Kant & The Temporal PSR

PHIL 971

October 13, 2022

In these notes I discuss Kant's position on the PSR in the critical period, under the guise of the causal law of nature, that every alteration (or event) has a cause.

Contents

The aims of the Analytic of Principles are to show what basic synthetic a priori truths we can know on the basis of the application of the categories of the understanding. In general we can see the Analytic of Principles as trying to answer four questions:

1. Which concepts are a priori? (the Metaphysical Deduction)
2. Must the categories apply to objects of experience? (the Transcendental Deduction)
3. How could the categories apply to objects of experience? (the Schematism)
4. What synthetic a priori truths do we know as the result of their application? (the System of All Principles)

The Analytic of Principles aims to answer questions (3) and (4). A full vindication of the categories as applicable to objects of experience thus depends not only on the arguments of the Analytic of Concepts but also those of the Principles.

1 Schematism & Time

Each section of the Analytic of Principles describes or elucidates the manner in which the "schematized" categories in question (i.e. the categories of quality, quantity, relation, or

modality) provide the basis for synthetic a priori cognition and knowledge of nature (as the system of possible experience). What is a "schema" and what are the "schematized categories"?

A schema is that which acts as an intermediary between two otherwise heterogeneous types of representation. As Kant puts it,

> In all subsumptions of an object under a concept the representations of the former must be **homogeneous** with the latter, i.e., the concept must contain that which is represented in the object that is to be subsumed under it, for that is just what is meant by the expression "an object is contained under a concept". (A137/B176)

Call the requirement that something must explain the subsumption of a sensory representation of an object under a concept the "homogeneity requirement."

Homogeneity Two representations(?) X and Y are (partially) homogeneous iff X and Y share (some of) the same content.

The Homogeneity requirement raises a specific problem for the pure categories. It must be shown how the categories, whose content is purely a priori, and based on the logical (and thus non-sensory) functions of judgment, apply to object of experience, given that they are not homogenous with the objects of intuition.

Kant's answer is to appeal to time, as the form of inner sense (i.e. our inner receptivity). Time, as the pure form of our inner intuition, is an intermediary that is homogeneous with both the categories and appearances, in the sense that it is *universal* (it applies to all appearances as such), *knowable a priori* (we have a priori knowledge of form of inner sense), *diverse* (compatible with the full variety of logical properties and relations specified by the categories). Kant's contention is that time (and temporal relations) is uniquely suited to play this intermediary role. Hence, each category, in providing a synthetic a priori principle for cognition and knowledge, must be understood not in its "pure" logical form, but rather as a way of structuring time and temporal relations.

> The schemata are therefore nothing but a priori **time-determinations** in accordance with rules, and these concern, according to the order of the categories, the **time-series** [categories of quantity], the **content of time** [categories of quality], the **order of time** [categories of relation], and finally the **sum total of time** [categories of modality] in regard to all possible objects. (A145/B184-5)

Thus what we should expect, for each part of the second chapter of the Analytic of Principles (what Kant calls the "System of all principle of pure understanding"), a discussion of how the relevant categories relate to time, and how that in turn grounds further cognition of nature (as the sum total of all appearances).

2 The Analogies

The chapter called "The Analogies of Experience" is a part of the broader section, the "Analytic of Principles", of the *Critique of Pure Reason*. It concerns those principles that ground cognition through the application of the categories of relation (i.e. `<subsistence-inherence>`, `<cause-effect>`, `<community>`)

There are at least two important questions to ask about the section as a whole.

1. What is an "analogy"?
2. Are the analogies making epistemic or metaphysical claims?

Concerning the first question, Kant makes two explicit claims about the nature of analogies. He says,

> [An analogy is] not the identity of two **quantitative** [relations, as in mathematical analogy] but [the identity] of two **qualitative** relations, where from three given members I can cognize and give a priori only the relation to a fourth member but not this fourth member itself, although I have a rule for seeking it in experience and a mark for discovering it there (B222)

So an analogy, in the sense with which Kant is concerned, is something of the form "A:B :: C:D", where "D" refers to something that is not cognizable a priori, though what is designated by "A", "B", "C", and the relevant relations *are* so cognizable.[1] For example (leaving aside the issue of what counts as a priori), consider the following analogy, red:crimson::shape:???. Kant's contention is that given knowlege of what "red", "crimson", "shape", all mean, as well as the relation between red and crimson, we should be able to conclude by analogy something concerning what is marked by the "???." In this case the relevant relation is the "determinate-determinable" relation, so the blank should be filled-in by some determinate of "shape", e.g. "rectangle". In general, then, the discussion of the Analogies of Experience should concern some relation and how knowledge comes to be possible of some fourth member, given a rule.

[1] See (Callanan 2008) for extensive discussion and relevant citations concerning Kant's conception of an analogy.

In light of this, and concerning the notion of an "analogy of experience" in particular, Kant says,

> An analogy of experience will therefore be only a rule in accordance with which unity of experience is to arise from perceptions (not as a perception itself, as empirical intuition in general), and as a principle it will not be valid of the objects (of the appearances) **constitutively** but merely **regulatively**. (B222)

This would seem to indicate that the relevant relata of the analogy are perceptions (or the appearances of objects of experience), and the relation is one that is set out by a specific rule. These rules are (here taking only the second edition of 1787 into consideration):

1. Principle of the persistence of substance: In all change of appearances substance persists, and its quantum is neither increased nor diminished in nature (B224)
2. Principle of temporal sequence according to the law of causality: All alterations occur in accordance with the law of the connection of cause and effect (B232)
3. Principle of simultaneity, according to the law of interaction, or community: All substances, insofar as they can be perceived in space as simultaneous, are in thoroughgoing interaction (B256)

Kant thus distinguishes three different kinds of temporality (B219) present in the relational categories: persistence, succession, and simultaneity. He then claims that each kind of temporality is connected with each of the relational categories (i.e. persistence with `<substance-inherence>`, succession with `<cause-effect>`, and simultaneity with `<community>`).

Kant therefore prefaces his discussion of the three Analogies of Experience with a single principle, which, in the first edition, reads: "As regards their existence, all appearances stand a priori under rules of the determination of their relation to each other in one time" (A176) and in the second, reads: "Experience is possible only through the representation of a necessary connection of perceptions" (B218). The basic idea here is that each of the three relational categories represents a necessary connection that is required for the possibility of *experience* (not intuition or perception!) of (i) a single time and (ii) of objects existing and being temporally related to each other within a single time.

Concerning the second question, as to whether Kant is making an epistemological or metaphysical argument, a few points are worth noting. First, Kant rejects the position that time (qua form) or temporal properties may be directly percieved (A176/B219). Time and its properties are only representable analogically whereby,

> we … represent the temporal sequence through a line progressing to infinity, in which the manifold constitutes a series that is of only one dimension, and infer from the properties of this line to all the properties of time, with the sole difference that the parts of the former are simultaneous but those of the latter always exist successively. (A33/B50)

Time also (in a sense to be explored further below) necessitates. Given two temporal regions, A and B, A stands as a sufficient condition of B's occurrence (or the occurrence of a temporal series of which B is a member) just by virtue of occurring before B (i.e. standing in the `<earlier than>` relation). This is due solely to specific topological facts about time—that it is a single dimensional serial order of situation that is continuous and connected.[2]

These points might indicate that Kant's concern is with the metaphysical structure of time. However, Kant also assumes a distinction between an objective temporal order between states of objects (and between objects) and the subjective temporal appearance of such order, construed merely as the subjective succession of representations in a particular empirical mind. Much of Kant's discussion is then aimed at answering the question "how do I manage to cognize and know anything about an objective temporal order if all I have access to is the subjective temporal succession of my own representations?" Thus he is definitely also concerned with epistemic issues surrounding how we cognize or come to know objective truths about temporal relations between objects of experience. Hence it looks like Kant is concerned *both* with metaphysical *and* with epistemological issues in his discussion of the analogies between the temporal order of perception and the categories of relation.

3 The Second Analogy

Here, the analogy under consideration seems be that A precedes B (considered as appearances or alterations of a substance) as cause precedes effect. Hence the law that all alteration (i.e. all successive being and not-being of the determinations of a substance) occurs in accordance with the law of the connection of cause and effect. More generally, Kant's claim (unpacking his discussion of analogy above) is that we can cognize the effect of some cause by virtue of applying a rule – the rule of the succession of appearances – to objects as they appear to us.

[2] The fact that space has three dimensions presents an important contrast to time in this respect. Note that since I appeal only to topological rather than metric features of time here the issue of source of the determinacy of time's metric can, at least for now, be set to the side. See (Longuenesse 1998; Dunlop 2009; Stan 2017) for discussion.

3.1 An Epistemological & Conceptual Argument

There are seemingly a number of different ways in which Kant argues for his succession principle in the Second Analogy. One way that we might try to reconstruct his argument is to see the Second Analogy as aiming to reject Hume's conclusion that the necessary connection between a putative cause and its effect is merely a fiction, and that instead all such connections are associations formed on the basis of habituation to experiences of constant conjunction.

Given that Kant's aim is to argue against Hume, we must ask whether Kant starts from a premise concerning causation which Hume would grant. As Lewis White Beck effectively argued, Kant does indeed agree with Hume's thesis that all our knowledge of causal connections proceeds via induction, that is, we come to know that A causes B (or A-type events cause B-type events) by observing the constant conjunction of A and B in our experience.[3] Indeed, this should be unsurprising given that Kant considers the fourth term of the analogy to be something of which we lack any a priori cognition or knowledge. Now, a presupposition of observing the constant conjunction of A and B is that we perceive a temporal succession of events. One event (A) comes *before* another (B). This much must be assumed by Hume if his argument about constant conjunction is to make sense. Kant's ingenious move is to argue that Hume's assumption of an awareness of temporal succession presupposes a grasp of the difference between the subjective order of our perceptual states and the objective temporal order of the events or objects we perceive. Kant illustrates this by way of an example involving a ship moving downstream.

> That something happens, i.e., that something or a state comes to be that previously was not, cannot be empirically perceived except where an appearance precedes that does not contain this state in itself; for a reality that would follow on an empty time, thus an arising not preceded by any state of things, can be apprehended just as little as empty time itself. Every apprehension of an occurrence is therefore a perception that follows another one. Since this is the case in all synthesis of apprehension, however, as I have shown above in the case of the appearance of a house, the apprehension of an occurrence is not yet thereby distinguished from any other. Yet I also note that, if in the case of an appearance that contains a happening I call the preceding state of perception A and the following one B, then B can only follow A in apprehension, but the perception A cannot follow but only precede B. E.g., I see a ship driven downstream. My perception of its position downstream follows the perception of its position upstream, and

[3] (Beck 1978, chap. 8).

> it is impossible that in the apprehension of this appearance the ship should first be perceived downstream and afterwards upstream. The order in the sequence of the perceptions in apprehension is therefore here determined, and the apprehension is bound to it. (A191-2/B236-7)

Kant's point here is that *given* an objective succession of events (the ship's moving down the river from point A to point B) our perceptions of those events have to proceed in a particular order (see (Watkins 2005, 212)). The order of one's perceptions is thus parasitic on the objective order of the events. Kant then asks us to consider the following contrast case.

In contrast to the case of the river boat, Kant discusses the successive apprehension of the parts of a house (A190-1/B235-6). In this case, the subjective order of our perceptions of the house is not made necessary by (or better, does not track) an objective succession of events. Since the house is a persisting object, our subjective apprehension of it could come in any of a variety of orderings, including an ordering that is simply the reverse of that in which we actually perceived the house. This raises a problem. A subjective succession of experiences is necessary, but not sufficient, for an awareness of an objective temporal order to what one experiences. So how do we get from the one to the other?

Put another way, it seems incontrovertible that we distinguish the representation of a persisting object, such as a house, from a series of events, such as a ship moving downriver. But in both cases there is no difference subjectively in what occurs (at least at a certain level of abstraction), viz. a succession of subjective perceptual experiences. So how is it that we can distinguish in the ship case that we have an objective succession of events, while in the house case we have objective simultaneity, i.e. one synchronic object, whose parts (e.g. roof, walls, windows, etc.) we could diachronically perceive in any of a variety of orderings? How is it possible that we successfully distinguish objective succession from objective simultaneity?

Kant rules out several possibilities. We can't distinguish objective succession from objective simultaneity by perception of any necessary connection because (and here Kant agrees with Hume) experience "to be sure tells us what is, but not that it must necessarily be so and not otherwise" (A1).

Second, the supposed irreversibility of our perception of successive events (such as with the riverboat case) cannot tell us anything because one can only be aware of the necessary contrast between 'reversible' and 'irreversible' perceptions if one is *already* aware that there is an irreversible order (e.g. that B's follow A's and not vice versa) to what one is perceiving, such that one's perceptions must be in accord with it.

Third, one cannot appeal to some independently perceivable temporal succession (e.g. "absolute" time), because Kant has already ruled out the possibility of perceiving time itself (B 245).

Fourth, one cannot appeal to the perception of any mind-independent object (a "thing in itself"), since these too have been ruled out as wholly inaccessible to our conscious awareness.

So Kant has issued (the Humean) a challenge: granted that a subject of experience has a grasp of the distinction between the objective succession of events (the occurrence of events of type A followed by events of type B) and the objective simultaneity of the features of an object (e.g. the various features of a house), what account for such awareness? The Humean must grant that we make such a distinction, for the Humean argument against our understanding causation as necessary connection *presupposes* that we can distinguish the objective sequence of events from our subjective train of sense experiences.

Kant's claim then, is that it is only if there is a rule ordering our representations, such that what makes it possible for us to grasp two alterations or events as related by objective temporal succession is that one event *caused* the other. Here is a reconstruction of the whole argument, as articulated by Georges Dicker.[4]

1. We cannot know by experience that an event—that is, a transition from a state A to a state B—is occurring by knowing that the perceptions of A and B occur in the order A, B; by knowing that the perceptions of A and B are irreversible; by knowing that A precedes B by reference to absolute time; or by knowing that these perceptions are of successive states of things-in-themselves.
2. If (1), then the only way we can know by experience that an event—that is, a transition from a state A to a state B—is occurring is by knowing that B follows A according to a rule, that is, that the event has a cause.
3. If the only way we can know by experience that an event—that is, a transition from a state A to a state B—is occurring is by knowing that B follows A according to a rule, that is, that the event has a cause, then any event such that we can know of its occurrence by experience must have a cause.
4. ∴ Any event such that we can know of its occurrence by experience must have a cause.

Kant's conclusion here is limited in several ways. First, it concerns only knowledge that events have causes. It does not say, e.g., that *similar* events always have *similar* causes. Second, it presupposes that we correctly grasp the difference between objective succession and objective simultaneity. But, despite these presuppositions, the argument seems an effective

[4] (Dicker 2004, 173).

answer to the Humean, for the Humean analysis of causation requires that we have a grasp of objective succession (as well as the distinction between objective simultaneity and succession), for this is used by the Humean to explain how our associative powers get their grip on causal judgment (i.e. that we associate successive and not simultaneous events with causation). Hence, while Kant's argument concerning causation may not be effective against all comers, particularly against the skeptic who might deny that we have any cognitive grasp of objective succession, it nevertheless seems effective against Hume's argument.

3.2 A Metaphysical Argument

The preceding argument concerns our knowledge of objective succession and simultaneity. It contends that if we have such knowledge then we are justified in utilizing the concepts of cause and effect, since the application of such concepts constitutes the rule by which we come to make the relevant distinction between objective succession and simultaneity.

But Kant also at times seems to be arguing for more than an epistemic justification of the application of `<cause-effect>`; he seems to contend that the relational categories in fact *constitute* temporal determinacy, rather than simply function as part of the explanation of our knowledge of such determinacy.

In general, Kant remarks in the introduction to the discussion of the principles that,

> [t]he conditions of the **possibility of experience** in general are at the same time conditions of the **possibility of the objects of experience**, and on this account have objective validity in a synthetic judgment a priori. (A158/B197)

For Kant, an object of experience is a "causally unitary, spatiotemporally persisting substance whose present complex of interrelated properties are a function of its causal nature and its causal history, which is in thoroughgoing law-governed community with other objects, and which is made of stuff that cannot come into or go out of existence absolutely."[5] That is, an object of experience is what it is in virtue of falling under the schematized categories. For example, consider the category `<substance-inherence>`. Nothing can *be* an object unless it is the kind of being that both substands and subsists, which is to say that it is both that in which properties inhere, and which exists independently of (in the sense of not inhereing in) other things. In this sense `<substance-inherence>` is not only maximally general way of thinking of an object, but also a metaphysically fundamental way of *being* an object. Hence, for Kant, anything that is or could be is either a subject of inherence or inheres in some subject. Hence, in applying the category of substance one is employing not

[5] (Allais 2009, 405).

only a maximally general way of *thinking about* a being, but also designating a maximally fundamental fact *about being* (i.e. what it is to be) itself. A similar point holds for all of the other categories.[6] The categories are thus *both* the discursively fundamental ways of representing objects, and the ways of representing what is fundamental *about* objects.

If this is all correct, it would be surprising if Kant were arguing a merely epistemological point about our use of the concept `<cause-effect>` (or any of the other categories of relation). And indeed, Kant says things that express just such a seemingly metaphysically constitutive role for the categories. For example, he says that,

> it is only because we subject the sequence of the appearances and thus all alteration to the law of causality that experience itself, i.e., empirical cognition of them [i.e. the sequence of appearances], is possible; consequently they themselves, as objects of experience, are possible only in accordance with this law. (B234)

Here again we see Kant claiming that through the application of the categories of relation we constitute the objects of experience. Similarly, he says in summing up the argument of the Analogies that,

> [t]hese, then, are the three analogies of experience. They are nothing other than principles of the determination of the existence of appearances in time, in accordance with all three of its *modi*: that of the relation to time itself, as a magnitude (the magnitude of existence, i.e., duration); that of the relation in time, as a series (one after another); and finally that in time as a sum of all existence (simultaneous). (A215/B262)

The principles "determine" appearances, and in doing so *constitute* the objects of experience. That is why they are conditions of the possibility of experience (and thus according to the opening of the chapter, of the objects of experience).

3.3 Time, Causality, & the PSR

Kant makes two references to the principle of sufficient reason (or "determining ground") in the Analogies. The first comes in the Second Analogy.

[6] The modal categories are the exception since, as Kant indicates, they are "merely subjectively valid for the human understanding" and "are not valid of objects in general" (CPJ 5:402); see also (Stang 2016, chap. 10; Kohl 2015).

> This rule for determining something with respect to its temporal sequence, however, is that in what precedes, the condition is to be encountered under which the occurrence always (i.e., necessarily) follows. Thus the principle of sufficient reason is the ground of possible experience, namely the objective cognition of appearances with regard to their relation in the successive series of time. (A200-1/B246)

Kant here asserts (perhaps surprisingly) that the PSR is the ground of possible experience. Hence, with respect to the objects of possible experience (i.e. "phenomena"), we are justified in appealing to the PSR. What version of the PSR might Kant have in mind? Here it is less clear, but it seems to be a version of the ontic PSR, and is put in terms of "alterations". So every alteration has a determining ground that necessitates it. This ground, moreover, constitutes the determinate objective temporal sequence of such alterations, such that we can be said to cognize one as before or after (or in the limit case, simultaneous with) the other.

It is this appeal to the PSR as part of the explanation of the possibility of (objectively) determinate temporal sequences that is the basis of Kant's other remark in the conclusion to the Analogies. He says,

> If we had wanted to prove these analogies dogmatically, i.e., from concepts…then all effort would have been entirely in vain. For one cannot get from one object and its existence to the existence of another or its way of existing through mere concepts of these things, no matter how much one analyzes them. So what is left for us? The possibility of experience, as a cognition in which in the end all objects must be able to be given to us if their representation is to have objective reality for us. In this third thing, now, the essential form of which consists in the synthetic unity of the apperception of all appearances, we found a priori conditions of the thoroughgoing and necessary time-determination of all existence in appearance, without which even empirical time-determination would be impossible, and we found rules of synthetic a priori unity by means of which we could anticipate experience. In the absence of this method, and in the delusion of wanting to prove dogmatically synthetic propositions that the empirical use of the understanding recommends as its principles, a proof of the principle of sufficient reason was often sought, but always in vain. (A217/B264-5)

Kant here contends that it is only with the transcendental method through which we regress from the actuality of experience to the conditions of its possibility that we can justify, or, in some sense, "prove" the PSR.

However, the justification for applying the PSR extends only to objects of possible experience. We can see this clearly in his discussion of the Third Antinomy. In this Antinomy, Kant argues that reason provides plausibly sound arguments for opposing conclusions—viz. that there both is and is not a form of causality other than temporal succession. The arguments proceed thusly:

> **Thesis** Causality in accordance with laws of nature is not the only one from which all the appearances of the world can be derived. It is also necessary to assume another causality through freedom in order to explain them. (A444/B472)

Kant presents the argument for the Thesis as follows:

1. The only form of causation is natural causation. [Assumption for reductio]
2. ∴ Every event that occurs has a cause. [1, definition of causation]
3. ∴ There is no first cause of events and thus no complete regression of the causal series. [1,2]
4. However, the content of the causal law demands that there be a complete regression if the causal series is to exist. [definition of causation]
5. ∴ Contradiction. [3,4]
6. ∴ There must exist a spontaneous cause—one that is not determined by a temporally prior ground. [Negation of 1]

As Kant puts the conclusion:

> a causality must be assumed through which something happens without its cause being further determined by another previous cause, i.e., an **absolute** causal **spontaneity** beginning **from itself** a series of appearances that runs according to natural laws, hence transcendental freedom, without which even in the course of nature the series of appearances is never complete on the side of the causes. (A446/B474)

Kant then presents a counter-argument.

> **Antithesis** There is no freedom, but everything in the world happens solely in accordance with laws of nature. (A445/B473)

1. There is an uncaused beginning (i.e. a free beginning) to the causal series of appearances. [Assume for reductio]
2. For everything that happens, there must a previous state from which it is causally determined according to a natural law. [definition of causation]
3. ∴ If a spontaneous cause happens (or begins to act), there must be a previous state from which it follows (causally) in accordance with a natural law [2]
4. ∴ The action of a spontaneous cause follows a previous state (causally) in accordance with a natural law [1,3]
5. ∴ Contradiction [1,4]
6. ∴ There can be no freedom or first cause. [Negation of 1]

Thus there is an "antinomy" of reason – a equipollent set of arguments, which cannot both be correct, but which (Kant posits) are both required by reason's search for the unconditioned condition (i.e. absolute ground) of a given conditioned being or set of such beings (i.e. the consequent of the absolute ground).

Kant's solution to this antinomy (and the others) is to argue that such antinomies are generated because (i) for any given conditioned thing (e.g. an appearance) the whole set of conditions must also be given; (ii) in each instance of the argument of the Antinomies, the Thesis and Antithesis present arguments showing that the series of conditions of the object that is given both can and cannot be complete. As Kant puts it,

> The entire antinomy of pure reason rests on this dialectical argument: If the conditioned is given, then the whole series of all conditions for it is also given; now objects of the senses are given as conditioned; consequently, etc. (A497/B525)

But if we assume that the total series of conditions is given along with what it conditions, we generate the contradictions seen in each Thesis and Antithesis. But this, Kant contends, is only true of we interpret the condition-conditioned relation as follows:

> If the conditioned as well as its condition are things in themselves, then when the first is given,…the latter is thereby really already given along with it (A498/B526)

Kant contends that we shouldn't construe this condition-conditioned relation as applying to things in themselves in the same way as it does to phenomena (objects of experience). Kant thus argues that the Antinomies are resolved because the condition-conditioned relationship applies *differently* to appearances than to things in themselves.

> [In contrast] if I am dealing with appearances…then I cannot say with the same meaning that if the conditioned is given, then all the conditions (as appearances) for it are also given. … For the **appearances**, in their apprehension, are themselves nothing other than an empirical synthesis (in space and time) and thus are given only **in this synthesis** (A498-99/B527)

The condition(s) of appearances are set as a task for reason to resolve, rather than as a given totality.

> [for appearances] if the conditioned is given, then through it a regress in the series of all conditions for it is **given** to us **as a problem** (A497–498/B526)

According to Kant's doctrine of Transcendental Idealism, the appearance(s) of an object is indeterminate in a way that a thing in itself is not. Things in themselves are completely determinate in the sense that for every pair of contradictory predicates one of them must be truly ascribed to the thing (A571-6/B599-604). Since appearances are representations, and as representations depend on apprehension and synthesis to count as representations (appearances) of determinate *objects*, they only give their conditions in that synthesis, which Kant contends is infinite, and thus a never fully determinate totality.[7]

Hence, Kant argues that though we are justified in applying the PSR to appearances, understood as alterations of substances (objects), we can utilize this principle only *within* the bounds of possible experience, and the impetus of reason (as a faculty) to seek the unconditioned condition (or totality) of given conditions will never be satisfied; thus is the application of the PSR both justified and stringently limited.

References

Allais, Lucy. 2003. "Kant's Transcendental Idealism and Contemporary Anti-Realism." *International Journal of Philosophical Studies* 11 (4): 369–92.

———. 2009. "Kant, Non-Conceptual Content and the Representation of Space." *Journal of the History of Philosophy* 47 (3): 383–413.

Beck, Lewis White. 1978. *Essays on Kant and Hume*. New Haven: Yale University Press.

Callanan, John J. 2008. "Kant on Analogy." *British Journal for the History of Philosophy* 16 (4): 747–72.

[7] For argument that phenomena are inherently indeterminate, and thus that Kant endorses a kind of anti-realism with respect to objects of experience, see (Allais 2003).

Dicker, Georges. 2004. *Kant's Theory of Knowledge : an Analytical Introduction*. Oxford: Oxford University Press.

Dunlop, Katherine. 2009. "The Unity of Time's Measure": Kant's Reply to Locke." *Philosophers' Imprint* 9 (4): 1–31.

Kohl, Markus. 2015. "Kant on the Inapplicability of the Categories to Things in Themselves." *British Journal for the History of Philosophy* 23 (1): 90–114. doi:10.1080/09608788.2014.978838.

Longuenesse, Béatrice. 1998. *Kant and the Capacity to Judge*. Princeton: Princeton University Press.

Stan, Marius. 2017. "Absolute Time: The Limit of Kant's Idealism." *Noûs*, 1–29. doi:10.1111/nous.12229.

Stang, Nicholas F. 2016. *Kant's Modal Metaphysics*. New York: Oxford University Press.

Watkins, Eric. 2005. *Kant and the Metaphysics of Causality*. Cambridge: Cambridge University Press.