# Synthetic *A Priori* Judgments and Kant’s Response to Hume on Induction

## Introduction

It is probably fair to say that a large proportion of philosophical arguments fail the unforgiving test of time. Even among those deemed canonical, there are only a handful that transcend scholarly interest, continuing to perplex philosophers to this day. If you were to make a list of paradigmatic examples of such arguments, Hume’s problem of induction would likely feature near the top. And with good reason: it is an ingenious and troubling sceptical argument that threatens the very foundations of science and daily life, with no obvious resolution readily apparent.

 This paper will make the case that we can find in Kant’s Second Analogy a substantive response to this argument. This response is substantive insofar as it does not merely consist in independently arguing for the opposite conclusion, but rather, it identifies and exploits a gap in Hume’s argument. More specifically, Hume misses the possibility of justifying the uniformity of nature as a synthetic *a priori* proposition, which Kant looks to establish in the Second Analogy. Note that the focus on the paper is on Kant’s identification of the *form* that a solution to Hume’s inductive scepticism must take. In making this point, I will look to establish two lemmas: (1) Kant identifies synthetic *a priori* judgments as a means of justifying metaphysical knowledge in a way that circumvents Hume’s dichotomy between matters of fact and relations of ideas; (2) the Second Analogy aims to establish the uniformity of nature as a synthetic *a priori* proposition. However, my paper generally abstains from the question of the *tenability* of Kant’s argument in the Second Analogy. Doing justice to this latter discussion would require more space than I am able to offer here. My paper therefore has a conditional bearing on the philosophical issue of inductive scepticism. *If* one believes Kant’s Second Analogy to be philosophically cogent, *then* Kant offers a successful justification of induction against Hume’s scepticism. If not, then at least one can still admire Kant’s identification of the gap in Hume’s argument, which, to a degree, can be exploited independently of Kant’s system.

 Besides the philosophical ramifications, this comparative project is also one of scholarly importance. One crucial interpretative question that often arises is this: does Kant actively respond to Hume’s argument on induction in the Second Analogy? It is far from clear that he does. Kant’s formulations of Hume’s problem invariably centre on his subjective treatment of causation and necessary connection,[[1]](#footnote-1) rather than his scepticism about the justification for our inductive practices.[[2]](#footnote-2) Indeed, it is a matter of some interpretative controversy whether Kant even intends to respond to Hume on *causation* in the Second Analogy, much less induction.[[3]](#footnote-3) And even those who see Kant as having Hume’s scepticism about causation in mind in this section often do not see him as extending the same courtesy to Hume’s scepticism about induction. For instance, Guyer writes: ‘But if we think that Hume has raised a logical problem about the rationality of induction, or that there is such a problem, then nothing Kant has said [in the Second Analogy] will directly address it.’[[4]](#footnote-4)

Perhaps Kant intended to address Hume on induction in the Second Analogy. Perhaps he did not. In this paper, I content myself with the weaker claim that we *can* find in Kant’s Second Analogy a response to Hume on induction,[[5]](#footnote-5) and indeed, one that is continuous with his general response to Humean scepticism, whether or not Kant explicitly intended to reply to Hume in this regard. More specifically, although Kant’s primary intention in the Second Analogy is to establish the metaphysical thesis that events are actually connected in accordance with universal causal laws, in doing so, he also endorses an epistemological point: if objective temporal succession is to be possible, we can know *a priori* that any changes in appearances must obey universal causal laws. If successful, this is sufficient to establish the uniformity of nature and thus respond to Hume’s problem of induction. In this, I disagree with Guyer: Kant’s Second Analogy does indeed provide the resources to engage with this infamous sceptical argument.[[6]](#footnote-6)

## Kant’s General Response to Hume: Synthetic *A Priori* Propositions

As just mentioned, it is difficult to deny that Kant’s primary goal in the Second Analogy is to establish the universality of causation, which is a distinctly *metaphysical* issue. Nevertheless, I think that this account comprehends an answer to the *epistemological* problem of induction, since it establishes a uniformity in nature, thus licensing us to trust induction. Whether by design or not, the Second Analogy offers a reply to Hume on induction.

Would it be surprising for the Second Analogy to contain such a reply, if Kant did not deliberately intend one? I do not think so. Consider the fact that Hume extends a similar sceptical methodology beyond causation to various topics, including not only substance but also the self. Despite seemingly being unaware of these arguments,[[7]](#footnote-7) Kant manages to offer responses to them in the *Critique*, a fact which substantiates his claim that his system seeks to offer a general response to Humean scepticism that is founded on synthetic *a priori* judgments (see below). Perhaps a similar thing takes place with regard to induction: Kant’s reply to Hume on this matter naturally falls out of his framework. As it happens, I will argue that his response to Hume on induction is indeed continuous with his general response to Humean scepticism.

As mentioned above, this general solution hinges on synthetic *a priori* propositions:

Hume perhaps had it in mind, although he never fully developed it, that in judgments of a certain kind we go beyond our concept of the object. I have called this sort of judgment **synthetic**.... But we also believe ourselves to be able to go beyond our concepts *a priori* and to amplify our cognition. We attempt to do this either through pure understanding, with regard to that which can at least be an **object of experience**, or even through pure reason, with regard to such properties of things, or even with regard to the existence of such objects, that can never come forth in experience. Our skeptic did not distinguish these two kinds of judgments, as he should have, and for that reason held this augmentation of concepts out of themselves and the parthenogenesis, so to speak, of our understanding (together with reason), without experience, to be impossible; thus he held all of its supposedly *a priori* principles to be merely imagined, and found that they are nothing but a custom arising from experience and its laws, thus are merely empirical, i.e., intrinsically contingent rules, to which we ascribe a supposed necessity and universality. (A764–5/B792–3)

Here Kant states that Hume’s sceptical malaise stemmed from his failing to ‘distinguish these two kinds of judgments’: synthetic *a posteriori* judgments (which involve the augmentation of our concepts by experience), and synthetic *a priori* judgments (which involve the augmentation of our concepts by pure understanding or pure reason). Kant may even be hinting that had Hume realised the possibility of synthetic *a priori* propositions, he might have stumbled upon Kant’s solution to the sceptical problem.

Kant also makes various remarks to the effect that synthetic *a priori* propositions are critical to addressing Hume on the connection of cause and effect in particular. See the Preface to the *Prolegomena*:

[Hume] indisputably proved that it is wholly impossible for reason to think such a connection [of cause and effect] *a priori* and from concepts, because this connection contains necessity; and it is simply not to be seen how it could be, that because something is, something else necessarily must also be, and therefore how such a connection could be introduced *a priori*. (4:257)

A similar remark occurs in the B Introduction to the first *Critique*:

David Hume, who among all philosophers came closest to this problem [of how synthetic judgments *a priori* are possible], still did not conceive of it anywhere near determinately enough and in its universality, but rather stopped with the synthetic proposition of the connection of the effect with its cause (*Principium Causalitatis*), believing himself to have brought out that such an *a priori* proposition is entirely impossible… (B19)

Is Kant correct that Hume fails to accommodate synthetic *a priori* propositions? First, we need to consider the two relevant distinctions: between the *a priori* and the *a posteriori*, and the analytic and the synthetic.[[8]](#footnote-8) The former distinction is epistemological in nature: for a proposition to be *a priori* is for it to be justifiable independently of experience, and for it to be *a posteriori* is for it to be justifiable only by experience. In this regard, Hume and Kant do not substantially disagree. More difficult is the distinction between the analytic and the synthetic. This distinction was not one that Hume explicitly recognised, given that it was introduced by Kant. Nevertheless, we can, as Kant himself did, fruitfully view Hume’s framework through this lens. In doing so, we are best served by turning to Kant’s seminal discussion of this distinction.

Kant’s most famous formulation of the analytic/synthetic distinction rests on the notion of conceptual containment:

Either the predicate *B* belongs to the subject *A* as something that is (covertly) contained in this concept *A*; or *B* lies entirely outside the concept *A*, though to be sure it stands in connection with it. In the first case I call the judgment **analytic**, in the second **synthetic**. (A6–7/B10)

The idea is that a judgment is analytic if what is predicated of the subject is already contained within the concept of this subject. Take the classic example: ‘all bachelors are unmarried’. ‘Bachelor’ is analysable as ‘unmarried man’, and so, what is predicated of the subject ‘bachelors’ in this judgment is something that is already contained in the concept of it. On the other hand, a judgment is synthetic if it predicates something of the subject that is not already contained in its concept.

However, Kant also provides characterisations that are broader in nature. He labels analytic judgments ‘**judgments of clarification**’ and synthetic judgments ‘**judgments of amplification**’ (A7/B11). The idea is that analytic judgments can only be explicative in that they ‘do not add anything to the concept of the subject, but only break it up by means of analysis into its component concepts’, while synthetic judgments are ampliative in that they ‘add to the concept of the subject a predicate that was not thought in it at all’ (*ibid*.). Later in the *Critique*, Kant offers an account of analyticity based on what he calls ‘the principle of contradiction’:

For, **if the judgment is analytic**, whether it be negative or affirmative, its truth must always be able to be cognized sufficiently in accordance with the principle of contradiction… Hence we must also allow the **principle of contradiction** to count as the universal and completely sufficient **principle of all analytic cognition**… (A151/B190–1)

Essentially, this characterisation dictates that a judgment is analytic if its negation would not be ‘free of any internal contradiction’ (A150/B190). Correspondingly, a judgment is synthetic if neither it nor its negation is self-contradictory.

 Although Kant’s first formulation in terms of conceptual containment is likely his most famous, it also is the most problematic in many respects.[[9]](#footnote-9) First, unlike the latter two formulations, it seems to apply only to judgments with a subject-predicate form—that is, categorical judgments. Moreover, it does not provide a positive way of understanding syntheticity (beyond being a negation of analyticity). Furthermore, the notion of conceptual containment can be somewhat opaque, and Kant’s discussion of analyticity does not offer much to clarify it. And problematically, this formulation misleadingly suggests that the analytic/synthetic distinction, resting on an Aristotelian subject/predicate framework, should be construed as a formal or logical notion. However, Kant cannot successfully account for the analytic/synthetic distinction in merely formal terms precisely because of his commitment to a Aristotelian framework: the Aristotelian syllogistic logic that he avails himself of is quite simply too weak to be fit for purpose.[[10]](#footnote-10) Thus, Kant states in the *Prolegomena*:

But judgments may have any origin whatsoever, or be constituted in whatever manner according to their **logical form**, and yet there is nonetheless a distinction between them according to their **content**, by dint of which they are either merely *explicative* and add nothing to the content of the cognition, or *ampliative* and augment the given cognition; the first may be called *analytic* judgments, the second *synthetic*. (4:266, **boldface added**)

Here Kant is quite clear that the analytic/synthetic distinction is one that rests on the content rather than the logical form of the judgments, which indicates not a *formal* conception of this distinction, but rather a *semantic* one. As Hanna puts it: ‘The proper point of access to the correct interpretation of Kant’s theory of analyticity, it seems to me, is the assumption that the first *Critique* is a treatise in general cognitive semantics’.[[11]](#footnote-11)

 In this respect, Kant’s formulation of the analytic/synthetic distinction in terms of non-contradiction quite clearly illustrates its semantic character. As Allison puts it: ‘How, after all, could one determine whether the contradictory of a given judgment is self-contradictory without appealing to the meanings of the terms…?’.[[12]](#footnote-12) Both Van Cleve and Buroker recognise this formulation as primary, and take complex judgements to be analytic in virtue of their logical forms *or* the meanings of non-logical terms.[[13]](#footnote-13) Similarly, Hanna argues that a purely logical notion of contradiction fails to explains why propositions like ‘Bodies are extended’ and ‘triangulars are trilaterals’ are analytic judgments for Kant.[[14]](#footnote-14) Hanna elaborates that for Kant, the principle of contradiction applies not only to the logical forms of propositions, but also to conceptual microstructures, clarifying the semantic aspect of this formulation and tying it to the first formulation in terms conceptual containment.[[15]](#footnote-15)

Armed with these two distinctions, we can turn to Hume. Hume’s Fork (EHU 4.1–2) divides all items of knowledge into relations of ideas and matters of fact.[[16]](#footnote-16) Relations of ideas are clearly *a priori*, insofar as they ‘are discoverable by the mere operations of thought, without dependence on what is any where existent in the universe’ (EHU 4.1). Correspondingly, matters of fact are *a posteriori*.

Meanwhile, judgments regarding matters of fact are synthetic:

The contrary of every matter of fact is still possible; because it can never imply a contradiction, and is conceived by the mind with the same facility and distinctness, as if ever so conformable to reality. *That the sun will not rise to-morrow* is no less intelligible a proposition, and implies no more contradiction, than the affirmation, *that it will rise*. We should in vain, therefore, attempt to demonstrate its falsehood. Were it demonstratively false, it would imply a contradiction, and could never be distinctly conceived by the mind. (EHU 4.2)

The negation of any matter of fact is not self-contradictory, which is to say that judgments regarding matters of fact are synthetic. Correspondingly, relations of ideas are analytic, and their negations are self-contradictory.

 What account does Hume give of contradiction and non-contradiction? For a proposition to be non-contradictory is for it to express a metaphysically possible state of affairs, and Hume offers a positive criterion of metaphysical possibility via his Conceivability Principle: if something is conceivable, then it is metaphysically possible. This principle is frequently both stated and employed, including in EHU 4.2 above, but the following is most explicit in asserting its established authority:

’Tis an establish’d maxim in metaphysics, That whatever the mind clearly conceives includes the idea of possible existence, or in other words, that nothing we imagine is absolutely impossible. (THN 1.2.2.8)

Thus, indirectly, Hume offers an account of non-contradiction based on imaginative conceivability: for a proposition to be non-contradictory is for it to express a conceivable state of affairs. Yet Hume fails to offer a complete positive account of self-contradiction. This is because, as Millican and Lightner have argued, Hume rejects the *Inconceivability Principle*: the principle that inconceivability entails metaphysical impossibility.[[17]](#footnote-17) Thus, the fact that a state of affairs cannot be conceived does not prove that a proposition expressing it is self-contradictory; such an inability might reflect a limitation of our faculties rather than any metaphysical fact (see for instance EHU 2.7).[[18]](#footnote-18) Nevertheless, conceivability and self-contradiction remain closely related. We might say that the inconceivability of a state of affairs is a necessary but insufficient condition for the proposition expressing it to be self-contradictory. Further conditions will largely rest on stipulations that this inability is not due to any contingent psychological limitations, but I do not need to enter into the nitty-gritty of such an account here. The point is that for Hume, self-contradiction and non-contradiction both have their roots in imaginative conceivability.

 In any case, Millican suggests that Hume’s distinction between matters of fact and relations of ideas corresponds to the distinction between analytic and synthetic, insofar as both appropriately correspond to the same *semantic* notion of contradiction: relations of ideas and analytic claims are such that their negations are imply a contradiction.[[19]](#footnote-19) We have seen above that for Hume, contradiction seems founded on a psychologistic notion of imaginative conceivability, but this is not obviously the basis for a semantic account thereof. Yet we can straightforwardly draw a line from this psychologistic notion to a semantic one in Hume. For Hume, the semantic content of our terms is determined by the content of our *perceptions*: for instance, he concludes that ‘necessary connection’ can only mean an impression of reflection, because that is the content of the perception that corresponds to it (c.f. EHU 7.4).[[20]](#footnote-20) Insofar as Hume’s notion of contradiction is founded on the content of our imagined ideas, which determine meaning, this notion of contradiction is correctly said to be semantic in nature. Correspondingly, Hume’s Fork, in characterising relations of ideas and matters of fact in terms of contradiction, does indeed carve along semantic lines.

Given this, Hume’s Fork offers a neat and *prima facie* plausible conceptual division: relations of ideas are all *a priori* and analytic, while matters of fact are all *a posteriori* and synthetic. In short, the possibility of synthetic *a priori* propositions is a departure from Hume’s Fork, which takes syntheticity and *a posteriority* to inseparably go together.

 This reading is denied by Garrett,[[21]](#footnote-21) who argues that Hume’s Fork and Kant’s analytic/synthetic divide do not map on to one another, because the two philosophers simply employ different notions of contradiction; for Kant, and not for Hume, contradiction is a formal notion:

Like Leibniz, Kant has a conception of contradiction that is *formal*: all contradictions can be reduced by conceptual decomposition or other form-based transformations to a logical form in which the same thing is explicitly both affirmed and denied. Like Descartes, Spinoza, and Locke, Hume has a broader and non-formal conception of contradiction. For Hume, a contradiction consists of two things that cannot be thought together….[[22]](#footnote-22)

On this view, relations of ideas would encompass synthetic *a priori* propositions, which are such that their negations are contradictory in Hume’s informal sense, but not in Kant’s formal sense. Clearly, as seen from the passages above, this was not Kant’s view of his relationship to Hume, since he took it to be uncontroversial that Hume could not accommodate synthetic *a priori* propositions. But perhaps Kant’s understanding of Hume was confused in this respect.

 However, we have seen that Kant’s understanding of the analytic/synthetic distinction, as well as his account of contradiction, is semantic rather than strictly formal. Indeed, Garrett implicitly recognises this fact in his statement that the derivation of a contradiction will typically involve conceptual decomposition. Meanwhile, Hume’s relations of ideas, and correspondingly his account of contradiction, should also be construed as semantic, as we have seen. This does not entail that Kant’s and Hume’s notions of contradiction map perfectly onto one another, of course; they might carve along *different* semantic lines. And indeed, although their accounts of ‘contradiction’ are perhaps not as distant as one might have thought, they are nevertheless distinct in the details, notably in Hume’s tying non-contradiction to imaginative conceivability, which Kant would reject. But at the very least, this indicates that any differences between Kant’s and Hume’s notions of contradiction are relatively minor.

In any case, despite Hume and Kant endorsing different accounts of contradiction, I maintain that Kant was not mistaken in his characterisation of his relationship to Hume with regard to synthetic *a priori* propositions. After all, Hume holds that relations of ideas are those with contradictory denials. Kant holds that analytic judgments are those with contradictory denials. They might provide different analyses of what ‘contradictory’ amounts to. But ‘contradictory’ is hardly a technical term of art peculiar to either system, but rather a term common to both ordinary and philosophical parlance. Their differing analyses of ‘contradictory’ should not undermine the fact that their distinctions are intended to carve at the same philosophical joint. For comparison, consider the debate about whether free will is compatible with universal causation. Now, Kant and Hume disagree with regard to their accounts of ‘causation’: for Hume, it is (simplifying for exposition) constant conjunction, whereas for Kant it is a relation between events captured by an *a priori* concept that structures our apprehension of successive appearances in time, and implies a genuinely objective necessity of the relation of cause to effect. This disagreement notwithstanding, Hume and Kant’s debate concerning free will seems substantive rather than merely verbal. When they agree that everything has a cause, this agreement is not hindered by their differing accounts of causation. And when they disagree about whether this is compatible with free will, they are not talking past or begging the question against, one another. Similarly, relations of ideas can correctly be seen to correspond to analytic judgments, despite the differing accounts of contradiction employed by each philosophical system.[[23]](#footnote-23)

Given the centrality of synthetic *a priori* propositions to Kant’s response to Hume on induction (as I will argue), it is worth venturing a little deeper into the matter. For Kant, since synthetic judgments involve a predicate that ‘lies entirely outside the concept’ of the subject, and yet ‘stands in connection with it’ (A6/B10), there is required a distinct representation to ensure this connection. If the synthetic judgment is also *a priori*, then this element ‘cannot be experience’ (A9/B13). At the end of the Transcendental Aesthetic, Kant will reveal that the *a priori* intuitions of space and time are crucial elements in connecting subject and predicate in synthetic *a priori* judgments:

Here we now have one of the required pieces for the solution of the general problem of transcendental philosophy—**how are synthetic *a priori* propositions possible?**—namely pure *a priori* intuitions, space and time, in which, if we want to go beyond the given concept in an *a priori* judgment, we encounter that which is to be discovered *a priori* and synthetically connected with it, not in the concept but in the intuition that corresponds to it… (B73)

Space and time are therefore the first step towards the answer of how synthetic *a priori* judgments are possible: synthetic *a priori* judgments are true not merely in virtue of the concepts involved (which would make them analytic), and not in virtue of experience (since then they would not be *a priori*), but in virtue of the *a priori* intuitions of space and time.[[24]](#footnote-24)

## Hume’s Argument on Induction

Let us now examine Hume’s famous argument on induction.[[25]](#footnote-25) Here I will enter into a brief discussion of this argument, focusing on the elements most relevant to Kant’s response; I provide a fuller treatment elsewhere.[[26]](#footnote-26) Hume begins EHU 4 (entitled ‘Sceptical Doubts concerning the Operations of the Understanding’) by setting out Hume’s Fork (EHU 4.1–2), which, as we have just seen, divides all knowledge into relations of ideas and matters of fact.[[27]](#footnote-27)

 Having set out his eponymous ‘fork’, Hume proceeds to raise the central question of EHU 4: ‘what is the nature of that evidence, which assures us of any real existence and matter of fact, beyond the present testimony of our senses, or the records of our memory’ (EHU 4.3)— that is, what is the *justification* for our beliefs about the unobserved?[[28]](#footnote-28) Hume astutely identifies that all inductive reasoning is founded on what has become known as the Uniformity Principle, which is ‘the supposition, that the future will be conformable to the past’ (EHU 4.19). This principle is not ‘intuitive’, and thus requires a ‘medium’ of argument if it is to be justified (EHU 4.16).[[29]](#footnote-29)

 Hume points out that there are two forms of argument, demonstrative and probable:

All reasonings may be divided into two kinds, namely demonstrative reasoning, or that concerning relations of ideas, and moral reasoning, or that concerning matter of fact and existence. (EHU 4.18)

Note here that Hume explicitly links demonstrative reasoning to relations of ideas, and moral reasoning—which refers to probable reasoning—to matters of fact.[[30]](#footnote-30)

 Hume rules out the possibility of there being a successful demonstrative argument that can take us from past experience to future expectation. His basis for this claim is that

it implies no contradiction, that the course of nature may change, and that an object, seemingly like those which we have experienced, may be attended with different or contrary effects… Now whatever is intelligible, and can be distinctly conceived, implies no contradiction, and can never be proved false by any demonstrative argument or abstract reasoning *a priori*. (EHU 4.18)

The idea is that we can always conceive of the course of nature changing—that is, we can always conceive the negation of the Uniformity Principle. Hume concludes on this basis that we cannot have a successful demonstration for the Uniformity Principle: because the negation of this principle can be conceived, it cannot be a relation of ideas, and so ‘there are no demonstrative arguments in the case’ (*ibid*.).

 Nor can there be a successful probable argument in favour of the Uniformity Principle, on pain of circularity:

We have said, that all arguments concerning existence are founded on the relation of cause and effect; that our knowledge of that relation is derived entirely from experience; and that all our experimental conclusions proceed upon the supposition, that the future will be conformable to the past. To endeavour, therefore, the proof of this last supposition by probable arguments, or arguments regarding existence, must be evidently going in a circle, and taking that for granted, which is the very point in question. (EHU 4.19)

Justifying the Uniformity Principle on the basis of probable reasoning would be to already assume the Uniformity Principle itself, since all probable reasoning is founded on the supposition of this principle. Thus, the Uniformity Principle cannot be justified by experience. But we have seen above that it cannot be justified *a priori* either. Thus, we can have no justification for the Uniformity Principle, and hence, for our inductive inferences.[[31]](#footnote-31)

## The Second Analogy

Kant’s System of Principles seeks to establish that appearances are possible objects of experience only if they are ordered in time in accordance with transcendental schemata. Transcendental schemata are ‘*a priori* **time-determinations** in accordance with rules’, that is, they set out the properties of time to which all objects of possible experience must conform, namely ‘the **time-series**, the **content of time**, the **order of time**, and finally the **sum total of time** in regard to all possible objects’ (A145/B184–5).[[32]](#footnote-32) These schemata are necessary for the application of *a priori* concepts to sensible intuition:

Thus the schemata of the concepts of pure understanding are the true and sole conditions for providing them with a relation to objects. (A145–6/B185).

This is because for an object to be subsumed under a concept, the two must be ‘**homogenous**’, and yet *a priori* concepts are ‘entirely unhomogenous’ with intuitions (A137/B176).[[33]](#footnote-33) Thus ‘there must be a third thing, which must stand in homogeneity with the category on the one hand and the appearance on the other, and makes possible the application of the former to the latter’ (A138/B177). This ‘third thing’ is a transcendental schema.[[34]](#footnote-34)

The unschematised category of causation is simply that of the purely logical relation of ground to consequent. In the case of the concept of cause, the schema is ‘the succession of the manifold insofar as it is subject to a rule’ (A144/B183). This transcendental schema is the rule of ordering time by which one recognises that something falls under the concept of cause, and justifies the assertion of the Causal Principle, which is formulated as follows in each edition:

**A edition**: Everything that happens (begins to be) presupposes something which it follows in accordance with a rule. (A189)

**B edition**: All alterations occur in accordance with the law of the connection of cause and effect. (B232)

Importantly, the Causal Principle is a synthetic *a priori* judgment on either formulation. The principle is clearly synthetic, since it is not contradictory to imagine it failing to hold. Indeed, Kant notes that it cannot be derived from an analysis of the concepts involved:

The proof does not show, that is, that the given concept (e.g., of that which happens) leads directly to another concept (that of a cause), for such a transition would be a leap for which nothing could be held responsible; rather it shows that experience itself, hence the object of experience, would be impossible without such a connection. (A787/B811)

Meanwhile, Kant takes it that strict universality is a secure mark of *a priority*, and the Causal Principle is clearly strictly universal: since it applies to ‘everything that happens’ (A189/B233), it is ‘in such a way that no exception at all is allowed to be possible’ (B3). Thus, the Causal Principle is both synthetic and *a priori*. Importantly, it is not experience that renders the Causal Principle true, nor is it the constituent concepts in themselves, but rather it is the transcendental determination of the pure intuition of time. In short, it is the transcendental determination of time according to rules of synthesis that allows for the Causal Principle to be both synthetic and *a priori*.

 Crucially, the Causal Principle embodies an endorsement of the uniformity of nature. For ease of exposition I will focus my attention on the formulation of the principle in the A edition; that said, I think that my argument applies equally to the formulation in the B edition as well.[[35]](#footnote-35) Here, the claim is not merely that ‘everything that happens presupposes a cause’. Rather, the claim is that ‘everything that happens presupposes something (a cause) *which it follows in accordance* *with a rule*’ (emphasis added). Thus, each causal relation occurs in accordance with a rule. What it is to apprehend a succession as an instance of causation is simply to see it as rule-bound. These rules are simply causal laws, which are necessary and universal. However, given the necessity and universality of these causal laws, Kant’s Causal Principle will imply the Uniformity Principle: at least with respect to causal laws, appearances behave in uniform ways across time.

Indeed, this notion of rule-boundedness is central to Kant’s argument for the Causal Principle in the Second Analogy. Briefly, his argument proceeds as follows. Kant offers a transcendental argument, exploring the preconditions of our apprehension of objective succession. He begins by noting that ‘[t]he apprehension of the manifold of appearance is always successive’ (A189/B234). However, this by itself does not tell us whether the apprehension is merely a subjective one—that is, a succession of our perceptual states—or if it is also an apprehension of objective succession—that is, a succession of states in the objects that we take to exist independently of our perceptual states.

The question, then, is this: when do we take this subjective succession in our apprehension to correspond to an objective one? Kant’s answer is: when we consider our succession of perceptual states to be irreversible, or order-determinate (A192/B237). Kant illustrates this by appealing to two contrasting examples of successive apprehension: one whereby we apprehend the parts of a house successively, and one whereby we apprehend a ship sailing downstream. Clearly, the former involves only a subjective succession in apprehension, while the latter is an apprehension of a genuinely objective succession. Kant points out that the difference between the two boils down to our taking the succession of perceptual states to be reversible in the case of the house, and irreversible in the case of the ship: we could have observed the parts of the house in a different order and yet *still be apprehending the same thing*, but this is not true of the states of the ship sailing downstream.[[36]](#footnote-36)

The next question is: when do we consider a succession of our perceptual states to be irreversible? Kant’s answer is: when we consider there to be a rule according to which later states of the object follow from earlier states of the object. In short, we distinguish an apprehension of an objective succession from a merely subjective succession in apprehension by treating the former as subject to rules that govern the changes in the object:

Therefore I always make my subjective synthesis (of apprehension) objective with respect to a rule in accordance with which the appearances in their sequence, i.e., as they occur, are determined through the preceding state, and only under this presupposition alone is the experience of something that happens even possible. (A195/B240)

…we never ascribe sequence (of an occurrence, in which something happens that previously did not exist) to the object, and distinguish it from the subjective sequence of our apprehension, except when a rule is the ground that necessitates us to observe this order of the perceptions rather than another… (A196/B241–2)

Given that this is a necessary and thus transcendental condition of our taking there to be objective temporal succession in appearances, Kant concludes that all objective successions are governed by causal laws:[[37]](#footnote-37)

…that which follows or happens must succeed that which was contained in the previous state in accordance with a general rule… (A200/B245)

Thus, Kant infers the Causal Principle: ‘Everything that happens (begins to be) presupposes something which it follows in accordance with a rule’.[[38]](#footnote-38)

We have seen that the notion of rule-boundedness is crucial to the Causal Principle. Importantly, Kant sees rule-boundedness as implying a complete uniformity in nature, and thus his treatment of the metaphysical problem of causation carries with it a response to the epistemological problem of induction. For Kant, the causal rules that we take to govern objective successions apply *universally* and *without exception*:

…the very concept of a cause so obviously contains the concept of a necessity of connection with an effect and a strict universality of rule… (B5)

This means that, in Kant’s view, distinct instantiations of a certain causal relation *must* be uniform with each other, insofar as we take them to fall under the same rule. In seeing a succession as causal, we recognise that it is not a *sui generis* occurrence, but that it must be of a kind with all other successions to which this rule applies. This establishes a uniformity between the observed and unobserved: the very same rule governs all instances of a certain causal relation, thus ensuring that unobserved instances of a causal relation will resemble observed instances of the same causal relation.

This does not mean that we must be able to recognise the particular rule that governs any given objective succession, only that we recognise *that there is* some rule or the other that does so. Kant points out that the particular rule at play in a given objective succession can only be discovered empirically:

Of course the logical clarity of this representation of a rule determining the series of occurrences, as that of a concept of cause, is only possible if we have made use of it in experience, but a consideration of it, as the condition of the synthetic unity of the appearances in time, was nevertheless the ground of experience itself, and therefore preceded it *a priori*. (A196/B241)

In apprehending a ship sailing downstream as an objective succession, it is not necessary that we know how ships work, or the laws that govern the weather or the flow of the river. Rather, what Kant is arguing is that we must take there to be *some* laws at play if we are to take a succession as objective. That is, we must recognise that there is *some* uniformity involved here, even if we do not know *which* uniformity that is: as Longuenesse puts it: ‘I can presuppose a rule, without being able to specify what this rule is’.[[39]](#footnote-39)

 It is worth dwelling on this point. Kant’s Second Analogy argues that a necessary precondition of temporal objectivity is that we see a succession as governed by the concept of causation. If this precondition were too strong, then it would unduly rule out the possibility of temporal objectivity for many who intuitively possess it. Requiring that one be able to identify the specific causal laws that apply to a given succession in order to view it as objective seems too demanding. After all, even an untutored child can recognise the succession of the states of a boat sailing downriver as objective, and the inductive implications that follow, without any meaningful knowledge of the underlying science.[[40]](#footnote-40) Perhaps the following analogy might be useful. One can know that it would be illegal in Singapore to put up posters spreading malicious falsehoods about the Prime Minister, even if one cannot identify the particular laws that would be violated.[[41]](#footnote-41) One can recognise the *legal* necessity at play without knowing the particular statutes. Similarly, one can recognise the *causal* and hence *temporal* necessity at play in a succession without knowledge of the particular causal laws. Kant recognises this in distinguishing between a ‘logical clarity of this representation of a rule’ that governs an objective succession, and a mere ‘consideration of it’ (A196/B241). The former is the knowledge of the empirical scientific laws governing a given objective temporal succession, and this is only possible through its use in experience. And yet the latter, which is an awareness that *there is some causal law* governing this succession, is ‘the ground of experience itself, and therefore preceded it *a priori*’ (*ibid.*). It is the latter that is the transcendental ground of temporal objectivity.

Importantly, this relatively modest (but by no means insignificant) result is all Kant needs to respond to Hume. To be justified in holding the Uniformity Principle is not to be able to discern any given particular uniformity. Rather, it is only to be justified in holding that *uniformity generally holds between observed and unobserved*, even if the particular form that this uniformity takes is sometimes beyond us. Compare with external world scepticism: an adequate response need not establish that *every* dictate of our senses is correct, but only that our senses are generally on course in informing us about the existence of an external world.

Here it is helpful to situate my view in relation to that of Friedman, who likewise defends the view that Kant’s Second Analogy provides a guarantee of induction. Friedman looks to establish this thesis by arguing that the Second Analogy offers a guarantee of the necessity of not only the transcendental Causal Principle, but also particular scientific laws, in virtue of the fact that the latter are grounded in the former.[[42]](#footnote-42) Friedman’s account is carefully and excellently argued, and importantly, I need not disagree with it here. My point is that the Second Analogy does not *need* to establish the necessity of particular empirical laws to provide an answer to Hume’s problem of induction.[[43]](#footnote-43) In guaranteeing the transcendental Causal Principle, the Second Analogy does enough to address Hume’s sceptical argument, whatever the case with particular empirical laws; this at the very least establishes that in general, uniformity is rationally projectible, which is precisely what Hume’s argument seeks to deny. Perhaps the Second Analogy does indeed establish the necessity of individual empirical laws, but my paper need not take a stand on this issue.

Allison raises a general worry about such attempted justifications of uniformity.[[44]](#footnote-44) The worry is that, although causal laws apply universally, it remains a possibility that such laws might only have ‘a single instantiation of each type’, which is to say that a given true universal causal generalisation might be such that there is only one instance of it that obtains.[[45]](#footnote-45) Such single-instanced laws would be unable to secure any uniformity between observed and unobserved.

Single-instanced laws might be a theoretical possibility, but this mere possibility is insufficient to threaten my point. The possibility of single-instanced laws can undermine the thought that any *particular* law tells us anything about uniformity, since that law might merely be single-instanced, and it is worth noting that Allison raises this objection to Friedman’s interpretation, which reads Kant as guaranteeing the necessity of particular empirical laws. But the possibility of single-instanced laws does not in itself undermine the thought that a general rule-boundedness tells us something about the uniformity of nature. After all, Kant’s argument still succeeds in establishing a uniformity in nature if some apprehensions of objective successions involved single-instanced laws, while others involve general ones.

However, it seems clear that such single-instanced laws, even if they are a possibility, would be the exception rather than the rule. Indeed, were objects only governed by single-instanced laws, this would be indistinguishable from a situation whereby objects were ungoverned by any laws whatsoever; such a situation would not allow for Kant’s aim of securing successive objectivity in the Second Analogy. And phenomenologically, in apprehending objective successions, we frequently (if not always) take the successions to be governed by general laws—indeed, it is unclear if we *ever* apprehend an objective succession as constrained by merely single-instanced laws.

## Revisiting Hume’s Argument

We have seen above that Kant’s Second Analogy can be seen as seeking to establish the uniformity of nature: the Causal Principle is not the Uniformity Principle as Hume phrases it, but it includes a claim about the uniformity of nature.[[46]](#footnote-46) But this leaves underdetermined the details of how this engages with Hume’s argument on induction. What is the gap in Hume’s argument that Kant’s response might hope to exploit?

 Recall that Hume’s argument rules out justification for the Uniformity Principle on the following basis. Since this principle is not intuitive, it must be justified by argument. Hume divides arguments into two kinds, corresponding to the two prongs of Hume’s Fork: demonstrative arguments concerning relations of ideas, and probable arguments concerning matters of fact. The Uniformity Principle cannot be justified by probable arguments, since this would be circular. Nor can it be justified by demonstrative arguments, since the negation of the Uniformity Principle is conceivable. On the Lockean assumption that these two forms of argument exhaust the logical space, there is no possible argument for the Uniformity Principle.

To identify Kant’s response to this argument, it is perhaps helpful to start by examining the points of agreement between the two. First, Kant would agree that the Causal Principle is not intuitive in Hume’s sense: it is not a directly perceivable and simple relation of ideas.

Second, Kant takes the Causal Principle to be *a priori*, and so would agree with Hume that we cannot offer a probable argument for it—experience can only establish what is, and not what must be the case. Hume would maintain that this is because to establish the uniformity of nature by appeal to experience would be circular, whereas Kant would maintain that it is because such an empirical ground would be insufficient to establish the necessity and strict universality of such a principle, but both agree that experience cannot justify the uniformity of nature.[[47]](#footnote-47) Kant thus agrees with Hume that experience cannot justify the Causal Principle. For Kant, if it is to be justified, it cannot be *a posteriori*, but must be *a priori*.

To linger on this point of agreement for a moment, it should be noted that both Hume and Kant share the assumption that *a priority* is incompatible with probability. This can, and has, been contested, both in the particular case of induction and elsewhere. In the context of Hume scholarship, Millican points out that *a priori* probabilistic reasoning might allow for a justification of the Uniformity Principle that circumvents Hume’s argument.[[48]](#footnote-48) This is in line with a variety of responses to the problem of induction beyond Hume scholarship. A classic attempt might be gleaned from Russell’s discussion of the issue, and such a strategy has had its defenders down the years.[[49]](#footnote-49) More recently, a proposal in similar vein is offered by White.[[50]](#footnote-50)

Third, Kant clearly maintains that the connection between cause and effect cannot be analytic, deriving from an analysis of the concepts involved (A787/B811). In taking the Causal Principle to be synthetic, Kant agrees with Hume that we can conceive of the negation of the Causal Principle without contradiction, and thus it cannot be established by demonstrative arguments.

Hume would conclude from this that the Causal Principle cannot be *a priori*.

Kant disagrees. Hume has ruled that the Uniformity Principle cannot be *a priori*, because its negation can be conceived without contradiction (i.e. it is synthetic), and he would say the same about the Causal Principle. However, to Kant, this commits the general Humean error of conflating analyticity with *a priority*. Kant would agree with Hume that the Causal Principle is synthetic rather than analytic. But for Kant, Hume overlooks the possibility that this may be compatible with its being *a priori*. By aiming to establish the Causal Principle as a synthetic *a priori* proposition, Kant offers a response to Hume’s sceptical attack on induction.

How does Kant attempt to do this? Hume limits legitimate forms of argument to two: probable arguments, which establish matters of fact, and demonstrative arguments, which establish relations of ideas. Kant challenges this dichotomy. He argues that there are synthetic *a priori* propositions that are neither matters of fact nor relations of ideas. If these propositions are to be establishable by argument, at least in principle, then there must be a third legitimate form of argument. A transcendental argument, which establishes synthetic *a priori* truths by investigating the necessary conditions for the cognition of objects, is neither demonstrative nor probable. The Second Analogy offers a transcendental argument for the Causal Principle, which establishes the uniformity of nature in such a way as to circumvent Hume’s sceptical argument.[[51]](#footnote-51) More specifically, the synthetic *a priori* judgment that is the Causal Principle is justified by a transcendental argument establishing that it follows as an *a priori* condition for objective temporal succession.

For Kant, transcendental arguments establish their conclusions by showing that they are necessary conditions for the possibility of an integral aspect of experience. Perhaps the best way to understand how they differ from probable and demonstrative arguments is as follows. Probable arguments compel their conclusions by means of *causal* necessity: given such and such causal laws, the conclusion is supported by the premises.[[52]](#footnote-52) Demonstrative arguments compel their conclusions by a *logical* and/or *semantic* necessity: given certain logical laws, along with certain definitions, the conclusion follows from the premises. As Stern has argued, transcendental arguments cannot compel their conclusions by means of either of these necessities.[[53]](#footnote-53) Utilising a merely logical or semantic necessity could only produce analytic knowledge. But utilising a merely causal necessity could not deliver *a priori* knowledge. Rather, transcendental arguments compel their conclusions by means of necessity intermediate between the two, which we might label *metaphysical* necessity. Pinning down the nature of this metaphysical necessity is a tricky task, which I cannot enter into here, but at least this allows us to see the way in which transcendental arguments might fundamentally differ from both demonstrative and probable arguments.[[54]](#footnote-54)

Thus, there is a gap in Hume’s famous argument on induction that Kant exploits: by arguing that the Uniformity Principle (or something like it) is a synthetic *a priori* truth, Kant offers a justification for this principle, via a transcendental argument, that Hume’s sceptical argument has not ruled out. A final note before moving on. Kant’s argument in the Second Analogy seems uniquely well placed among transcendental arguments to respond to Hume’s inductive scepticism. Consider the following. A transcendental argument that responds to Hume in this regard would argue that there is a certain indubitable feature of experience that necessarily presupposes the Uniformity Principle. But Hume might respond, querying whether this feature of experience might come to cease—how do we know, without begging the question, that this feature of experience will continue in the future? However, for Kant, this feature of experience is that of objective temporal succession. It makes no sense to ask if objective temporal succession itself will persist in the future—if there is no objective temporal succession, then there is no future. Kant’s transcendental argument against Hume’s inductive scepticism therefore does not beg the question by assuming the Uniformity Principle.

## Taking Stock

We have seen that, contrary to what is often claimed in the secondary literature, we can indeed find a response to Hume’s argument on induction in the Second Analogy. Moreover, this response engages deeply with the argument itself, rather than merely denying its result in a question-begging manner.[[55]](#footnote-55) By contrast, Watkins’ interpretation argues that no meaningful engagement with Hume occurs in the Second Analogy:

But if Hume’s and Kant’s models of causality and basic ontologies have almost nothing in common, it follows that Kant’s argument cannot be understood as a refutation of Hume’s position. (Watkins, 2004, p.486)

It might be that Kant’s *metaphysical* account of causality has almost nothing in common with Hume’s, and hence will ‘beg the question’ against him *on the topic of causation*, as Watkins argues.[[56]](#footnote-56) I have not taken a stand on this issue in this paper. However, I do not think that Kant’s *epistemological* justification of the uniformity of nature can be fairly said to beg the question against Hume *on the topic of induction*. I see the response to Hume that we find in the Second Analogy as constituting a substantive engagement with Hume’s argument on induction. On my reading, it is inaccurate to describe Hume and Kant as sharing almost no common ground with regard to this argument; Kant substantially agrees with Hume on many of the underlying premises, as we have seen. Even the crucial point of departure from Hume, that is, the possibility of synthetic *a priori* propositions, is hardly such that Kant has ‘almost nothing in common’ with Hume. For we have also seen that Hume and Kant are happy to divide judgments along the same lines of *a priority/a posteriority* and syntheticity/analyticity, and that they agree that these distinctions are epistemological and semantic respectively. Their disagreement in this regard is only limited to whether these two distinctions entirely coincide. Even so, Kant agrees that Hume’s Fork is generally correct: it is true that all *a posteriori* judgements are synthetic (A7/B11), and that all analytic judgments are *a priori*. The only thing that Hume’s Fork omits is the possibility of synthetic *a priori* judgments, which Kant does not simply assume, but argues for in the Introduction to the first *Critique*.[[57]](#footnote-57)

That said, to claim that Kant’s response constitutes a *refutation* of Hume’s argument on induction would seem too strong a claim—after all, a philosophical response can be edifying and cogent without outright refuting its target. Kant’s reply might convince some of a certain philosophical outlook, but Hume would likely not be among them. He would almost certainly deny Kant at least some of the resources required to establish the uniformity of nature.

First, he might urge that the argument of the Second Analogy fails to establish its desired conclusion, which is a question that my paper has explicitly shied away from. For instance, Hume would likely deny that our experience of objective succession requires anything as strong as an apprehension of necessary and strictly universal rules governing the changes of states in the objects.[[58]](#footnote-58) Hume might also question whether the fact (assuming it is one) that objective placement of successive perceptions requires rules justifies the sweeping conclusion of *universal* causal determination in the phenomenal world.[[59]](#footnote-59) Or Hume might argue that Kant conflates the metaphysical question of whether events are in fact causally connected, and the epistemological question of whether we can discern their causal connection.[[60]](#footnote-60) More generally, Hume might take issue with the very notion that transcendental arguments can offer any sort of response to scepticism.[[61]](#footnote-61)

Certainly, Hume might take issue with the possibility of synthetic *a priori* propositions. But also, even if he did not, he would certainly take issue with the claim that the conclusion of the Second Analogy in particular was a synthetic *a priori* proposition. Recall that key to a judgment’s being synthetic *a priori*, according to Kant, is for an *a priori* intuition to connect its constituents. The Causal Principle is synthetic *a priori* in virtue of a schema—that is, a transcendental determination of the *a priori* intuition of time—mediating the application of the category of causation to appearances. Kant’s response to Hume therefore turns on the Transcendental Aesthetic, which claims to establish that time is an *a priori* intuition.[[62]](#footnote-62) But Hume can and does deny that time is *a priori*, instead offering an unmistakeably empirical account of it in Book 1 Part 2 of the *Treatise*.

Does this mean that Kant’s response to Hume, in already presupposing his transcendental idealism, merely begs the question against him, contrary to what I claimed above? I do not think so.[[63]](#footnote-63) Although it is true that Kant’s *specific* reply is one that Hume would not readily accept, there is a more general level of description of this response that seems a philosophically perspicacious one. Kant’s response to Hume identifies a genuine gap in the argument, which is that it fails to consider the possibility of *a priori* justification for the Uniformity Principle that leaves open the conceivability of the negation of this principle. Whatever one thinks of the merits of Kant’s critical philosophy, this seems a philosophically insightful diagnosis of a potential gap in Hume’s argument on induction.

Importantly, this general strategy of deriving justification for the Uniformity Principle that is neither demonstrative nor merely empirical is one that need not turn on transcendental idealism. For instance, we have seen that Hume and Kant share the assumption that *a priori* probability is an impossibility. And as mentioned in the previous section, many commentators have aspired to defend induction from Hume’s assault precisely by appealing to such *a priori* probabilities. Although obviously quite distant from, and indeed precluded by, Kant’s framework of transcendental idealism, such a strategy shares in Kant’s insight against Hume: we could potentially have *a priori* justification of the Uniformity Principle that is synthetic insofar as it allows for the negation of the Uniformity Principle to be perfectly conceivable, whether this justification is probabilistic or necessary.

Unsurprisingly, Kant’s own solution to the problem of induction will be continuous with his transcendental philosophy, and his appeal to the *a priori* intuition of time to connect the constituents of synthetic *a priori* judgments reflects this. Thus, it will be the case that the fate of Kant’s response to Hume on induction will be tied to the success of his transcendental idealism. One would hardly expect anything less from a philosopher as systematic as Kant. But this systematicity should not be used as a stick with which to beat him. His response to Hume’s problem of induction is, I contend, a philosophically edifying one.[[64]](#footnote-64) , , , (Kant, 1724–1804, 2004; Price, 1758)

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1. See for instance A766/B794 in the *Critique*, and 4:257–58 and 4:310 in the *Prolegomena*. (Kuehn, 1983) argues that Hume’s problem also was the instigator for Kant’s Antinomy of Pure Reason. References to the *Critique of Pure Reason* follow the standard A and B paginations for the first and second editions respectively. The translation used is the 1998 Cambridge edition, edited and translated by Paul Guyer and Allen Wood. References to the *Prolegomena to any Future Metaphysics* use the pagination of volume 4 of *Kant’s* *Gesammelte Schriften*, edited by the Königlich Preussische Akademie der Wissenschaften, Berlin, 1911. The translation used is the 2004 Cambridge edition, edited and translated by Gary Hatfield. [↑](#footnote-ref-1)
2. Lewis White Beck’s famous essay, ‘A Prussian Hume and a Scottish Kant’, rather pithily labels the principles that Hume challenges in his account of causation (in the *Treatise*) and induction as ‘every-event-some-cause’ and ‘same-cause-same-effect’ respectively (Beck, 1978). [↑](#footnote-ref-2)
3. See (Hatfield, 2001) and (Watkins, 2005, Chapter 6) for some interpretations that do not see the Second Analogy as particularly concerned with responding to Hume’s worry about causation. See (Guyer, 2008, pp.9–20) and (Chance, 2013) for some replies in this regard. [↑](#footnote-ref-3)
4. (Guyer, 2008, p.123). See also (Beck, 1978), (Walker, 1999, p.14), (Waxman, 2008), (Allison, 1994), (Allison, 2004, p.246), and (Allison, 2008b, p.541). That said, commentators often hold that Kant *elsewhere* offers such a response to Hume. Walker argues that Kant answers Hume in this respect in ‘On the Regulative Use of the Ideas of Pure Reason’ (A642–704/B670–732), although see (Bird, 1999) for a reply. Guyer and Allison see this response in the Introduction to the *Critique of the Power of Judgement*, which argues that in looking for the *particular* causal rule to apply, we presuppose that nature as a whole is organised according to a continuous hierarchy of empirical laws, from the more universal to the more particular; see (Guyer, 2008, Ch.5), (Allison, 2001, Ch.1), (Allison, 2003), and (Allison, 2008a, Ch.5, Appendix). (Ginsborg, 2017, p.74) argues that this response cannot in itself constitute an answer to Hume’s problem of induction, insofar as the relevant principle of judgement is confirmed by observation, and thus an appeal to it to justify induction would be question-begging. (Landy, 2015, p.216) argues that the Second Analogy only adds ‘the specific form’ of the causal laws, but the necessity of these laws has already been established by Kant’s general account of mental representation. [↑](#footnote-ref-4)
5. There have been a number of interpretations that see Kant’s account of causation as capable of addressing Hume’s inductive scepticism. One prominent such interpretation is (Friedman, 1992) and (Friedman, 1994), which argues that transcendental laws ground empirical laws by supplying them with the requisite necessity, thus offering a guarantee for the uniformity of particular empirical laws. By contrast, my account only looks to offer a guarantee for general uniformity, while remaining silent on the status of particular empirical causal laws. Another account is offered in (Melnick, 2006, p.217), which argues that the uniformity of nature is founded on the homogenous nature of the unfolding of time, which necessitates a homogeneity in the unfolding of events that occur in time; this position is also defended in (Longuenesse, 2005, pp.172–177), which relates the conceptual continuity from higher to lower concepts and empirical laws, to the intuitive continuity of time. (Buroker, 2006, p.173) finds convincing Melnick’s and Friedman’s arguments for Kant’s being concerned with establishing the uniformity of nature in the Second Analogy. Watkins also argues that Kant’s overall model of causality allows him to establish general uniformity in (Watkins, 2004, §6) and (Watkins, 2005, Ch.4), although he stresses the metaphysics of Kant’s account of causation, while I emphasise the notion of rule-boundedness. [↑](#footnote-ref-5)
6. I do not deny that Kant’s response requires elements of his critical philosophy that go beyond the Second Analogy, but I maintain that the bulk of the heavy lifting is done in establishing the synthetic *a priori* judgment that is the Causal Principle, which is the task of the Second Analogy. [↑](#footnote-ref-6)
7. Kant might, however, have encountered Hume’s argument on the self second-hand by means of Beattie’s discussion of it. Of course, there are a number of possible routes via which Kant might have been exposed to the *Treatise* (c.f. for example (Kuehn, 1989)), and so any such suggestion must remain speculative. [↑](#footnote-ref-7)
8. Here I bracket the distinction between metaphysical necessity and contingency. Hume and Kant would agree that metaphysical necessity goes hand-in-hand with *a priority*, and contingency with *a posteriority*. (Kripke, 1980) would later dispute this (but see Millican (2017, §7) for detailed discussion). Hume of course recognises causal as well as metaphysical (or ‘absolute’) necessity; the former is only knowable *a posteriori*. Kant, in criticising Hume for failing to recognise the necessity of causation, takes it that Hume’s notion of causal necessity is insufficient in this regard, since Kant takes it to be overly psychologistic in its roots. [↑](#footnote-ref-8)
9. (Allison, 2004, p.90) very usefully and concisely discusses some of these issues. [↑](#footnote-ref-9)
10. (MacFarlane, 2002, p.26). [↑](#footnote-ref-10)
11. (Hanna, 2001, p.125). Hanna offers a detailed semantic account of analytic judgments, whereby to make an analytic judgment is to articulate the decompositional content of a concept (Hanna, 2006, p.371). [↑](#footnote-ref-11)
12. (Allison, 2004, p.91). [↑](#footnote-ref-12)
13. (Van Cleve, 1999, p.20), (Buroker, 2006, p.31). [↑](#footnote-ref-13)
14. (Hanna, 2001, p.148); see also (Anderson, 1992, p.84). [↑](#footnote-ref-14)
15. (Hanna, 2001, p.150). [↑](#footnote-ref-15)
16. An excellent and thorough discussion of Hume’s Fork is available in (Millican, 2017). [↑](#footnote-ref-16)
17. (Lightner, 1997) and (Millican, 2017, pp.37–42). (Holden, 2014) has argued that Hume in fact endorses the Inconceivability Principle, in line with his reading of Hume as an expressivist about modality, but see the just-mentioned Millican paper for strong criticism of this view. [↑](#footnote-ref-17)
18. (Millican, 2017, p.38). [↑](#footnote-ref-18)
19. (Millican, 2017, §7). [↑](#footnote-ref-19)
20. Here I am convinced that ‘New Hume’ positions such as (Wright, 1983), (Strawson, 1989), and (Kail, 2007) that argue otherwise have been decisively refuted by (Winkler, 1991) and (Millican, 2009). [↑](#footnote-ref-20)
21. (Garrett, 2008, pp.203–206). [↑](#footnote-ref-21)
22. (Garrett, 2008, p.206). [↑](#footnote-ref-22)
23. Indeed, whether or not Hume thinks that synthetic *a priori* propositions are in general possible, he clearly does not think that the *Uniformity Principle* in particular could be a synthetic *a priori* truth. For importantly, he clearly denies that it could be *a priori* at all (EHU 4.18). Thus, even if one is inclined to maintain that Hume’s Fork can accommodate synthetic *a priori* propositions, one can still take this paper’s conclusion on board: Kant aims to answer Hume’s argument on induction by showing that the Uniformity Principle (or something like it) is a synthetic *a priori* proposition, a possibility that Hume missed. [↑](#footnote-ref-23)
24. Space and time are necessary but insufficient conditions for the possibility of synthetic *a priori* judgments. Crucial also is the transcendental unity of apperception, but to go into the details of the Kantian machinery on this point would take us too far afield, and would be somewhat tangential to my paper. For my purposes, it suffices to show that synthetic *a priori* propositions require *a priori* intuitions; as I will later argue, Hume rejects the latter. [↑](#footnote-ref-24)
25. In this paper, I will be discussing the version that Hume offers in the *Enquiry Concerning Human Understanding* (rather than the version set out in Book 1 of the *Treatise of Human Nature*,or the one set out in *An Abstract of a Book Lately Published*). This is because the *Enquiry* was the work of Hume’s that Kant referred to in writing his *Critique of Pure Reason* (Guyer, 2008, pp.5–6). This is also the most polished and complete version of the argument—for details of the differences, see (Millican, 2012, §3) and (Qu, 2020, Ch.3). [↑](#footnote-ref-25)
26. (Qu, 2014) and (Qu, 2020, Ch.3–4). [↑](#footnote-ref-26)
27. In the references to Hume’s texts throughout, ‘THN’ refers to the *Treatise of Human Nature*, and ‘EHU’ refers to the *Enquiry Concerning Human Understanding*. Arabic numerals refer to section and paragraph numbers (EHU), or to book, part, section, and paragraph numbers (THN). [↑](#footnote-ref-27)
28. I take EHU 4 to be making a sceptical point (we lack reason-based justification for our inductive inferences) rather than a psychological one (the process by which we are caused to inductively infer is not one that involves reason). For some defences of the latter reading, see (Garrett, 1997) and (Owen, 1999). I offer a case for reading EHU 4 as sceptical in nature in my (Qu, 2014) and (Qu, 2020, Ch.3); see also (Winkler, 1999) and (Millican, 2002), as well as (Millican, 2012), which revises his account in a few respects. It is worth noting that Kant, at least, clearly takes Hume’s problem to be genuinely sceptical, whether or not he was correct to do so.

 In correspondence, Peter Millican suggests that Hume himself might be read as providing a quasi-transcendental argument for the Uniformity Principle. One might read Hume as arguing that we do in fact have justified belief about unobserved matters of fact (EHU 5.2), and the Uniformity Principle being justified is a necessary precondition of this—therefore, the Uniformity Principle is justified. [↑](#footnote-ref-28)
29. Elsewhere in (Qu, 2020, pp.66–76), I have argued that Hume also dismisses the possibility of sensation directly grounding our inductive inferences in EHU 4.16, following (Millican, 1998) and (Millican, 2002). But this is controversial, and is denied by (Garrett, 1998), for instance. As the matter is not crucial for my purposes in this paper, I set it aside here. [↑](#footnote-ref-29)
30. Probable reasoning includes both what Hume calls ‘probabilities’ and ‘proofs’, and is not Hume’s favoured term in the *Enquiry*. I use it because it is more convenient that ‘reasoning concerning matters of fact’ and less prone to confusion than ‘moral reasoning’. [↑](#footnote-ref-30)
31. Elsewhere in (Qu, 2014) and (Qu, 2020, Ch.3–4), I argue that Hume seeks to mitigate this sceptical result by adducing some positive justification for our inductive practices in EHU 5; as such, the argument of EHU 4 is not watertight, and can be circumvented, as I maintain Hume himself aimed to do. However, insofar as Kant either did not seem aware of, or convinced by, any such considerations, I bracket them for the purposes of my paper. [↑](#footnote-ref-31)
32. (Allison, 1981, p.70) puts it elegantly: ‘transcendental determinations of time, as products of the transcendental synthesis of the imagination, are universal and necessary (*a priori*) characteristics of objective time or an objective temporal order.’ [↑](#footnote-ref-32)
33. The sense in which concepts and objects are not homogenous can be somewhat obscure. In my view, it is best understood as due to the fact that concepts are logically ordered, while objects are spatio-temporally ordered. [↑](#footnote-ref-33)
34. An anonymous referee poses an interesting question: what is the relation, if any, between pure intuition as the bridge between concepts in synthetic *a priori* judgments and schemata as the bridge between object and concept? My own view is that these two issues are somewhat orthogonal. For one, schemata are the products of the imagination, while *a priori* intuitions fall within the province of sensibility. For another, schemata, which allow for concepts to apply to intuitions, are universal to all judgments; meanwhile, among judgments, only those that are synthetic *a priori* have *a priori* intuitions playing this bridging function. This corresponds to pure intuitions and schemata having different functions with respect to judgments. The function of *a priori* intuitions in synthetic *a priori* judgments is tied to *truth*: they allow a concept not contained within a subject to be truly predicated of it. Meanwhile, the function of schemata is independent of truth: even false applications of concepts to intuitions will require schemata as a means of bridging the gap between the conceptual and the sensible. [↑](#footnote-ref-34)
35. For instance, (Landy, 2015, p.215) points out that alterations might accord with the general law of the connection of cause and effect by according with more specific causal laws, thus bringing the B version in line with the A version. Similarly, (Watkins, 2010, p.161) claims that Kant ‘often refers to the law of the connection of cause and effect simply as a causal rule, so the content of the principle of the Second Analogy is that every event occurs according to a causal rule’. See also (Allison, 2004, p.247): ‘…the difference between the two formulations is merely terminological.’ For a detailed account of the relation between the two formulations, see (Longuenesse, 1998, Chapter 11). [↑](#footnote-ref-35)
36. ‘Same thing’ is somewhat ambiguous here. In Kant’s example of the house, we are observing the same *object* regardless of order. In Kant’s example of the ship, we are observing the same *event* only if the order is retained. Perceivings of events are order-sensitive, while perceivings of objects are not. If we changed the former example to involve a burning house, then this would be an event rather than an object, and so the order of perceptual states would matter: if the perceptual states were in a different order, we would be observing a different event (e.g. a house fire extinguishing rather than kindling). [↑](#footnote-ref-36)
37. Kant’s position here presupposes that scepticism about the external world (a form of which Hume arguably endorses) is unviable, but Kant elsewhere addresses such scepticism in his Refutation of Idealism. [↑](#footnote-ref-37)
38. Here, ‘everything that happens’ refers to changes in objects, that is, objective change. [↑](#footnote-ref-38)
39. (Longuenesse, 2005, p.166). [↑](#footnote-ref-39)
40. That even infants and beasts behave inductively is a point that Hume repeatedly stresses (EHU 4.23, EHU 9.1). [↑](#footnote-ref-40)
41. It might in fact be overdetermined: defamation, sedition, and the Protection from Online Falsehoods and Manipulation Act (POFMA) may all be seen to apply. [↑](#footnote-ref-41)
42. (Friedman, 1992, particularly §3 and §5); (Friedman, 1994, p.38). [↑](#footnote-ref-42)
43. Although, of course, there might be other reasons to establish the necessity of particular laws. As such, my disagreement with Friedman is less on Kant scholarship, and more on the nature of Hume’s sceptical attack on induction (and what would suffice to constitute a response to this attack). [↑](#footnote-ref-43)
44. (Allison, 1994). See also (Paton, 1951, pp.275–8) and (McFarland, 1970, pp.8–11). [↑](#footnote-ref-44)
45. (Allison, 1994, p.298). [↑](#footnote-ref-45)
46. Kant’s use of the Causal Principle to justify the Uniformity Principle is similar to Price’s attempt in his *Review of the Principal Questions and Difficulties in Morals* to justify the Uniformity Principle on the basis of the Causal Maxim (every event has a cause) being intuitively known. See (Millican, 2012, pp.76–77) for discussion of Price’s attempt. [↑](#footnote-ref-46)
47. Hume does suggest that the principle that every event has a cause might be justified by experience, for instance in THN 1.3.3.9, THN 1.3.8.14, and THN 1.3.12.5 (see also EHU 8.15). [↑](#footnote-ref-47)
48. (Millican, 2002, pp.136–7). (Millican, 1996) carefully explores such strategies. [↑](#footnote-ref-48)
49. (Russell, 1912, Chapter 6). For other attempts, see for instance (Williams, 1947), (De Finetti, 1969), (Blackburn, 1973), (Mackie, 1979), and (Stove, 1986). See also (Howson, 2000, Chapter 4) for a more formal discussion of such strategies, and (Ayer, 1972) for a rejection of such accounts. (Millican, 1996) has a careful and comprehensive discussion of such attempts. [↑](#footnote-ref-49)
50. (White, 2015). White argues that it is very difficult to construct a world whereby induction goes radically wrong; in most cases, induction will go even (on average) or do well. Thus, on balance, we have *a priori* reason to think induction reliable, since we are statistically likely to occupy an induction-friendly world. For a recent rejection of this solution, see (Barnett & Li, 2018). [↑](#footnote-ref-50)
51. See (Garrett, 2015, p.322), who similarly describes Kant as addressing Hume’s problem of induction by means of offering a third kind of argument—that is, a transcendental argument. [↑](#footnote-ref-51)
52. As mentioned earlier, Hume recognises causal necessity (e.g. EHU 8.5), but this should be sharply distinguished from objective necessary connections between causes and effects, which he rejects. Note also that Hume acknowledges *uncertain* probable arguments (e.g. his ‘probability of chances’ and ‘probability of causes’, e.g. THN 1.3.11–12;EHU 6.4). [↑](#footnote-ref-52)
53. (Stern, 2004, pp.8–10). [↑](#footnote-ref-53)
54. For some discussion of such difficulties, see (Stern, 2004, pp.59–63). [↑](#footnote-ref-54)
55. This might be contrasted with accounts that see Kant’s response to Hume on induction as residing in the Introduction to the third *Critique*, such as those defended by Guyer and Allison. For Kant there leans heavily on a teleological conception of nature, which is a philosophical worldview of which Hume is trenchantly dismissive (THN 1.4.3.10–11). For different reasons, (Guyer, 2008) concedes that this teleological account cannot offer an epistemological rebuttal to Hume’s worries on induction (p.219), and ‘begs the question against Hume’s worry’ if it addresses it at all (p.220). (Allison, 2008a, p.154) is similarly pessimistic. [↑](#footnote-ref-55)
56. (Watkins, 2004, p.485). [↑](#footnote-ref-56)
57. Although the *Prolegomena*, in following an ‘analytic’ method rather than the ‘synthetic’ method of the *Critique* (not to be confused with the analytic/synthetic distinction), does proceed by assuming the possibility of synthetic *a priori* propositions (4:263). [↑](#footnote-ref-57)
58. See (Falkenstein, 1998) for a careful response on Hume’s behalf to the argument of the Second Analogy, which argues that his notion of ‘exact scrutiny’ (THN 1.3.12.5) can play the role that Kant requires of the *a priori* causal rules. [↑](#footnote-ref-58)
59. Thanks to Peter Millican for raising this issue in correspondence. [↑](#footnote-ref-59)
60. Thanks to Peter Millican for highlighting this worry to me in correspondence. Kantians might respond that for appearances, the metaphysical and epistemological questions are identical: since phenomena are partly constituted by the *a priori* intuitions and concepts we impose on them, the epistemological question of what we can know *a priori* about appearances also amounts to the metaphysical question of what necessarily obtains in appearances. And one might also raise an *ad hominem* point: Hume himself plausibly runs together epistemological and metaphysical questions in his own philosophy, for instance with regard to causation. Here, he seems to proceed from the epistemological claim that all we can know of necessary connection is a subjective impression, via his empiricist Copy Principle, to the metaphysical claim that necessary connection can only be such a thing. [↑](#footnote-ref-60)
61. This worry is perhaps most prominently raised in (Stroud, 1968). I lack the space to discuss this issue here, but for an excellent discussion of this and surrounding issues, see Stern’s collection (Stern, 1999b). (Stern, 1999a) in particular addresses this issue with respect to the Second Analogy, while elsewhere (Stern, 2008) does so with respect to the Refutation of Idealism. [↑](#footnote-ref-61)
62. The centrality of time to Kant’s argument in the Second (and First) Analogy is emphasised in (Melnick, 2006, p.203): ‘Kant’s views on the nature of causation and substance… depend… on what he calls a “third thing”, the pure intuition of time…’. Landy argues that Kant’s arguments on our representations of time are directed at Hume in particular (Landy, 2015, Chapter 2). [↑](#footnote-ref-62)
63. A similar perspective is adopted in (Stern, 2008, p.273), which argues that transcendental arguments can successfully respond to scepticism independently of the framework of transcendental idealism, although he does concede, with respect to the Refutation of Idealism, that a challenge to the argument might require an appeal to a form of transcendental idealism. (Stern, 1999a) is also representative of such a stance, this time with respect to the Second Analogy. [↑](#footnote-ref-63)
64. For very detailed and helpful comments, thanks are owed to Peter Millican, Don Garrett, Lorne Falkenstein, David Landy, and Thomas Moore. For some searching questions which were invaluable to improving the paper, I am also grateful to a reading group at the National University of Singapore and an audience at the Australian Seminar in Early Modern Philosophy 2017 at the University of Sydney. [↑](#footnote-ref-64)