that experience is involved in understanding that 1+2=3. Moreover, experience seems *essentially* involved because it seems very difficult to imagine someone who understands such concepts but never went through the aforesaid process or something relevantly similar; in order to avoid this process one must get the idea of counting and

[3] In some tribes many body parts are used—e.g., fingers, elbows, nose, forehead, etc.

quantity without objects to be counted and abstracted from. But this is precisely what seems impossible.

In summary: in order for the claim 1+2=3 to count as *a priori* knowledge no experience can be essentially involved in our reasons for believing it to be true. But, it seems that there is no gap between understanding this claim and reasons for believing it to be true. Further, experience seems essentially involved in understanding this claim. Thus, since our reason for believing it to be true is simply because we understand it, and understanding it is based essentially on our experience, then our reason for believing it to be true is based essentially on experience. Thus, it is not *a priori* knowledge.

Let's now consider the following logical claim: If x, then y. x. ∴ y. Like the previous claim, believing that the logical rule of modus ponens is true requires that we first understand it; but, once again, that is *all* it seems to require. If someone were to believe that this rule is false, or conclude not-y, we would charge them with not understanding modus ponens. Thus, if this is to count as *a priori* knowledge, then experience must not be essentially involved in understanding it.

In order to determine what it takes to understand modus ponens, let's approach it as if we were learning it for the first time. First, we would have to understand the concept of a variable, e.g., *x* and *y*. Like a number, a variable is something that we can grasp only after we have abstracted it completely from some object. It is not something we can encounter in the world; rather, it is only something we can *abstract from* some object in the world.[4]

Once we understand the concept of variables, we have to grasp the concept of conditionality. The concept of conditionality is best understood when we first break it into its

[4] It seems we can say the same thing about shapes as well: though we don't see any perfect circles, squares, triangles, etc. we abstract certain qualities from objects until we form the concepts of circle, triangle square, etc.

component parts—antecedent and the consequent—and then understand the relation between those parts. The antecedent and consequent are best understood in terms of hypothetical claims. Let's understand a hypothetical claim simply as a claim that is not a verified state of affairs, but rather an assumed state of affairs. It seems that this concept of assumed, non-verified state of affairs is derived from experience as well. Its most plausible foundation is in the concept of motion. When a projectile is in motion we continually see it in one location after another. It seems that after witnessing this constant change of location a sufficient number of times, we can form the idea of, not where the projectile *is*, but where the projectile is *going to be*; i.e., we make an assumption on where it will be, namely, a hypothesis.[5]

The final requirement to understanding the conditional is to understand the relation between the antecedent and the consequent. Let's understand this relation as follows: if the antecedent is the case, then the consequent is the case. It seems that at the root of this relation is the relation of cause and effect, or some close variant of it. When humans interact with the world we inevitably experience that our actions produce effects in the world, and the world's "actions" produce effects in us. When, e.g., we move—via crawling or walking—from one place to another we grasp the concept that if we move specific body parts in a certain way, our whole body will then move; if there is a bump or an obstacle in our path, eventually we grasp that we have to get by it, and that we can achieve this if we move our body parts in a slightly different way.

[5] Of course there could be other experiences that engender our ability to form hypotheses. Motion just seems like the most obvious one. It seems that observing any sort of change would be sufficient. But, in the last analysis, I would argue that change simply is motion of some form or other.

Though this is grossly oversimplified, it seems to get at the relevant type of experience required to grasp the relation of cause and effect.[6] From experiencing relations of cause and effect, we form the general concept of the relation of cause and effect (e.g., ideas about a hypothetical cause and its hypothetical effect). Once we have this concept of the relation of cause and effect, it isn't much of an extension to grasp the relation expressed in a conditional. It's not as if the *being-the-case* of the antecedent *causes* the consequent to be the case, but it is relevantly similar. In order to demonstrate the relevant similarity let's consider the following three conditionals:

1. *If it rains, then the roads are wet.*
2. *If A is in California at time* t*, then A can't be in New York at time* t.
3. *If ABC is a triangle, then ABC has three sides*.

Notice that in each conditional the relationship between the antecedent and the consequent is different: in 1 it is causal (i.e., rain causes the roads to be wet); in 2 it is space-temporal (i.e., an object cannot both be in California and New York at the same time); in 3 it is definitional (i.e., the definition of a triangle includes having three sides). Nonetheless, there is a relationship that is common to all—the fundamental relation of the conditional: implication. If we assume that all three conditionals are true, then in each of them the truth of the antecedent *implies* the truth of the consequent. The relation of implication is relevantly similar to the relation of cause and effect. We understand the relation of cause and effect (something like) as follows: for A to cause B means there is something about A that enables it to make B the case. Something very similar can be said of our understanding of the relation of implication: for A to imply B means that there is something about A that enables it to make B the case. Thus, it seems plausible to claim that an

[6] The main point is that whether it is this type of experience or some other, *some* sort of experience is essential to our concept of the relation of cause and effect.

extension of our concept of cause and effect engenders our concept of the relation of the conditional, i.e., the relation of implication. Moreover, assuming our concept of the relation of cause and effect is required for our concept of the relation of implication, and the former concept essentially relies on experience, then it follows that the latter concept essentially relies on experience as well.[7]

In summary: In order for our knowledge of the rule of modus ponens to count as *a priori* knowledge it must be the case that our reasons for believing it to be true do not essentially rely on experience. Our understanding of modus ponens constitutes our reasons for believing it to be true. Understanding modus ponens is based on understanding its components: the antecedent, the consequent, and the relation of implication. Understanding any of these components essentially relies on experience. Thus, our knowledge of modus ponens is not *a priori* knowledge.

It seems, then, that our two candidates for *a priori* knowledge have failed to meet our conception of *a priori* knowledge. We have several options at this point: we can consider any objections to the above treatments of the two candidates; we can consider other candidates for *a priori* knowledge; we can amend our conception of *a priori* knowledge to fit the original candidates; or, we can drop *a priori* knowledge all together, and determine whether there is some other relevant distinction amongst our knowledge. First, I plan to consider an objection.

In our treatment of whether experience is essentially involved in understanding modus ponens, we argued that it was; specifically, experience was essentially required to understand the general concept of the relation of cause and effect, which in turn accounted for understanding the relation of the conditional (i.e., the relation of implication). We claimed that the general concept of the relation of cause and effect was derived from experience. Hume denies any such

[7] Strictly speaking I haven't demonstrated how we understand modus ponens; all I've shown is how we understand the relation of the conditional. Nonetheless, once we have the former understanding not much else is needed to arrive at understanding the rule of modus ponens.

derivation. Hume concedes that we have the general concept of cause and effect, and we need it on order to reason about any matter of fact, but we cannot prove, in anyway, that we derive it from experience.

In order to understand Hume's skepticism on this point let's consider his own example. When a child feels pain from touching the flame of a candle for the first time, the child immediately pulls his/her hand away. Moreover, the child (either after the first time or soon afterwards) concludes not to do it again because he/she will receive the same pain. This means, according to Hume, the child must have the following belief: *qualitatively similar causes will produce qualitatively similar effects*. Hume finds this problematic because the child only experienced a *particular* cause and a *particular* effect; but, the child believes something about a *general* cause and a *general* effect. Hume accuses the child of reasoning as follows:

(i) I have found that a certain object has always been attended with a certain effect.

∴ (ii) Other objects, which are similar in appearance, will be attended with similar effects.

Hume argues that though we make the inference from (i) to (ii), we are not justified in doing so. His point is that mere *similarity* in qualities does not imply, *necessarily*, similarity in effects. If, e.g., I were to touch a flaming candle when my hand was numb, I wouldn't get the burning sensation. In short, the mere happening of something several times is insufficient to prove that it always happens that way. Thus, since the relation of cause and effect is general, we cannot derive it from particulars.

There seems to be several problems with Hume's objection. First, it is important to note that Hume does not claim that we don't derive the concept of the relation of cause and effect from experience—all he claims is that we have no argument that *proves* it does come from

experience. In other words, Hume has not argued that we don't derive it from experience, rather, that no one has proved it is. But, since we need something like the relation of cause and effect in order to understand the relation of the conditional, the burden of proof does seem to lie on us here.

The main problem with Hume's objection rests on two assumptions he grants us: (1) that humans have the capacity to determine the qualities of objects; (2) that we can derive the relation of cause and effect *of particulars* from experience. These two assumptions are very important. I will argue that there is an inconsistency in granting these assumptions while denying justification in believing any general relation of cause and effect.

Let's assume, as Hume does, we have no justification for the claim *qualitatively similar causes will produce qualitatively similar effects*. This means that something beyond the mere qualitative similarity of causes is needed to determine qualitatively similar effects. Thus, when we derive the relation of cause and effect of particulars from experience we must not appeal to the former claim. Suppose A burns her hands once on a candle. It seems that Hume allows her to be justified in believing that the heat of the flame *caused* her to have the effect of the burning sensation; i.e., that the belief is obviously derived from experience. Would Hume grant her justification in the belief that one second after the first burn, if she were to put her hand over the flame again, she would experience a similar burning sensation? It seems that Hume, in order to be consistent, must not grant her this justification, because it would justify the former claim that *qualitatively similar causes will produce qualitatively similar effects*. This seems inconsistent with the two former assumptions.

Since we have the capacity to determine the qualities of a thing, we have the capacity to determine heat as a quality of the flame. We determine this quality by feeling it. We don't

merely determine that the flame has the quality of being hot when we touched it *in the past*, but that the flame *is* hot, i.e., that the quality of the flame as being hot is not a temporary property of it, but a continuous one; we don't merely say that the flame *was* hot when we touched it, but that the flame *is* hot. Thus, we imply a statement about the future: *if we were to touch the flame it would produce the sensation of feeling hot*. Likewise for the property of its color: we don't, e.g., merely claim that the flame *was* orange when we looked at it, but that it *is* orange; i.e., we claim that if we were to look at it, we would experience the color sensation of orange. Hume must allow for this if he wishes to distinguish between the claims that *the flame is orange (or hot)* and *the flame was orange (or hot)*; such a distinction is necessary in order to determine the qualities of things, which Hume assumes we can do.

Accordingly, it seems that we can understand an object's qualities as to include its causal capacities. When we experience any quality of an object, we experience it because of the causal powers of that object. Whenever we see an object's color, taste its taste, feel its texture, etc. we perceive the object's qualities because the object has the capacity to cause those sensations in us. Orange juice, e.g., does not have the capacity to produce the sensation of chocolate on my tongue, but it can produce the sensation of orange juice; a rock does not have the capacity to produce the sensation of softness, like cotton, but it can produce the sensation of hardness. We experience these sensations because the objects have the causal powers to produce them.

We can say the same thing of a flame's capacity to cause a burning sensation. We can say, e.g., in addition to the candle being white and having an orange flame, that flames have the quality of producing burning sensations, or being "burning hot." Just as when we touch a rock and feel its hardness, when we touch a flame we feel its *hotness*, and feeling its hotness is tantamount to feeling a burning sensation. Thus, we can say of the flame that it is "burning hot";

i.e., that it has the capacity to produce a burning sensation. Moreover, once we grant that one its qualities is the capacity to produce a burning sensation, it follows that if we were to touch it, we would experience a burning sensation. But this is precisely what Hume denies: that *qualitatively similar causes produce qualitatively similar effects*. Thus, Hume is inconsistent in assuming 1 and 2, but denying justification in believing any general relation of cause and effect.

Since this seemed to be the only available objection to the above treatments we will move on. We will not consider any other candidates for *a priori* knowledge because knowledge of mathematics and logic seemed to be the best. Moreover, any further amendment to our conception of *a priori* knowledge seems to take us too far from the original conception. Thus, we will now drop our inquiry into *a priori* knowledge all together and instead, determine whether there is some other relevant distinction amongst our knowledge that will capture our original intuitions about *a priori* knowledge.

Though we may not be able to find a case of *a priori* knowledge within our knowledge, there still seems to be an intuitive distinction between our two candidates and other types of knowledge. Let's inquire into the distinction between the following two claims: (a) '1+2=3' and (b) 'water boils at 100ºC'. The most fundamental difference is one that captures our original treatment of claim (a). Simply understanding (a) was necessary and sufficient for believing it to be true; whereas, understanding (b) is necessary but not sufficient for believing it to be true; beyond understanding claim (b) we need some further reasons for believing it to be true (e.g., seeing 100^{o}C on a thermometer when it is immersed in boiling water, reading it in a chemistry textbook, etc.). We shall attempt to elucidate this difference.

Prima facie, the root of the difference between the two claims is the difference in the subjects of the two claims.[8] Claim (a) is about numbers and claim (b) is about water. The peculiarity of numbers is that they are objects of mental abstractions. As mentioned previously, we abstract the property of quantity from an object by excluding all of its other properties. If we want to investigate numbers, we have to think about them because they exist only as ideas; we can't encounter them apart form our ideas, i.e., *in the world*, so to speak. Moreover, if we make a hypothesis about some mathematical relation (e.g., the difference between 70 and 50 is 20) we verify that hypothesis via thought (or by writing our thoughts down in the form of written calculation), because numbers are objects of thought. Contrarily, water is an object of the world; we can't determine any of its qualities simply via thought.

Thus, the way in which we come to believe whether a claim about numbers is true is necessarily different than the way in which we come to believe whether a claim about water is true; to state it more generally: the way in which we come to believe whether a claim about a mental object[9] is true is necessarily different than the way in which we come to believe whether a claim about a material object is true. Since mental objects reside in thought, we determine truths about them simply by thinking; we have no other choice. This should be in no way extraordinary. Moreover, since material objects don't reside in thought, but in the world, we determine truths about them by some form of observation.[10]

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[8] I am aware that many have argued for a distinction in terms of analytic and synthetic statements: the former being true solely in virtue of the meanings of the terms and the latter being true in virtue of the meanings of the terms plus facts about the world. However similar, I intend to make a more foundational distinction, because I am hesitant to accept the traditional distinction as stated.

[9] I am using the term "mental object" very loosely. I do not wish to make any sort of ontological distinction in terms of physical and non-physical; rather, I wish to make the distinction merely between *in-thought* and *in-world*.

[10] I say "some form of observation" because, for sake of simplicity, I wish to use "observation" very loosely. I would count reading about properties of water in a chemistry textbook as indirect observation because the observation necessarily took place, it was just performed by someone else.

Thus, the reason we can believe 1+2=3 simply by thinking about the claim is because thought is the relevant location of the objects in the claim; with water, the relevant location is in the world somewhere. Thus, understanding the meaning of 1+2=3 is sufficient for believing it is true because understanding here implies thinking about the relevant relation between the numbers 1, 2and 3. To put it more explicitly: to understand 1+2=3 is to understand that when we add the numbers 1 and 2, we arrive at the sum of 3. We attain this understanding by performing the addition via thought. Thus, understanding seems to be sufficient for knowledge. With the claim 'water boils at 100^{o}C' a further step of verification is needed. Hence the difference between the two ways in which we know both claims.

Though this explanation of the distinction between the two claims seems to be accurate, there nonetheless seems to be another way of viewing them such that they are isomorphic and the distinction is merely in the types of objects to which the claims refer. We can say of both types of claims that we do the following: first we understand the meaning of the stipulated claim, and then we verify whether the stipulation is true. In the case of 1+2=3, first we understand the stipulation—that the sum of 1 and 2 is 3. Then, we verify whether the stipulation is true. In this case, the verification step goes unnoticed because the sum is so small. If the sum were larger, however, e.g., 1235+2769=4004, the verification step would not go unnoticed. In the case of 'water boils at 100^{o}C' we do the same: first we understand the stipulation and then we verify whether the stipulation is true.[11]

Thus, the two ways of knowing are isomorphic. The only relevant difference is in the method of verification: since the types of objects in the two claims are different (one is an object

[11] I realize that some may worry about the "verification step" in small arithmetic (e.g. 1+2=3) and "definitional" statements like *a triangle has three sides*. There does not seem to be the verification step here. This idea goes beyond the scope of my paper. My belief is that the verification step occurs, but it occurs in the *act of understanding*. When we come to understand 1+1=2 we must count—the counting constitutes the verification step; when we come to understand *a triangle has three sides* we must be presented with a figure that has three sides and we count the sides—that original presentation constitutes the verification step.

located in thought, the other located in the world), the regions of verification are going to be correspondingly different. This difference is able to account for our original intuitions about *a priori* knowledge. The reason the mathematical claims seemed to be *a priori* knowledge is because we did not appeal to typical experience to determine their truth—we appealed to thought. Likewise, we can say something very similar about logical relations. Logical relations deal with entities (typically variables) that are mental abstractions. Thus when we verify the ways in which these abstractions relate to one another, we appeal to thought.

In summary: there does not seem to be any *a priori* knowledge. And the only difference between our knowledge is in the types of objects our knowledge is about. But, we derive all of these objects, nonetheless, from experience.

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