NO INFERENCE NECESSARY:

KANT'S ACCOUNT OF THE EXPERIENCE OF A CAUSAL CONNECTION

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Abstract

The near consensus among Kant's interpreters is that if he holds experience of a causal connection to be possible, then cognition of necessity gets 'injected' into it through reason when we infer it from a particular causal law. Kant, however, does not write of such injection. Rather, in its least scientifically developed form, he seems to hold that experience of a causal connection is constituted merely through present perceptions and the categories—especially cause and necessity—in a judgment of the understanding. I present an interpretation where experience of a causal connection is so constituted, and the cognition of necessity in it need not be grounded in cognition of a particular causal law.

Keywords: Kant's response to Hume, cognition, causality, necessity, the postulates of empirical thinking, Kant, Hume, experience of causal connections, knowledge, principles of the understanding, judgments of experience, judgments of perception, experience, dynamical synthesis

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§1 – Introduction

Suppose there is a stone sitting out in the sun. Can we cognize the sun's warming the stone? Common sense says that we can. After all, we make these kinds of causal judgments all the time. Hume famously holds that this kind of putative cognition of a particular causal connection can never be legitimate because it is impossible to offer a coherent account on which causal beliefs are objective. Because our purported cognition of particular causal connections is an illusion, he maintains that we cannot cognize the general causal principle that everything that happens or comes into existence has a cause (*T*, 1.3.3, SBN 78–82; compare, e.g., A189).[1]

A central task of Kant's philosophy is to offer a response to Hume, but what kind of causal cognition (*Erkenntnis*/*Cognitio*) does he take us to have? Kant clearly maintains that we can cognize (c_{iv})[2] the general causal principle 'everything that happens (begins to be) presupposes something which it follows in accordance with a rule' (A189). He argues for this in the Second Analogy and this argument clearly requires cognition (c_i) of occurrences, alterations, events, objective successions, or happenings, which must be effects, like my experience of the stone's becoming warm. Interpreters disagree, however, on the extent to which Kant thinks we can have cognition not merely of effects, but (c_{ii}) of particular causal connections—a nexus of a cause and its effect—like my experience of the sun's warming the stone. Relatedly, they also disagree on whether he thinks we can cognize (c_{iii}) particular causal laws, like 'when the sun shines on a stone, it will warm the stone through its light'.

Prima facie, a full reply to Hume requires that Kant account for the possibility (c_{ii}) of everyday experience—which is always cognition for Kant—of specific causal connections, like of the sun's warming the stone. This impression is bolstered by many texts where Kant treats as paradigmatic this kind of experience (c_{ii}), as in his discussion of 'air is elastic' (*Prol,* 4:300–301), 'the sun warms the stone' (*Prol*, 4:301n, 4:305n, 4:312), or 'the body is heavy' (B142). Therefore, on its face, there is not only philosophical reason, but also strong textual evidence, to think that Kant's job would be incomplete if he couldn't offer an account of how experiences of specific causal connections (c_{ii}) are possible. In contrast to many, I take Kant to offer such an account. I aim to reconstruct it here.

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[1] All citations of Hume use the standard abbreviations and citation styles of the Hume Society; the text is from the Clarendon Press editions. All citations of Kant follow the standard Academy Edition pagination and A/B pagination of the *Critique of Pure Reason*, along with the *Kantian Review* abbreviations for the titles of Kant's works.

[2] Four kinds of cognition that cannot be run together will be especially relevant here. I mark these with '(c_i)' to '(c_{iv})'.

In §2 we will examine the faulty framework that has led Kant's interpreters to be skeptical of the possibility of experience of specific causal connections (c_{ii}). In §3 we will turn to the *Prolegomena,* where Kant is clear that the categories of cause and effect dictate *a priori* laws that govern experience of any causal connection (c_{ii}), while such experiences are differentiated from one another through the differences among their perceptions. In presenting this account, however, Kant points the reader to the First *Critique* where the faulty framework can seem to find more support. In §4, however, we will see that this support is merely apparent.

§2 – The injection framework

I take Kant to hold that simply giving an account of how causal cognition (especially c_{iv} & c_{ii}) is possible will go a long way towards replying to Hume. Kant reads Hume as investigating in good faith. Hume wants an account of causal cognition, but he cannot see how such cognition could be possible. As a result, to respond to Hume, Kant need neither refute him, nor even begin from the same basic principles, but only satisfy the original interests that drove him to skepticism, while offering an account of the possibility of the cognition in question.[3]

One of Hume's basic principles that Kant does not accept is 'Hume's fork'—that all of our knowledge of 'the objects of human reason or enquiry may naturally be divided into two kinds[:] *Relations of Ideas*, and *Matters of Fact*' (*EHU* 4.1, SBN 25)—since he takes this to rule out cognition of a necessity that is not merely an analytic relation of concepts, but is 'synthetic *a priori*' (*Prol* 4:270; cf. 4:272).[4] Two kinds of such synthetic *a priori* principles are those of the understanding and reason. In the Transcendental Analytic, Kant aims to vindicate our cognition of the fundamental synthetic *a priori* principles of the understanding which directly ground experience and its possibility (e.g., A157/B196). He carves these principles off from the principles of pure reason, which are not directly constitutive of experience but only indirectly regulative of it (A664–666/B692–694, A765/B793), and so do not have a direct role in grounding experience of causal connections and their necessity (c_{ii}). Hume, however, expected that the cognition of a causal necessity (c_{ii}) would depend on principles Kant attributes to reason. We will see (§2.1) that this expectation is shared by most interpreters of Kant, insofar as they endorse an interpretive framework which requires that the cognition of necessity in experience of a causal connection (c_{ii}) stems from reason's cognition of particular causal laws (c_{iii}). In

[3] See, e.g., A758ff/B786ff. In this orientation towards the empiricist skeptic, I am largely in agreement with the interpretation recently defended in Goldhaber 2024.
[4] For discussion see Goldhaber (2024: 441–2).

§2.2 I turn to a philosophical motivation behind thinking that reason must have this role. In §2.3 I suggest that in its least scientifically developed form Kant not only does not require that an experience of a causal connection (c_{ii}) be deduced from a particular causal law, but that he also is neutral about whether repeated past encounters with the cause and effect are required before such experience (c_{ii}).

§2.1 – The two-step injection framework

In the discussion of Kant's account of our causal cognition (c_i – c_{iv}), the topic of our experiences of causal connections (c_{ii}) has been somewhat of an afterthought, while more attention has been paid to whether we can cognize particular causal laws of nature (c_{iii}), like 'if the sun shines on the stone, it will cause the stone to become warm'. To see why, consider that on traditional interpretations—like that of Lewis White Beck,[5] Gerd Buchdahl,[6] or Michael Friedman[7]—and on newer 'necessitation accounts,'[8] insofar as experiences of causal connections (c_{ii}) are possible, this experience is constituted in at least two steps. First, whatever cognition of necessity we might have in cognizing a particular causal law (c_{iii}) is 'injected' into this cognition (c_{iii}) through the derivation of this law from higher laws.[9] Second, whatever cognition of necessity may or may not be achieved of the appropriate particular causal law (c_{iii}) is then transferred into the corresponding experience (c_{ii}) or purported experience, by deriving the given case from the law. The major difference between these kinds of interpretations is that on more traditional accounts, the focus is on the epistemic question of how we cognize particular causal laws, while on 'necessitation accounts' the focus shifts to the metaphysical status of these laws as necessary truths grounded in the real essences or natures of things.

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[5] Other interpretations that, like Beck's (1978: 119), take our only means for cognizing particular causal laws (c_{iii}) to be induction, and so take Kant to be in basic agreement with Hume over the impossibility of such cognition include Bird (1962: e.g., 144, 165; 2006: esp. 471–472) and Van Cleve (1999: 31, 230).

[6] Interpretations that, like Buchdahl's (1969, 1992), maintain that we come closest to the cognition of particular causal laws (c_{iii}) through a regulative postulation by reason of a system of such laws include: Paton (1936: ch. 45, §7, esp. 276), Brittan (1978: 185), Kitcher (1986), Allison (e.g., 1994; 2001: ch. 1; 2004: 259–260), Guyer (1997: ch. 1; 2005: chs. 1–2; 2017).

[7] Interpretations that, like Friedman's (1992b, 2012, 2013, 2014), maintain that we can sometimes cognize particular causal laws by deriving these laws from the laws of nature in general include: Anderson (2002), Longuenesse (2005: ch. 6), Kreines (2009: 543), Stang (2016: ch. 8, esp. 246–248; Appendix), Messina (2017), Massimi (2017).

[8] This label is due to Kreines (2009: 528). Interpretations that endorse views in this ballpark include: Watkins (2005), Kreines (2009, 2017), Stang (2016), Massimi (2017), Messina (2017), Engelhard (2018), Cooper (2023), and Hoffer (2022).

[9] This happens in one of two ways. Either 'the 'necessitarian' character of the laws' is '*injected* in virtue of the regulative activity of reason' which postulates a system of empirical laws (Buchdahl 1992: 195–196). Or 'the transcendental principles,' like that 'everything that happens has a cause' (c_{iv}), 'inject necessity into empirical laws of nature' through the derivation of the latter from the former (Friedman 1992b: 175, 174).

All accounts agree, however, that the representation of the law is required prior to the corresponding experience (c_{ii}), and so it is no wonder that the topic of this experience is an afterthought.[10]

Among both traditional and necessitarian accounts, there is disagreement over the extent to which cognition of particular causal laws (c_{iii}) is possible. As a result, insofar as interpreters comment on the topic, there is also disagreement over the extent of the possibility of experiences of causal connections (c_{ii}). Because interpreters are in broad agreement over the two-step framework, however, the same resources are available to interpreters, no matter whether they take Kant to be skeptical of, or to endorse, widespread cognition of particular causal laws (c_{iii}) or experiences of causal connections (c_{ii}).[11]

Now, an obvious circularity will afflict any account that requires cognition of particular causal laws (c_{iii}) to ground experience of causal connections (c_{ii}), if that same experience (c_{ii}) must also ground cognition of particular causal laws (c_{iii}). Furthermore, James Kreines (2009) and Noam Hoffer (2022) have argued that those who endorse such widespread cognition (c_{ii} & c_{iii}) have not successfully entitled themselves to it, and that the skeptical position is the stronger one. So long as interpreters are working within the two-step injection framework, I think Kreines and Hoffer are right. It is in this sense that on existing interpretations the experience of a causal connection (c_{ii}) is either impossible,[12] rare,[13] or not properly cognition.[14]

§2.2 – Knowledge (*Wissen*) and cognition (*Erkenntnis*) of causal necessity

This can seem like the verdict that we should expect. Kant holds that experience of a causal connection (c_{ii}) involves cognition of a particular causal necessity. As a result, interpreters have had difficulty seeing how, in each specific case, we cognize enough about nature to cognize this—especially after Hume's challenge. After all, Kant agrees with Hume that the cognition of necessity is not analytic (or a mere relation of ideas) and that repeated past encounters are never enough to establish that a

[10] James Van Cleve and Paul Guyer have readings that don't quite fit into these traditions because they hold that, as Van Cleve puts it, 'there must be some events that are known [(c_i)] to occur independent of any causal knowledge' (1984: 53). Still, they think that cognition of necessity must come through reason and so share the injection presumption.

[11] E.g., while Beck (1978: 119) and Buchdahl (1969: 517) read Kant as maintaining that we can never really cognize particular causal laws (c_{iii}), both Melnick (2006: 169, 176) and Kitcher (1986: §II) take Kant to allow it. This is even though Melnick, like Beck, thinks that the way we would arrive at this cognition (c_{iii}) is through induction. Or even though Kitcher, like Buchdahl, thinks that the way that we would arrive at this cognition (c_{iii}) is through treating these laws as though we had established their necessity, in a complete systematic body of doctrine.

[12] E.g., Beck (1978), Bird (1962, 2006), Van Cleve (1999), Buchdahl (1969, 1992), Brittan (1978).

[13] E.g., Friedman (1992b, 2012, 2013, 2014), Anderson (2002), Longuenesse (2005: ch. 6), Kreines (2009, 2017), Stang (2016), Messina (2017), and Hoffer (2022).

[14] E.g., Melnick (1973: esp. 130–5, 2006), Kitcher (1986), Massimi (2017), Engelhard (2018).

given connection is necessary (e.g., B3–B4). Therefore, it looks like the only way that we could know that a given necessity obtains would be through deriving this connection from first principles, and we can only do this, at best, in rare cases.

I think this conclusion is incorrect and that this expectation treats experience of a causal connection (c_{ii}) as more scientific than it is. Let me explain. Arguably, the two most influential interpretations of Kant on causal cognition over the last sixty years are that of Gerd Buchdahl and Michael Friedman, both of whom approach Kant through his philosophy of science. Kant conceives of a science (*Wissenschaft*) as a systematic body of cognition, organized architectonically according to a fundamental idea. This 'systematic unity is that which first makes ordinary cognition [*Erkenntnis*] into science, i.e., makes a system out of a mere aggregate of it' (A832/B860) and in developing sciences, we work to turn our ordinary cognition (*Erkenntnis*) into scientific knowledge (*Wissen*/*Scientia*).[15] Scientific knowledge is not just cognition that something is the case but is also knowledge of why it is the case. Kant thinks we explain why something is the case through reason. This is because in contrast with the faculty of concepts or the power of judgment, reason is the faculty of deductions or syllogisms (A304/B360–361). It is through a deduction or syllogism that we recognize how a particular causal law (c_{iii}) stands under higher laws, and it is through a deduction or syllogism that we recognize how a given experience of a causal connection (c_{ii}) falls under a particular causal law (c_{iii}). Such syllogisms provide insight; they explain a conclusion by exhibiting the reason that the conclusion obtains, and thereby explain why something is the case (*Log-D*, 24:730; *Log-Pö*, 24:539; *JL* 9:65; *R* 1866, 16:141; *R* 1955, 16:169; & *R* 2394, 16:342; *CPrR*, 5:26). They fit our knowledge into a larger unified body—a science. Thus, Kant thinks of reason as the basis of scientific knowledge.

Now, Kant holds knowledge that has been situated within a science has been derived from first principles. For example, we do this in geometry when carrying out its proofs or in the metaphysics of extended matter when we see how the laws of motion govern all occurrences. A science is like an organism that unifies all of its organs into a single whole. The idea of the science is 'the rational concept of the form of the whole, insofar as through this the domain of the manifold as well as the position of the parts with respect to each other is determined *a priori*' (A832/B860). 'It can, to be sure, grow internally (*per intus susceptionem* [from an internal cause]) but not externally (*per appositionem* [by juxtaposition]), like an animal body, whose growth does not add a limb but rather makes each limb stronger and fitter for its end without any alteration of proportion' (A833/B861). Because scientific

[15] There has been a lot of recent work on the distinction between *Erkenntnis* and *Wissen* (e.g., Smit 2009, Chignell 2014, Tolley 2020, Watkins and Willaschek 2020). In these discussions, my own position is closest to Schafer's (2023: ch. 2).

knowledge grows through such apodictic derivation from first principles, and all of its parts fit together into this kind of mutually interdependent whole, Kant holds that it has certainty (*Gewißheit*) and must be true (A822/B850).

Because Kant holds that experience of a causal connection (c_{ii}) involves cognition of a necessity, we saw above why, in the wake of Hume's challenge, it has seemed to Kant's interpreters that this cognition of necessity requires cognition of why this necessity obtains. We can find further support for this position by noting that in many cases cognition of necessity involves knowledge of what grounds it.[16] For example, suppose you cognize that the angles of a given triangle necessarily add up to two right angles. Suppose you cognize this because you cognize the general law that for any triangle, its angles will add up to two right angles (A716/B744). And suppose you cognize this because you cognize its proof, which depends solely on the definitions, axioms, postulates, and theorems of geometry. Here you cognize the given case through cognizing the corresponding law, and you cognize this law because you cognize what grounds the law—its proof. Finally, because you see how this mathematical fact follows from the first principles of geometry, you do not merely cognize it, but know it scientifically, because you understand why the fact obtains. In general, on Kant's view, cognition of necessary mathematical facts is like this. It is scientific knowledge because you cognize these facts through cognizing the law they fall under, and you have scientific knowledge of this law because you grasp its proof or demonstration, all of which is why you know the fact to be necessary.[17]

Returning to cognition (*Erkenntnis*), I think Kant notices that not all cognition of necessity needs to include a proof of why that necessity obtains. This is because some of our cognition of necessities—specifically our experiences of causal connections (c_{ii})—comes in experience. Experience is, in the first instance, common cognition, not scientific knowledge. Such cognition need not be derived apodictically from first principles or be certain, but can be a mere aggregate that lacks systematicity (*JL*, 9:72) and is fallible. This is just what we should expect of experience. After all, we cognize many things in our everyday experiences that we cannot explain, and much of our cognition we unreflectingly accept, although we might come to realize that things are not as we had judged them to be in this experience, once we have further information.

Thus, if my suggestion is correct, because an experience of a causal connection (c_{ii}) can be mere cognition, even though in it we cognize that a necessary connection obtains, then to have such

[16] In §4 I address further textual reasons for thinking that experience of a causal connection (c_{ii}) involves cognition of a corresponding particular causal law.
[17] For Kant's discussion see, especially, A734/B762–A737/B765.

scientifically undeveloped cognition we need not cognize the particular causal law (c_{iii}) that would explain why there is this necessary connection. This, of course, is not to deny that Kant may think that experience requires the possibility of working to perfect our empirical cognition scientifically (A651/B679).[18] It is only to point out that the constitution of experience through the principles of the understanding and the perfection of cognition through the principles of reason, according to Kant, are distinct, and thus treated in separate parts of metaphysics.

§2.3 – The faulty inductive presumption

Relatedly, there is another commonplace in discussions of Kant's account of cognition of particular causal necessities in experience (c_{ii}) that I think is mistaken: that experience of a causal connection (c_{ii}) requires some kind of inductive basis—some kind of repeated past encounters with the perception of first the cause, then the effect, first the cause then the effect. I submit that careful consideration of the relevant passages that are almost always[19] taken as decisive evidence for this (e.g., *Prol*, 4:312, 4:301n, 4:305n, A91/B124, B3–B4, A195–196/B240–B241) reveals that although Kant thinks that prior to having experiences of causal connections (c_{ii}) we may *often* have had past encounters with an appropriate constant conjunction, he does not claim that past encounters are *required*. Indeed, if he did, this would be quite surprising, since not even Hume maintains this without reservation (*T*, 1.3.8.14, SBN 104–105; *EHU*, 4.23, SBN 39).

The following text is exemplary. Immediately prior to it, Kant claims that to experience an occurrence (c_i), we must presuppose that something else precedes it from which it follows in accord with a universally applicable rule. Then he claims that:

> To be sure, it seems as if this contradicts everything that has always been said about the course of the use of our understanding, according to which it is only through the perception and comparison of sequences of many occurrences on preceding appearances that we are led to discover a rule, in accordance with which certain occurrences always follow certain appearances, and are thereby first prompted to form the concept of cause. On such a footing this concept would be merely empirical, and the rule that it supplies, that everything that happens has a cause, would be just as contingent as the experience itself: its universality and necessity would then be merely feigned, and would have no true universal validity, since they would not be grounded *a priori* but only on induction. (A195–196/B240–B241)

Here Kant is denying that 'it is only through' induction that we establish causal connections, since this cognition must have an *a priori* source. He is not also claiming or implying that we must perceive and

[18] Indeed, for all I say, Kant might endorse the kind of strong indirect dependence of experience on reason for which Hamid (2022: esp. 646–647) argues.
[19] The only exception I know of is Paton (1936: ch. 45, §4, 268–271).

compare many sequences of occurrences on preceding appearances, before we are led to discover a particular causal rule.[20] For all Kant says here, this might be required, but it also might not be.

We have, then, the following contours of an account that remains to be filled in: In its most scientifically undeveloped form, our experiences of causal connections (c_{ii}) would be cognition of the fact in front of us—e.g., that the sun warms the stone—not cognition of how to deduce this fact syllogistically from causal laws. On it such experience (c_{ii}) consists, like all experience, in an immediate judgment, brought about through the understanding working on the material of perception and will not require a syllogism of reason.

A reading with this shape will fit better than injection accounts with Kant's discussions of the relation between the understanding and reason and their respective principles (see, for example, A156–8/B195–7, A302/B359, A310–311/B367, A642–51/B670–9, A663–6/B690–4, A671/B699, A680/B708). This is because Kant holds that the understanding and its principles constitutively ground experience, while reason and its principles are only indirectly related to experience through the way in which it regulates 'the systematic unity of all use of the understanding' (A665/B693).

If this sketch can be filled in, then it will be clear why Hume overlooked the possibility of this account of the cognition of necessity in an experience of a causal connection (c_{ii}). The way in which Hume thought cognition of a causal connection might be vindicated is through an intuitive or demonstrative relation of ideas, or through probable reasoning (*T*, 1.3.3, SBN 78–82, 1.3.6, SBN 88–94; *EHU* 4). He held that past experience alone would not be enough because it concerns the past and cannot justify a belief about the present, without supplementation by a principle like 'the future resembles the past' (*T*, 1.3.6–7, SBN 89–90; *EHU* 4.19, SBN 35–6). Now, Hume's intuitive relations of ideas are similar to Kant's immediate analytic judgments, and Hume's demonstrative relations of ideas are similar to Kant's syllogisms, while probable reasoning is similar to a syllogism that takes past experience and a principle like 'the future resembles the past' as premises. Thus, according to Kant, Hume does not see the possibility of accounting for our cognition of the necessary features of experience—be they e.g., mathematical, causal, or mechanical—in the way that Kant proposes (*Prol*, 4:272–3, 4:260, 4:257). For, on Kant's account these features are grounded in the fundamental principles of the understanding, and these principles are not grounded in past experience, but lie at the ground of experience itself (e.g., A196/B241), make it possible, and are not valid beyond it. As a

[20] In contrast with how this passage is usually read. See, e.g., Beck 1978: 126; Van Cleve 1999: 289n31; Friedman 1992b: 172–173; Longuenesse 1998: 370n.

result, as Kant sees, Hume does not have in view the kind of cognition of necessity that Kant claims for the synthetic *a priori* principles of the understanding (*Prol*, 4:313).

§3 – The Prolegomena account

Turning to the reconstruction of Kant's account of the constitution of experiences of causal connections (c_{ii}) and beginning with the *Prolegomena*, in §18 to §22 Kant develops his distinction between judgments of experience and judgements of perception. On the interpretation I will develop, all experience is constituted in a judgment of experience. In this section I will (§3.1) introduce these judgments, then (§3.2) I will introduce the two kinds of experience most relevant to our topic—of occurrences (c_i) and causal connections (c_{ii})—and finally (§3.3), I examine the role of the categories of effect and cause in the constitution of these.

§3.1 – Perception and Experience

For Kant, experience (*Erfahrung*) is cognition of an object of experience. Objects of experience are objects cognizable through the categories. Perception, which is closely related to empirical intuition, is the material for such experience. Experience is paradigmatic cognition because in the primary sense, a cognition is the representation of an object as a substance or a feature of such objects. In addition to experience, mathematical or metaphysical judgments are also cognition in this sense. These indicate necessary features of such objects. Along with experience, they indicate features of objects that all similarly situated knowers should be able to cognize; cognition in this sense purports to be valid of the object, and thus for all subjects (*Prol*, 4:298). In addition to this primary sense, Kant will also use 'cognition' in a secondary sense to mean a representation that is a component of cognition in the primary sense (A320/B376–77). Such cognitions include both concepts and intuitions. To make the discussion here easier to track, when I use the term 'cognition' I will use it only in the primary sense and when I speak of 'experience,' I always mean it in Kant's cognitively robust sense.

Turning to perceptions, to get a sense of what perceptions are, suppose you are flying in an airplane. Lazily looking down, you see an unidentified swath of blue. It will have a shape, a certain order to the sensation in it. This perception will also have a certain intensity, a certain force with which its sensation hits you (e.g., its brightness). Because this is a mere perception, however, you have not yet recognized that what you are perceiving is a river. It is not yet cognition of an object in nature. Cognition of such objects happens only once perceptions are connected to other perceptions in experience, in this case when you recognize the swath of blue as a river.

Kant maintains both perception and experience are constituted with an empirical judgment—what he calls judgments of perception or experience, respectively—which connect empirical intuitions in consciousness (*Prol*, 4:300, 4:304–305). Judgments of perception connect intuitions 'in a consciousness of my state,' while judgments of experience 'connect them in a consciousness in general' (*Prol*, 4:300). Although judgments of perception merely apprehend an inner state, judgments of experience relate perceptions to an object in the world, by relating perceptions to one another in a consciousness that could be had by any judging subject. In such a case I take it not only that this perception will be this way for me, but that it would also be this way for any similarly situated cognizing being. This is because I take it that the object would bring the perception about in the same way in us all. In this sense, Kant will claim that in a judgment of experience I take the connection or unity among my perceptions to be 'universally valid' or 'necessary' for everyone (see, e.g., *Prol,* 4:301).

Any judgment of experience will be founded on certain actual perceptions—certain actually apprehended empirical intuitions in inner sense. In our example, when you judge 'River!' you take your actual perceptions to be of a substance, the river, which has the accidents of being blue and having such and such a shape. Here there is a commitment to the features of the intuition that will be of the substance and of the accident, respectively. The judgment connects perceptions in this way through a category, like that of substance or cause (*Prol*, 4:300). This is because the categories determine the mode in which a perception can serve for judging in general. That is, they provide the rules that will govern my perceptions, if they are of their object, that are universally valid for all judging subjects. In the next two subsections we will see how this works for experience of an occurrence (c_i) and of a causal connection (c_{ii}), as well as for the corresponding concepts of effect and cause.

§3.2 – Experiences of occurrences (c_i) and causal connections (c_{ii})

To elaborate our account of the constitution of experience of both occurrences (c_i) and causal connections (c_{ii}), it will help to draw from Kant's discussion of the Second Analogy, where he contrasts experiences of occurrences (c_i) with experiences of simultaneity (A192/B237–A193/B238). Take an occurrence, like a ship floating downstream, and something coexisting, like a door and a window on the same house. In seeing either, there is a succession of perceptions flowing through my consciousness. I distinguish the cases as perceptions of an occurrence and as perceptions of something coexisting, however, when I connect the perceptions together into experience and commit to—or determine—my perceptions as either being irreversible or reversible. On the one hand this is when I'm committed to having had to perceive the ship upstream before perceiving it downstream. Or, on

the other, when I'm committed to having been able to have had my perceptions of the door and the window in the reverse order. Such a connection of my perceptions, as either irreversible or reversible, is what Kant claims constitute one or the other kind of experience.

Experiences of succession (c_i) and of simultaneity, like all experiences, are constituted in judgements of experience. In our examples, the judgment of experience will be 'the ship is floating down stream' or 'the stone is becoming warm'. The judgments are about the ship or the stone. Nonetheless, they combine or determine the perceptions. And this combination or determination is apparent in my commitment to the order irreversibility of my perceptions of the ship or the stone. Furthermore, this experience of an occurrence or succession (c_i) is cognition of an alteration in the state of a substance—the ship's floating down stream or the stone's becoming warm. This is an effect: the changed state in the ship or stone. To have this experience, however, we need not cognize the cause or the agent that brought this change about. That is, I need not know that it is the river that is carrying the ship downstream or that it is the sun that is warming the stone. Still, in each case I cognize the change of state in the ship or the stone, and so in each case these substances are the patients, acted on by some agent. The judgement of experience will be this cognition and experience of an occurrence or succession (c_i) is constituted by a judgment of experience of the form: '*P* changes from *a* to *b*'.

Turning to experiences of causal connections (c_{ii}), these involve experience of an occurrence (c_i), which is an effect, together with the cause that brought this occurrence about. In this way, an experience of an occurrence (c_i) is an incomplete version of an experience of a causal connection (c_{ii}). In experiences of causal connections (c_{ii}), not only do we cognize what happens (the effect), but we also cognize what necessitated the change. For example, such experience would not only be of the stone becoming warm, or the ship going down stream, but also of the carrying by the river or of the warming by the sun. In experience of a causal connection (c_{ii}), then, we have experience of an agent changing the state of a patient. For example, in experiencing the sun warming the stone we experience that the sun shines, and through this action, it changes the state of the stone from cooler to warmer. Or in the experience of the river and ship, we experience the river acting on the ship and moving it from upstream to downstream.

Experience of a causal connection (c_{ii}) is constituted in a judgment of the form, '*A* acts on *P*, changing *P* from *a* to *b*'. For this reason, the judgment constitutive of experience of a causal connection (c_{ii}) builds on the judgment constitutive of experience of an occurrence (c_i). It takes the judgment of the form, '*P* changes from *a* to *b*,' and adds to it the agent *A*, and the action of *A* that brings the change about. Similarly, the connections among perceptions in experience of a causal connection (c_{ii})

build on the connections among perceptions in experience of an occurrence (c_i). An experience of succession (c_i) involves a judgment about the objects. That judgment constituted the experience in question, insofar as it brought about a connection between the perceptions involved: they could not have been had in the reverse order. Experience of a causal connection (c_{ii}) is analogous. In it (c_{ii}) we represent not only an occurrence, a change, but also the agent that is acting throughout the change to bring it about. So, for example, we judge that the sun is warming the stone. This is the experience. It connects to our perceptions of first the cool, then the warmth, the present experience of the shining sun. With this judgment we are committed to the possible experience of the shining sun, as the agent producing the warming, so long as this warmth in the stone is being brought about. In this way, the connections among perceptions in experience of the sun's warming the stone (c_{ii}) build on the connections in experience of the stone's being warmed (c_i).

I take most of the claims of this sub-section to be widely agreed upon. The most novel claim, which should still not be controversial, is that if we can have an experience of a causal connection (c_{ii}), in it we are committed to the possible experience of the cause, as agent, so long as the effect is being brought about. This should not be controversial because at the end of the Second Analogy Kant briefly turns to examples of full-blown causal connections like of a stove heating a room or a ball indenting a pillow. There he notes that the moment in which the effect first arises is actually always simultaneous with the causality of the cause, and that the temporal sequence of the effect (e.g., the room's going from cool to warm) 'is occasioned only by the fact that the cause cannot achieve its entire effect in one instant. But in the instant in which the effect arises, it is always simultaneous with the causality of its cause, since if the cause had ceased to be an instant before then the effect would have never arisen' (A203/B248). For example, if the ball had popped out of existence right before it made contact with the pillow, then the dent in the pillow would have never been made. Kant goes on to argue that all alteration—like of the pillow, the room, or the stone—is possible only through the continuous action of the cause, 'which manifests its causality in the entire time during which the alteration proceeds' (A208/B253). Thus, the cause is acting on the patient throughout the entire time in which the effect is being brought about. Now, in these discussions Kant's focus is on the causal connection itself, not our cognition of it. Nonetheless, because experience is constituted through modal connections among perceptions, and the cause must act throughout the alteration, we can conclude that Kant would hold that the experience of a causal connection (c_{ii}) involves commitment to the possible perception of the cause, so long as its effect is being brought about.

§3.3 – The roles of the concepts of effect and cause in the constitution of experience (c_i & c_{ii})

Turning now to the role of the categories of effect and cause in the constitution of experience, according to Kant, judgments of both perception and experience are synthetic. There is an intuition mediating the connection between their concepts. When the intuition involved in a judgment of perception is subsumed under one of the categories, it is related to an object (*Prol,* 4:300). This transforms the subjective judgment of perception into an objective one of experience (*Prol,* 4:300). Kant's main examples in the discussion of judgments of experience are 'air is elastic' and 'the sun warms the stone'. In each case, there is a sensation of the air or the elasticity, or of the sun and the warming (*Prol,* 4:299). At first these judgments are only judgments of perception that express a relation of these sensations to the same subject—me. These judgments are transformed into judgments of experience, however, through the subsumption of the mediating intuition under the category of cause (*Prol,* 4:300–301). In this way, I determine my perception, and am committed to its being governed by a rule, dictated by the category of cause.

Developing this, we can isolate two moments in the transformation of mere perceptions into experience of a causal connection (c_{ii}). First, there is the experience of the stone's becoming warm—the occurrence of the change of state in the affected substance (c_i). We just saw that here the material is first the perception of no warmth, then later the perception of warmth, and that these perceptions are connected together in a judgment of the form '*P* changes from *a* to *b*'. The way that this judgment comes about is through subsuming my perceptions of the cold and the warmth under the *a priori* concept of effect. This determines these perceptions, connecting them together, which consists in my commitment to their order-irreversibility. I thereby take them to be representations of an objective occurrence—of the change of state in the stone. It is the *a priori* concept of effect that dictates the general rule: when successive perceptions are order-irreversible, they are perceptions of things that are at successive moments in time (see, A198/B243). This general rule is independent of whatever the particular perceptions happen to be. In this way, it is the *a priori* concept of effect that provides the form connecting the material of perceptions together into the experience in question.

Second, there is the full experience of the sun's warming the stone—the causal connection (c_{ii}). We just saw that its material is the perception of the stone's becoming warm and the sun's shining, and that these perceptions are connected together in a judgment of the form '*A* acts on *P*, changing *P* from *a* to *b*'. Now, in addition to subsuming the perception of the warmth under the concept of effect, the way that this judgment comes about is by subsuming my perception of the shining sun under the *a priori* concept of cause. This determines the perceptions, connecting them together, which

consists in my commitment to the perceivability of the shining sun throughout the warming of the stone. Although Kant isn't as explicit here about the general rule dictated by the *a priori* concept of cause, it will be something like: when I experience an occurrence and I have a present perception of something else such that if it ceased to be possible then the occurrence would also cease, then this perception is of the cause bringing the occurrence about.[21] This general rule is independent of whatever the particular perceptions happen to be. And in this case too, it is the *a priori* concepts of effect and especially cause that provide the form connecting the material of perceptions together into the experience.

On my account, then, the categories of effect and cause will be at work in judgments of experience connecting perceptions together into experiences of occurrences (c_i) or causal connections (c_{ii}). At each moment there is empirical material, consisting in present perceptions and an *a priori* rule that stems from the categories. This *a priori* rule dictates how the empirical material will be connected together into experience through a judgment about the fact in question. These rules are *a priori*, both because they obtain independently of any particular given perceptions and because they are prior to any experience, themselves making this experience possible. Thus, on my reading the form of the experience is contributed solely by the categories of effect and cause, through the *a priori* rules.

This reading is borne out in a climactic footnote:

> If I say: Experience teaches me something, every time I mean only the perception that is in it—e.g., that upon illumination of the stone by the sun, warmth follows every time—and hence the proposition from experience is, so far, always contingent. That this warming follows necessarily from illumination by the sun is indeed contained in the judgment of experience (in virtue of the concept of cause), but I do not learn it from experience; rather, conversely, experience is first generated through this addition of a concept of the understanding (of cause) to the perception. Concerning how the perception may come by this addition, the *Critique* must be consulted, in the section on transcendental judgment, pp. 137ff. (*Prol*, 4:305n)

Here Kant affirms that in the experience of a particular causal connection (c_{ii}) there is a perceptual and an *a priori* element. The perceptual element is contingent. It is the *a priori* element that stems from the concept of cause, which furnishes strict universality or necessity. And 'experience is first generated through this addition of' the concept of cause 'to the perception'.

§4 – The first *Critique* & cognition of particular causal laws

[21] NB: this rule is grounded in the concept of cause; it is not an explanation of it. Consider the objection: 'what if I perceived a necessary secondary effect of the cause, such that if it ceased to be possible, then the occurrence would also cease? The secondary effect fits the rule. Yet it is not the cause.' This is confused. It treats the rule as a criterion for sorting causes from non-causes. It is not. Rather, the "if it ceased to be possible" in the rule carries the connotation of a causal connection; it excludes the secondary effect because this effect is not the cause.

At the end of the footnote Kant points us to the *Critique of Pure Reason*. In the *Critique*, however, interpreters have found an account that seems quite different than the one we just examined, because they have thought that on it the addition of the cognition of necessity comes not through the category, so much as through cognition of a corresponding particular causal law (c_{iii}). This account has been developed furthest by Béatrice Longuenesse (2006). In §4.1 I will present her interpretation. In the following subsection (§4.2), I will present further apparent support for her reading from the Postulates of Empirical Thinking, as well as clarify how I understand Kant's elucidation of the third postulate as clarifying how the category of necessity contributes the cognition of necessity to our experience of occurrences (c_i) and causal connections (c_{ii}). I then (§4.3) argue that Kant, in the *Critique,* should not be read as claiming that the cognition of a particular causal connection in experience (c_{ii}) is grounded in cognition of a corresponding particular causal law (c_{iii}), but that such experience will merely accord with a particular causal law. Finally, in §4.4 I turn to the justification of experiences of causal connections (c_{ii}) and how Kant sees the *a priori* syntheses of the imagination that correspond to the categories of effect and cause as at work in the relation of intuitions, if they are to be intuitions of existing objects in nature.

§4.1 – Longuenesse's interpretation

In the Second Analogy, the first edition statement of the general causal principle is 'Everything that happens (begins to be) presupposes something which it follows in accordance with a rule' (A189). In Kant's defense of this principle the relevant 'rule' for any given thing that happens will be an appropriate particular causal law. Now, although the general causal principle states that everything that happens, or occurs, is governed by a particular causal law, it does not state that we must cognize that law (c_{iii}) in order to experience the occurrence (c_i). When we experience an occurrence (c_i), Kant is claiming we are committed to there being *some such* particular law governing it, but he is not claiming we need to cognize the law itself.

As Longuenesse (2005: 166; 1998: 370) argues, whenever we experience an occurrence (c_i), Kant thinks we are committed to the possible completion of a schema like the following. For our experience of the stone's becoming warm: (1') whenever a stone is subjected to conditions XYZ, it becomes warm (major); (2') the stone has been subjected to conditions XYZ (minor); (3') therefore, XYZ causes the stone to become warm (i.e. 'XYZ warms the stone'). But when we experience the stone's being warmed, we need not cognize what conditions should go in for XYZ.

Now if we are committed to an incomplete syllogism like this whenever we have experience of an occurrence (c_i), this suggests that we are committed to a complete syllogism when we experience a causal connection (c_{ii}). After all, in this experience we cognize what brought the change about. This is Longuenesse's view. On it, the judgment of experience 'the sun warms the stone' has the meaning of the following syllogism: (1) 'if the sun shines on the stone, it will cause the stone to become warm' (major); (2) 'the sun shines on the stone' (minor); (3) Therefore, 'the sun causes the stone to become warm' (i.e. 'the sun warms the stone') (1998: 178n25; 2005: 154–156).

In support of her view, Longuenesse appeals to Kant's consistent claims about the connection between the concept of cause and the hypothetical form of judgment. Here she is on solid footing; in his discussions of causal cognition, Kant often refers to this form of judgment as 'inferential' (A112; A228/B280). This can seem mysterious: where is the inference, or even the hypothetical connection, in the judgment 'the sun warms the stone'? Although the judgment itself isn't hypothetical in form, in it we cognize an agent (the sun) acting on a patient (the stone), bringing about a change of state in it. The judgement recognizes an antecedent (or condition) and a consequence (or conditioned), because the cause (e.g., the shining sun) is the condition of the effect (e.g., the warmth). So although the logical form of the judgement is not inferential, its content carries an implicit inferential structure, because this includes that the cause brings about the effect and that we could infer from the existence of the one to the other. Now, what licenses this implicit inference is not the antecedent or consequence themselves, but the rule that connects them—the relevant particular causal law. Thus, as Longuenesse argues, merely because of its inferential content, any experience of a causal connection (c_{ii}) involves commitment to a relevant particular causal law and corresponding causal syllogism.

As I have presented it so far, I do not take issue with Longuenesse's reading. The problem with it comes with her search for how we move from a perception of the stone's becoming warm in the presence of the shining sun to the experience of the sun's warming the stone. To make this move Longuenesse argues that we have to presuppose the particular causal law (1), and she maintains that this presupposition happens on the basis of regular repeated past perceptions of the conjoined cause and effect, as well as the presupposition of unified objective time that is grounded in necessary and unchanging particular laws (2005: 172–177; 1998: 363–370). Specifically, she first searches for how we can cognize (c_{iii}) (à la Friedman), or act as though we cognize (à la Buchdahl), the necessity of the particular causal law. Second, she takes either the cognition of, or the presupposition of, the necessity of this law to transfer to the experience (c_{ii}) (Friedman) or purported experience (Buchdahl). Thus, on her interpretation Kant holds that we look first for either an inductive or deductive justification of the

law, then this justifies the cognition of the causal connection. This is an instance of the two-step injection framework (Longuenesse, 2005: 154–157, 171, 175). *Pace* this, although experience of a causal connection (c_{ii}) involves commitment to a corresponding law, we will see that there is not compelling textual evidence for reading Kant as taking this experience to require that we cognize (c_{iii}), or act as though we cognize, the particular causal law or its necessity.

§4.2 – The Postulates of Empirical Thinking and cognition of necessity

Although she does not draw attention to it, Longuenesse's view can seem to find support in Kant's discussion of the three postulates of empirical thinking (A218/B266ff). This discussion—especially of the third—also requires our attention because it is partially through the principles of modality that we cognize necessity in experience of occurrences (c_i) and causal connections (c_{ii}).[22]

Longuenesse's view that experience of causal connections (c_{ii}) requires that we cognize (c_{iii}), or act as though we cognize, the necessity of the particular causal law seems to find support in the Postulates because in Kant's discussion of each, cognition of particular causal laws can seem to play a crucial role. The cognition of possibility requires not only that I judge an object to be in accordance with the non-modal principles of the understanding, but also that the object is 'grounded in experience and its known (*bekannte*) laws' (A220/B267, A222–223/B269–270). Cognition of actuality requires either perception of the object or 'connection with some actual perception in accordance with the analogies of experience' (A225/B272) or 'empirical laws' (A226/B274). Finally, necessity concerns the necessity in existence 'of effects from given causes in accordance with [*nach*] laws of causality,' where these effects are not substances but their 'states, which are given in perception, in accordance with [*nach*] empirical laws of causality' (A227/B279–B280). In each case Kant appeals to the laws of experience, and these seem to be empirical particular causal laws like (1).

Kant, however, usually first stresses that the cognition of possibility, actuality, and necessity will be in accord with the principles of the understanding, which are the general laws of possible experience, along with given perceptions. As the most important example, take Kant's discussion of the third postulate (A226/B279ff). As Longuenesse argues, when I experience an occurrence (c_i) I am committed to the necessity of some cause of the occurrence, and when I experience a causal connection (c_{ii}) I cognize the cause's necessitating an effect. Kant calls this kind of necessity a 'material

[22] Paton (1936: Bk. 11, 333–371, esp. ch. 50, §2, 362–364) and Abaci (2019: ch. 7) offer more complete discussions of the Postulates of Empirical Thinking than I will here. Other interpreters who take the Postulates of Empirical Thinking to be of fundamental importance for Kant's account of our cognition of necessity in cognition of causal connections include Kannisto (2017), Friedman (1992b, 2012, 2013, 2014), and those influenced by Friedman (e.g., Laywine 1998).

necessity in existence' (A226/B279). This kind of necessity, he thinks, can be cognized 'only comparatively *a priori* relative to another already given existence' and 'always only from the connection with that which is perceived, in accordance [*nach*] with general laws of experience' (A226–227/B279). These general laws of experience include the general causal principle of the Second Analogy 'that everything that happens is determined *a priori* through its cause' (A227/B280). He claims that the 'criterion of necessity' lies in this principle and that 'we cognize only the necessity of **effects** in nature, the causes of which are given to us' (A227/B280). He concludes from this that such necessity concerns only the relations of appearances, in accordance with the general causal principle and 'the possibility grounded upon it of inferring *a priori* from some given existence (a cause) to another existence (the effect)' (A228/B280). In this sense, although these inferences will be in accord with empirical laws of causality, like (1), Kant is also here stressing the priority of the general laws of possible experience over those laws. We will examine this priority in the next subsection (§4.3).

In discussing the third postulate, Kant also clarifies the source of our cognition of necessity in experience of occurrences (c_i) and causal connections (c_{ii}) and the relationship between the categories of relation and modality (especially causality and necessity). Kant seems to hold that the general causal principle establishes that 'everything that happens is hypothetically necessary' and that this 'is a principle that subjects alteration in the world to a law, i.e., a rule of necessary existence' (A228/B281). On this basis he then points out two propositions that will both be *a priori* laws of nature: '"Nothing happens through a mere accident" (*in mundo non datur casus* [In the world there is no chance]),' and '"No necessity in nature is blind, but is rather conditioned, consequently comprehensible [*verständliche*] necessity" (*non datur fatum*)[There is no fate]' (A228/B280–281).[23] Although Kant thinks these follow from the hypothetical necessity of everything in nature, he also goes on to point out that 'the first is a consequence of the general principle of causality' and 'the second belongs to the principles of modality' (A228/B281). Thus, the two propositions are closely linked through the hypothetical necessity of everything in nature (and the principles in which they originate seem to be closely linked as well). In ruling out chance and fate, respectively, the propositions seem to be ruling out related sorts of material causal and explanatory gaps. This is because something happening by chance would lack a cause and something happening by fate would be incomprehensible. As a result, in these two propositions Kant

[23] Kannisto (2017) also draws attention to the close link between these propositions and their importance for Kant's account of causal cognition, and for a further recent discussion of the 'no chance' and 'no fate' principles, see Watkins (2019: ch. 9, esp. §9.3.1). Abaci's (2019: 187) brief discussion suggests that he would agree with my construal of the relation between these principles, as does, roughly, Leech's (2022: 76–80).

seems to be pointing to an objective and a subjective consequence of the very same hypothetical necessity of everything in nature.

This is also what a broader look at the discussion suggests. After pointing out that the no fate principle belongs to the principles of modality, Kant concludes that they add 'to the causal determination the concept of necessity' (A228/B281). What, however, is this concept of necessity? At the outset and closing of his discussion of the Postulates, Kant stresses that the modal predicates do not 'add something to the representation of the object,' but add to the concept of a thing only 'the cognitive power whence [this concept] arises and has its seat' (A233–235/B286–B287, A219/B266).[24] In the case of necessity, this concept of the thing will be 'determined through the connection of perceptions in accordance with concepts' (A234/B286). To see what Kant has in mind, consider the concept of an occurrence, say <being warmed>. The addition of the concept of necessity to it does not alter its content or meaning. Rather, it indicates only that this occurrence is materially necessary; this involves not only according with the formal possibility of experience—which is given through the non-modal principles of the understanding—and being actually perceivable, but also being brought about necessarily through a cause—say, the shining sun. When we experience an occurrence (c_i) or causal connection (c_{ii}), although the objective content of the judgment of experience is grounded in the concepts of effect and cause as Kant claimed in the *Prolegomena* (4:305n), the concept of necessity that the third postulate adds indicates the cognitive power in which the representation of the occurrence or causal connection has its seat, which will be both the understanding, through its principles, and sensibility, through perception.

§4.3 – Reconciling the *Prolegomena* and first *Critique* accounts

In §3.3 we saw that according to the *Prolegomena*, perceptions are the material for experiences of causal connections (c_{ii}), while the category of cause provides their form—the *a priori* rule governing the modal connection among the perceptions in the experience. In §4.1, following Longuenesse, we saw that in the *Critique* it looked like the way perception came by this addition of necessity was not through the category so much as through either the cognition, or presupposition, of a corresponding particular causal law and in §4.2 we saw that this impression might be bolstered by the Postulates of Empirical Thinking. As a result, the accounts of the *Prolegomena* and *Critique* seem to be in tension.

[24] See Blecher (2018), Abaci (2019: ch. 7), and Leech (2022) for recent discussions of this claim.

I think we can see, however, that this tension is merely apparent, if we recognize that the *a priori* rule of connection between perceptions dictated by the concept of cause of §3.3, once applied to these perceptions in this experience, *just is* the rule of connection that is dictated by the corresponding particular causal law. With this recognition we will see how it can be that experience of a causal connection (c_{ii}) will be in accord with a particular causal law (e.g., (1) of §4.1), and can involve commitment to this law, but not be grounded in cognition of this law (c_{iii}). In this way, experience of a causal connection (c_{ii}) will be constitutively grounded in the concepts and principles of the understanding, and such experience will provide inductive evidence for corresponding particular causal laws, but reason will not be directly involved in the constitution of this experience.

Spelling this out, although Kant's reference to the *Critique* in the climactic footnote of the *Prolegomena* is to the beginning of the Schematism chapter, he references the entire section on 'transcendental judgment,' and here we should take him at his word as having in mind the entire Analytic of Principles (*Prol*, 4:305n). Nonetheless, the Schematism, with its description of the rules governing the application of the categories, is the place to begin. According to Kant, a cause is something such that when it exists, it allows the inference to the existence of something else (A243/B301). In the Schematism, Kant argues that applied to objects we can experience—things in space and time—the concept of cause indicates those real things which, when they are posited, something else always follows (A144/B183). We learn later that when we deploy this concept in a judgment of experience it will be through a concept of experience, like <being warmed> or <warming>. This is because these concepts are nothing but the concepts of effect and causality used in *concreto* (A567/B595; *KU*, 5:174). So, for example, when we experience the sun warming the stone, we cognize that the shining sun is a real thing upon which, when in the presence of the stone, the warmth will always follow. And we cognize this through the concept of experience, <warming>, which is the way the concept of cause is concretely deployed in this judgment.

This relationship between concrete concepts of experience and the categories is a clue to why experiences of occurrences (c_i) and causal connections (c_{ii}) will necessarily *accord with* incomplete and complete causal laws (e.g., (1′) and (1) of §4.1), although these experiences (c_i & c_{ii}) are not *grounded in cognition* of these (c_{iii}). As the concepts of effect and cause are deployed in experience through the concrete concepts of <being warmed> and <warming>, Kant holds a similar relationship obtains between the *a priori* rules of connection among perceptions dictated by the concepts of effect and cause, and the rules of connection among these perceptions in this experience of the stone's being warmed or the sun's warming the stone. Just as the *a priori* concepts are made concrete in this case

through the concepts of experience, the *a priori* rules of connection among perceptions in the constitution of experience are made concrete in this case as the rules of connection among these perceptions, as dictated by the incomplete and complete particular causal laws (e.g., (1') and (1)).

For *occurrences*, when I judge that the stone is becoming warm, I am committed (§4.1) to this warmth being an effect, to the existence of some unknown cause, as well as to some unknown particular causal law governing this connection. Further, remember (§3.3), the general *a priori* rule for the connection of perceptions into experience of an occurrence (c_i) is: when successive perceptions are order-irreversible, they are perceptions of things that are at successive moments in time (compare A198/B243). This rule, made concrete with my perceptions of the warming stone, will be: when perceptions of first the cool, then the warmth are order-irreversible, they are of the warming stone. My judgement that the stone is becoming warm determines my perceptions 'in accordance with' (*nach*) this rule (e.g., A193/B238, A198/B243). It commits me to this rule governing their order. This order, however, is the order among perceptions dictated by the incomplete causal law (1'). Thus, my experience is 'in accordance with' (*nach*) it (1') (A194/B239) and, along with Longuenesse, we can say it (1') is even contained in this experience. Still, this containment does not entail that I am conscious of, or cognize, this incomplete law.

For *causal connections*, when I judge that the sun warms the stone, I am committed to (§4.1) the shining sun as cause, to the warmth as effect, and to 'if the sun shines on the stone, it will cause the stone to become warm' as the particular causal law governing the connection between the two. This law, however, just is the rule for applying the schematized concept of cause to this particular case, since it says that the shining sun is a real thing upon which, when in the presence of the stone, the warming will always follow. Further, remember (§3.3), the *a priori* rule for the connection of perceptions into experience of a causal connection (c_{ii}) is: when I experience an occurrence and I have a present perception of something else such that if it ceased to be possible then the occurrence would also cease, then this perception is of the cause bringing the occurrence about (compare A198/B243–B244). This rule, made concrete with my perceptions of the sun and the stone, will be: when I experience the stone's becoming warm and I have a perception of the shining sun such that if it ceased to be possible then the stone would cease becoming warm, then this perception of the sun is of the cause of the warming. My judgement, 'the sun warms the stone,' determines my perceptions in accordance with (*nach*) this rule. It commits me to this rule governing their order. This order, however, is the order among perceptions dictated by the corresponding causal law (1). Thus, my experience is 'in accordance with' (*nach*) it (1) (A227/B279) and, along with Longuenesse, we can say it (1) is even

contained in this experience. Still, this containment does not entail that I am conscious of, or cognize, this law.

§4.4 – The epistemic standing of experience of a causal connection (c_{ii})

We have described in detail the role of the categories of effect, cause, and necessity in the constitution of experiences of occurrences (c_i) or causal connections (c_{ii}). We've seen that for Kant, in the first instance, the origin of such experience lies neither in associations of the imagination nor inferences of reason, but in immediate judgments of the understanding, where these judgments consist in the immediate application of the categories of effect and cause to given perceptions. If that is right, then what justifies this application? The injection framework theorist can appeal to inductively or deductively established particular causal laws, along with empirical regularities, and particular associative habits. In the least scientifically developed everyday cases that have been our focus, we cannot. So on the interpretation that we have been developing, what justifies our everyday experiences of causal connections (c_{ii}) like of the sun's warming the stone or cold air's freezing water?

A full answer would require a complete interpretation of the Transcendental Analytic, something obviously beyond our present remit, but here is a sketch. The categories rest on functions of synthesis of the imagination that are at work in the synthesis of representations in an intuition (A79/B105). Kant draws a distinction between the mathematical categories of quantity and quality and the dynamical categories of relation and modality (B110). He holds that the use of the synthesis of the mathematical categories pertains 'merely to the **intuition**,' while the use of the synthesis of the dynamical categories pertains 'to the existence of the appearance in general' (A160/B199).

With the mathematical categories, those of quantity constitutively apply to every intuition because these have a shape and are extensive magnitudes (A162/B202; *Prol*, 4:309), while those of quality apply to every empirical intuition because they involve sensation, which has an intensive magnitude (A165/B207; *Prol*, 4:309). Empirical intuitions have both an extensive and intensive magnitude, in turn, because of the *a priori* syntheses of representations in them. These correspond to the categories of quantity and quality, respectively, and so, roughly speaking, the application of these categories to empirical intuitions is justified by the way that their syntheses are at work, *a priori,* in intuitions.

The dynamical categories of relation, however, do not concern the constitution of empirical intuitions themselves, but regulate the relation of these intuitions, such that they can be intuitions of existing objects in nature (A176–181/B218–224; *Prol*, 4:310). Accordingly, the *a priori* syntheses of the

categories of relation are not at work in the constitution of intuitions, but in how these intuitions are related, such that they are intuitions of objects of experience. Since the rules governing this synthesis will not be at work in constituting intuitions themselves, when it comes to the necessity of causal connections, Kant agrees with Hume that we have no sensation, intuition, or perception of it (e.g., A137/B176; A91/B123–124) & (*T*, 1.3.2.12 SBN 77). Nor will any habitual association of intuitions be sufficient to justify the cognition of necessity that we have in our everyday experience of a causal connection (c_{ii}) (e.g., A90/B122–A92/B124, A201/B246). Nonetheless, the *a priori* syntheses corresponding to the categories of effect and cause will be at work in relating intuitions of objects in nature. In making the judgment of experience, 'the sun warms the stone,' I am committed to the modal order of my empirical intuitions. The empirical intuitions, as the material for this judgment, must allow for this modal determination. In so far as they are related to the objects—the sun, the stone, the warming—they will not allow, say, determination through the category of community. In this way, my intuitions or perceptions come forward successively in inner sense. I make a judgment that determines which perceptions I take to be possible or impossible. If my intuitions are of an object in nature, then there is a fact of the matter about which perceptions are possible or impossible. And my judgment will be true or false depending on whether my commitment matches the fact, with regards to the possible and impossible perceptions.

One element in justifying my judgment of experience, therefore, is which intuitions are in fact possible or impossible. Another element might be that if it turns out that the perceptions that I was committed to being possible (impossible) in my experience are in fact impossible (possible), and I recognize this, then I will take the experience to have been illusory, and I will reject the judgment constitutive of it. There is also my general capacity to make judgments of experience and to, for the most part, do this successfully. After all, these judgments are ubiquitous and while I may occasionally be mistaken (as when the train next to mine is pulling away, but I take my own train to be moving) this is the exception, not the rule—and it is an exception that I am liable to correct. For these reasons, although on my reading the justification for our least scientifically developed experiences of causal connections (c_{ii}) is not as (scientifically) robust as what other interpreters have expected, it would be a mistake to think these experiences lack justification.

§5 – Conclusion

I have presented an interpretation of Kant's account of our experiences of causal connections (c_{ii}) on which cognition of necessity is not injected into these experiences through cognition of

particular causal laws (c_{iii}), because they are not directly grounded in reason—either inductively or deductively. Rather, this experience (c_{ii}) is constituted merely through present perceptions and the categories. The categories ground the cognition of necessity, while the perceptions make it *this* experience and not another (*Prol*, 4:305). This contrasts with two-step injection views like Longuenesse's for which, in line with the point of §2.1, actual experience of causal connections (c_{ii}) is impossible, rare, or not proper cognition. These views are not positioned to account for how Kant could reply to Hume, if this requires Kant to account for the possibility that such experience (c_{ii}) is commonplace. In contrast, on the interpretation developed here, we have seen how such everyday cognition of causal necessities is possible.[25]

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References

Abaci, Uygar (2019) *Kant's Revolutionary Theory of Modality*. Oxford University Press.

[25] I believe this account is also well suited to explain Kant's remarks on why we have no insight into the necessity of particular causal laws (e.g., *KU*, 5:181–186), but this will have to wait for a future occasion.

Allison, Henry E (1994) 'Causality and causal laws in Kant: A critique of Michael Friedman', in P Parrini, ed., *Kant and Contemporary Epistemology*, vol. **54** of *The University of Western Ontario Series in Philosophy of Science*: 291 – 307. Springer.

Allison, Henry E (2001) *Kant's theory of taste: a reading of the Critique of Aesthetic Judgment*. Cambridge University Press.

Allison, Henry E (2004) *Kant's Transcendental Idealism, An Interpretation and Defense, Revised and Enlarged Edition*. Yale University Press.

Anderson, Lanier (2002) 'Kant on the apriority of causal laws', in M Heidelberger and F Stadler, eds., *History of Philosophy of Science. Vienna Circle Institute Yearbook*, vol. **9**: 67 – 80. Springer.

Beck, Lewis White (1978) 'A Prussian Hume and a Scottish Kant,' in *Essays on Kant and Hume*: 111 – 29. Yale University Press.

Bird, Graham (1962) *Kant's Theory of Knowledge: An Outline of One Central Argument in the 'Critique of Pure Reason.'* Routledge.

Bird, Graham (2006) *The Revolutionary Kant: A Commentary on the Critique of Pure Reason*. Chicago: Open Court.

Blecher, Ian (2018) 'Kant's principles of modality', *European Journal of Philosophy* **26**: 932–944. doi: 10.1111/ejop.12306.

Brittan, Gordon (1978) *Kant's Theory of Science*. Princeton University Press.

Buchdahl, Gerd (1969) *Metaphysics and the Philosophy of Science: the Classical Origins: Descartes to Kant*. Basil Blackwell.

Buchdahl, Gerd (1992) *Kant and the Dynamics of Reason: Essays on the Structure of Kant's Philosophy*. Basil Blackwell.

van Cleve, James (1984) 'Another volley at Kant's reply to Hume', in R Meerbote and W Harper, eds., *Kant on Causality, Freedom, and Objectivity*: 42 – 57. University of Minnesota Press.

van Cleve, James (1999) *Problems from Kant*. Oxford University Press.

Chignell, Andrew (2014) 'Modal Motivations for Noumenal Ignorance: Knowledge, Cognition, and Coherence', *Kant-Studien* **105**: 573 – 97. doi: 10.1515/kant-2014-0027.

Andrew, Cooper (2023) 'Hypotheses in Kant's philosophy of science', *Studies in History and Philosophy of Science* **99**: 97 – 105. doi: 10.1016/j.shpsa.2022.04.007.

Engelhard, Kristina (2018) 'The problem of grounding natural modality in Kant's account of empirical laws of nature', *Studies in History and Philosophy of Science* **71**: 24 – 34. doi: 10.1016/j.shpsa.2018.06.007.

Friedman, Michael (1992a) *Kant and the Exact Sciences*. Harvard University Press.

Friedman, Michael (1992b) 'Causal laws and the foundations of natural science', in Paul Guyer, ed., *The Cambridge Companion to Kant*: 161 – 199. Cambridge University Press.

Friedman, Michael (2012) 'The *Prolegomena* and natural science', in O Schliemann and H Lyre, eds., *Kants Prolegomena. Ein kooperativer Kommentar*: 299 – 326. Klostermann.

Friedman, Michael (2013) *Kant's Construction of Nature: a Reading of the Metaphysical Foundations of Natural Science*. Cambridge University Press.

Friedman, Michael (2014) 'Laws of nature and causal necessity', *Kant-Studien* **105**: 531 – 553. doi: 10.1515/kant-2014-0025.

Charles Goldhaber (2024) 'Kant's Offer to the Skeptical Empiricist', *Journal of the History of Philosophy* **62**: 421–47. doi: 10.1353/hph.2024.a932355.

Guyer, Paul (1987) *Kant and the Claims of Knowledge*. Cambridge University Press.

Guyer, Paul (1997) *Kant and the Claims of Taste*. Cambridge University Press.

Guyer, Paul (2003) 'Kant's answer to Hume?' *Philosophical Topics* **31**: 127 – 164. doi: 10.5840/philtopics2003311/218. Reprinted in: Guyer (2008).

Guyer, Paul (2005) *Kant's System of Nature and Freedom: Selected Essays*. Oxford University Press.

Guyer, Paul (2008) *Knowledge, Reason, and Taste: Kant's Response to Hume*. Princeton University Press.

Guyer, Paul (2017) 'Imperfect knowledge of nature: Kant, Hume, and the laws of nature', in M Massimi and A Breitenbach, eds., *Kant and the Laws of Nature*: 131 – 149. Cambridge University Press.

Hamid, Nabeel (2022) 'Reason in Kant's Theory of Cognition', *Canadian Journal of Philosophy* **52**: 636–653. doi: 10.1017/can.2023.3.

Hoffer, Noam (2023) 'Kant's regulative essentialism and the unknowability of real essences', *European Journal of Philosophy* **31**: 887–901. doi: 10.1111/ejop.12838.

Hume, David (1999) *An Enquiry Concerning Human Understanding*. Oxford University Press.

Hume, David (2000) *A Treatise of Human Nature*. Oxford University Press.

Hutton, James (2021) 'Kant, causation and laws of nature', *Studies in History and Philosophy of Science* **86**: 93–102. doi: 10.1016/j.shpsa.2021.01.003.

Kannisto, Toni (2017) 'Kant on the necessity of causal relations', *Kant Studien* **108**: 495–516. doi: 10.1515/kant-2017-0041.

Kant, Immanuel (1979) *Gesammelte Schriften*. 29 vols. de Gruyter. (Along with the Cambridge Edition of the Works of Immanuel Kant. Cambridge University Press.)

Kitcher, Philip (1986) 'Projecting the order of nature', in R Butts, ed., *Kant's Philosophy of Physical Science*: 201 – 235. Springer.

Kreines, James (2009) 'Kant on the laws of nature: Laws, necessitation, and the limitation of our knowledge', *European Journal of Philosophy* **17**: 527 – 558. doi: 10.1111/j.1468-0378.2008.00322.x.

Kreines, James (2017) 'Kant on the laws of nature: Restrictive inflationism and its philosophical advantages', *The Monist* **100**: 326 – 341. doi: 10.1093/monist/onx013.

Laywine, Alison (1998) 'Problems and postulates: Kant on reason and understanding', *Journal of the History of Philosophy* **36**: 279–309. doi: 10.1353/hph.2008.0953.

Leech, Jessica (2022) 'Kant on the Necessity of Necessity', *History of Philosophy & Logical Analysis* **25**: 66–94. doi: 10.30965/26664275-02400005.

Longuenesse, Béatrice (1998) *Kant and the Capacity to Judge: Sensibility and Discursivity in the Transcendental Analytic of the Critique of Pure Reason*. Princeton University Press.

Longuenesse, Béatrice (2005) *Kant on the Human Standpoint*. Cambridge University Press.

Massimi, Michela (2017) 'Grounds, modality, and nomic necessity in the critical Kant', in M Massimi and A Breitenbach, eds., *Kant and the Laws of Nature*: 150 – 170. Cambridge University Press.

Melnick, Arthur (1973) *Kant's Analogies of Experience*. University of Chicago Press.

Melnick, Arthur (2006) 'The second analogy', in G Bird, ed., *A Companion to Kant*: 169 – 181. Blackwell.

Messina, James (2017) 'Kant's necessitation account of laws and the nature of natures', in M Massimi and A Breitenbach, eds., *Kant and the Laws of Nature:* 131 – 149. Cambridge University Press.

Paton, Herbert J (1936) *Kant's Metaphysic of Experience: A Commentary on the First Half of the Kritik der Reinen Vernunft, in Two Volumes*. George Allen & Unwin.

Schafer, Karl (2023) *Kant's Reason: The Unity of Reason and the Limits of Comprehension in Kant*. Oxford University Press.

Smit, Huston (2009) 'Kant on Apriority and the Spontaneity of Cognition', in S Newlands and L M Jorgensen, eds., *Metaphysics and the Good: Themes From the Philosophy of Robert Merrihew Adams*: 188 – 251. Oxford University Press.

Stang, Nicholas F (2016) *Kant's Modal Metaphysics*. Oxford University Press.

Tolley, Clinton (2020) 'Kant on the Place of Cognition in the Progression of Our Representations', *Synthese* **197**: 3215–3244. doi: 10.1007/s11229-017-1625-3.

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

Watkins, Eric and Willaschek, Marcus (2020) 'Kant on cognition and knowledge', *Synthese* **197**: 3195–3213. doi: 10.1007/s11229-017-1624-4.

Watkins, Eric (2019) *Kant on Laws*. Cambridge University Press.