

Two Distinctions in Kant

In his *Critique of Pure Reason*, Immanuel Kant makes two distinctions: first, between analytic and synthetic judgments; second, between a priori and a posteriori judgments.¹ These distinctions play an essential role in his justification of metaphysics as a natural science and in his argument that metaphysical reasoning, rather than empirical experimentation, is responsible for our understanding of much of the world. My purpose here is to (1) explain these distinctions and Kant's arguments for them, (2) examine the conclusions which follow from them, and (3) examine why Kant believes Euclid's geometric theorems are a priori synthetic.

I. Explaining Kant's Distinctions

Affirmative analytic judgments are, for Kant, claims in which the truth of the predicate belongs to the subject by identity (i.e. by definition).² They are not judgments about concepts, but rather judgments about the truth of concept-relationships. His example, "all bodies are extended," illustrates his point. If we expand the body concept, the same judgment looks like this: "All physical objects having extension and a certain level of solidity are extended." The truth of the predicate concept of extension is inseparably a part of the definition of a body, and the analytic judgment just elucidates this. Since analytic predicates merely break down the subject into constituent parts, we may also call these judgments "explicative."

However, notice that here Kant explains only affirmative judgments; he is so far silent about negative, disjunctive, if-then, wide scope, and other types of judgments. Later in the *Critique* he offers a second definition of analyticity regarding judgments: if a judgment is analytic, whether negative or affirmative, its truth can always be known in

accordance with the Principle of Contradiction.³ This more inclusive definition covers all possible analytic judgments in Kant's *Critique*, and thus is satisfactory.

Synthetic judgments, then, are those in which the truth of the predicate is connected to the subject, but is not inherent in the subject by definition.⁴ For example, the judgment that "all Euclidian triangles contain two right angles" gives us a synthetic truth: containment of two right angles is in no way inherent in the definition of triangles, but it is always necessarily connected to the subject. From Kant's example, "all bodies are heavy," we can see that the truth of "are heavy" is inextricably connected to bodies, but not inherent in the concept of bodies (in the way extension is). Whereas analytic judgments are of the form: "All A & B & C's are C's," synthetic judgments are of the form: "all A & B & C's are D's." Because the predicate adds a new truth to the subject, we may call these "expansive" judgments.⁵

I should note for the sake of clarity that this distinction, between analytic and synthetic, applies not to concepts but to judgments and, more particularly, their truths. From the judgment, "all bachelors are unmarried," we obtain an analytic truth: the concept of unmarried is inherent in the concept of bachelors. Likewise, synthetic truths are obtained from their respective judgments (e.g. "all bodies have weight"). Note also that Kant's discussion of "a priori" and "a posteriori" applies to judgments, concepts, and knowledge.

There is nothing philosophically interesting about the way Kant uses the term "a posteriori." He means "knowable only through empirical experience"—the definition commonly accepted in philosophy. What is interesting, however, is his use of the term "a

priori.” In order to understand this, it is necessary first to understand some of Kant’s metaphysics.

Kant believes that we cannot know objects as things, having their own properties, entirely independent of our cognition. That is, we can’t know them in abstraction from everything, including time and space. Rather, he thinks that things in the world conform to our cognition of them. We can know things in the world only insofar as we perceive them; we cannot know them apart from our perception. Kant later explains this idea in terms of his Categories. But this metaphysics does not allow for a priori knowledge of the world, in the traditional sense. If we can’t understand things as they are themselves—that is, independent of ourselves—then we can’t have any knowledge that comes prior to our experience. Thus, a modified definition of “a priori” is necessary.

By “a priori [regarding judgments],” Kant means, “knowable with just enough experience to understand the concepts involved in it.”⁶ Another way of saying this is that a priori judgments are *mind-supplied*—they require no sense experience beyond the absolute minimum. This is as close to the traditional definition as he can get in his system of metaphysics. A priori judgments are distinct from a posteriori ones in that they require not full empirical experience of the concepts, but rather the fact of having had experience of the world.

*For experience itself is a way of cognizing for which I need the understanding. But the understanding has its rule, a rule that I must presuppose within me even before objects are given to me, and hence must presuppose a priori; and that rule is expressed in a priori concepts. Hence all objects of experience must necessarily conform to these concepts and agree with them.*⁷

He also gives two criteria for a prioricity: (1) a judgment must be thought along with its necessity, and (2) the judgment must have strict universality (as opposed to empirical universality).⁸

We may then take Kant's a priori not as a way of knowing things, but rather as a way of justifying judgments. A posteriori judgments are justified by sense experience; a priori judgments are justified either by containment (analytic) or by connection (synthetic) of concepts. A priori truths are obtainable on the condition of possessing absolute minimum sense experience; a posteriori truths are obtainable on the condition of possessing a relatively great deal of sense experience. Put differently, all we need to obtain a priori truths is having had any experience at all, whereas we need more extensive examination of things to obtain a posteriori truths about them.

Kant's a priori is a rule for the function of the understanding. He names pure mathematics and (relatively) pure physics as paradigmatic examples of fields that are understood a priori, and it is easy to see how we can reason a priori from their premises to their conclusions.⁹

One problem with Kant's modified a prioricity, however, is circularity. Kant uses his transcendental idealist metaphysics to justify a modified a prioricity (p.638, Bxvi-xviii), but then uses his new definition to justify his metaphysics (p.643, B16-17). While this may or may not cause further complications, it is only one of many validity problems in the *Critique*.

II. Consequences of the Distinctions

These two distinctions function centrally on various levels in the *Critique*, but I will consider only the ideas immediately following from them. On the smallest level,

these distinctions make possible Kant's innovation: propositions that are both synthetic and a priori. His examples of such are "7+5=12," the statement "every event has its cause," and the theorems of Euclidian geometry, among others.¹⁰ Kant argues (plausibly) that 7 and 5 can be added, but their conjunction yields nothing more than 7+5; the concept of equaling 7 is added (i.e., is synthetic), and this whole process is performed a priori.

Kant believes that pure mathematics, physics, and metaphysics all contain judgments which are synthetic a priori, and these judgments are also principles of their sciences.¹¹ This is important for Kant because at this point in the *Critique* he is trying to establish metaphysics as a pure science of the understanding, with as much claim to its field as physics has to motion. Showing that the synthetic a priori functions the same way in all three of these sciences also establishes an analogy between metaphysics and math (or physics); no one doubts math's claim to numerical understanding, and analogously, Kant thinks, no one should doubt metaphysics' claim to understanding of the world.

The synthetic a priori also provides a basis on which Kant can build his theory of metaphysics: transcendental idealism (TIism). In TIism, the mind automatically projects onto the world a template. It is only through this template that we can understand the world. This is why we can't know things as they in themselves, but only insofar as they relate to us.¹² This template (thereafter called the Categories) is deduced from basic Judgments we make in our understanding of things: whether they are universal, particular, or singular; affirmative, negative, or infinite; and so on. All of these

Judgments are synthetic a priori—that is, they are justified not on the basis of experience, but conceptually.

III. Why is Geometry Synthetic a Priori?

Kant believes that Euclidian geometry consists almost entirely of synthetic a priori judgments, and explains his reasons for thinking so in two parts of the *Critique*. I will first consider why it is synthetic, then why it is a priori, and finally what the significance is of all this.

Kant thinks geometry is synthetic because he seemingly cannot find any “principles of pure geometry [to be] analytic.”¹³ He gives an example of this: “...the straight line between two points is the shortest...For my concept of straight contains nothing about magnitude...Therefore the concept of shortest is entirely added to the concept of a straight line and cannot be extracted from it...only by means of [intuition] is the synthesis possible.”¹⁴ Kant here claims that length is synthetically added to straightness in a mind-supplied (i.e., a priori) way. Presumably we are supposed to extrapolate from this example that all geometric theorems are synthetic a priori as well.

But this example does not illustrate Kant’s point very well. Indeed, the judgment in his example is *analytic*—not synthetic. Both concepts, straightness and length, are contained in the concept of a line. A line, by definition, is a straight connection of two points not identical with each other (i.e., having a length of space between them). Thus we can turn Kant’s example into an affirmative, explicit analytic judgment: a straight connection of two points having a length of space between them, is straight and has length.

Since Kant thereafter¹⁵ mentions other analytic principles in geometry, it seems as if he has actually provided us with more objections to his claim than support. But this, however, may not be the case. If we look at geometric theorems (such as his line example), we seem to find nothing but analytic principles. But if we consider the principles constituting those theorems, we can find synthetic ones. An example given earlier in this paper, “all Euclidian triangles contain two right angles,” illustrates this. The truth of “containing two right angles” in no way belongs to the concept of “triangle”—but it *is* inextricably connected to it.

Kant’s Metaphysical Exposition of space (see “Transcendental Doctrine of Elements”, §2) shows that space has an a priori origin. His argument looks like this¹⁶:

1. *Space is either an empirical concept or an intuition.*
2. *Space is not an empirical concept abstracted from experiences, because we can represent to ourselves only one space.*
3. *Experience is only possible through space.*
4. *Therefore, space must be a “necessary a priori representation that underlies all outer intuitions.”*
5. *Space is a pure intuition and essentially a unified whole.*
6. *Therefore, an a priori intuition underlies any concept of space.*
7. *Therefore, since geometry is the correct way of understanding space, geometry must be derived from a priori intuition.*
8. *Therefore, geometry is a priori.*

Kant gives arguments, not reproduced here, for space as a priori at A23-24/B38 (the 1st and 2nd a priorities).

Kant immediately follows the Metaphysical Exposition with his Transcendental Exposition (§3), which is a “best explanation” for why space (and geometry) are a priori:

*This intuition [of space] must, however, be encountered in us a priori, i.e., prior to any perception of an object; hence this intuition must be pure rather than empirical. For geometric propositions are one and all apodeictic, i.e., linked with the consciousness of their necessity—e.g., the proposition that space has only three dimensions. But propositions of that sort cannot be empirical judgments or judgments of experience; nor can they be inferred from such judgments.*¹⁷

Both of these references illustrate why Kant thought geometry was a priori, and we have previously shown why he thought it was also synthetic.

It remains to be shown why Kant's synthetic a priori geometry was important to his theory. Kant believed that space actually conformed to Euclidian geometry, just as the world conformed to his TIism. If the world were Euclidian, and geometry were comprised of synthetic a priori principles, then it follows that the world would have been understood correctly via synthetic a priori principles; thus, Kant's TIism would have been the proper way of understanding the world. It would have been a very strong argument in favor of TIism. Unfortunately for Kant, the early 20th Century proved that the world is not Euclidian, and so refuted one of his main arguments for his metaphysics.

We can see, then, (1) how Kant makes his distinction, (2) the results which follow from it, and (3) why and how he applied his distinction to geometry. These basic parts of the *Critique* provide the ground on which he can later build his Categories and other theories, and therefore have an essential function in the *Critique* as a whole.

¹ Kant, Immanuel. *Critique of Pure Reason*. Ariew, Roger and Watkins, Eric: Modern Philosophy: An Anthology of Primary Sources, ©1998 Hackett Publishing Company. pp.641-642, A6/B10-A10/B14.

[NOTE: All citations here refer to this work, so only page numbers and sections are referenced.]

² p.641, A6/B10-B11

³ A151/B190 (not in textbook)

⁴ p.641, B11

⁵ *Ibid*

⁶ p.638, Bxvii-xviii

⁷ *Ibid*

⁸ B3 (not in textbook)

⁹ p.636-637, Bx-xii

¹⁰ p.642-644, A10/B14-B18

¹¹ *Ibid*

¹² Throughout the *Critique*, see especially the "Preface to the Second Edition"

¹³ p.643, B16

¹⁴ p.643, B16

¹⁵ p.643, B16-17

¹⁶ p.647, B38-40

¹⁷ p.648, B41