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Generating Necessary *A Posteriori* Truths

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One should always say in the first sentence of a paper what is its aim. I ask for your patience; I cannot do that in this case. To state the aim of this paper I'll have to say a few things first.

Saul Kripke presents a picture of the way we reach necessary *a posteriori* truths:

> One knows by a priori philosophical analysis, some conditional of the form "if P, then necessarily P." . . . On the other hand, then, we know by empirical investigation that P, the antecedent of the conditional, is true. . . . We can conclude by modus ponens:
>
> $$\begin{array}{l} P \supset \Box P \\ \underline{P \qquad\quad} \\ \Box P \end{array}$$
>
> . . . this conclusion is known a posteriori, since one of the premises on which it is based is a posteriori.[2]

An example of the form above might be "If water is H_2O, water is necessarily H_2O; water is H_2O; therefore, water is necessarily H_2O."

Why we should accept a statement like "If water is H_2O, water is necessarily H_2O" is not our concern here. Kripke showed, or tried to show, that we have some clear examples of true conditionals like this. I think he is right, but that is not what we will discuss here. Let's assume that he is right, that there are true conditionals like this. Does it follow that there are necessary *a posteriori* truths? No, unless he is also right when he claims that the conclusion of the argument above is *a posteriori.*

Our problem is the "since" at the end of Kripke's quotation above. As we shall see, we may run into trouble trying to spell out exactly what principle, if any, is at work. Why is it that when one of the premises is *a posteriori* the conclusion is also *a posteriori*? What we need is an explanation. We need to explain why the conclusion of a valid argument is *a posteriori* if one of the premises is *a posteriori.* That is the aim of this paper.

This is important because it's easy to think that all necessary truths are *a priori* and all *a posteriori* truths are contingent. In fact, many philosophers have

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[2] "Identity and necessity", p. 88.

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thought so, namely Kant and Hume. Kripke rejected this idea, presenting several examples of necessary *a posteriori* truths. They all rely on that "since" in the quoted sentence. To my knowledge, no one has explained that "since." If there's no reason to accept that the conclusion of a valid argument is *a posteriori* just because one of its premises is *a posteriori,* then there's no reason to accept that there are necessary *a posteriori* truths. In that case, we would have no reason to accept one of the most interesting and revolutionary philosophical ideas of the twentieth century.

The point of this paper is not philosophical exegesis. This is not a paper about what Kripke thinks about this matter. I do not know what he thinks. As far as I know, his texts do not address this problem; but that is not the point. The point here is philosophical rather than exegetical: How can we understand the relation between the epistemic status of a conclusion in a valid argument, and the epistemic status of its premises?[3] Is there some special principle that regulates such relation? I will argue that we do not need any special principle to understand that relation; we need only to understand what *a priori* knowledge is.

Let's rewrite Kripke's *modus ponens* and call it KMP:

(a) $P \supset \Box P$
(b) $\underline{P \qquad\qquad}$
(c) $\Box P$

To explain why (c) is *a posteriori,* we might want to say this:

(1) If one of the premises of a scheme like KMP is *a posteriori,* then the conclusion will also be *a posteriori.*

This principle is not good for two reasons.

First, it speaks only of some obscure "inheritance" scheme: Somehow the epistemic status of the premises of an argument is passed on to its conclusion. However, in the cases at hand, namely the case of water, the first premise is not *a posteriori*; why does the conclusion have to be *a posteriori*? Why is it not that if one of the premises is *a priori* the conclusion will also be *a priori*? At best, (1) tells us what may be going on with KMP, but not why.

Second, it's not general enough. What's so special about *modus ponens*? It's not plausible that whatever is going on has to do with *modus ponens* in particular. We should generalise principle (1) to hold in any valid reasoning.

(2) If one of the premises of a valid reasoning is *a posteriori* then the conclusion will also be *a posteriori.*

This principle is not good, because there are obvious counter-examples:

(3) If water is H_2O, then necessarily $2 + 2 = 4$.
Water is H_2O.
Therefore, Necessarily $2 + 2 = 4$.

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[3] The epistemic status of a proposition is whether that proposition is *a priori* or *a posteriori.* Below I will spell out what is *a priori* and *a posteriori* knowledge.

There's a trick here, of course: There's no content relation between the antecedent and the consequent of the first premise. The premise is true, but it's something like a vacuously true statement: It is true due to the fact that its consequent is necessarily true. Whatever antecedent you pick up, those premises will always be true.

Principle (2) would have to be reformulated like:

(4) If one of the premises of a valid inference is *a posteriori,* then the conclusion will also be *a posteriori,* unless one of the premises relevant to the conclusion has no epistemic relevance.

Of course, we would now have to present a good characterisation of "epistemic relevance." Maybe we can do that. However, we would have to deal with all kinds of counter-examples, not just "vacuously true" conditionals. Consider this counter-example:

(5) Water is not H_2O or necessarily $2 + 2 = 4$.
Water is H_2O.
Therefore, Necessarily $2 + 2 = 4$.

Here we do not have the "trick" of a vacuously true conditional. Principle (4) is not promising, even if we try to enlarge it to cover all kinds of reasoning; there is so far no systematic way of ruling out counter-examples like (5). Moreover, if we try to rule out counter-examples the way (4) did with (3), then we will end up with a principle that may work just because we ruled out in a completely *ad hoc* fashion all possible counter-examples. This is not a promising path. We still do not know why the *a posteriori* character of one premise is passed on to the conclusion, while the *a priori* character of the other premise is not passed on to the conclusion. At best, principle (4) or some other version of it will state what is going on, but will not tell us why. Anyway, there is another possibility, perhaps more enlightening and surely simpler.

How can we characterise *a priori* and *a posteriori* knowledge?[4] One way to do it, suggested by Kripke's own work[5], is this:

(6) *P* is *a priori* iff *P* can be known by reason alone.
P is *a posteriori* iff *P* must be known by experience.

This doesn't mean that all *a priori* truths have to be known by reason alone. The example of Kripke to illustrate this point is the calculator.[6] When I use a calculator to determine the result of, say, 122×98, I get an answer that is true, but I come to know it by experience. It is my confidence in the laws of physics and

[4] A small detail that is worth noting is this. Knowledge is "factive." This means we cannot know falsehoods. I cannot know that the earth is flat, because it is not flat. Of course, I can falsely believe that the earth is flat. This shows that belief is not factive, whereas knowledge is. For our purposes, this means that there are neither *a priori* nor *a posteriori* falsehoods. We can know *a priori* that a statement is false—like "$2 + 3 = 13$"—but that is not to know *a priori* that $2 + 3 = 13$.

[5] Kripke, *Naming and Necessity,* pp. 34-38, 158-160.

[6] Ibid., p. 35.

my experience that justifies my belief that the result delivered by the calculator is correct. But that doesn't mean (7) is *a posteriori.*

(7) $122 \times 98 = 11956$

According to our characterisation of *a priori* and *a posteriori* knowledge, (7) is still *a priori*, since it can be known by reason alone.[7] I may use the calculator to determine the result, but I can also calculate it myself.

Now consider a statement like this:

(8) Water is H_2O.

There's no way I can know this statement is true by reason alone. Therefore, (8) is *a posteriori.*

Now consider the following valid reasoning:

(9) If water is H_2O, then water is necessarily H_2O.
Water is H_2O.
Therefore, Water is necessarily H_2O.

There is no way of knowing the conclusion is true without knowing that the second premise is true; but the second premise is *a posteriori.* Therefore, the conclusion is also *a posteriori.* Consider again case (3) above. I do not have to know that water is H_2O in order to know that necessarily $2 + 2 = 4$. I can know that the conclusion of (3) is true by reason alone.

Now we can see that the principle at work in order to generate necessary *a posteriori* truths is this:

(10) If *P* must be known by experience, then *P* is *a posteriori.*

So, (3) is not a counter-example to principle (10), because the conclusion of (3) can be known by reason alone.

In fact, we do not need (10) as an independent principle to explain what is at work in generating necessary *a posteriori* truths. For (10) is just a corollary of (6). All we need, then, to understand what's going on is a clear understanding of the notion of *a priori* and *a posteriori* truth. With that in mind, we understand why the conclusion of (9) is *a posteriori.* It's not due to some metaphorical and

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[7] It was pointed out to me that this "can" is obscure. Do we mean "can, in theory" or "can, in practice"? Some highly complex mathematical theorems can only be proved using a computer. Does this mean that those theorems are *a priori* because if our natural reasoning resources were better we could run the proofs ourselves? Or does it mean they are *a posteriori* because we cannot actually run those proofs ourselves? Actually, we should not talk abstractly about "*a priori* knowledge" at all but about particular statements known *a priori* by some specific agent. It's not hard to see that the concept of *a priori* knowledge has to be agent-relative; God knows perhaps *a priori* many things that we only know *a posteriori.* An advanced mathematician knows many theorems *a priori* that I know of only *a posteriori* because he tells me they are true, and I may never be able to crack them — because I'm no mathematician. Our purpose, however, is to explain why one *a posteriori* premise in a valid argument makes the conclusion also *a posteriori.* What I show is that there's a general way of understanding *a priori* and *a posteriori* knowledge that explains it. A deep understanding of *a priori* knowledge is not the topic of this paper.

obscure "inheritance." It's because that conclusion cannot be known by reason alone; it can only be known by some reasoning in which at least one of the premises is *a posteriori.*

Let's consider again KMP. Now we understand why premise (b) determines the epistemic character of the conclusion, but not premise (a). We can also understand that what's wrong with case (3) is not the "vacuously true" first premise. It happens that we can arrive at that conclusion by other means, means that do not involve *a posteriori* premises—and that makes all the difference.

We can now explain what is at work in Kripke's way of generating necessary *a posteriori* truths. We do not need a principle to explain what is going on; we just need to understand a certain conception of *a priori* and *a posteriori* truth. Whether that conception is right is another matter. If something is wrong with the idea of necessary *a posteriori* truths, it lies not in the "inheritance" scheme.

Bibliography

Kripke, Saul

1971 Identity and Necessity. In *Identity and Individuation,* Milton K. Munitz ed., New York University Press, pp. 135-164. Reprinted in *Naming, Necessity and Natural Kinds,* Stephen P. Schwartz ed., Cornell University Press, 1977, pp. 66-101. All page references are to the latter edition.

1980 *Naming and Necessity,* Harvard University Press.