Focusing on Presupposing to Clarify Kant's Critique

Abstract

By focusing on the nature and function of suppositions, particularly absolute presuppositions, we can clarify a number of obscurities in Kant's *Critique of Pure Reason* (particularly obscurities relating to the 'principles' a/k/a synthetic a priori judgments), better appreciate the *Critique*, and improve our own thinking. Obscurities clarified include the following:

- How, precisely, are the sensory-perception and conceptual aspects of our thinking related?
- What exactly are the principles? How do they function?
- How can our use of the principles be justified?
- What is the limit (proper scope) of our justified use of the principles?
- Do we need to show that appearances necessarily conform to the principles?
- Do we 'know' the principles?
- How do we acquire the principles?
- Are the principles permanent, or do they change?
- Why do the principles change?

Keywords: Kant; supposition; presupposition; category; principle; judgment

1. Introduction

Immanuel Kant recognized that his *Critique of Pure Reason* was in some respects obscure. He said that it could be made clearer by better exposition (PRO 4:261; Bxxxviii, xlii-xliii). Much of the *Critique*'s obscurity, however, stems not from the manner of exposition but from inadequate attention to the nature and function of suppositions, particularly absolute presuppositions.

In his *Critique*, Kant treats what in fact are fundamental suppositions (absolute presuppositions) of the physics of his day (which he calls the 'principles') not as suppositions but as a priori 'judgments.' Kant does this for at least two reasons: (i) Although Kant sees thinking in empirical science as involving asking and answering questions, he does not give adequate attention to a third action, that of making suppositions. Thinking in empirical science (as in other fields) is a process of making suppositions (some of which are absolute presuppositions), asking questions which arise from the suppositions, and answering those questions (I call this process 'S/Q/A'). (ii) In the case of the 'principles,' he thinks, and considers it crucial, that we do not merely suppose them, but rather we know them. The foregoing (i) and (ii) together give rise to much of the obscurity in his otherwise masterful *Critique*.

Conversely, understanding that thinking in empirical science (as in other fields) is S/Q/A and that the 'principles' (or as Kant also calls them, 'synthetic a priori judgments') are absolute presuppositions (not judgments) clears up much of the obscurity in the *Critique*.[1] Specifically, it helps answer or clarify the following:

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[1] Others have pointed out (i) that the principles are presuppositions of physics (as practiced by Kant et al.); for example, Hermann Cohen (1871/1885), R. G. Collingwood (1940), and Michael Friedman (1992, 2001, 2006). I have not found anyone addressing (ii) whether Kant considers the principles to be presuppositions as presuppositions are understood in the logic of S/Q/A or (iii) whether by focusing on the nature and function of such presuppositions we can clear up these obscurities in the *Critique*. Regarding (ii): Collingwood suggests that Kant did consider the

- How, precisely, are the sensory-perception and conceptual aspects of our thinking related: when we think in empirical science, do we, in fact, start with sensory impressions and then add concepts?
- Regarding the principles, which are a focus of the *Critique*:
  - What exactly are the principles? How do they function? Are they 'judgments' or 'rules that we apply'? Or, are they absolute presuppositions?
  - Does Kant sometimes recognize that the principles are presuppositions?
  - How can our use of the principles be justified — both in general (as concepts of a peculiar kind) and in particular (that is, how can we justify our use of any particular principle)?
  - What is the limit (proper scope) of our justified use of the principles?
  - Do we need to show that appearances necessarily conform to the principles?
  - Do we 'know' the principles?
  - How do we acquire the principles?
  - Are the principles permanent, or do they change?
  - Why do the principles change?

S/Q/A enables us not only to clarify Kant's *Critique* but also better to appreciate it for (among other things) Kant's identification of the absolute presuppositions of the physics of his day.

S/Q/A also helps us in our own thinking. Like Kant, many of us want our fundamental suppositions to be more than suppositions. We want them to be things that we know (that is, to have the status of knowledge), and we may worry that if we cannot show that our fundamental suppositions are true, we cannot use them. Such a worry could actually be dangerous. For example, in many fields of empirical science, researchers presuppose cause-and-effect. If they were to stop presupposing cause-and-effect, they could no longer ask questions such as 'Does X cause cancer?' (This is not to say that a different presupposition could not give rise to an even better question.) Hence, it is important generally, not just for understanding Kant, to understand S/Q/A, including what absolute presuppositions are, how they function, how they can and cannot be justified, why they change, and what are our own presuppositions.

Before showing how S/Q/A enables us to clarify Kant's *Critique* as to the matters listed above, I first explain S/Q/A and then give an overview of Kant's analysis of how we think (in empirical science).

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principles to be presuppositions as understood in the logic of S/Q/A (1940, pp. 239-41). But, Collingwood does not address this question in detail. Béatrice Longuenesse suggests this as well (in different terms), also without addressing the question in detail. She says that a category is (among other things) a 'rule' in the sense that it tells or enables us to 'look for' something: 'For instance, to have the category of substance is to have the rule: look for something that remains permanent while its properties change. To have the category of cause is to have the rule: look for some real that is such that whenever it exists ("is posited") something else follows.' (2005, p. 24) (a similar characterization appears at pp. 26-7, 58, and 104-5). In other words, each category (and each principle) gives rise to certain questions. Kant, however, generally does not put it this way. For instances where he does, see section 4.2.2.

2. S/Q/A

Let us consider a few examples. Confronted with a patient (P) who speaks with difficulty, unstable voice quality, and excessive tension in the vocal muscles:

(1) A speech therapist oriented to psychology may ask: Supposing that P's problems result from emotions associated with speaking, do they result from anxiety that he will be unable to produce suitable sound, and if so, would P resolve that anxiety (and its effects on the voice) by developing new emotional habits A, B, and C in connection with speaking?

(2) A speech therapist oriented to vocal technique may ask: Supposing that P's problems result from poor physical habits, do they result from clenching the jaw and forcefully squeezing the vocal folds, in the effort to produce sound, and if so, would P be able to replace those habits (and improve P's voice) by means of easy-onset exercises, exercises to dissociate the tongue from the jaw, yawning, etc.?

(3) A laryngologist may ask: Supposing that P's problems result from an organic defect, are P's vocal folds properly closing, and if not, would the poor closure (and its effect on the voice) be resolved by moving the vocal folds closer to each other using a permanent implant?

In each case, the questions arise from the indicated supposition. That supposition, in turn, presupposes that P's problems with speech have a cause (or causes).

An archaeologist working on the Roman wall in Britain between Tyne and Solway may ask: Supposing that the wall was for defending a frontier, keeping out the tribes beyond it, how did the Romans intend it to accomplish that purpose: 'Was it meant to work, for example, like a town-wall, from the top of which defenders repelled attacks?' Or, was it 'a sentry-walk, elevated from the ground and provided (no doubt) with a parapet to protect the sentries against sniping'? (Collingwood 1939a, p. 128-9) The archaeologist's questions arise from his supposition, which, in turn, presupposes that any manmade object (in this case, a wall) is 'for' something.

As these examples show, not only does thinking involve asking and answering questions, but questions arise from suppositions.

A question's immediate, or direct, supposition usually has its own suppositions. More precisely, it is the answer to a question that arises from another supposition. Thus, in most cases, a supposition is both a supposition and an answer to a question. It is thus a 'relative' supposition: relative to one question, it is that question's supposition; relative to another question, it is that question's answer. To take an example given by R.G. Collingwood (1940, pp. 29-30): (i) when a surveyor, taking hundreds of measurements using his old measuring tape, successively asks 'What is the distance between these two points?,' he is supposing each time that the tape is the length that it professes to be; relative to that question, the accuracy of his tape is a supposition; (ii) over the years, however, the tape may have stretched, and so from time to time the surveyor will check its length against something not liable to stretching (or shrinking), for example, a surveyor's chain, asking himself 'Is this

tape accurate?'; relative to this question, the accuracy of the tape is one of two possible answers, the affirmative answer.[2]

Some suppositions, however, are not also answers to questions: they give rise to questions but are not an answer to a question. These are fundamental or 'absolute' suppositions, sometimes called absolute presuppositions. Examples are given above: the absolute presupposition of a speech therapist or a surgeon that every medical or physical disorder has a cause, and the absolute presupposition of an archaeologist that every manmade object was made for some purpose.

An absolute presupposition neither admits nor requires verification. This does not mean that the presupposition is defective, that is, that it needs to be verified but cannot be. It means that *its function is only to give rise to questions* and not also to be an answer to a question. So, in the case of an absolute presupposition, the distinction between truth and falsehood does not apply, that distinction being peculiar to a proposition that is an answer to a question. Put another way, an absolute supposition stands at the very beginning of our thinking. We cannot get behind it and ask, 'Is it true?' 'What evidence is there for it?' or 'How can it be demonstrated?' As to an absolute presupposition, such a question does not apply (whereas such a question does apply to a supposition that is relative). (Collingwood 1940, pp. 32-3, 40-8)

Not only do absolute presuppositions neither admit nor require verification, they do not even need to be believed to be true. To perform their function in our empirical thinking (giving rise to questions), they need only be presupposed.

Each science makes, and must make, some absolute presuppositions. These may differ from science to science, since each science has its own subject matter, as to which it needs to ask its own questions. For example, in contrast to Newtonian physics, the sciences of history (as the study of human action) and ethics presuppose that persons have free will.

A few words about judgments:

(i) In the logic of S/Q/A, a judgment is an answer to a question. There is no such thing as a judgment, and no way to determine its meaning or whether it is true (whether 'in itself' or in its 'correspondence' to some 'state of things' or 'fact' or in its relation to other propositions with which it 'coheres'), apart from the specific question to which it is an answer (which question arose from a specific supposition) and the larger complex of suppositions/questions/answers of which that question is a part. (Collingwood 1939a, pp. 33-41) In contrast to the logic of S/Q/A, propositional logic (A) tends to focus on a proposition (judgment) in isolation rather than as part of a specific complex of suppositions, question, and answer, and (B) tends to neglect (or even fails to recognize or, at least, recognize consistently) the supposing and questioning aspects of thinking and to treat all thinking as asserting (Collingwood 1939b at II.c.). Kant's logic differs somewhat from modern propositional logic, being a logic of relations of concepts (Longuenesse 2005, pp. 88-91, 115-

[2] As this example shows, a relative supposition can be made provisionally, before being confirmed as an answer to a question. It is, however, susceptible of being confirmed, or disconfirmed, as an answer to a question.

6, 204-5). But, Kant's logic, too, does not adequately attend to the supposing and questioning aspects of thinking.

(ii) As for Kant's conception of judgments (and the capacity to judge) generally, it is a broad one, encompassing forming concepts, relating concepts to each other or to objects (for example, subsuming objects under a concept or subordinating lower concepts under higher concepts), and making syllogistic inferences (Longuenesse 2005, pp. 18-9, 94, 186, 228). I address Kant's treatment of the principles as judgments in section 4.2.1.

(iii) For purposes of this essay, the main points regarding judgments are that (A) an absolute presupposition is not a judgment but rather gives rise to questions, the answers to which are judgments, and (B) by treating the principles as judgments, Kant obscures the principles' true nature and function as absolute presuppositions that give rise to questions. See section 4.2.1.[3]

3. How we think, according to Kant (an overview)

In this essay, my focus is on Kant's view of thinking — particularly his view of the nature and function of our presuppositions — in empirical science (specifically, physics), and not in other fields, such as mathematics, moral philosophy, speculative theology, speculative cosmology, and non-empirical speculation about the soul, mind, or self.

Broadly speaking, Kant argues that 'all our cognition starts from the senses [and] goes from there to the understanding' (A298/B355). He is probably referring to a progression that is logical rather than temporal, although he does in places give it a temporal sense, saying that sensory impressions prompt us to think (B1; A86/B118).

To summarize Kant's view of cognition in more detail:

In Kant's view, empirical cognition (cognition of sensibly perceived matters) requires both (i) sensible (able to be sensed) perceptions or 'intuitions,' which we passively receive as a result of the mind being affected by objects, and (ii) active conceptualization.

In sensible perception, we perceive objects through 'forms' or 'conditions' of sensibility that we impose, namely, space and time. As Henry Allison (2004, p. 27) puts it, our forms or conditions of sensible perception (space and time) 'structure the way in which the mind receives its sensory data.'

As for conceptualization, some of our concepts are empirical concepts, for example, the concept of 'body.' Other concepts (and these are the ones in which Kant is most interested) we have a priori. By 'a priori' Kant means that they are not based on sensory perceptions or 'experience.' In empirical science, these are the 'categories' and their related 'principles.'

Kant makes a detailed and systematic inventory of the categories and their principles. According to Kant, the categories ('forms' or 'root concepts' of our thought) are:

[3] For further explication of thinking as a suppositions-question-answer dynamic and of absolute presuppositions, see Collingwood's *Essay on Metaphysics* (1940) and the ongoing work by Giuseppina D'Oro, including 2018a, 2018b, 2019a, 2019b, and D'Oro et al. 2019.

Categories of quantity: unity; plurality; allness
Categories of quality: reality; negation; limitation
Categories of relation: inherence and subsistence (substance and accident); causality and dependence (cause and effect); community (interaction between agent and that which is acted upon). The categories of relation are particularly important because of their related principles (examined in examples (i), (ii), and (iv) in section 4.2.1).
Categories of modality: possibility–impossibility; existence–nonexistence; necessity–contingency.

The categories have derivative, but still a priori, principles, by which the categories may be used with respect to empirical objects. Examples are given in section 4.2.1, numbered (i) – (v).

Corresponding to the sensory and conceptual features of our cognition, Kant posits two distinct cognitive powers: 'sensibility,' which is the power of sensible perception, and 'understanding,' which is the power of conceptualization.

In all this, Kant is responding to those who say that cognition is direct intuition (an immediate, non-conceptual grasp of the object), whether sensible (Hume and Locke) or non-sensible (Leibniz). Kant argues that we cannot know an object unmediated by our forms of sensibility (space and time) and our concepts (such as the categories and their principles).

4. Now, let us consider the questions and obscurities in the *Critique* that S/Q/A helps to answer or clarify.

4.1. How, precisely, are the sensory-perception and conceptual aspects of our thinking related: when we think in empirical science, do we, in fact, start with sensory impressions and then add concepts?

As noted in section 3, in Kant's view, in our cognition we start with sensory impressions and then add concepts. To the extent that Kant means this in a temporal sense, in that sensory perceptions prompt us to think, it is often the case. To the extent he means a logical progression, however, his description inverts the actual order of thought. Cognition does not start from the senses. It starts with suppositions and goes from there to ask questions that arise from those suppositions and then to answer those questions by means of experimentation, sensory observation, logic, and so on. In answering questions, we may need to seek out and consider data obtained through the senses, but our thinking does not actually *start* there.

Moreover, this formula, that thinking starts with the senses and goes from there to the understanding, could be construed to be consistent with a mistaken view of cognition that Kant rightly opposes, namely, the claim that we can immediately intuit what something is. For example, if I see a familiar type of red flower, I may think that just by seeing it I can 'apprehend' that it is a rose. The problem with such examples is that they involve not orderly, efficient thinking but low-grade, casual, drifting, barely-switched-on 'thinking' involving a familiar object. Yet, even in such cases, we are making suppositions and asking questions that arise from them. We are just not aware that we are doing that, because the object of our thought is a familiar one. (Collingwood 1940, pp. 34-6)

4.2. Regarding the principles:

4.2.1. What exactly are the principles? How do they function? Are they 'judgments' or 'rules that we apply'? Or, are they absolute presuppositions?

Although Kant analyzes the conceptual aspects of our thinking in impressive detail, he does not focus enough on exactly how the principles function. He says in general that the principles make possible—or structure—our experience (A92-3/B125-6; A96-7, 111, 125-7; B165).

Precisely how do the principles do that?

Sometimes, Kant vaguely says that the principles (or categories) are the 'bases of the recognition of' sensory impressions and the 'means' by which sensory perceptions 'can belong to cognition' (A125) or that the principles are something 'through which' we think an object (B6; A92-3/B125-6; A95-7; B146; A245/B303; A399; A677/B705) or something that we 'put into' experience (A125; A196/B241).

More specifically, he says that the principles function as *'rules' that we 'apply'* (to sensible perceptions or to judgments) at the end of our thinking, *to produce or validate a judgment* (A90/B122; A108; A126-8; A132/B171; A157/B196; A158-61/B197-200; A247/B303). (He sometimes uses a different metaphor, asserting that we 'bring [a sensible perception] under' an empirical concept or a principle, or that we 'subsume [a sensible perception or an empirical concept] under' a principle (A51/B75; B129; A179/B221; A253/B306; A306/B363; A723/B751; PRO 4:305-6).) At other times, he sees them as being *themselves judgments*, in the sense of the *application of a rule*, namely, a category that is considered as a rule (A137-9/B176-8). He also regards them as judgments in a vaguer sense, that is, 'an action through which given representations first become cognitions of an object' (MF 4:476).[4]

He notes that, as a judgment, a principle is synthetic, meaning that its conclusion is not already contained in the definition or concept of its subject (A6-7/B10-11). As a central question of his *Critique*, he asks: How is it possible that we make such judgments a priori (B19)?

However, the principles are in fact not judgments, or rules[5] that we apply to produce or validate a judgment, but *suppositions that give rise to questions*. The answers to the questions — not the suppositions that give rise to the questions — are judgments.

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[4] For in-depth examination of Kant's understanding of judgments (and the capacity to judge) generally, see Béatrice Longuenesse (1998 and 2005). In this essay, I am focusing on Kant's treatment of the principles as judgments. By treating the principles as judgments, Kant obscures their true nature and function as absolute presuppositions that give rise to questions.

[5] Although it is not so with the principles, some concepts can rightly be said to function as rules. Specifically, in the case of empirical concepts, Kant says that we apply them as rules to recognize an object as being of a particular sort (A106; Allison 2015, p. 225). I think he is right about this, at least regarding empirical concepts of *classes of objects*; for example, the empirical concept *plant* or some sub-classification, such as *rose*. Making the supposition that living things can be classified into non-overlapping classes of plant versus animal, and non-overlapping subclasses under those, we can ask, 'Is this one a plant, and if so, is it a plant of the subclass "rose"'? To answer the

Not only are the principles suppositions, but they are a special kind of supposition. Unlike other suppositions, they give rise to questions but are not themselves answers to questions. As explained in section 2, most of our suppositions are also answers to questions: we ask a question and answer it, and that answer becomes a supposition that gives rise to the next question, and so on as our thinking progresses. This is not so with the principles. They stand at the very beginning of our thinking. This makes them fundamental or 'absolute' suppositions or 'presuppositions.'

To see this, let us look at a few examples of the principles:

> *(i)* *Substance versus accident*: This is the distinction between a subject and its properties. By this, as Allison (2004, pp. 148-9) puts it, we conceive of an empirical object 'as a bearer of properties,' so that in the case of any empirical object '[some] element is to be thought of as subject and [some] as predicate.' According to Kant, this principle unifies our perceptions (A182-9/B225-32). What it actually does, however, is give rise to questions, such as, 'In the case of this object, since I suppose that it comprises substance and accidents, what is its substance and what are its accidents?' For example, in the case of a piece of wood that burns, resulting in ashes and smoke: presupposing that every empirical object comprises substance and accident, we may ask; 'What is the subject (substance) that undergoes the burning?' and we may treat its original shape and form as non-substantial properties.
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> *(ii)* *Every event has a cause*: Considering the example of a stone becoming warm in sunshine, Kant says that we add the concept of *causality* to the judgment 'If the sun shines on the stone it becomes warm' to produce the judgment 'The sun warms the stone' (PRO 4:301n and 4:306n). However, the concept that every event has a cause operates at the beginning of our thinking, as a supposition (that the stone's becoming warm has a cause), by giving rise to the question 'Does the stone become warm because the sun shines on it?' Similarly, with respect to water changing from liquid to solid form (ice) in conjunction with a reduction in temperature, Kant describes the cause-and-effect concept's role as unifying these successive events or states, or as determining that the sequence and connection are necessary (in either case as the final step in our cognition of the change) (B162-3; A189/B233-4). Yet, the concept actually operates as the first step in our cognition: a supposition (that water becoming ice has a cause) that gives rise to the question 'Does the water change from liquid to solid form because of the reduction in temperature?' In each case, to answer the question, we would devise experiments.
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> *(iii)* *Unity*: Kant treats this concept as something the intellect 'applies' to 'unify' what we perceive (sky, grass, houses, trees, etc.) rather than leave our sensible perceptions as a mere jumble (A77-9/B102-5; A110-1; A114; B129-31; B162n). Yet, 'unity' is in fact a supposition that gives rise to questions. On the supposition that certain data or concepts *can* be unified, we ask *how* to unify them; or, on the

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question, we check to see whether it has the distinctive features of a rose. Kant could rightly say that we are applying an empirical concept (plant or rose) as a rule for recognizing the object, in that we are applying a set of specifications in order to recognize whether this object should be put in that class.

supposition that the data or concepts *are* unified (*have* a unity), we ask *what is* that unity.

(iv) *Thoroughgoing interaction*: This is the principle that all co-existing substances reciprocally influence (interact with) each other at every moment and do so as a community. In other words, it is not just that A interacts with B, but also that A interacts with C, and B with C, and so on. Whereas Kant thinks this principle of thoroughgoing interaction is, or validates, a judgment (A212-4/B259-61), what it actually does is give rise to questions, such as, 'Supposing that these particular distinct things interact, how do they interact?'

(v) *Permanence of substance*: Finally, consider an example (adapted from one given by R.G. Collingwood (1940, pp. 262-3) that involves the 'synthetic a priori judgment' (principle) that substance is permanent:

> A golfer hits his ball into the rough. He arrives where he saw it land but does not find it there. Since he supposes the persistence of substance ('the ball can't have just vanished or self-destructed') and has perceived the flight of the ball through his 'forms' of space and time ('I saw it go into this area and I've been watching this area all the time since I saw it land'), the question arises, 'Did the ball roll from where I saw it land to a place under this nearby branch?'
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> The golfer has not yet made a judgment. So far, there is only a question, which arose from his supposition (persistence of substance) and his conditions of sensibility (space and time). That supposition and those a priori intuitions have started his thinking; they have not produced or validated any judgment. To answer the question (produce or validate a judgment), the golfer must go look under the branch.

Thus, in empirical science we do not make 'synthetic a priori *judgments.'* (I am leaving aside Kant's examples of synthetic a priori judgments in non-empirical science, namely, mathematics. As for the principles' character as 'synthetic,' I am addressing whether the principles are judgments. Since they are not, it does not matter that they are synthetic. There is nothing remarkable about an a priori supposition being synthetic.)

As the examples above show, the principles are not judgments, whether in Kant's sense of applications of rules or in the sense of answers to questions. Rather, the principles are judgments only in grammatical form. In function, they are suppositions (more precisely, absolute presuppositions, from which we start our thinking) that give rise to questions. That is how they make possible, or structure, our experience.

4.2.2. Does Kant sometimes recognize that the principles are presuppositions?

Kant does sometimes call a principle of empirical science a 'presupposition.' For example, he uses this term with respect to the principle of the permanence of substance and that of thoroughgoing interaction. However, he does not consider the principle as functioning as a supposition, that is, as giving rise to a question. Rather, he regards it as functioning and refers to it as a 'proposition' (that is, a judgment) (A184-6/B227-8; A211/B258).

Kant does sometimes describe the principles as operating at the beginning of our thinking. For instance, he famously says that, rather than assume that our cognition must conform to

objects, we will do better to assume that objects must conform to our cognition, and then he notes that this assumption agrees better with our having 'an a priori cognition of objects — that is, a cognition that is to ascertain something about them before they are given to us' (Bxvi). Here, too, however, Kant does not regard the principles to be functioning as suppositions (giving rise to questions). This is because he does not ask precisely enough, '*How* do the principles make objects conform to our cognition, or enable us to ascertain something about objects before the objects are given to us?' They do so by determining what questions we ask.

At times, Kant does suggest that the principles give rise to questions. At A180/B222 he characterizes each principle as 'a rule for seeking [something, say, a cause, a permanent substance, an interaction among substances, etc.] in experience, and a mark for discovering it there.' Once, while addressing the principle of causality, he says, 'I look around for the cause' (A202/B248). Similarly, where he says 'The principle of the causality of appearances among one another is required by us in order that for natural events we can seek and indicate natural conditions, i.e., causes in [the realm of] appearance' (A544/B572), he does seem to treat this principle as a presupposition in function, that is, as giving rise to questions. That is, presupposing that an event has a cause, I ask, 'What is its cause?' But these are outliers.

With respect to some concepts (for example, the ideas of a complete series of causes, the systematic unity of nature, and the systematic character of cognition of nature), Kant does acknowledge that they determine our questions and thus are presuppositions in function. He states, 'we interrogate nature in accordance with these ideas' (A645/B673). However, he generally does not acknowledge that this is also the case with the 'principles' of empirical science (for example, the principle that every event has a cause): that they, too, are presuppositions that determine what questions we put to nature. He thinks that the principles need to be, and are, something more.

4.2.3. How can our use of the principles be justified — both in general (as concepts of a peculiar kind) and in particular (that is, how can we justify our use of any particular principle)?

Kant justifies our use of the principles (in empirical cognition) as discussed below. He provides his justification in the portion of his *Critique* that he calls the 'transcendental deduction.' By 'deduction,' he means a demonstration that the use of the principles is warranted. Although in the transcendental deduction he expressly refers only to the categories (probably because at this stage of the *Critique* he has not yet explained and identified the categories' related principles), he is implicitly also justifying our use of the principles. The following is an extremely compressed summary. For the fascinating detail, including history, of Kant's thought in his transcendental deduction, see Allison (2015).

Justification #1: He shows that the categories (and, implicitly, their related principles) are 'necessary conditions of' our cognition of empirical matters or that they make it possible for us to think (judge) about such matters. In other words, they are 'conditions of the possibility of experience.' Without using the categories (and principles), (i) we cannot think about concepts of an object and (ii) we cannot think about determinate objects (empirically perceived, in space and time) (A92-3/B125-6; A96-7, 111, 125-7; B165).

Justification #2: He insists that we do not derive the categories (and, implicitly, the principles) from sense data (or 'experience') (in particular, we do not extrapolate them from

observations) but rather they are inherent in the very nature of our intellect: we have them a priori (A94-5/B127-8; B159-60, 166-8).

Justification #3: In support of #2, Kant claims that the categories completely coincide with fundamental concepts and rules of general logic (A65-83/B90-116; B143, 159).

Justification #4: He links the categories (and, implicitly, their principles) to the 'unity of apperception' (A107-10, 115-30; B131-40). By 'apperception' Kant means a form of self-consciousness: consciousness of one's self as a thinker, that encompasses a consciousness of the act of thinking, of the contents of this act, and of one's self as a subject that thinks (Allison 2015, p. 121). By 'unity of apperception' he means the possibility of an 'I think' accompanying all our thinking (B132-3). He also refers to a 'synthetic unity of apperception,' by which he means combining (grasping) the manifold of consciousness in one consciousness ('I think') (B133-8). For Kant, the categories' connection with the 'unity of apperception' validates the categories (Allison 2015, p. 353).

As a justification of (our use of) the principles in general, justification #1 (that we cannot do any empirical thinking without them or other similar concepts) is by itself sufficient. Kant does not, however, identify precisely how it is that the principles are necessary conditions of our cognition of empirical matters. The answer is that we think using suppositions (some of which are absolute presuppositions), questions, and answers, and the principles (or whatever similar concepts we are then using) are our absolute presuppositions. It is from them that our thinking starts. And, without them we could not ask certain questions (such as the questions indicated in the examples of the principles given in section 4.2.1 and in the examples given below in this section 4.2.3 of Aristotle's and Newton's presuppositions regarding motion).

Regarding Kant's justification #2: Kant thinks there are two alternatives and these alternatives are mutually exclusive: (i) that we derive the principles from experience (sensible perception) or (ii) that we generate them a priori, independent of experience (A91-2/B123-4; B166-8). He insists on alternative (ii), in opposition to Hume's view that we extrapolate the principles from observations. Kant thinks that if the principles derive from experience, custom, or habit, we must concede Hume's empirical skepticism (A94/B127-8; PRO 4:257-61). Since thinking is S/Q/A, however, and the principles are absolute presuppositions, there is no reason why the principles cannot be to some extent both: that is, we both extrapolate them from experience and suppose them, as presuppositions that give rise to questions about empirical matters.

Regarding Kant's justification #3: For our purposes, we need not consider whether Kant succeeds in mapping the categories onto fundamental concepts and rules of propositional logic. It suffices to reiterate that in the logic of S/Q/A, the categories (and principles) are absolute presuppositions.

Regarding Kant's justification #4: Here, Kant focuses on the category (or principle) of unity, linking it to the 'I think.' S/Q/A clarifies Kant's analysis by pointing out that (i) we are presupposing that the manifold of sensory perceptions is, or can be, unified in one self-consciousness, tied to the 'I think' (in other words, that *I* unite, or can unite, them or that they are, or can be, unified *for me*), and (ii) this presupposition enables us to seek out such a unity, by enabling us to ask questions such as, '*How* is the manifold thus unified, or exactly what is that unity, or how can the manifold be thus unified?' The category or principle of unity is justified because without it we could not ask these questions. Kant himself puts it similarly,

saying: 'The thought that these presentations given in intuition belong one and all to me is, accordingly, tantamount to the thought that I unite them, or at least can unite them, in one self-consciousness. And although that thought itself is not yet the consciousness of the *synthesis* of the presentations, it still presupposes the possibility of that synthesis. I.e., only because I can comprise the manifold of the presentations in one consciousness, do I call them one and all *my* presentations.' (B134) Still, Kant does not clearly focus on exactly how this (or any other) category (or principle) operates: it *enables us to ask certain questions*, relating to unifying various perceptions.

Kant attempts to justify the categories and principles only in general, as concepts of a peculiar kind. He does not attempt to justify the use of any particular category or principle. He even suggests that it is not possible to do that, saying that we cannot further explain why we have 'just this kind and number of them' (B145-6) (although here he may be focusing as much on the question how do we come to have them as on how can we justify our use of them). With the aid of S/Q/A, however, we can justify particular principles (presuppositions). We can do that not by showing that a particular presupposition is true, or known, but by focusing on the questions to which it gives rise. Focusing on that, we can show that it is more productive than another presupposition, better enabling us to explain what we observe. In his *Metaphysical Foundations of Natural Science*, Kant does indicate that a principle (presupposition) of empirical science can be justified by its power to enable us to explain (MF 4:535, 563). However, he does not seem to see clearly how it does that. It does that by enabling us to ask, and therefore answer, questions that do not arise from other presuppositions. For example, suppose a body (say, the moon) is moving in a circle (or ellipse). On Aristotle's presupposition that each basic physical body has within itself a principle (or source or cause) of motion (of a particular sort) or stationariness (*Physics* 192b 15-34), it may be that no question arises as to why the body is moving in this manner. One may be content to say, 'it moves in a circle because that is its nature.' By contrast, on Newton's presupposition that no body has any particular motion that is inherent or natural to it but instead every body perseveres in its state of rest or of uniform motion in a straight line except as it is compelled to change that state by impressed forces, the question arises, 'What force(s) is (are) causing it to constantly change from motion in a straight line?' In particular, one can ask, 'Does the moon orbit the earth because the earth exerts on the moon a force directed at the earth, namely, gravity?'[6]

4.2.4. What is the limit (proper scope) of our justified use of the principles?

According to Kant, we may properly use the principles only in empirical cognition, that is, only with respect to objects of the senses (or sensible/empirical 'intuitions') (B146-9, 165-6). Kant's purpose in so restricting the scope of our use of the principles is to forestall 'metaphysics' that purports to attain knowledge about reality beyond the empirical (that is, beyond what we can perceive by our senses) (Bxiv-xxxvi, B21-4).

[6] For more on the transition from the presuppositions of Aristotle to those of Newton, and on the resulting changes in the askable questions, see Maudlin (2012) at pp. 1-5 and 17-23. In the rest of his book, Maudlin brings the history regarding changes in the presuppositions of physics up to current-day relativity. Also addressing the transitions in the presuppositions of physics from those of Aristotle to those of Newton and from those of Newton to those of Einstein is Friedman (2001) at pp. 54-68 and 105-15.

In terms of S/Q/A, what this restriction on our 'use' of the principles means is that we may properly ask only those questions (arising from a principle) that we can answer by means of empirical evidence. For example, in the case of the principle that every event has a cause, we should not 'seek the cause for anything outside of nature' (A470/B498). In other words, we should ask only about causes for which there may be empirical evidence. Kant does not, however, mean we must deny that there may be a cause outside of nature (A471/B499).

4.2.5. Do we need to show that appearances necessarily conform to the principles?

Once we understand that the principles are absolute presuppositions, we see that Kant's problem of how to show that appearances (that is, what we perceive through our senses) necessarily 'conform to' the categories (and, implicitly, their related principles) (A89-92/B122-4) does not arise. The relation of appearances to principles is not one of 'conforming.' Rather, the principles *give rise to questions* about things that we perceive.

4.2.6. Do we 'know' the principles?

Instead of regarding the principles as a priori suppositions that give rise to questions, Kant describes them (or the categories and principles) as 'well-founded claims' (A768/B796) that are 'established' (A180/B223; A536/B564) or 'proved' (A181/B223; A216-8/B263-5; B289; A737/B765) as correct, 'objectively valid' (Axvi; A93/B126; A96-7; A111; A126; A158/B197), 'a priori certain' (A125), and 'true synthetic a priori cognitions' (A796/B824). In other words, for Kant, they are things that we know.

Regarding his characterization of the principles as 'objectively valid': Kant generally uses the phrase 'objectively valid' (or 'objective validity') in a special sense, namely, valid universally or for everyone as opposed to valid only subjectively, privately, or for me (B3-4; A820-2/B848-50; PRO 4:298). This amounts to no more than that the categories and principles are concepts that everyone shares and that everyone in similar circumstances applies (or should apply) in the same manner (PRO 4:298) — which is not quite what 'objectively valid' means in its ordinary sense. I think Kant recognizes that he cannot show that the categories and principles are 'objectively valid' in the ordinary sense. The phrase is attractive to him because even though he is using it in a special sense it still carries the connotation of its ordinary sense, and he thinks the categories and principles need to be 'objectively valid' also in that sense. He sometimes even makes that connotation express, equating objective validity with 'truth' (A125, 128).

The principles are in fact absolute presuppositions, however. Accordingly, we do not and cannot 'know' them. We only presuppose them, at the beginning of our thinking.

4.2.7. How do we acquire the principles?

Kant insists that we have the principles purely a priori, as concepts inherent to the human mind. Since thinking is S/Q/A, however, and the principles are absolute presuppositions, this question about origins does not really matter. See section 4.2.3 at 'Regarding Kant's justification #2'.

4.2.8. Are the principles permanent, or do they change?

Whereas Kant seems to regard the principles as permanent, in fact, they change. For example,

Kant, and physicists for many years thereafter, presupposed that every event has a cause. Today, in their work in quantum mechanics, many physicists presuppose that each individual atomic particle — electron, proton, etc. — behaves randomly. See also the example given in section 4.2.3, of the shift from Aristotle's to Newton's presupposition regarding motion.

4.2.9. Why do the principles change?

As indicated in section 4.2.3 (regarding justifying the principles), S/Q/A also helps us to explain something that Kant does not examine, namely, why from time to time the absolute presuppositions of physics change. As shown in 4.2.3, a presupposition may change because its successor enables us to ask new questions. In other cases, presuppositions change because within a group of presuppositions one (or more) of them is in tension, or is incompatible, with another. Or, as R.G. Collingwood puts it, the existing set, or constellation, of presuppositions is under 'internal strains,' making its equilibrium unstable (Collingwood 1940, pp. 48, 74-7).[7]

5. How S/Q/A – and in particular, focusing on presupposing – helps us better to appreciate Kant's *Critique* and to improve our own thinking

S/Q/A not only enables us to clarify Kant's *Critique* but also better to appreciate it. In his *Critique*, Kant identified with precision, and in painstaking detail, the absolute presuppositions of the physics of his day (which presuppositions remained in use for many years afterward). His exposition of those presuppositions was a great service to all the scientists who used them in their work. (This is not to suggest that identifying the presuppositions of physics is all that Kant is doing in the *Critique*, just that S/Q/A helps us better appreciate that feature of the *Critique*.)

As for our own thinking: Since thinking is S/Q/A, to think as well as possible we need to know what our suppositions are. In particular, we need to identify our absolute presuppositions. Doing that helps us in our thinking in several ways. Identifying our presuppositions enables us to clarify them, which in turn enables us to formulate more precisely the questions that arise from them. It may also enable us to make needed changes in our presuppositions, by revealing that some of our presuppositions are incompatible with each other. More generally, it gives us greater freedom in our thinking. If we become aware that we are making a particular presupposition, (i) we can see the possibility of making a different one, which different presupposition enables us to ask questions that do not otherwise arise, or (ii) we can commit to use the existing presupposition more thoroughly, asking additional questions that arise from it.

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Competing Interests

[7] For historical illustrations of how and why presuppositions of physics have changed, and related discussion (in terms somewhat different from S/Q/A), see Friedman (2001) at pp. 47-68 and 105-15.

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