Modality and A Priori Knowledge

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The prominence of questions regarding the relationship between a priori knowledge and the modalities in contemporary philosophy is largely due to the influence of Immanuel Kant and Saul Kripke. Although Kant's primary focus is on epistemological questions that pertain to the nature and existence of a priori knowledge and Kripke's primary focus is on metaphysical and semantic issues that pertain to the modalities, the relationship between a priori knowledge and the modalities plays a prominent role in the work of both. As we shall see, many of the contemporary discussions take as their point of departure either particular views of one of them or apparent disagreements between them.

Kant makes three noteworthy contributions to the contemporary discussion. He introduces a conceptual framework that involves three distinctions: the epistemic distinction between a priori and a posteriori (or empirical) knowledge; the metaphysical distinction between necessary and contingent propositions; and the semantic distinction between analytic and synthetic propositions. Within this framework, Kant poses four questions: What is a priori knowledge? Is there a priori knowledge? What is the relationship between the a priori and the necessary? Is there synthetic a priori knowledge? Kant's distinctions, the questions that he poses, and his responses to them remain at the center of the contemporary discussion.

Kant (1965: 43) maintains that a priori knowledge is absolutely independent of all experience, whereas a posteriori knowledge is possible only through experience. Kant

approaches his second question indirectly by seeking criteria, or sufficient conditions, for the a priori. Although he offers two such criteria, necessity and strict universality, his primary argument for the a priori appeals to the first. Kant's claim that necessity is a criterion of the a priori commits him to the following thesis about the relationship between the a priori and the necessary:

(K1) All knowledge of necessary propositions is a priori.

He also appears to endorse:

(K2) All propositions known a priori are necessary.

Although Kant is often portrayed as holding that the categories of the a priori and the necessary are coextensive, the conjunction of (K1) and (K2) do not support that attribution since it does not entail that all necessary propositions are known or knowable a priori. According to Kant, all propositions of the form "All A are B" are either analytic or synthetic: analytic if the predicate is contained in the subject, synthetic if it is not. Here he contends that

(K3) All knowledge of analytic propositions is a priori, and

(K4) Some propositions known a priori are synthetic.

In support of (K4), Kant argues that the predicate terms of "7 + 5 = 12" and "The straight line between two points is the shortest" are not covertly contained in their respective subjects.

Kripke (1980: 34) contends that, in contemporary discussion, the terms "a priori," "analytic," and "necessary" are often used interchangeably. He credits Kant with distinguishing between "a priori" and "analytic." His focus is on the terms "a priori" and "necessary." Here he stresses, following Kant, that the former expresses an epistemological concept, and that the latter expresses a metaphysical concept. Moreover, he stresses that it is a substantive philosophical thesis, as opposed to a matter of definitional equivalence, that the two concepts are coextensive. Apart from forcefully defending Kant's conceptual framework and stressing that answers to Kant's third and fourth questions require substantive philosophical argument, Kripke makes two noteworthy contributions to the contemporary discussion. First, he rejects (K1) and (K2) by arguing that some necessary propositions are known a posteriori and that some contingent propositions are know a priori. Second, Kripke distinguishes between belief in *de dicto* modality (the view that propositions are necessarily or contingently true or false) and belief in *de re* modality (the view that an object's possession of a property is necessary or contingent), and defends the latter. Putative examples of *de re* modal knowledge underwrite his case against (K1).

1. What is A Priori Knowledge?

Kant's conception of a priori knowledge is not fully perspicuous since he allows that such knowledge can depend on experience in some respects but is not explicit about the respect in which it must be independent of experience. Most contemporary theorists agree that a priori knowledge is knowledge whose *justification* does not depend on experience. They endorse the following articulation of Kant's conception of a priori knowledge:

(KAP) S knows a priori that p if and only if S's justification for the belief that p does not depend on experience and the other conditions on knowledge are satisfied.

Since (KAP) does not entail that necessity is constitutive of the a priori, it does not directly underwrite either (K1) or (K2). They require independent support.

There is a remaining source of controversy among contemporary proponents of (KAP), which pertains to the sense of "dependence" relevant to a priori justification. Some, such as Casullo (2003), endorse:

(AP1) S knows a priori that p if and only if S's belief that p is nonexperientially justified (i.e., justified by some nonexperiential source), and the other conditions on knowledge are satisfied.

Others, such as Philip Kitcher (1983), favor:

(AP2) S knows a priori that p if and only if S's belief that p is nonexperientially justified and cannot be defeated by experience, and the other conditions on knowledge are satisfied.

Other contemporary theorists, such as BonJour (1985), reject (KAP) in favor of the traditional rationalist conception of a priori knowledge:

(RAP) S knows a priori that p iff S's justification for the belief that p consists in intuitively "seeing" (directly or indirectly) that p is necessarily true, and the other conditions on knowledge are satisfied.

Since (RAP) entails that necessity is constitutive of the a priori, it directly supports (K2) but not (K1).

Casullo (2003) contends that both (RAP) and (AP2) face serious objections. Kripke (1980) and Kitcher (1983) hold that an adequate conception of a priori knowledge should allow for the possibility that one can know empirically some proposition that one knows a priori. (AP2) precludes this possibility. Suppose, for example, that S knows a priori some mathematical proposition that p and that S can know a posteriori that p. It follows that S's belief that p can be justified either a priori or a posteriori to a degree that is sufficient for knowledge. The empirical sources that have been alleged to justify mathematical propositions, such as counting objects or consulting a mathematician, are defeasible by empirically justified overriding defeaters. Hence, it follows that if S's belief that p is justifiable by experience, then S's belief that not-p is also

justifiable by experience. But, according to (AP2), if S's belief that p is justified a priori, then S's belief that not-p is not justifiable by experience. Hence, (AP2) entails that if S's belief that p is justified a priori, then it is not justifiable by experience.

(RAP) faces a different objection. If we assume that the metaphorical sense of "see" shares with the literal sense the following feature: "S sees that p" entails "S believes that p," then (RAP) leads to a problematic regress. It entails that if S's belief that p is justified a priori then S believes that necessarily p. Either S's belief that necessarily p is justified or not If not, it is hard to see why it is a necessary condition of having an a priori justified belief that p. If it is, then presumably it is justified a priori. But in order for S's belief that necessarily p to be justified a priori, S must believe that necessarily necessarily p, and the same question arises with respect to the latter belief. Is it justified or not?

(AP1) also faces a challenge. Some theorists have questioned the significance of the a priori - a posteriori distinction. Williamson (2007) distinguishes two roles that experience can play in the acquisition of knowledge: enabling and evidential. According to (AP1), a priori knowledge is incompatible with an evidential role for experience, but is compatible with an enabling role for experience. He contends that, on his account of knowledge of counterfactuals, experience can play a role that is neither purely enabling nor strictly evidential and, as a consequence, such knowledge is not happily classified as either a priori or a posteriori. Williamson (2013) distinguishes two approaches to introducing the a priori - a posteriori distinction, and argues that the distinction introduced by both is superficial.[1]

2. Is there A Priori Knowledge?

(K1) is the leading premise of Kant's primary argument for the existence of a priori knowledge:

(K1) All knowledge of necessary propositions is a priori.

(K5) Mathematical propositions, such as that 7 + 5 = 12, are necessary.

(K6) Therefore, knowledge of mathematical propositions, such as that 7 + 5 = 12, is a priori.

Kant's argument remains central to the contemporary discussion since it is frequently cited and endorsed by proponents of the a priori.

In order to evaluate Kant's argument, we must first recognize that the expression "knowledge of necessary propositions" masks the following important distinctions:

(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).

(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.

(A) and (B) are logically independent. One can know that Goldbach's Conjecture is a necessary proposition without knowing whether it is true or false. Alternatively, one can know that the Pythagorean Theorem is true without knowing whether it is a necessary proposition or a contingent proposition. Since the specific modal status of a proposition is just the conjunction of its truth value and its general modal status, one cannot know the specific modal status of a proposition unless one knows both its general modal status and its truth value.

Returning to Kant's argument, we can now distinguish two readings of (K1):

(K1T) All knowledge of the *truth value* of necessary propositions is a priori.
(K1G) All knowledge of the *general modal status* of necessary propositions is a priori.

The argument is valid only if (K1) is read as (K1T). Kant (1965: 43), however, supports the contention that necessity is a criterion of the a priori with the observation that although experience teaches that something is so and so, it does not teach us that it cannot be otherwise. Taken at face value, this observation states that although experience teaches us that a proposition is true, it does not teach us that it is necessary. Hence, Kant's contention supports (K1G), but not (K1T). Consequently, either Kant's argument is invalid or its leading premise is unsupported.

Recent proponents of the a priori, such as Chisholm (1966), have offered a reformulation of Kant's argument:

(K1G) All knowledge of the *general modal status* of necessary propositions is a priori.

(K5) Mathematical propositions, such as that 7 + 5 = 12, are necessary.

(K7) Therefore, knowledge of the *general modal status* of mathematical propositions is a priori.

This version of Kant's argument circumvents the problem faced by the original version and can be generalized to knowledge of the general modal status of any necessary proposition.

Radical empiricism is the view that denies the existence of a priori knowledge. Many contemporary radical empiricists draw their inspiration from Quine's (1963) classic paper, "Two Dogmas of Empiricism." The bearing of the argument of the paper on the existence of a priori knowledge remains controversial. The primary target of the paper is a variant of Frege's conception of analyticity: an analytic statement is one that is reducible to a truth of logic by replacing synonyms with synonyms. There are two strands to Quine's argument: (1) synonymy cannot be explained in terms of definition, interchangeability *salve veritate*, or semantic rules; and (2) the verification theory of meaning does provide an account of statement synonymy; but the theory presupposes radical reductionism, which is a failed program. Quine, however, contends that a vestige of that program survives in the view that individual statements admit of confirmation or disconfirmation. This view, he maintains, lends credence to the idea that there are statements confirmed no matter what, which he (1963, p. 43) rejects on the grounds that "no statement is immune to revision." Neither strand of Quine's argument is explicitly directed at a priori knowledge. The first challenges the cogency of semantic concepts such as synonymy. The

second challenges the remaining vestige of reductionism. Hence, if Quine's argument does present a challenge to a priori knowledge, some additional premise is necessary that connects one of its explicit targets to the a priori.

The traditional reading of the argument is that his goal is to undermine the central tenet of logical empiricism, (LE), by showing that the analytic - synthetic distinction is not cogent:

(LE) All a priori knowledge is of analytic truths.

Suppose we grant that Quine's goal is to undermine (LE) and that his arguments establish that the analytic - synthetic distinction is not cogent. It follows that (LE) is incoherent. But it does not follow that the claim of logical empiricists that there is a priori knowledge is incoherent since they not take (LE) to be constitutive of the concept of a priori knowledge and they do not base their case for the existence of a priori knowledge on a premise, such as (LE), that involves the concept of analytic truth.[2]

One might suggest, in defense of Quine, that although the concept of a priori knowledge does not include the concept of analytic truth explicitly, it does include it implicitly. The only plausible case for maintaining that the concept of a priori knowledge implicitly involves the concept of analytic truth is based on two premises: (1) the concept of necessary truth is constitutive of the a priori, and (2) the concept of necessary truth is analyzable in terms of the concept of analytic truth. Both premises are problematic since (KAP) does not entail that

necessity is constitutive of the a priori, and there is no available analysis of the concept of necessary truth in terms of the concept of analytic truth.

Some champions of "Two Dogmas" propose an alternative reading of Quine's argument. Putnam (1983) maintains that the two strands of Quine's argument are directed toward two different targets. The first is directed toward the semantic concept of synonymy, but the second is directed toward the concept of a statement that is confirmed no matter what, which is a concept of apriority. Kitcher (1983: 80) endorses this reading of Quine's argument: "If we can know a priori that *p* then no experience could deprive us of our warrant to believe that *p*." This reading commits Quine to (AP2), which was rejected in section 1.

3. What is the relationship between the a priori and the necessary?

Kripke (1980: 100-16) rejects (K1) by offering examples of necessary truths that are alleged to be known a posteriori. His two initial examples involve statements in which an essential property is attributed to some particular physical object and identity statements involving co-referential proper names. He later extends his account of identity statements to theoretical identity statements. Our discussion will focus on his initial examples. Let "a" be the name of a particular desk and F be the property of being made of wood. Suppose that someone knows that Fa—i.e., that this desk is made of wood. Such knowledge is a posteriori. Yet, if Fa is true, it is necessarily true since F is an essential property of a. In any possible world in which a exists, a is F. Similar observations apply to Kripke's example of identity statements involving

proper names. Since, according to Kripke, ordinary proper names, such as "Hesperus" and "Phosphorus," are rigid designators, each picks out the same object in all possible worlds in which it picks out any object. Therefore, if both pick out the same object in the actual world, both pick out the same object in all possible worlds in which they pick out any object. Hence, if "Hesperus is Phosphorus" is true, it is necessarily true. Yet, if someone knows that it is true, such knowledge is a posteriori since it is an astronomical discovery that Hesperus is Phosphorus.

How do Kripke's examples bear on (K1)? Once again, we must distinguish between (K1T) and (K1G). Kripke's examples, if cogent, establish that (K1T) is false. They establish that one knows a posteriori that some necessary propositions are *true*. They establish that one knows that this desk is made of wood and that Hesperus is Phosphorus. Kripke's examples, however, do not establish that (K1G) is false. They do not establish that one knows a posteriori that some necessary propositions are *necessary*. Moreover, Kripke denies that such knowledge is a posteriori. In both cases, he (1971: 153, 1980: 109) is explicit in maintaining that we know by "a priori philosophical analysis" that if the statement in question is true, then it is necessarily true. Hence, he does not take his examples to be cases of a posteriori knowledge of the *general modal status* of necessary propositions. Instead, he (1971: 153) offers a general inferential model for understanding knowledge of a posteriori necessities, where one knows (Kr3) by inference from (Kr1) and (Kr2):

(Kr1) If P then necessarily P.

(Kr2) P.

(Kr3) Therefore, necessarily P.

On Kripke's model, one knows (Kr1) a priori and (Kr2) a posteriori. Since knowledge of (Kr3) is based on knowledge of (Kr2), which is a posteriori, knowledge of (Kr3) is also a posteriori.

It may appear that Kripke's conclusion that one has a posteriori knowledge that *necessarily* P entails that (K1G) is false. Here we must distinguish between (K1G) and

(K1S) All knowledge of the *specific modal status* of necessary propositions is a priori.

Kripke's examples establish that (K1S) is false: They establish that one knows a posteriori that some necessary propositions are *necessarily true*. Since knowledge of the specific modal status of a proposition is the conjunction of knowledge of its general modal status and knowledge of its truth value, it follows from the fact that one's knowledge of the truth value of P is a posteriori that one's knowledge of its specific modal status is also a posteriori. However, from the fact that one's knowledge of the specific modal status of P is a posteriori, it does not follow that one's knowledge of its general modal status is also a posteriori.

In conclusion, there is a significant point of agreement and a significant point of disagreement between Kant and Kripke. Kant endorses both (K1T) and (K1G). Kripke's examples of necessary a posteriori knowledge are examples of a posteriori knowledge of the truth of necessary propositions. They are, if cogent, counterexamples to (K1T). Kripke, however,

denies that his examples are examples of a posteriori knowledge of the general modal status of necessary propositions. He explicitly endorses (K1G), at least with respect to the examples that he considers.

Although Kant and Kripke both endorse (K1G), we are faced with the question: Why accept (K1G)? Kant's observation that experience can teach us only what is the case appears to be rooted in the idea that experience can provide knowledge of only the actual world, but not of other possible worlds. But a good deal of our ordinary practical knowledge and the bulk of our scientific knowledge provide clear counterexamples to the claim. My knowledge that my pen will fall if I drop it does not provide information about what is the case for its antecedent is contrary-to-fact. Scientific laws are not mere descriptions of the actual world. They support counterfactual conditionals and, hence, provide information beyond what is true of the actual world. Kripke offers only sketches of supporting arguments for (K1G) with respect to the particular cases that he considers. He does not offer either a general account of knowledge of general modal status or a defense of the claim that we do not (or cannot) have a posteriori knowledge of general modal status.

Kripke (1980: 56) rejects (K2) by offering an example of a contingent truth that is alleged to be known a priori. His example is based on the observation that a definite description can be employed to fix the reference, as opposed to give the meaning, of a term. Consider someone who employs the definition description "the length of S at t_0" to fix the reference of the expression "one meter." Kripke maintains that this person knows, without further empirical investigation,

that S is one meter long at t_0. Yet the statement is contingent since "one meter" rigidly designates the length which is in fact the length of S at t_0 but, under different conditions, S would have had a different length at t_0. In reply, Plantinga (1974) and Donnellan (1979) contend that, without empirical investigation, the reference fixer knows that the sentence "S is one meter long at t_0" expresses a truth, though not the truth that it expresses.

4. Is there synthetic a priori knowledge?

The literature on the a priori is dominated by Kant's endorsement of

(K4) Some propositions known a priori are synthetic.

In addressing that literature, one question immediately arises: Why is the existence of synthetic a priori knowledge *epistemologically* significant? Kant maintains that analytic a priori knowledge requires only possession of the relevant concepts and the principle of contradiction, but synthetic a priori knowledge requires more. In order to know that 7 + 5 = 12, for example, Kant (1965: 53) maintains: "We have to go outside these concepts, and call in the aid of the intuition which corresponds to one of them." The significance of (K4) is rooted in the assumption that the source of synthetic a priori knowledge is different from, and more problematic than, the source of analytic a priori knowledge.

Kant, however, does not defend this assumption. Although he maintains that knowledge of analytic propositions requires only knowledge of the principle of contradiction and the content of concepts, he does not explicitly address the source of such knowledge. Since he does not explicitly address the source of analytic a priori knowledge, Kant has no basis for claiming that the source of such knowledge is different from the source of synthetic a priori knowledge, let alone that the latter is epistemologically more problematic than the former. Consequently, the epistemological significance of (K4) is presupposed rather than established.

Reactions to (K4) fall into three broad categories. Those in the first endorse (K4) but take issue with some of Kant's examples. Those in the second reject (K4). Those in the third deny the cogency of the analytic - synthetic distinction and, a fortiori, the cogency of (K4). The epistemological import of these reactions is minimal.

Frege endorses (K4), but contends that

(F) All arithmetic truths are analytic.

His (1974: 4[e]) defense of (F) requires a modification of Kant's definition of an analytic truth: "If, in carrying out this process [of constructing the proof of the proposition from primitive truths], we come only on general logical laws and on definitions, then the truth is an analytic one." Frege's goal is to demonstrate that all arithmetic truths can be proved from primitive truths via general logical laws and definitions. This project faces formidable technical obstacles. But even

if they are overcome, such a demonstration, taken by itself, tells us little about knowledge of arithmetic truths since it is silent with respect to the issue of how one knows the primitive truths, definitions, and logical laws employed in such proofs. In particular, such a demonstration is compatible with the claim that the truths of arithmetic are knowable only via intuition. Hence, it is of limited epistemological significance.

Ayer rejects (K4) and defends

(LE) All a priori knowledge is of analytic truths.

His (1952: 78) defense also requires a modification of Kant's definition of an analytic truth: "a proposition is analytic when its validity depends solely on the definitions of the symbols it contains, and synthetic when its validity is determined by the facts of experience." Ayer's most explicit defense of (LE) is presented in the context of discussing logical truths. He (1952: 78-9) contends that the proposition "Either some ants are parasitic or none are" is analytic on the grounds that one need not resort to observation to determine that it is true: "If one knows what is the function of the words "either," "or," and "not," then one can see that any proposition of the form "Either *p* is true or *p* is not true" is valid, independently of experience." Here Ayer explains a priori knowledge of logical truths in terms of an ability to "see" that they are true independently of experience. The sense of "see" that he invokes is not the literal sense; it is a metaphorical sense he does not explain. Therefore, Ayer's explanation is of limited epistemological significance.

Quine's rejection of the cogency of the analytic - synthetic distinction has been widely viewed as challenging the existence of a priori knowledge. In section 2, we examined two lines of argument in support of that view and concluded that both fail. There is, however, a third argument that draws its inspiration from Quine. Its leading premise poses an explanatory challenge:

(E1) If a theory of knowledge posits a category of knowledge but cannot explain how that knowledge is possible, then the theory is unacceptable.

If (E1) is conjoined with the leading assumption of logical empiricism:

(E2) The only nonmysterious explanation of how a priori knowledge is possible involves the analytic - synthetic distinction,

then Quine's contention that the distinction is incoherent leads straightforwardly to the conclusion that

(E3) Therefore, a theory of knowledge that endorses the a priori is unacceptable.

The explanatory challenge is the primary challenge facing proponents of a priori knowledge. The epistemological import of Kant's, Frege's, and Ayer's accounts of analyticity, however, is minimal. Therefore, the explanatory challenge goes beyond the coherence of the analytic -

synthetic distinction. A response to the challenge must reject (E2). Casullo (2003) offers a strategy for responding to the challenge that gives a prominent role to empirical investigation.

5. New Developments

There are two significant developments in the discussion of knowledge and modality, one epistemological and one metaphysical. The traditional debate regarding a priori knowledge focused primarily on knowledge of the truth value of necessary propositions. The contemporary debate gives greater prominence to questions about knowledge of the general modal status of propositions—i.e., questions about knowledge of necessity and possibility. As we saw in section 3, both Kant and Kripke endorse (K1G), but neither offers a compelling supporting argument. Controversies within metaphysics, especially those regarding dualism, have raised the prominence of questions regarding knowledge of possibility.

Kripke's rejection of (K1) features statements that attribute essential properties to contingent objects. Fine (1994) distinguishes two approaches to explaining essence: the traditional Aristotelian approach in terms of real definition, and the modern approach in terms of de re modal attributions. He rejects the latter on the grounds that not all properties that an object has necessarily are properties that it has essentially. For example, although it is necessary that Socrates is distinct from the Eiffel Tower, it is not essential to Socrates that he be distinct from the Eiffel Tower. As a corollary, Fine maintains that metaphysical necessity should be viewed as a special case of essence.

Questions about possibility and necessity are related given the following equivalences:

(N) $\Box P \equiv \neg\Diamond\neg P$; and

(P) $\Diamond P \equiv \neg\Box\neg P$.

Questions about modality and essence are related given the following entailment:

(E) F is essential to a $\rightarrow \Box Fa$.

Nevertheless, an array of questions about the relationship between the a priori and the modalities remain open. These are the core questions that must be addressed to fully articulate that relationship.

The first two questions are *priority* questions. Is knowledge of one modality (i.e., necessity or possibility) epistemologically prior to (or more basic than) knowledge of the other? Is knowledge of essence epistemologically prior to (or more basic than) knowledge of modality? In order to fully address the priority questions, a number of *source* questions must be addressed. With respect to the first priority question, three further questions arise. Is the basic source of knowledge of necessity identical to the basic source of knowledge of possibility? An integrated theory maintains that they are identical; a divided theory maintains that they are different. A related question arises with respect to knowledge of each of the modalities. Is there a single basic source of knowledge for each modality? A single-source account maintains that there is a

single source for each. A multi-source account maintains that there is more than one source for one or both modalities. When the basic sources of modal knowledge are identified, a third question can be raised with respect to each of them. Is it a priori, a posteriori, or neither?

With respect to the second priority question, there are two options to consider. For those who endorse the modern approach to understanding essence, the basic source of knowledge of essence is identical to the basic source of modal knowledge and the answer to the second priority question is negative. For those who follow Fine and reject the modern approach, the second priority question remains open. To answer it, one must first address the question: What is the basic source (or sources) of knowledge of real definition? One can then address two further questions. Is that source (or sources) different from the basic sources of knowledge of possibility and necessity and, if so, is it more basic than those sources? Is that source (or sources) a priori, a posteriori, or neither?

The final set of questions pertain to de re modal knowledge. Is the basic source of de re modal knowledge of contingent objects identical to the basic source of de re modal knowledge of necessary objects? This question breaks down into two questions. Is the basic source of knowledge that a contingent object necessarily has some property identical to the basic source of knowledge that a necessary object necessarily has some property? Is the basic source of knowledge that a contingent object possibly has some property identical to the basic source of knowledge that a necessary object possibly has some property? When the basic sources of de re

modal knowledge are identified, a third question can be raised with respect to each of them. Are the basic sources a priori or a posteriori?

References

Ayer, A. J. (1952) *Language, Truth and Logic*, New York: Dover Publications, Inc.

BonJour, L. (1985) *The Structure of Empirical Knowledge*, Cambridge: Harvard University Press.

Casullo, A. (2003) *A Priori Justification*, New York: Oxford University Press.

_____. (2012) "Articulating the A Priori - A Posteriori Distinction," in *Essays on A Priori Knowledge and Justification*, New York: Oxford University Press.

_____. (2015) "Four Challenges to the A Priori - A Posteriori Distinction," *Synthese* 192: 2701-24.

Chisholm, R. M. (1966) *Theory of Knowledge*, 1st ed., Englewood Cliffs: Prentice-Hall, Inc.

Donnellan, K. S. (1979) "The Contingent *A Priori* and Rigid Designators," in P. French et al. (eds.) *Contemporary Perspectives on the Philosophy of Language*, Minneapolis: University of Minnesota Press.

Fine, K. (1994) "Essence and Modality" *Philosophical Perspectives* 8: 1-16.

Frege, G. (1974) *The Foundations of Arithmetic*, 2nd ed. revised, J. L. Austin (trans.), Evanston: Northwestern University Press.

Kant, I. (1965) *Critique of Pure Reason*, N. K. Smith (trans.), New York: St Martin's Press.

Kitcher, P. (1983) *The Nature of Mathematical Knowledge*, New York: Oxford University Press.

Kripke, S. (1971) "Identity and Necessity," in M. K. Munitz (ed.) *Identity and Individuation*, New York: New York University Press.

Kripke, S. (1980) *Naming and Necessity*, Cambridge, MA: Harvard University Press.

Plantinga, A. (1974) *The Nature of Necessity*, Oxford: Oxford University Press.

Putnam, H. (1983) "'Two Dogmas' Revisited," in *Realism and Reason: Philosophical Papers, Vol. 3*, Cambridge: Cambridge University Press.

Quine, W. V. (1963) "Two Dogmas of Empiricism," in *From a Logical Point of View*, 2nd ed. revised, New York: Harper and Row.

Williamson, T. (2007) *The Philosophy of Philosophy*, Oxford: Blackwell.

_____. (2013) "How Deep is the Distinction between A Priori and A Posteriori Knowledge?" in A. Casullo and J. Thurow (eds.) *The A Priori in Philosophy*, Oxford: Oxford University Press.

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Notes

1. For a general survey of challenges to the significance of the a priori - a posteriori distinction, including Williamson's, and a defense of its significance, see Casullo (2012). For other challenges to the distinction, see Casullo (2015).

2. For a more detailed discussion of the leading argument of logical empiricists in support of the existence of a priori knowledge, see Casullo (2003).