
Counterfactuals and Modal Knowledge

One influential argument in support of the existence of a priori knowledge is due to Kant, who claimed that necessity is a criterion of the a priori—that is, that all knowledge of necessary propositions is a priori. That claim, together with two others that Kant took to be evident—we know some mathematical propositions and such propositions are necessary—led directly to the conclusion that some knowledge is a priori. Kripke (1971, 1980) challenged Kant’s central claim by offering examples of necessary a posteriori propositions.¹ Kripke’s challenge has led epistemologists to reconsider questions about the relationship between a priori knowledge and necessary truth and the nature of modal knowledge.

Although modal knowledge is often touted as a compelling example of a priori knowledge, there are few available accounts of how we acquire such knowledge. Timothy Williamson (2007) offers a novel approach that attempts to provide a reductive account of modal knowledge in terms of knowledge of counterfactual conditionals.² The account is developed in a broader context of defending two more general theses regarding the subject matter and methodology of philosophy. My primary focus in this paper is Williamson’s account of

1. For a more detailed discussion of these issues, see Casullo (2003, chapter 7).

2. Christopher Hill (2006) also offers such an account, which is discussed in chapter 13 here.

modal knowledge. In section 1, I argue that Williamson's account does not support his more general theses regarding the subject matter and methodology of philosophy. Section 2 addresses Williamson's account of knowledge of counterfactuals. Here I argue that the two central claims of his account are rooted in unsubstantiated empirical assumptions. Section 3 presents Williamson's argument in support of the conclusion that modal knowledge is a special case of counterfactual knowledge. In sections 4 through 6, I contend that his supporting argument rests on three errors: conflating logical reduction and epistemological reduction, a misguided appeal to cognitive economy, and incorrectly locating what needs to be explained by an account of modal knowledge.

1

Williamson's account of modal knowledge is presented as the central premise in a broader argument whose goal is to defend two general theses regarding the subject matter of philosophy and its methodology:

- (T1) The differences in subject matter between philosophy and other disciplines are not very deep;
- (T2) The differences in methodology between philosophy and other disciplines are not very deep.

Williamson's (134) defense of (T1) and (T2) begins by considering a characteristic philosophical question: "Philosophers characteristically ask not just whether things are some way but whether they could have been otherwise."³ He thinks that we have some answers to that question. We know, for example, that Henry VIII could have had more than six wives and that three plus three could not have been more than six.

Williamson's characteristic question requires some clarification. In order to provide it, the following distinctions are necessary:

- (A) S knows the *truth value* of p just in case S knows that p is true or S knows that p is false.
- (B) S knows the *general modal status* of p just in case S knows that p is a necessary proposition (i.e., necessarily true or necessarily false) or S knows that p is a contingent proposition (i.e., contingently true or contingently false).

3. All page references in the text are to Williamson (2007) unless otherwise indicated.

- (C) S knows the *specific modal status* of p just in case S knows that p is necessarily true or S knows that p is necessarily false or S knows that p is contingently true or S knows that p is contingently false.

It is critical to distinguish two aspects of Williamson's characteristic question. To ask whether things are some way is to ask whether p is true or false. To ask whether they could have been otherwise is to ask whether p is necessary or contingent. So we have two questions:

- (Q1) What is the truth value of p?
 (Q2) What is the general modal status of p?

The two questions are independent of one another. One can know the answer to one of the questions without knowing the answer to the other. Moreover, the characteristic philosophical question is (Q2) not (Q1).

These points are transparent if we consider Williamson's two examples:

- (E1) Henry VIII had six wives.
 (E2) Three plus three equals six.

One can know that (E1) is true without knowing whether it is necessary or contingent, and one can know that (E1) is a contingent proposition without knowing whether it is true or false. Similarly, one can know that (E2) is true without knowing whether it is necessary or contingent, and one can know that (E2) is a necessary proposition without knowing whether it is true or false. Whether (E1) is true is not a characteristically philosophical question; it is a historical question. Similarly, whether (E2) is true is not a characteristically philosophical question; it is a mathematical question. But whether (E1) and (E2) are necessary or contingent propositions is a characteristically philosophical question.

If (Q2) is the characteristic philosophical question then, unless other disciplines are concerned with the general modal status of the propositions that they investigate, philosophy has a distinctive subject matter. Its distinctive subject matter is metaphysical necessity and metaphysical contingency. Mathematicians, however, are concerned with the truth value of (E2) and not with its necessity or contingency. Similarly, historians are concerned with the truth value of (E1) and not with its necessity or contingency. So philosophy appears to have a distinctive subject matter.

Williamson, however, disagrees. He maintains: "If thought about metaphysical modality is the exclusive preserve of philosophers, so is knowledge of metaphysical modality" (135). But Williamson disputes the view that there is a special cognitive capacity distinctive of philosophical thought. Instead, he maintains

that a plausible account should subsume our capacity to discriminate the metaphysical modalities “under more general cognitive capacities used in ordinary life” (136). Hence, his goal is to show that “the ordinary cognitive capacity to handle counterfactual conditionals carries with it the cognitive capacity to handle metaphysical modality” (136).

Before turning to the evaluation of Williamson’s account of our knowledge of the metaphysical modalities, I conclude this section by arguing that even if the account is correct it does not support either (T1) or (T2). This contention is more obvious with respect to (T1). From the fact that our ability to discriminate the metaphysical modalities is tied to cognitive capacities that are employed in ordinary life, it does not follow that the subject matter of history or mathematics includes the metaphysical modalities. For example, if certain theories of natural theology are true, then our ability to discriminate a divine presence in the world is tied to our ordinary cognitive capacities. But, even if our ordinary cognitive capacities can discriminate the presence of the divine, it does not follow that the divine is part of the subject matter of mathematics or history. If philosophy is the unique discipline whose subject matter is the metaphysical modalities, then that is a striking difference between it and the other disciplines, irrespective of which cognitive capacities are responsible for modal knowledge.

Although perhaps less obvious, this contention is also true with respect to (T2). From the fact that the cognitive capacities that are employed in the methodology of disciplines such as mathematics and history can also be employed to discriminate the metaphysical modalities, it does not follow that such an employment plays any role in the methodology of those disciplines. Returning to the example of natural theology, even if the cognitive capacities employed in mathematics and history can also be employed to discriminate a divine presence in nature, it does not follow that such an employment of those cognitive capacities plays any role in the methodology of mathematics or history. If the methodology of philosophy is unique in its capacity to reveal the metaphysical modalities, then that is a striking difference between it and the other disciplines, irrespective of which cognitive capacities underlie that methodology.

2

Williamson’s strategy is to offer an account of the epistemology of counterfactuals and to extend that account to the epistemology of the metaphysical modalities. We begin with his account of the epistemology of counterfactuals. Williamson maintains that there is no uniform epistemology of counterfactuals. He does, however, provide a schematization of a typical overall process of evaluating a counterfactual conditional:

- (CC1) One supposes the antecedent and develops the supposition, adding further judgments within the supposition by reasoning, offline prediction mechanisms, and other offline judgments.
- (CC2) To a first approximation: one asserts the counterfactual conditional if and only if the development eventually leads one to add the consequent. (152–153)

His leading example of the application of this process involves the following counterfactual:

- (CC3) If the bush had not been there, the rock would have ended in the lake.

I will focus my discussion on this example.

Suppose that you are in the mountains and see a rock slide down the mountainside and into a bush. You wonder where the rock would have landed had the bush not been there. Williamson maintains that you come to know (CC3) by using your imagination. The explanation, as it stands, is not very satisfying since it offers no account of what guides the imagination in such an exercise. After all, one can imagine the rock behaving in many different ways. One straightforward account maintains that we have tacit knowledge of some general principles regarding the behavior of physical objects. Given such tacit knowledge, one can conjoin the antecedent of (CC3) and some further premises about the rock and mountainside with the general principles to infer the consequent of (CC3).

Williamson, however, rejects this account and offers an alternative based on simulation, where simulation involves the “offline” application of our cognitive processes:

- (S1) Imagine the rock falling as it would visually appear from your actual present location.
- (S2) Simulate (imagine) the initial movement of the rock in the absence of the bush, form an expectation as to where it goes next, feed the expected movement back into the simulation, form a further expectation as to its subsequent movement, and so on. (148–149)

Williamson’s account rests on two central claims: (1) we evaluate counterfactuals by employing a process of imaginative simulation, and (2) such evaluations suffice for knowledge. Both claims, however, are rooted in unsubstantiated empirical claims.

Questions about which cognitive mechanisms are involved in the evaluation of counterfactuals are empirical. In particular, whether tacit knowledge or

simulation better explains a particular cognitive capacity is a question addressed within cognitive science using empirical methods.⁴ It is not an issue that can be settled from the armchair. Williamson, however, offers the following argument in support of the claim that expectations generated in imaginative simulation, as opposed to tacit knowledge of the general principles of folk physics, guide our evaluation of counterfactuals such as (CC3):

- (TK1) If someone believes a conclusion solely on the basis of inference from premises and *p* is an essential premise, then one knows the conclusion only if one knows *p*.
- (TK2) Folk physics is an essential background premise of the supposed inferences from antecedents to consequents of counterfactuals like (CC3).
- (TK3) Folk physics is false and, therefore, not known.
- (TK4) The conclusion that no belief formed on the basis of folk physics constitutes knowledge is wildly skeptical.⁵ (145–146)

The argument is striking because it turns on a priori considerations about the necessary conditions for knowledge and the claim that skepticism regarding knowledge of counterfactuals is false. But it is implausible to maintain that a controversial question in the cognitive sciences can be settled by such a priori considerations. It is more plausible to maintain that if (a) the empirical evidence supports a tacit knowledge account of our evaluation of counterfactuals, and (b) the conjunction of the tacit knowledge account and Williamson's epistemological assumptions entail skepticism regarding counterfactuals, then (c) the problem lies with the epistemological assumptions.

Moreover, unless Williamson can establish that the capacities that guide our development of counterfactual conditionals do not involve tacit knowledge of general principles regarding the behavior of physical objects, his account does not explain our knowledge of counterfactuals. According to the tacit knowledge account, our development of counterfactual conditionals is guided by a tacit folk physical theory. But if the general principles involved in such tacit knowledge are themselves natural laws (or rough approximations of such laws), they have modal import. They support counterfactual

4. For a discussion of the debate within cognitive science between tacit theory and simulation accounts of cognitive capacities, see Stich and Nichols (1992) and Nichols et al. (1996).

5. Williamson offers two other arguments. The first, by his own admission, is technical and can be resolved by a technical refinement. The second is based on empirical speculations for which no supporting evidence is provided. The third, which is discussed in the text, carries the burden of his case against tacit knowledge accounts.

conditionals. So if antecedent knowledge of natural laws guides the development of counterfactuals, the account presupposes rather than explains modal knowledge. Moreover, the problem does not disappear merely by invoking an account in terms of the offline use of our cognitive capacities. The reason is straightforward. If our online use of the capacities in question appeals to tacit knowledge of such laws, then so does our offline use of those capacities. Consequently, Williamson's account of our knowledge of counterfactuals can discharge its explanatory burden only if the capacities he invokes to explain such knowledge do not involve tacit knowledge of natural laws. But he has not shown that this is the case.

Williamson's contention that beliefs based on imaginative simulations constitute knowledge also rests on an unsubstantiated empirical claim. He maintains that the use of the imagination in evaluating counterfactuals is reliable and offers the following consideration in support of that contention:

- (S3) The natural laws and causal tendencies our expectations roughly track also help us determine which counterfactuals really hold. (149)

(S3) is an empirical claim, but Williamson offers only anecdotal evidence in support of it. Suppose, however, that our expectations track universal generalizations that are supported by our past experiences. Not all true universal generalizations are natural laws; some are so-called accidental generalizations. One important difference between accidental generalizations and natural laws is that the latter, but not the former, support counterfactual conditionals. Consequently, if our expectations track universal generalizations rather than natural laws, they will be much less reliable in helping us determine which counterfactuals hold. Williamson, however, has offered no evidence in support of the claim that our expectations track natural laws rather than universal generalizations. But, if our cognitive capacities do not track natural laws in their online applications, then they do not do so in their offline applications and Williamson's account collapses.

3

Section 2 raised questions about Williamson's account of knowledge of counterfactuals. But let us suppose that those concerns can be allayed and that the account can be sustained. Williamson's primary and most significant claim is that this account can be extended to provide an account of knowledge of the metaphysical modalities. His supporting argument involves two steps. First, he (157) presents two equivalences, due to David Lewis (1973), between counterfactual conditionals and metaphysical modalities:

(17) $\Box A \equiv (\neg A \Box \rightarrow \perp)$, and

(18) $\Diamond A \equiv \neg(A \Box \rightarrow \perp)$,

where \perp is a contradiction.⁶ Second, he contends that these equivalences show that the epistemology of the metaphysical modalities is a special case of the epistemology of counterfactual conditionals:

- (W1) Given (17) and (18), we should expect the epistemology of metaphysical modality to be a special case of the epistemology of counterfactuals.
- (W2) Despite the nonsynonymy of the two sides, our cognitive capacity to evaluate the counterfactual conditionals gives us exactly what we need to evaluate the corresponding modal claims too.
- (W3) The idea that nevertheless we evaluate them by some quite different means is highly fanciful, since it indicates a bizarre lack of cognitive economy and has no plausible explanation of where the alternative cognitive resources might come from.
- (W4) Furthermore, characteristic features of the epistemology of modality are well explained by subsumption under corresponding features of the epistemology of counterfactuals:

By (17), we assert $\Box A$ when our counterfactual development of the supposition $\neg A$ robustly yields a contradiction; we deny $\Box A$ when our counterfactual development of $\neg A$ does not robustly yield a contradiction (and we do not attribute the failure to a defect in our search).

Similarly, by (18), we assert $\Diamond A$ when our counterfactual development of the supposition A does not robustly yield a contradiction (and we do not attribute the failure to a defect in our search); we deny $\Diamond A$ when our counterfactual development of A robustly yields a contradiction. (162–163)

Williamson (163) concludes that “our fallible imaginative evaluation of counterfactuals has a conceivability test for possibility and an inconceivability test for impossibility built in as fallible special cases.”

Williamson’s argument introduces three issues. The first, introduced by premises (W1) and (W2), is the relationship between logical reduction and

6. Williamson articulates two additional pairs of equivalences and argues that we have no reason to regard any of them as strict synonymies. His supporting arguments, however, appeal only to the first.

epistemological reduction. The second, introduced by premise (W3), is the value of cognitive economy. The third, introduced by premise (W4), is what needs to be explained by an account of modal knowledge. Each of these issues is significant in its own right and requires separate treatment.

4

Williamson (160) contends that “If we treat (17) and (18) like definitions of \Box and \Diamond for logical purposes, and assume some elementary principles of the logic of counterfactuals, then we can establish the main principles of elementary modal logic for \Box and \Diamond .” Our goal is to examine the epistemological significance of such a derivation of the main principles of modal logic from principles of the logic of counterfactuals. In order to do so, let us consider another well-known attempt to provide an analogous derivation: Frege’s attempt to derive the main principles of arithmetic from principles of second-order logic. Frege’s attempt, of course, failed due to the paradox that Russell derived from his notorious Axiom 5. Since we are not concerned with the success of Frege’s reduction but only with the epistemological consequences of a successful reduction, let us make the three following assumptions: (1) that Frege had at his disposal a consistent set of logical principles; (2) that he provided definitions of the basic concepts of arithmetic in terms of the vocabulary of his logical principles; and (3) that he derived the truths of arithmetic, suitably translated into his logical vocabulary, from his logical principles.⁷ Given the successful derivations, it follows that

(F1) The truths of arithmetic are reducible to truths of logic.

Does it also follow that

- (F2) We should expect the epistemology of arithmetic to be a special case of the epistemology of logic; or
- (F3) Our capacity to evaluate logical claims gives us exactly what we need to evaluate the corresponding arithmetical claims; or
- (F4) The idea that we evaluate them differently is highly fanciful since it indicates a bizarre lack of cognitive economy; or
- (F5) In the absence of a plausible explanation of where the alternative cognitive resources come from, we should deny that we evaluate them differently?

7. If these assumptions are too fanciful, one can consider in their place Hale and Wright’s (2000) neo-Fregean view that the truths of arithmetic are derivable from the principles of second-order logic and Hume’s Principle.

(F2) is clearly false. If the epistemology of arithmetic is a special case of the epistemology of logic, then if one knows an elementary arithmetical truth, such as that $7 + 5 = 12$, then one knows it by deriving its logical analogue—that is, its translation into the vocabulary of second-order logic—from principles of second-order logic. Most literate adults, however, have no understanding, implicit or explicit, of the principles of second-order logic necessary to derive the truths of arithmetic. Moreover, most also lack the logical acumen necessary to translate an elementary arithmetical truth, such as that $7 + 5 = 12$, into the vocabulary of second-order logic and to derive it from the principles of second-order logic. Yet virtually all literate adults know that $7 + 5 = 12$. It follows, therefore, that logical equivalence is not the same as epistemological equivalence. Even granting that the logical analogue of “ $7 + 5 = 12$ ” can be derived from principles of second-order logic, the epistemology of arithmetic is not a special case of the epistemology of logic.

(F3) is also questionable. It does not follow from the fact that one has the capacity to evaluate logical claims that one has the logical capacity to evaluate arithmetical claims by deriving their logical analogues from basic logical principles unless having the capacity to evaluate logical claims requires having the capacity to evaluate *all* logical claims. Cognitive capacities come in degrees, and different tasks may require that one possess that capacity to different degrees. Virtually all literate adults possess the capacity to evaluate logical claims, but virtually none possesses that capacity to a degree sufficient to derive an arithmetical proposition from basic logical principles. Their capacity to evaluate logical claims does not give them exactly what they need to evaluate the corresponding arithmetical claims.

Suppose that we have the capacity to evaluate arithmetical claims by deriving them from basic logical principles using our logical capacities. It does not follow that the idea that we employ a different cognitive capacity to evaluate such claims indicates a lack of cognitive economy. (F4) overlooks the fact that there are different types of cognitive economy. One type of cognitive economy is ontological, which pertains to the number of different cognitive systems possessed by a cognizer. But there is another type of cognitive economy, efficiency, which pertains to the cognitive costs of a system and the speed of its results. In human cognizers, a system dedicated to mathematical reasoning gives quicker results with less investment of cognitive effort than a logical reasoning system employed to do mathematics. The cognitive time and energy necessary to employ a logical reasoning system to prove an elementary truth of arithmetic from principles of second-order logic is so great that if such a system were the only means to arithmetical knowledge, very few people would have very little knowledge of elementary arithmetic at great cognitive cost. Therefore, a reduction in ontological economy can produce a gain in cognitive efficiency.

Finally, (F5) has little plausibility. Suppose we concede that our capacity to evaluate logical claims gives us what we need to evaluate arithmetical claims. Since we also know that, given its inefficiency in evaluating arithmetical claims, the hypothesis that it is our only means to such knowledge cannot plausibly explain the extent of our arithmetical knowledge, we also have ample reason to conclude that we have an alternative capacity to evaluate arithmetical claims. The force of that reason is not hostage to whether we have a plausible explanation of where the alternative cognitive resources come from.

5

Premise (W3) of Williamson's argument depends on an appeal to cognitive economy.⁸ Principles of cognitive economy bear on two more general epistemological issues. First, unless such principles are wielded with considerable care, they will put philosophers in the position of deciding controversial empirical issues on largely a priori grounds. For example, Williamson (104) maintains that it is a widespread view among psychologists that humans have two reasoning systems. System 1 is associative, holistic, automatic, undemanding of cognitive capacity, and relatively fast. System 2 is rule-based, analytic, controlled, demanding of cognitive capacity, and relatively slow. This widespread view is open to immediate objection by an analogue of (W3): it is highly fanciful since it indicates a bizarre lack of cognitive economy. It is evident, however, that whether psychologists are correct on this matter is an empirical issue; it cannot be decided a priori by appeal to a principle such as (W3). Williamson, however, maintains that some principle of cognitive economy rules out the possibility that humans have different systems for evaluating counterfactual conditionals and modal claims. What remains unclear, however, is the basis for Williamson's differential treatment of the two cases.

Second, unrestricted principles of cognitive economy are incompatible with a type of epistemic overdetermination. S's justification for the belief that p is overdetermined just in case S has more than one justification for the belief that p, each of which is sufficient to justify that belief in the absence of the others. There are two varieties of epistemic overdetermination:

- (EOS) S's justification for the belief that p is overdetermined by the *same* source just in case S has more than one justification for the belief that p, each of which is sufficient to justify that belief in the absence of the others, and they all come from the same source; and

8. Appeals to cognitive economy figure prominently in the traditional debate over the existence of a priori knowledge. In Casullo (2005), I argue that the arguments of both J. S. Mill and W. V. Quine against the existence of a priori knowledge turn on appeals to cognitive economy.

- (EOD) S's justification for the belief that p is overdetermined by *different* sources just in case S has more than one justification for the belief that p, each of which is sufficient to justify that belief in the absence of the others, and they do not all come from the same source.

The following is an example of (EOS). You attended a concert last night and someone asks you if Sam also attended. You suddenly recall that you saw him during intermission, which triggers a host of additional recollections of his presence at the concert. Your original recollection justifies your belief that Sam attended the concert, and each of your subsequent recollections also justify that belief. Your justification for that belief is overdetermined by the same source. The following is an example of (EOD). You have misplaced your keys and wonder where they are. You suddenly recall having left them in the car. Your recollection justifies your belief that your keys are in the car. But, to be sure, you walk out to the car and see your keys. Your seeing your keys also justifies your belief that your keys are in the car. Your justification for that belief is overdetermined by different sources.

According to Williamson's (W3), some principle of cognitive economy rules out the following possibility: there are two different sources of modal knowledge. If some principle of cognitive economy rules out this possibility for modal knowledge, presumably it does so for other domains of knowledge as well. Hence, (W3) leads to the *Single Source Principle* (SS):

- (SS) For each domain of knowledge, there is only a single source of justification for the propositions within that domain.

(SS) is incompatible with epistemic overdetermination by different sources.⁹ There are, however, uncontroversial examples of epistemic overdetermination by

9. Epistemic overdetermination has significant epistemic benefits. It plays an important role in three desirable features of our epistemic practices: corroboration, correction, and calibration. If one has two different sources of information about a particular feature of one's environment, then one can use one source in order to corroborate the results of another. For example, if one sees a book on the table, one can corroborate one's perceptual evidence by attempting to pick up the book. If one succeeds, one's tactile evidence both increases one's justification for believing that there is a book on the table, since it is an independent source of evidence, and corroborates one's perceptual evidence by providing independent evidence that one's perceptual evidence is not misleading (say the result of hallucinating). Having two different sources of information about a particular feature of one's environment also allows one to correct the results of another. Returning to our previous example, if tactile evidence fails to corroborate the visual evidence that there is a book on the table then, in suitable circumstances, it provides a basis for correcting the erroneous belief that there is a book on the table. The ability to detect and correct erroneous beliefs by some source also provides the basis for calibrating the results of that source. For example, if in certain

different sources, such as the example offered in the previous paragraph.¹⁰ Therefore, at the very least, appeals to principles of cognitive economy require significant refinement.

6

I have offered very general criticisms of Williamson's argument in sections 4 and 5. One might respond, in defense of Williamson, that my criticisms establish only that logical reduction and epistemological reduction do not always go hand in hand and that considerations of ontological economy do not always rule out epistemic overdetermination. One might also maintain that, in this particular case, there is a basis for thinking that logical reduction and epistemological reduction do go hand in hand and for thinking that ontological economy does rule out epistemic overdetermination. That basis is provided by premise (W4) of Williamson's argument, which contends that the characteristic features of the epistemology of modality are well explained by the corresponding features of the epistemology of counterfactuals.

Williamson maintains that the epistemology of modality is a special case of the epistemology of counterfactuals. In particular, his account of knowledge of counterfactuals yields a conceivability test for possibility and an inconceivability test for impossibility. The resulting tests are alleged to explain the characteristic features of our knowledge of modality. In this concluding section, I argue that Williamson's account does not explain the characteristic features of our modal knowledge. The argument proceeds in two stages. I initially argue, by considering the conceivability test, that the account faces analogues of the problems raised in section 3 with respect to Frege's account of arithmetical knowledge. I go on to argue, by considering the inconceivability test, that the account faces two deeper problems: it presupposes, rather than explains, the capacity for modal knowledge, and it mislocates what needs to be explained by an account of the modal knowledge characteristic of philosophical investigation.

lighting conditions one's perceptual beliefs about the number of objects on the table are corroborated by tactile experience, but in other lighting conditions they fail to be corroborated by tactile experiences, such information provides a basis for determining the conditions under which perceptual evidence is reliable. Given that epistemic overdetermination underwrites these desirable epistemic features of our cognitive practices and that epistemic overdetermination betrays a lack of cognitive economy, one should be skeptical about glib appeals to the virtues of cognitive economy.

10. There are other uncontroversial examples. One's belief that there is a book on the desk can be justified both by seeing it and by touching it. There are also some more controversial, but widely accepted, examples. Most who maintain that mathematical truths are justifiable a priori also allow that such truths can also be justified on the basis of experience.

Consider an example of an elementary modal proposition that most of us know:

- (1) Possibly, something is both red and hexagonal.

According to Williamson's conceivability test for possibility, we assert (1) when our counterfactual development of the supposition

- (2) Something is both red and hexagonal

does not robustly yield a contradiction. Our capacity to employ this test is a byproduct of our capacity to evaluate counterfactuals. Therefore, the epistemology of modality is a special case of the epistemology of counterfactuals.

Williamson's account of modal knowledge faces problems analogous to those faced by Frege's account of arithmetical knowledge. First, if the epistemology of modality is a special case of the epistemology of counterfactuals, then if one knows (1), one knows (1) by employing Williamson's conceivability test. But most literate adults are not cognizant, either implicitly or explicitly, of that test. Moreover, most also lack the skill to implement it effectively.¹¹ Yet they know (1). They employ a different test to evaluate modal claims such as (1). They try to imagine a red hexagon and, if they succeed, they assert (1). Therefore, the epistemology of modality is not a special case of the epistemology of counterfactuals.

Second, it does not follow from the fact that one has the capacity to evaluate counterfactuals that one has the capacity to evaluate modal claims by employing Williamson's conceivability test unless having the capacity to evaluate counterfactuals requires having the capacity to evaluate *all* counterfactuals. Although most literate adults have the capacity to evaluate ordinary counterfactuals such as

- (3) If I had left the house earlier, I would not have missed the bus,

few have the capacity to evaluate counterfactuals to the degree necessary to implement effectively Williamson's conceivability test. Therefore, the capacity to evaluate ordinary counterfactuals does not give one exactly what it takes to evaluate modal claims.

11. A number of questions arise with respect to its implementation. There are indefinitely many premises that one could add to (2) in an effort to derive a contradiction. Must one try a large number of premises to verify that none leads to a contradiction? If so, how many? Will any premises do? Must one also ensure that one has a representative sampling of the range of premises that one might try? If so, what counts as a representative sampling?

Third, even if we have the capacity to evaluate modal claims by employing the conceivability test, it does not follow that the idea that we employ a different method to evaluate them betrays a lack of cognitive economy. Just as our ordinary method for evaluating arithmetical claims is more efficient than the method that falls out of Frege's account, our ordinary method of evaluating modal claims is more efficient than the method that falls out of Williamson's account. Ontological extravagance is offset by a gain in cognitive efficiency.

Williamson's account of the epistemology of modality faces two deeper problems, which emerge when we consider his inconceivability test for impossibility. According to it, we assert

- (4) Necessarily, nothing is both red and green all over

when our counterfactual development of the supposition

- (5) It is not the case that nothing is both red and green all over

yields a contradiction.

Suppose that I wish to apply the test to evaluate (4). I begin by supposing (5). How do I proceed in order to show that the counterfactual development of (5) yields a contradiction? If there are no constraints on the premises I can introduce, then I can derive a contradiction from any supposition by introducing its negation. For example, I can establish

- (6) Necessarily, something is both red and green all over

by supposing

- (7) It is not the case that something is both red and green all over

and introducing

- (8) Something is both red and green all over

and adding it to (7) to derive a contradiction.

Williamson (143), however, maintains that "the imagination can in principle exploit all our background knowledge in evaluating counterfactuals." My background knowledge restricts what I can introduce. Hence, in the case at hand, I cannot introduce (8) into the counterfactual development of a supposition since I don't know (8). However, since I do know

(9) Nothing is both red and green all over,

I can add it to (5), derive a contradiction, and thereby come to know (4).

Restricting the propositions that I can introduce into the development of a counterfactual to those that I know is not sufficient to remedy the problem facing Williamson's test. Consider any contingent proposition that I know, such as

(10) Gold is yellow.

Using Williamson's inconceivability test, I can establish

(11) Necessarily, gold is yellow

by supposing

(12) It is not the case that gold is yellow

introducing (10), and adding it to (12) to derive a contradiction. But (11) is false.

Williamson recognizes that there is a problem here:

Such conceivability and inconceivability will be subject to the same constraints, whatever they are, as counterfactual conditionals in general, concerning which parts of our background information are held fixed. If we know enough chemistry, our counterfactual development of the supposition that gold is [not] the element with atomic number 79 will generate a contradiction. The reason is not simply that we know that gold is the element with atomic number 79, for we can and must vary some items of our knowledge under counterfactual suppositions. Rather, part of the general way we develop counterfactual suppositions is to hold such constitutive facts fixed. (163–164)

The key to solving the problem is to allow some items of background knowledge to vary but to hold others fixed when we develop counterfactual suppositions. The items of knowledge that are held fixed are those that pertain to constitutive facts. Since the fact that gold is yellow is not constitutive, the problematic example of the previous paragraph is blocked.

Although Williamson's proposal blocks the problematic example, it reveals a significant limitation of his account of modal knowledge. Our capacity for evaluating counterfactuals, according to Williamson, gives us exactly what we need to evaluate modal claims. But in order to reliably evaluate modal claims, our capacity

for evaluating counterfactuals must include the capacity to identify those items of one's background knowledge that can be legitimately introduced into the counterfactual development of a supposition—that is, it must include the capacity to identify those items of one's background knowledge that are constitutive facts. Since constitutive facts are necessary, our capacity to evaluate counterfactuals must include the capacity to identify those items of one's background knowledge that are necessary. Therefore, Williamson's account presupposes, rather than explains, our capacity for modal knowledge.¹²

Williamson's account is open to this problem because it mislocates the epistemological fact that requires explanation. It mislocates the modal knowledge that is characteristic of philosophical investigation. The goal of Williamson's conceivability test is to provide an account of knowledge of modal propositions of the form $\Box A$, such as

- (13) Necessarily, gold is the element with atomic number 79.

One who knows (13), however, knows the specific modal status of

12. Williamson considers a related objection:

in developing a counterfactual supposition, we make free use of what we take to be necessary truths, but not of what we take to be contingent truths. Thus we rely on a prior or at least independent stock of modal knowledge or belief. (169–170)

He replies:

Once we take something to be a necessary truth, of course we can use it in developing further counterfactual suppositions. But that does nothing to show that we have any special cognitive capacity to handle modality independent of our general cognitive capacity to handle counterfactual conditionals. (170)

My objection is different from the one that Williamson considers. I do not maintain that his account of modal knowledge relies on an independent stock of modal knowledge or belief. Instead, I maintain that the capacity for evaluating modal claims proposed by his account is reliable only if it includes the capacity to identify necessary truths. Moreover, my contention is also consistent with the response that Williamson offers to that objection, which contends that it does not show that we have any special cognitive capacity to handle modality independent of our general cognitive capacity to handle counterfactuals. My contention is not that the capacity for identifying necessary truths is *independent* of the capacity for evaluating counterfactuals; the contention is that the capacity for evaluating counterfactuals must *include* the capacity for identifying necessary truths. Williamson (170) goes on to deny that "our general cognitive capacity to handle counterfactuals has as a separate constituent a special cognitive capacity to handle metaphysical modality." Once again, my contention is consistent with that claim. My contention is not that the capacity for identifying necessary truths is *separate* from the capacity for evaluating counterfactuals; the contention is that the capacity for evaluating counterfactuals must *include* the capacity for identifying necessary truths.

(14) Gold is the element with atomic number 79.

Knowledge of the specific modal status of (14) is the conjunction of knowledge of its truth value and knowledge of its general modal status. But, as I argued in section 1, knowledge of the specific modal status of a proposition is not the appropriate target of an account of the modal knowledge that is acquired by philosophical investigation. Knowledge of the truth value of (14) is not acquired by philosophical investigation. It is acquired by scientific investigation. The appropriate target of an account of the modal knowledge that is acquired by philosophical investigation is knowledge of the general modal status of a proposition.

This point emerges clearly by reflection on Kripke’s discussion of knowledge of the related modal proposition:

(15) Necessarily, the lectern is not made of ice.

(15), like (13), is an example of an a posteriori necessity. And, like (13), one who knows (15) knows the specific modal status of a proposition. One knows the specific modal status of

(16) The lectern is not made of ice.

Kripke (1971, 153) provides the following account of our knowledge of (15):

In other words, if P is the statement that the lectern is not made of ice, one knows by a priori philosophical analysis, some conditional of the form “if P , then necessarily P .” If the table is not made of ice, it is necessarily not made of ice. On the other hand, then, we know by empirical investigation that P , the antecedent of the conditional, is true—that this table is not made of ice. We can conclude by *modus ponens*:

$$\begin{array}{l} P \supset \Box P \\ P \\ \hline \Box P \end{array}$$

The conclusion—“ $\Box P$ ”—is that it is necessary that the table not be made of ice, and this conclusion is known a posteriori, since one of the premises on which it is based is a posteriori.

Kripke’s account makes explicit that knowledge of the specific modal status of a proposition involves both knowledge of its general modal status and

knowledge of its truth value. Moreover, it also makes clear that philosophical investigation yields only knowledge of the former. Hence, what needs to be explained by an account of the modal knowledge acquired by philosophical investigation is knowledge of the general modal status of a proposition and not knowledge of its specific modal status. The reason is transparent. An account of how we know the specific modal status of a proposition will include an account of how we know its truth value. But we don't know the truth value of propositions such as (14) and (16) by philosophical investigation.

The account of modal knowledge that emerges from Williamson's account of knowledge of counterfactuals is an account of knowledge of the specific modal status of propositions. Knowledge of the specific modal status of a proposition is the conjunction of knowledge of its truth value and knowledge of its general modal status. Knowledge of the truth value of propositions such as (14) and (16) is not the goal of philosophical investigation. An account of the modal knowledge characteristic of philosophical investigation is an account of knowledge of the general modal status of propositions such as (14) and (16). Therefore, since Williamson's account of modal knowledge is directed at the wrong target; it does not explain the features of the modal knowledge characteristic of philosophical investigation.¹³

REFERENCES

- Casullo, Albert. 2003. *A Priori Justification*. New York: Oxford University Press.
- . 2005. "Epistemic Overdetermination and A Priori Justification." *Philosophical Perspectives* 19: 41–58.
- . 2010. "Knowledge and Modality." *Synthese* 172: 341–359.
- Gendler, T., and J. Hawthorne, eds. 2002. *Conceivability and Possibility*. Oxford: Oxford University Press.
- Hale, Bob, and Crispin Wright. 2000. "Implicit Definition and the A Priori." In *New Essays on the A Priori*, ed. P. Boghossian and C. Peacocke. Oxford: Oxford University Press.
- Hill, Christopher. 2006. "Modality, Modal Epistemology, and the Metaphysics of Consciousness." In *The Architecture of the Imagination*, ed. S. Nichols. Oxford: Oxford University Press.
- Kripke, Saul. 1971. "Identity and Necessity." In *Identity and Individuation*, ed. M. K. Munitz. New York: New York University Press.
- . 1980. *Naming and Necessity*. Cambridge, Mass.: Harvard University Press.
- Lewis, David. 1973. "Counterfactuals and Comparative Possibilities." *Journal of Philosophical Logic* 2: 418–446.

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Nichols, Shaun, Stephen Stich, Alan Leslie, and David Klein. 1996. "Varieties of Off-line Simulation." In *Theories of Theories of Mind*, ed. P. Carruthers and P. Smith. Cambridge: Cambridge University Press.

Stich, Stephen, and Shaun Nichols. 1992. "Folk Psychology: Simulation or Tacit Theory?" *Mind and Language* 7: 35–71.

Williamson, Timothy. 2007. *The Philosophy of Philosophy*. Oxford: Blackwell.

