

Kant's Better-than-Terrible Argument in the Anticipations of Perception

DAVID LANDY
San Francisco State University
Email: landy@sfsu.edu

Abstract

Scholars working on Kant's Anticipations of Perception generally attribute to him an argument that invalidly infers that objects have degrees of intensive magnitude from the premise that sensations do. I argue that this rests on an incorrect disambiguation of Kant's use of *Empfindung* (sensation) as referring to the mental states that are our sensings, rather than the objects that are thereby sensed. Kant's real argument runs as follows. The difference between a representation of an empty region of space and/or time and a representation of that same region as occupied by an object entails that, in addition to their extensive magnitude, objects must be represented as having a matter variable in intensive magnitude. Since it is the presence of sensation (sensing) in a cognition that marks the difference between representing only the extensive magnitude of the object and the object as a whole, it is sensation that represents its intensive magnitude.

Keywords: Anticipations of Perception, intensive magnitude, sensation, perception, matter, continuity

While the precise nature of the distinction between primary and secondary qualities is a topic of ongoing debate (cf. Nolan 2011), it is easy enough to distinguish two camps among early modern philosophers. Philosophers such as Descartes and Locke, noticing that secondary qualities such as colour, taste and smell vary depending on the state of the experiencing subject, conclude that such qualities are merely subjective, and that objects themselves comprise only primary qualities such as shape, size, motion and mass. Contrariwise, philosophers such as Berkeley and Hume, noticing that one can think of an object's primary qualities only via thinking of its secondary qualities, conclude that primary and secondary qualities are inseparable. (In the case of Berkeley

and Hume, of course, they conclude further that Locke's and Descartes' so-called primary qualities are also merely subjective.¹) As usual, Kant is a more difficult figure to place into this narrative. On the one hand, he certainly denies the Cartesian-Lockean thesis that objects have only primary qualities, or as Kant would put, are merely extensive magnitudes (i.e. have only qualities such as shape, size and duration).² On the other hand, he also denies both the Berkeleyan-Humean thesis that these magnitudes are merely subjective, and the obvious alternative that objects themselves have what we can call sensory qualities (colour, taste, smell, etc.). Instead, Kant holds both that objects are extensive magnitudes and that they have qualities that are not identical to, but rather 'correspond to', their sensory qualities. Objects are both extensive and *intensive* magnitudes. That correspondence, though, is a complicated one, made all the more so by the supposedly terrible use to which he puts it in his argument for this conclusion. It is that terrible argument, or rather the better-than-terrible argument that Kant actually gives, that is the subject of this article.

I begin with the terrible argument that scholars have attributed to Kant. That argument is supposed to be presented in the Anticipations of Perception of the first *Critique* and to go something like the following.

1. Sensations have an intensive magnitude.
2. Sensations represent objects.³
3. Therefore, objects have an intensive magnitude. (1, 2)

The argument is obviously invalid, and the most general premise that can be added to make it valid – that objects have whatever properties the representations of them have – is obviously untrue.⁴ The most prominent attempt at improvement has been to try to make that premise helpfully more specific. For example, Guyer and Falkenstein give it a specifically causal-explanatory form: only objects with intensive magnitude could *cause* sensations to have the intensive magnitudes that they do (Guyer 1987: 200, Falkenstein 1995: 117). As such scholars themselves report, however, there is no good reason to deny that (as e.g. Descartes and Locke hold) purely extensive magnitudes could also exercise such causality.

However, we do not need to read Kant's argument as proceeding from facts about sensations to facts about objects at all. That is because, just as Kant's use of the word *Vorstellung*, translated as 'representation', is famously subject to a systematic ambiguity between that which does

the representing and that which is thereby represented, so is the word at the centre of the Anticipations, *Empfindung*.⁵ 'Sensation' can refer to that mental item which is the sensing *or* that object which is thereby sensed.⁶ Scholars have understood certain key instances of 'sensation' in the Anticipations as referring to sensings, and puzzled over how an argument with premises concerning only mental states can terminate in a conclusion about non-mental objects. I will argue that their mistake comes in disambiguating Kant's use of 'sensation' in the wrong way. Kant's use of 'sensation' often refers to sensed objects, not the sensings that represent these, and so in such cases there is no need either to bridge the gap from the mental to the non-mental, causally or otherwise, or to close that gap by denying that it exists at all (as certain phenomenalist readings of Kant do).

Kant's argument proceeds in slightly different ways in the A-edition and B-edition versions, but both arguments share a general scheme, which I will set out when we get to the details of the B-edition version. In the meantime, I simply emphasize that, as I see it, the main argument proceeds in two stages. First, Kant notices that the very same bit of space and time can be represented as either empty or full. Since in either case that which is represented will have the same extensive magnitude, the difference cannot be one of extensive magnitude. But objects must also have a qualitative matter. Since representing this matter is a contribution of sensation, which distinguishes perceiving from representing empty space, it follows that objects of sensation have qualitative matter. This, however, is not because of any particular feature of sensings.

This first stage concerns what we may reasonably call 'intensive' magnitude, but at this point only in a relatively impoverished sense: zero or non-zero. In its second stage, Kant then offers reasons for concluding that the qualitative matter represented by our sensings admits of a multitude of non-zero degrees. Thus, once one has recognized that objects must have some qualitative character, this makes possible that their magnitude might vary other than extensively,⁷ namely, by varying in the degree of this character.⁸ And again, since representing this matter is the contribution that sensation makes to perception, it follows that what is an object of sensation has a variable non-zero intensive magnitude. Again, however, this is not because of any particular feature of sensings.

As I see it, the conclusion of this second stage establishes the announced conclusion of the Anticipations: in all appearances the real, which is an object of the sensation, has intensive magnitude in the full sense that Kant

has in mind, i.e. a degree. In the text of the Anticipations, however, Kant clearly has an additional thesis in his sights: that intensive magnitudes are *continuous* (no degree of an intensive magnitude is the smallest). As what I have called the terrible-argument interpretation has it, Kant attempts to derive this conclusion from the purported continuity of our sensings. As I understand it, by contrast, he takes continuity to be a property of all magnitudes, and takes himself to have established as much in his treatment of extensive magnitude in the Axioms of Intuition. This interpretative hypothesis is evidenced by the fact that Kant rehearses his argument from the Axioms in an otherwise strangely placed paragraph between his declaration that every reality is an intensive magnitude and his application of the continuity thesis to a series of examples. Without a mediating argument licensing the inference from a quality's being a magnitude to that quality's being continuous, those paragraphs would contain a striking lacuna. Thus, while it can appear that the continuity thesis plays an important role in Kant's main argument, it appears there only incidentally, and receives its real proof after that main argument has been completed.

Of course, the interpretative proof is in the exegetical pudding, and the time has come to move from my understanding of Kant's argument to his own presentations of it. Kant rewrote the paragraph containing this argument for the B-edition of the *Critique*, and while the argumentative structure remains the same, it will be worth closely reading through both versions. Here is the A-edition version:

Apprehension, merely by means of sensation, fills only an instant (if I do not take into consideration the succession of many sensations). As something in the appearance, the apprehension of which is not a successive synthesis, proceeding from the parts to the whole representation, it therefore has no extensive magnitude; the absence of sensation in the same moment would represent this as empty, thus = 0. Now that in the empirical intuition which corresponds to the sensation is reality (*realitas phaenomenon*); that which corresponds to its absence is negation = 0. Now, however, every sensation is capable of a diminution, so that it can decrease and thus gradually disappear. Hence between reality in appearance and negation there is a continuous nexus of many possible intermediate sensations, whose difference from one another is always smaller than the difference between the given one and zero, or complete negation. That is, the real in appearance always has a magnitude, which is

not, however, encountered in apprehension, as this takes place by means of the mere sensation in an instant and not through successive synthesis of many sensations, and thus does not proceed from the parts to the whole; it therefore has a magnitude, but not an extensive one. (A167–8/B209–10)

Again, in broad strokes, I read Kant's argument here as follows. We can hold fixed the extensive magnitude of an object, in this case by considering it as it is perceived in a single moment. Such an object would have some quality over and above its extensive magnitude, since it is represented as *something*, i.e. not an empty region of space and/or time. This quality itself admits of diminution (or increase). Therefore, it is a (non-extensive) magnitude. Therefore, all objects of possible experience have an intensive as well as an extensive magnitude. Since it is the presence of sensings that constitute the representings of that magnitude, 'in all appearances the sensation, and the real, which corresponds to it in the object (*realitas phaenomenon*), has an intensive magnitude, i.e., a degree' (A165/B207).

To delve into the details of the argument, it will be helpful to take up the argument *in media res*:

Now, however, every sensation is capable of a diminution, so that it can decrease and thus gradually disappear. Hence between reality in appearance and negation there is a continuous nexus of many possible intermediate sensations, whose difference from one another is always smaller than the difference between the given one and zero, or complete negation.

To begin to decipher this passage consider the 'hence' that begins the second sentence. This is the moment where the terrible-argument interpretation gets its foothold. If one reads 'sensation' in the first sentence here as sensing, then Kant's claim is that sensings admit of gradual diminution, and what he then concludes is that between reality and negation there is a continuous nexus, etc.

This result, however, should give us pause. It should prompt us to wonder: what could earn Kant his 'hence'? As I mentioned earlier, some scholars have sought, unsuccessfully, to earn it by supposing that there is good reason for drawing conclusions about sensed objects from the nature of the sensings that represent them. Another way, at least in theory, is to suppose that Kant is adducing considerations about sensed

objects *before* the ‘hence’, so that the conclusion that he draws about sensed objects is supposed to follow from considerations concerning sensed objects from the beginning. Consider again the sentence: ‘Now, however, every sensation is capable of a diminution, so that it can decrease and thus gradually disappear.’ As I have suggested, the key to reading this sentence is to disambiguate ‘sensation’ (*Empfindung*) as sensed object rather than sensing. What Kant is claiming, then, is that every sensed object is capable of a diminution, etc. That would certainly earn him much of what he takes to follow from it. Again: ‘Hence between reality in appearance and negation there is a continuous nexus of many possible intermediate sensations’. Notice that disambiguating the first sentence in this way is, in fact, already suggested by the way one *must* disambiguate ‘sensation’ in the second sentence. Kant’s conclusion, illicit or not, is that between reality in appearance and negation there is a continuous nexus of many possible sensations. If one disambiguates ‘sensation’ here as sensing, then his claim would be that reality consists of a continuous nexus of possible mental states, which is certainly not what he means. Kant is not only explicit a moment before that reality is that in an empirical intuition which *corresponds* to (and so is not identical to) sensation (sensings), but he also reiterates this a moment later in rephrasing his conclusion:

That is, the real in appearance always has a magnitude, which is not, however, encountered in apprehension, as this takes place by means of the mere sensation, in an instant and not through successive synthesis of many sensations, and thus does not proceed from the parts to the whole. (A168/B210)

The ‘that is’ indicates that Kant is rephrasing the conclusion he has just drawn, and when he does so, he puts it in terms of ‘the real in appearance’. So what follows the all-important ‘hence’ refers to sensed objects, and does so by use of the ambiguous ‘sensation’. If, however, we must disambiguate ‘sensation’ in Kant’s conclusion as sensed objects, then perhaps we can do so before the ‘hence’ as well.

Are there, however, any reasons besides this application of the principle of charity to think that this disambiguation is the one that Kant meant? I think there are. Consider again the instance of ‘sensation’ that we are looking to disambiguate. ‘Now, however, every sensation is capable of a diminution.’ What we want to know is whether Kant means that every sensed object is capable of diminution, or that every sensing mental state is. One way to answer that question is to expand the scope of the

context in which we read that sentence to include not only what follows it, but also what precedes it. Consider, then, the two sentences that come just before this one:

As something in the appearance, the apprehension of which is not successive synthesis, proceeding from the parts to the whole representation, it therefore has no extensive magnitude; the absence of sensation in the same moment would present this as empty, thus = 0. Now that in the empirical intuition which corresponds to its absence is negation = 0. (A167–8/B209)

Notice that Kant begins here by writing about *something in the appearance*, and recall that as he uses it, an appearance is an object represented, not a mental representing.⁹ Kant then makes an aside concerning how that something is apprehended, but after that clause, the 'it' brings us back to discussing not the sensing of this something, but the something itself, the quality of the object sensed. It, that something in the appearance, that reality, that quality of the sensed object, has no extensive magnitude.¹⁰

Kant goes on. 'The absence of sensation in the same moment would present this (*diesen*) as empty.' Here, 'this' most likely refers to 'the same moment', and Kant's point is that if our representing of what exists in this moment were to remain otherwise the same except lack sensation, then it would be a representation *of* that moment as empty (specifically as an unoccupied region of space and/or time).¹¹ Despite the fact that Kant is adducing concerns about representings here, his attention throughout is on that which is represented by such representings. Finally, the sentence immediately preceding the one with which we are concerned is: 'Now that in the empirical intuition which corresponds to its absence is negation.' While 'its absence' here fairly clearly refers to the absence of sensings, notice that Kant's attention is on the ramifications of this absence for what is thereby represented. 'Intuition' (*Anschauung*) suffers from the same ambiguity as *Vorstellung* and *Empfindung*, but here refers to what is intuited, as is made clear by Kant's noting that what *corresponds* to this absence is negation, which is the categorial complement of reality.

So what is the treasure at the end of this anaphoric hunt? Recall that what we were attempting to determine is whether we had any reason to read 'sensation' in 'every sensation is capable of a diminution' as sensed object rather than sensing mental state, and the sentences that we have been

examining were those immediately preceding the one in which this phrase appears. I now conclude that we do have such reason. Those sentences that immediately precede this phrase mostly concern objects sensed. What Kant is saying in them is that something in appearances, that which is represented in intuition, can be represented as either a reality or a negation, even while abstracting from consideration of the extensive magnitude of what is represented. What he then adds to this in the crucial sentence – every sensation is capable of a diminution – is that not only can what is represented be represented as reality or negation, but also that such objects admit of degrees of reality as well. (More on that addition in a moment.) Finally, what he concludes from that claim is that, ‘between reality in appearance and negation there is a continuous nexus of many possible intermediate sensations’, i.e. that ‘the real in appearance always has a magnitude, which ... does not proceed from the parts to the whole’, i.e. that what is represented by intuition necessarily has an intensive magnitude. ‘Sensation’ in ‘every sensation is capable of a diminution’ can and ought to be disambiguated as sensed object because so much of what comes both before and after that instance of it must be disambiguated in just that way, and so disambiguating it renders Kant’s argument valid.

Taking a step back, notice that the final clause of this paragraph, which we have not yet examined, succinctly reflects precisely the argumentative structure that I have been attributing to Kant: ‘it therefore has a magnitude, but not an extensive one’. This final clause indicates that we should read the central move in Kant’s argument as being that, since represented items can vary in some magnitude even while remaining constant in their extensive magnitude, there must be magnitudes of another kind: intensive ones. It is that move, rather than the move from the purported intensive magnitude of sensings to the intensive magnitude of sensed objects, on which I see Kant’s argument turning and which frees us from the terrible-argument interpretation.

For further support, we can now turn to Kant’s reformulation in the B-edition (B207–8). The most significant change, although not very significant, is from considering the intensive magnitude of an object *in abstraction* from its extensive magnitude to considering it in the context of keeping its extensive magnitude *fixed*. Apart from that, the structure of Kant’s argument remains almost exactly the same. He notices that the magnitude of an object can change independently of any changes in its extensive magnitude and concludes that it must have an intensive magnitude as well.

But what comes out more clearly in this version is just why Kant adduces considerations regarding sensings at all. He does so not because he draws conclusions about sensed objects from these, but rather to draw attention to the fact that what is distinctive about perceiving objects, as opposed to representing the regions of space and/or time that such objects occupy, is precisely the presence of sensings. Rather than arguing from facts about sensings to facts about sensed objects, Kant is moving in precisely the opposite direction, concluding that it is via the presence of sensings that we represent intensive magnitude.¹²

Here is the paragraph in which the argument appears (with bracketed letters added):

[a] Perception is empirical consciousness, i.e., one in which there is at the same time sensation. [c] Appearances, as objects of perception, are not pure (merely formal) intuitions, like space and time ([b] for these cannot be perceived in themselves). [d] They therefore also contain in addition to the intuition the materials for some object in general (through which something existing in space or time is represented), i.e., the real of the sensation, as merely subjective representation, by which one can only be conscious that the subject is affected, and which one relates to an object in general. [e] Now from the empirical consciousness to the pure consciousness a gradual alteration is possible, where the real in the former entirely disappears, and a merely formal (*a priori*) consciousness of the manifold in space and time remains; [f] thus there is also possible a synthesis of the generation of the magnitude of a sensation from its beginning, the pure intuition = 0, to any arbitrary magnitude. [g] Now since sensation in itself is not an objective representation, and in it neither the intuition of space nor that of time is to be encountered, [h] it has, to be sure, no extensive magnitude, but yet it still has a magnitude (and indeed through its apprehension, in which the empirical consciousness can grow in a certain time from nothing = 0 to its given measure), [i] thus it has an intensive magnitude, corresponding to which all objects of perception, insofar as they contain sensation, must be ascribed an intensive magnitude, i.e., a degree of influence on sense. (B207–8)

Again, the main interpretative point is that, at crucial moments in this argument, occurrences of 'sensation' (*Empfindung*) can and should be

disambiguated as referring to the object sensed rather than the mental state that is the sensing of that object. That, in turn, leads to the key philosophical point that Kant does not make the illicit move so often attributed to him. Finally, what Kant's argument does is, first, move from the premise that empty space and time are represented as different from a represented object occupying that same space and time to the conclusion that such objects must have qualities in addition to their extensive quantities, and then, second, from the fact that objects must have such qualities to the possibility that such qualities themselves are capable of variations in their magnitude, i.e. are themselves intensive magnitudes. Overall, then, here is how I would reconstruct the B-edition version of the argument:

1. Extensive magnitude is a measure of successively synthesized homogeneous regions of space and/or time.
2. Objects of possible experience are *per se* necessarily represented as occupying only such regions.
3. The spatiotemporal region of the object and the object itself have the same extensive magnitude. (1, 2)
4. Perceiving a spatiotemporal object is different from representing only the spatiotemporal region that such an object occupies.
5. This difference cannot consist in a difference between the extensive magnitudes of the object and the spatiotemporal region of that object. (3, 4)
6. To represent empty space and time is to represent something without a qualitative character, or with an intensive magnitude of zero.
7. To represent a spatiotemporal object is to represent something with a qualitative character, or with a non-zero intensive magnitude. (5, 6)
8. If an object has qualitative character, then it is possible for the magnitude of this character to change, while the extensive magnitude of the object remains the same.
9. The qualitative character of a spatiotemporal object itself has a non-extensive, or intensive, magnitude. (7, 8)
10. The means by which we represent the qualitative character of spatiotemporal objects is sensation.
11. That which is represented by sensation has a non-zero intensive magnitude, or 'In all appearances the real, which is an object of the sensation, has intensive magnitude, i.e., a degree'. (9,10)

Kant begins by defining perception as a subspecies of representation, namely, empirical consciousness accompanied by sensation in the right way.¹³

[a] Perception is empirical consciousness, i.e., one in which there is at the same time sensation.

Right off the bat, this is one of the places where 'sensation' really has to be disambiguated as sensing. A perceiving is a conscious representing accompanied by a sensing. For our purposes, the most important feature of this definition is simply that it generates a contrast with [b] below. Perception is a mode of representation in which what is represented is sensed, as opposed to, for example, merely thought, or more relevantly, constructed in pure intuition.

[b] [Space and time] cannot be perceived in themselves.

This premise is the shared starting point of the Principles, and like the first one, is not particularly controversial in this context. Space and time are pure (i.e. non-empirical) forms of representation, and even if one puts a great deal of weight on Kant's talk of space and time as objects of formal intuitions, in neither case can they be perceived.

[c] Appearances, as objects of perception, are not pure (merely formal) intuitions like space and time.

Since we do not perceive space and time, and appearances are the objects represented in perception, whatever the objects of perception are, they must be something over and above space and time. Such objects might be (and necessarily are) *also* spatiotemporal, but they must be more than just spatiotemporal, since otherwise they could not be perceived. Notice that Kant's focus here is not on any features of our representing such appearances, but rather on what is represented by such representings.

[d] They therefore also contain in addition to the intuition the materials for some object in general (through which something existing in space or time is represented), i.e., the real of the sensation, as merely subjective representation, by which one can only be conscious that the subject is affected, and which one relates to an object in general.

This is Kant's first important conclusion, and despite his less than perspicuous idiom, I take his attention to remain on objects sensed. The idea is something like this. Since what is represented by pure intuition is different from what is represented in perception, there must be something in the representing of the latter that *makes* this difference. As Kant has just

pointed out, that is the presence of sensation, sensings. So, his relatively innocuous conclusion is that the difference on the side of what is represented is whatever it is that those sensings represent: ‘the real of the sensation’.

To see that this is what Kant is up to, we can take another deep dive into the text itself. First, the ‘they’ that opens this sentence refers back to the previous sentence’s ‘appearances, as objects of perception’. As we have noted previously, appearances for Kant are represented objects, and he makes that explicit here. What he is saying of such represented objects is that they are represented as not only extensive magnitudes, which pure intuitions of space and/or time are, but also as something more. That is what Kant means when he says that such objects ‘contain in addition to the intuition the materials for some object in general (through which something existing in space or time is represented)’. What such represented objects ‘also contain’, i.e. what they are also represented *as*, is ‘the real of the sensation’. What is that? Kant is not quite ready to specify it, so he instead takes the (awkward and confusing) tack of indicating it indirectly as whatever reality corresponds to the sensings that represent it!¹⁴

Given the way this argument has often been interpreted, one might be concerned that Kant is preparing to make that infamous illicit move from the intensity of sensings to the intensity of what is sensed. In fact, what he is setting up is the very different, and in its way much more anodyne, move that I have already suggested. But we begin with a controversial next step.

[e] Now from the empirical consciousness to the pure consciousness a gradual alteration is possible, where the real in the former entirely disappears, and a merely formal (*a priori*) consciousness of the manifold in space and time remains.

This premise marks the beginning of what I earlier described as the second stage of Kant’s argument. Having established that represented objects must have qualities in addition to their extensive magnitude, he now further concludes that their having this character makes possible a kind of variation in magnitude that is not a variation in extensive magnitude. It is important to note that this conclusion concerns only the *possibility* of such a variation, and not also its actuality.¹⁵ To bring this out, consider the examples that Kant presents later in the Anticipations. He uses those examples to block a certain widely accepted but invalid *inference*:

Nearly all natural philosophers, since they perceive a great difference in the quantity of matter of different sorts in the same volumes ... unanimously infer from this that this volume (extensive magnitude of the appearance) must be empty in all matter, although to be sure in different amounts. But who among these for the most part mathematical and mechanical students of nature ever realized that their inference rested solely on a metaphysical presupposition, which they make so much pretense of avoiding? – for they assume that the real in space ... is everywhere one and the same, and can be differentiated only according to its extensive magnitude, i.e., amount. (A173/B215)

Consider two objects that have the same volume, but different weights. It is tempting to conclude that the heavier one must have a greater amount of matter in it. Kant takes that inference to be invalid insofar as he recognizes the possibility that both objects might have the same amount of matter, but that one might consist of a kind of matter that is heavier, i.e. their difference might not be in the extensive magnitude present in the volume, but instead in the intensive magnitude of what is there:

For there we see that, although equal spaces can be completely filled with different matters in such a way that in neither of them is there a point in which the presence of matter is not to be encountered, nevertheless everything real has for the same quality its degree (of resistance or of weight) which, without diminution of the extensive magnitude or amount, can become infinitely smaller until it is transformed into emptiness and disappears. (A174/B216)

Again, note that what Kant needs to establish in order to demonstrate the invalidity of the inference in question is not that appearances *actually* differ in their degree, but only that it is *possible* that they could so differ:

My aim here is by no means to assert that this is how it really is concerning the specific gravity of the variety of matters, but only to establish, on the basis of a principle of pure understanding, that the nature of our perceptions makes an explanation of this sort possible, and that it is false to assume that the real in appearance is always equal in degree and differs only in aggregation and its extensive magnitude, especially when this is allegedly asserted on the basis of a principle of understanding a priori. (A174–5/B216)

A similar dialectic is at play in another of Kant's examples. 'The very same extensive magnitude of intuition (e.g. an illuminated surface) can excite as great a sensation as an aggregate of many other (less illuminated) surfaces taken together' (A176/B217). Suppose you are gazing at a particularly bright light in the night sky. Before reading the Anticipations, it is tempting to infer that such a light could only be produced by the combined energy from some number of stars clustered together. After the Anticipations, one can see that such an inference would be invalid because that brightness could instead be the result of the greater intensive magnitude of a single star. In both of these examples, what is at issue is not that any particular quality *actually* admits of degree, but only that it is *possible* that any such quality does.

As the form of Kant's argument shows, he takes that conclusion to follow simply from the fact that objects have qualitative characters.¹⁶ Consider again the step that immediately follows that conclusion. In A, that next step is, 'from the empirical consciousness to the pure consciousness a gradual alteration is *possible*', and in B, 'a gradual alteration is *possible*, where the real in the former entirely disappears'. The terrible-argument interpretation reads Kant as inferring these claims from undefended claims about our sensings. One might also take them as premises in his argument. My understanding, however, is that Kant takes them to follow from what precedes them. That an object has qualitative character opens the possibility that a change in its magnitude could be due to a change in its intensive rather than extensive magnitude. While it is not obvious that the inference itself is valid, it is also not obvious that it is invalid.

This way of interpreting Kant's move has the advantage of forestalling Bennett's objection that the closely related continuity thesis (more on which later) is merely empirical and so cannot provide sufficient justification for an *a priori* principle:¹⁷

This, however, merely says that our sensations *are* like that: it states an empirical fact, and has no place in Kant's apparatus of a priori principles. He provides no arguments for the impossibility of a world in which nothing is ever dim or in-between, in which there is only one level of pain, say, and only three degrees of saturation for each colour. (Bennett 1966: 172)

As I understand Kant's claim, it is not that sensed objects actually (or necessarily) admit of gradual diminution, but rather that their

having a qualitative character makes such a diminution possible.¹⁸ What then of his top-line claim that all objects of sensation are intensive magnitudes, i.e. have a degree, which does seem to assert something about the *actuality* of objects? Well, consider one of the worlds that Bennett describes, one in which everything is either dark or light, but nothing in between. We can easily imagine that in such a world there is a room with a single light connected to an on-off switch (with no dimming feature). In that world, the room always either has or lacks a certain qualitative character: it is either illuminated or unilluminated. Kant's claim, as I understand it, is that the room's having that (actually bivalent) qualitative character makes it possible, although not actual, that the room could change its illumination by degrees (i.e. that its luminosity could be polyvalent). In acknowledgement of this possibility, we might well refer to the (actually) bivalent quality as an intensive magnitude in virtue of its place on a spectrum of possible, but non-actual, polyvalent degrees. Thus, even in cases in which a qualitative character is in fact bivalent, we can nonetheless refer to it as an intensive *magnitude*.¹⁹

Returning to our investigation of the disambiguation of 'sensation', consider again Kant's claim here.

[e] Now from the empirical consciousness to the pure consciousness a gradual alteration is possible, where the real in the former entirely disappears, and a merely formal (*a priori*) consciousness of the manifold in space and time remains.

Notice that nothing prevents us from once again understanding the claim as entirely concerning what is represented in cognition, rather than what does the representing. Recall that the distinction between empirical consciousness and pure consciousness at work here is that between a representation *of* an object and a representation *of* empty space or time. Thus, when Kant refers back to empirical consciousness in the phrase 'the real of the former', 'the real' refers to the real that is the object *of* empirical consciousness. Kant's focus is not on sensings here, but once again on what is represented by those sensings, and his claim is that the real that is so represented is represented as admitting of a change of magnitude, even while its extensive magnitude remains the same. In addition to decomposing, things can simply fade away. Were they to fade into nothingness, all that would be left to be represented in their absence would be empty space and time.²⁰ The following step is the converse of this one.

[f] Thus there is also possible a synthesis of the generation of the magnitude of a sensation from its beginning, the pure intuition = 0, to any arbitrary magnitude.

If an object can fade out from something to nothing, it is also possible for that process to be reversed. In addition to a thing's being composed, it could also fade in from nothing to something. There are certainly some assumptions about possibility at play here, but nothing that need concern us. Next up is [g]:

[g] [S]ensation in itself is not an objective representation, and in it neither the intuition of space nor that of time is to be encountered.

The phrase 'sensation in itself' can certainly be read as marking a change to considering sensings rather than that which is sensed, but the remainder of this sentence belies the necessity of reading it as marking that apparent shift. To see this, first notice that what Kant writes of 'sensation in itself' is that it is not an objective representation. I have already been harping on the ambiguity of 'representation', so it should be obvious that as I read this sentence, 'sensation' retains that ambiguity. It is equally plausible, I think, to understand Kant as referring either to the non-objectivity of sensing – mere modifications of the state of the experiencing subject are not *per se* objective – or the non-objectivity of that which is sensed. For since what is sensed is merely the *matter* of an object, but not also its form, what is sensed is not *per se* objective either. That is, Kant's point is that represented matter is not itself represented as an object (and so in that sense 'objective'). To be represented as an object, that matter must also be represented as occupying a place in space and/or time. Kant indicates this latter point by including the clause 'in it [represented matter] neither the intuition of space nor that of time is to be encountered'. Notice that, in that clause, Kant's attention is on space and time as encountered, i.e. as themselves part of what is represented.²¹ Going forward, it is the fact that what is represented by sensation is not *per se* represented as spatiotemporal that will play an essential role in getting Kant from here to his conclusion.

As strange as writing about a represented object that is not an objective representation may seem, that this is how we ought to understand Kant's claim is confirmed by what follows it.

[h] It has, to be sure, no extensive magnitude, but yet it still has a magnitude (and indeed through its apprehension, in which the empirical consciousness can grow in a certain time from nothing = 0 to its given measure) (e, f, g)

The crucial interpretative question about this step is, once again: to what are we to take 'it' to refer? The 'it' that opens this sentence must refer back to the 'sensation' that 'in itself is not an objective representation' in [g], and the first claim that Kant makes about it bolsters the case for understanding it as a represented object. It has no extensive magnitude. Whatever ambiguities one might suppose Kant's use of 'intensive magnitude' to contain, to this point his entire discussion of extensive magnitudes has cast them as represented objects, and he has not applied that term to representings at all. So it would be very strange to suppose that Kant is suddenly introducing the enormous complication into his argument of denying that sensings are extensive magnitudes.

To shift our focus now onto [h] itself, Kant there tells us that what is represented by sensation cannot have an extensive magnitude (because it is not *per se* represented as having a location in space and time), but has some magnitude nonetheless because, as we saw in [e] and [f], what is represented by sensation can be represented as growing or diminishing through fading in or out of existence. He then also points to the apprehension of this matter as the source of our representation of its (at least possible) growth because apprehension essentially includes sensings and, once again, it is insofar as sensings are present that what is represented is represented as having matter at all (as opposed to being represented as empty space and/or time). Again, there is no reason to read Kant as claiming anything about the intensive (or extensive) magnitude of sensings; rather, he is making a point about the intensive magnitudes of that which is sensed.

[i] Thus, it has an intensive magnitude, corresponding to which all objects of perception, insofar as they contain sensation, must be ascribed an intensive magnitude, i.e., a degree of influence on sense.

Admittedly, this is where things look most grim, but there is hope still. First, once again, the reference of 'it' should be traced back to 'sensation in itself' in steps [g] and [h], and I have already argued that this is best disambiguated as 'what is represented by sensation *per se*'. So, to start

out, Kant's conclusion is that what is represented by sensation *per se* has an intensive (rather than a merely extensive) magnitude. So far so good. The next clause, 'corresponding to which all objects of perception, insofar as they contain sensation', is more problematic. That does seem to indicate, retroactively so to speak, that what 'it' refers to is sensing because sensing is precisely what *corresponds* to the real in appearance, or objects of perception.

Notice, however, that even this is complicated by the fact that Kant qualifies 'objects of perception' – the referent of 'they' – with 'insofar as they contain sensation'. Of course, objects of perception cannot literally contain sensings. They can literally contain that which is sensed and, as we have seen, this is exactly how Kant understands both represented objects and sensations. Sensings are the means by which we represent objects as having a matter that is sensed. Thus, here is a slightly more perspicuous, if also more tortuous, rendering of the first part of Kant's conclusion:

Thus, that which is represented by sensings has an intensive magnitude, corresponding to which all objects of perception, insofar as they contain a sensed matter, must be ascribed an intensive magnitude.

What 'corresponds' here is the intensive magnitude of the objects sensed to the intensive magnitudes of objects of perception, which *just are* those that are represented via sensation.²² Thus Kant is emphasizing in his conclusion the point he had made in his very first premise: what makes perception a distinct kind of representing is the presence of sensation in it. So, since he has now established that what is represented by sensation (as opposed to the other components of perception, namely, spatiotemporal form) is represented as having an intensive magnitude, what is represented by perception is *ipso facto* also represented as having intensive magnitude.²³

All of which brings us to the final clause of Kant's conclusion: 'intensive magnitude, i.e., a degree of influence on sense'. At this point, my reading can be easily anticipated. Intensive magnitude is a degree of influence on sense, not because intensive magnitude explains why sensings have intensity, but rather because sensing just *is* our way of representing the intensive magnitude that Kant has just proven represented objects must have.

It is now worth noting a few ramifications of understanding Kant's argument in this way. First, its conclusion is precisely what Kant needs to

show that Descartes and Locke were mistaken. If objects must have a qualitative matter (as per the first stage of his argument) in addition to their quantitative form, then objects cannot consist entirely of extensive magnitudes.²⁴ (However, as I noted earlier, this matter is not identical to sensory qualities, but only *corresponds* to these, so Kant holds neither that sensory qualities inhere in non-mental objects nor that extensive magnitudes are merely mental.)

That is not to say that Kant should expect Descartes or Locke to be satisfied by this argument *alone*. This argument addresses objects *qua* objects of *representation*. What is represented in perception is necessarily represented as having an intensive magnitude. One can imagine Descartes and Locke conceding the point, but then pushing back that their concern was not with how we *represent* objects as being (or even how we necessarily represent objects as being), but rather how objects *themselves are*. As I hope this way of framing that objection indicates, this is precisely the form of resistance with which we should expect all of Kant's arguments in the *Principles* to meet insofar as they are part and parcel of his *transcendental idealism*, and this is precisely the objection Kant anticipates the transcendental realist to make. That this objection remains open to Descartes and Locke is in fact a benefit of the interpretation, as its being closed off would indicate that the interpretation had overstepped its transcendental bounds. As I understand it, Kant's transcendental idealism is a representational idealism one consequence of which is that the *only* sense that we can make of the concept of an object is as an object of representation.²⁵ So any interpretation of the conclusion of the argument of the Anticipations should be limited to objects of possible representation.

Secondly, in any case, nothing in this argument requires Kant to make the questionable inference that scholars have attributed to him. Nowhere does the argument move from the qualities of sensings to the qualities of objects sensed. It concerns only the properties of sensed items throughout. And so of course nothing makes any appeal to the fact that sensings have intensive magnitude (although, of course, they might).

Thirdly, notice that this argument omits an important *additional* thesis that Kant seeks to establish in the Anticipations. While if successful it would establish that objects have qualitative character and intensive magnitude, or degree of quality, it does not establish the *continuity* thesis that Kant also advocates. The continuity thesis states that between any two degrees of intensive magnitude there is another. The terrible-argument interpretation sees this as part of Kant's main argument. If sensations

admit of continuous intensive degrees, and the intensity of objects must correspond to that of sensations, then objects would also necessarily admit of continuous intensive degrees. That, however, is just another application of the same questionable form of inference on which the terrible-argument interpretation turns. So, once again, the question is: can we do better on Kant's behalf?

We can begin by noticing that while Kant does mention continuity in his main argument – recall that he claims that represented objects can gradually disappear – that represented objects admit of such gradations does not do any real work there. As I have proposed understanding his argument, all that this premise does is introduce the possibility of the qualitative character of an object varying in magnitude even while the extensive magnitude of the object remains unchanged. No continuity needed. If that is right, however, then it seems that Kant's main argument establishes only that objects have an intensive magnitude, not also that this magnitude is continuous. I believe that this is right, and that it is further evidenced by the fact that Kant alludes to an argument for the continuity thesis *after* his main argument has concluded, and just *before* he goes on to present the examples demonstrating the important consequences of the continuity thesis that we have already examined. That order of presentation indicates that Kant does not take the continuity thesis to be a part of his main argument, but rather a corollary of it.

This stretch of text and argument begins at A169/B211 with the paragraph starting with 'Accordingly every sensation' and ends just before Kant gives his examples at A172/B214 with the paragraph starting 'Nevertheless, we are not lacking proofs'. Of course, as usual, Kant makes several lengthy digressions, but the gist of the dialectic is as follows. In the first paragraph, he reiterates and clarifies the conclusion of his main argument: all objects, in addition to being extensive magnitudes, are also intensive magnitudes, i.e. have a degree. In the second paragraph, he defines continuity and recounts his argument from the Axioms that extensive magnitudes are continuous. Kant then opens the third paragraph by declaring that 'All appearances whatsoever are accordingly continuous magnitudes, either in their intuition, as extensive magnitudes, or in their mere perception (sensation and thus reality), as intensive ones' (A170/B212). That is a striking pronouncement insofar as Kant does not appear to have yet presented an argument for the conclusion that intensive magnitudes are continuous. One might take this as evidence that he takes himself to have established it in his main argument. However, an alternative is that the reason that Kant repeats the argument from the

Axioms, in between his claim that objects are intensive magnitudes and his claim that intensive magnitudes are continuous, is because he takes an analogous argument to establish this latter claim. To see how this might go, first consider the argument from the Axioms as he presents it in the Anticipations:

Space and time are *quanta continua*, because no part of them can be given except as enclosed between boundaries (points and instants), thus only in such a way that this part is again a space or a time. Space therefore consists only of spaces, time of times. Points and instants are only boundaries, i.e., mere places of their limitation; but places always presuppose those intuitions that limit or determine them, and from mere places, as components that could be given prior to space or time, neither space nor time can be composed. (A170/B212)

Kant's point here is that determinate locations in space and time are defined by their boundaries, and a boundary is always between one region of space or time and another. Thus, whatever purportedly smallest region of space or time one wishes to consider (a point or an instant) is always itself yet another region of space or time that can be divided into smaller regions by a further boundary. Now our concern is not whether that is a good argument or not, but rather whether one can construct an analogous argument for the continuity of intensive magnitudes.

Just as determinate *locations* in space and time (extensive magnitudes) are defined by their boundaries, so will be determinate *degrees* of intensive magnitudes. For example, one could represent a determinate degree of the darkness of a cup of coffee by creating a scale on which 0 is pegged to black as midnight on a moonless night and 100 is pegged to a cup of plain whole milk. Determinate degrees of darkness would then be defined in relation to these two extremes by specifying their boundaries with respect to those shades one step darker and one step lighter. If, however, one is to construct such a boundary, then whatever purportedly smallest degree of darkness one wishes to consider is always itself yet another determinate degree that can be divided into smaller degrees by some further boundary.²⁶ Again, the point here is not to consider whether this argument is good, but only whether some such argument can be constructed, as is indicated by Kant's rehearsal of the analogous argument from the Axioms at just the point in the text where he needs to bridge the gap between the claim that objects have intensive magnitude and the claim that the intensive magnitude that objects have is continuous.²⁷

Finally, it is worth noting that Kant does not mention continuity in *either* of his top-line formulations of the thesis of the Anticipations. In both he claims only that the real in appearance has *an* intensive magnitude, i.e. *a* degree, not also that this degree is a continuous one. That accords with the argument that I have attributed to him, which turns on the difference between having *no* degree and having *some* degree, rather than on having a continuous degree. Likewise, recall that continuity is entirely absent from Kant's in-line statements of his conclusions as well. In A: 'it therefore has a magnitude, but not an extensive one', and in B: 'all objects of perception . . . must be ascribed an intensive magnitude'. In both places, Kant's conclusion is only that sensed objects have *some* intensive magnitude, as opposed to having only an extensive magnitude, and not also that this intensive magnitude is continuous. Thus, while Kant is certainly concerned with the continuity thesis in the Anticipations, casting it as his primary conclusion simply does not fit the text.

Thus I hope to have shown that we need not accept that Kant's argument in the Anticipations, or at least one significant part of that argument, is as terrible as scholars have supposed. This interpretative uncharity is due to a well-known, but easily overlooked systematic ambiguity in Kant's idiom, which once corrected makes for a better-than-terrible argument.²⁸

Notes

- 1 Of course, even this is an oversimplification. Cf. Locke 1975: I.iv ('Of Solidity').
- 2 Again the details are more complicated than a simple exposition allows. For example, while motion might be a primary quality for Descartes and Locke, because Kant takes it to be a kind of alteration, he places it not under the categories of Quality, but rather under those of Relation, and it is therefore not an extensive magnitude. See e.g. A41/B58, B155, B292. All quotations from the first *Critique* are from Kant 1998, with standard A/B pagination.
- 3 Very few scholars hold that sensations *by themselves* represent objects, and rightly so. Rather, the most plausible view is that sensation is that in an empirical intuition which represents the matter of appearance. Cf. A26/B34.
- 4 Perhaps not so obviously: cf. Jankowiak 2013, which argues that objects must have whatever properties sensations have because 'object' can only mean object of representation, and so objects are not entirely distinct from the sensations that represent them (once they are synthesized according to the categories, etc.). He has, however, since rejected that view, at least in personal correspondence, on the grounds that even objects of representation do not have *all* of the properties that sensations have.
- 5 Aquila 1982 makes a very strong case that *Empfindung* is ambiguous in precisely this way and that Kant's use of it to refer to the matter of sensed objects or to the sensations that correspond to these can only be determined in context. Giovanelli (2011: 17) also notices the ambiguity and specifically attributes Kant's reformulation of the principle of the Anticipations in the B-edition to a desire to avoid confusions arising from it. (Of course, it would have been nice if Kant had disambiguated it as clearly throughout the entirety of the B-edition version.)

- 6 Some philosophers would draw a further distinction here between the 'object' that is represented or sensed and the 'content' of the representing or sensing. If this distinction corresponds to that between veridical and non-veridical representation or sensation, then it is entirely appropriate. If, however, it is intended to distinguish between the content of a veridical representation and the object 'itself' that 'corresponds' to this content, then maintaining such a distinction amounts precisely to the denial of Kant's transcendental idealism. Kant holds that the term 'object' is not the name of a distinct metaphysical kind, but rather a meta-conceptual sortal that distinguishes object-concepts (concepts that fall under the categories) from other concepts; it always refers to an object of possible representation. Cf. Landy 2015: 115–17.
- 7 Wang 2018 helpfully traces this connection – between an object's having a qualitative character (as opposed to lacking one) and the necessary possibility of its admitting of degrees – to the categories of Quality themselves, and specifically to that of limitation. 'Limitation' is more than mere 'reality', as the latter only affirms a *single* reality *a*; but to place a reality in a 'bounded gradation', we require a manifold or a sequence of degrees. 'Limitation' is also more than mere 'negation', as the latter only denies a certain reality and affirms nothing. Both 'reality' and 'negation' revolve around the dichotomous state of a certain reality and never address other possibilities. By contrast, 'limitation' (through the 'negation' of a certain *a*) reveals another 'reality' that is the infinite sphere of all possible realities except *a*. . . . In view of the logical functions of judgments, our capacity of making infinite judgments is necessary. (Wang 2018: 69)
- 8 Notice that this claim concerns only the *possibility* of a variation in the intensive magnitude of the object. It is only for this that Kant seeks an *a priori* proof, not the actuality of any such variation. More on this soon.
- 9 Cf. 'The undetermined object of an empirical intuition is called appearance' (A20/B34).
- 10 Kant's claim here, that the intensive magnitude of the object 'has no extensive magnitude', is best understood as being that intensive magnitude *per se* has no extensive magnitude. For example, the redness of an apple (or the qualitative character corresponding to that redness) qua a quality of the apple, does have a shape and size, but this size and shape are not intrinsic features of the redness qua qualitative character.
- 11 My thanks to an anonymous referee for helping me clarify the details of the anaphoric references here.
- 12 Kant does *not* conclude that sensings are themselves intensive magnitudes, which would itself be another terrible argument.
- 13 This definition is admittedly difficult to square with the *Stufenleiter* passage (A320/B376–7) wherein perception is defined as a representation with consciousness, and a sensation is defined as a subspecies of *perception*, one that refers to the subject as a modification of its state. Kant also there contrasts sensation, so understood, with objective perception, or cognition, which of course is either an intuition or a concept. As I understand all this, what Kant is after is the idea that sensings are states of the experiencing subject that do not by themselves represent anything as anything, but do stand in as mental proxies for the qualities of worldly objects. Perceivings are intuitings (conceptually structured singular representations of determinate objects) that are accompanied in the right way by such sensings. Intuitings can also be pure, or non-empirical, in which case they represent space or time, but as empty.

- 14 Kant later cites colour, warmth and moments of gravity as examples, but is here refraining from giving any specific descriptions because, as noted earlier, it is not these specific examples but their shared *a priori* form that concerns him here.
- 15 Compare Wang on the even stronger thesis that such magnitudes are continuous: ‘Kant cannot and does not intend to prove the empirical continuity of alterations in appearances. On the contrary, he calls continuity in nature a “mere idea” (A661/B689), which has no determinative but an “excellent and indispensably necessary regulative use” in directing the understanding to a “goal” (A644/B672).’
- 16 See e.g. point [i]: ‘all objects of perception, *insofar as they contain a sensed matter*, must be ascribed an intensive magnitude’.
- 17 See Giovanelli (2011: 1–9) for an excellent discussion of the sense in which the principle of the Anticipations anticipates experience *a priori*.
- 18 Bennet himself concedes that Kant might earn himself a version of the possibility claim, and thereby block the inference with which he is concerned, but puts this interpretative victory aside as being too ‘feeble’:

Perhaps Kant would reply that even in such a world there would be ‘a continuity of many *possible* intermediate sensations’: such intermediate sensations need not actually occur but they must always be possible. This would make Kant’s talk about ‘forestalling experience’ look rather feeble, but still it would suffice for the most important of his arguments involving the notion of intensive magnitude. (Bennett 1966: 172)

- 19 Understanding Kant’s argument as beginning from a claim about the possibility of certain features of sensed objects rather than actual features of sensations also goes some way towards ameliorating Warren’s structural concerns regarding the very idea of anticipating experience (Warren 2001: 15–16).
- 20 Of course, even this is not *really* possible, since we will learn in the immediately following section of the first *Critique*, the First Analogy, that nothing is actually ever created or destroyed.
- 21 In fact, I think that this premise is stronger than Kant needs it to be, and the weaker version is more plausible. Given that space is the form of outer sense, whatever the object of sensation is, it really must be *per se* spatiotemporal. The point that Kant needs here, though, is only that the very same location in space and time can vary in its qualitative character. Most basically, it can be either empty or filled, but also it can be filled with matter of different kinds. My thanks to Samantha Matherne for helping me see the importance of this point.
- 22 A helpful anonymous referee suggests a different, but nonetheless friendly, interpretation of ‘corresponding to’ here. One can regard the correspondence as between the claims ‘that which is represented by sensation has intensive magnitude’, and ‘all objects of perception, insofar as they contain a sensed matter, must be ascribed an intensive magnitude’.
- 23 There is room to resist this further conclusion of Kant’s. One might hold that, even if the *matter* corresponding to *sensation* has an intensive magnitude, it does not follow that the *object as a whole* represented by *perception* does. For example, one could hold that the luminosity of a star admits of degrees, but that the star itself does not. My thanks to an anonymous referee for calling my attention to this point.
- 24 In all fairness, at least Locke’s position on this issue is probably more nuanced than this framing has indicated. Descartes’ might be too.

- 25 Either as the object of *our* forms of representation – space, time and the categories – or, by contrast, the object of some form of representation other than our own, e.g. God's *intuitus intellectualis* (A249/B305). Cf. Landy 2015: 276–301.
- 26 I follow Walker 1978, Buroker 2006, Warren 2011, Giovanelli 2011 and Wang 2018 in taking intensive magnitudes to be ordinal, but not necessarily also cardinal.
- 27 Thus we can vindicate Kant's note: 'Every magnitude has a quality, i.e., continuity. Every quality has a magnitude, i.e., intensity (degree)' (*Ref.* 5636, 18: 268; Kant 2005: 260).
- 28 I am grateful to Margo Landy, Tim Jankowiak, James Messina and Samantha Matherne for comments on early drafts of this article, as well as to the anonymous referees whose insightful and constructive feedback was invaluable.

References

- Aquila, Richard (1982) 'Is Sensation the Material of Appearances?'. In Moltke Gram (ed.), *Interpreting Kant* (Iowa City, IA: University of Iowa Press), 11–29.
- Bennett, Jonathan (1966) *Kant's Analytic*. Cambridge: Cambridge University Press.
- Buroker, Jill Vance (2006) *Kant's Critique of Pure Reason: An Introduction*. Cambridge: Cambridge University Press.
- Falkenstein, Lorne (1995) *Kant's Intuitionism: A Commentary on the Transcendental Aesthetic*. Toronto: University of Toronto Press.
- Giovanelli, Marco (2011) *Reality and Negation: Kant's Principle of the Anticipations of Perception*. Dordrecht: Springer.
- Guyer, Paul (1987) *Kant and the Claims of Knowledge*. Cambridge: Cambridge University Press.
- Jankowiak, Tim (2013) 'Kant's Argument for the Principle of Intensive Magnitudes'. *Kantian Review*, 18(3), 387–412.
- Kant, Immanuel (1998). *Critique of Pure Reason*. Trans. and ed. Paul Guyer and Allen W. Wood. Cambridge: Cambridge University Press.
- (2005) *Notes and Fragments*. Ed. Paul Guyer, trans. Curtis Bowman, Paul Guyer and Frederick Rauscher. Cambridge: Cambridge University Press.
- Landy, David (2015) *Kant's Inferentialism: The Case Against Hume*. New York: Routledge.
- Locke, John (1975) *An Essay Concerning Human Understanding*. Ed. Peter H. Nidditch. Oxford: Clarendon Press.
- Nolan, Lawrence (ed.) (2011) *Primary and Secondary Qualities: The Historical and Ongoing Debate*. Oxford: Oxford University Press.
- Walker, Ralph C. S. (1978) *Kant*. Abingdon, Oxon: Routledge & Kegan Paul.
- Wang, Weijia (2018) 'Kant's Argument for the Principle of Anticipations of Perception'. *Philosophical Forum*, 49(1), 61–81.
- Warren, Daniel (2011) *Reality and Impenetrability in Kant's Philosophy of Nature*. New York: Routledge.