Space as Form of Intuition and as Formal Intuition: On the Note to B160 in Kant's *Critique of Pure Reason*

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The footnote B160–61n that Kant appended to section 26 of the B-version of the Transcendental Deduction (TD) in the *Critique of Pure Reason* (CPR) addresses the relation of the unity of space to the faculty of understanding. This has been the source of much puzzlement among commentators, and the disagreements to which this has led have often had far-ranging consequences for one's approach to what is arguably

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Abbreviations of Kant's Works

AA = *Akademische Ausgabe* (Kant 1900–)
CPR = *Critique of Pure Reason* (Kant 1998)
DDS = *Concerning the Ultimate Ground of the Differentiation of Directions in Space*, in AA 2:375–84
Disc = *On a Discovery Whereby Any New Critique of Pure Reason Is to Be Made Superfluous by an Older One*, in AA 8:187–251
LF = *Thoughts on the True Estimation of Living Forces and Assessment of the Demonstrations that Leibniz and Other Scholars of Mechanics Have Made Use of in This Controversial Subject, together with Some Prefatory Considerations pertaining to the Force of Bodies in General*, in AA 1:1–181
Refl. = *Reflexionen*, in AA 16–19

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Kant's central argument in TD. Thus Martin Heidegger (1991, 146n203; 1995, 132ff.) supports his radical interpretation of Kant by explicit reference to this footnote, using it to shore up the central role he gives to the imagination in TD. Béatrice Longuenesse (1998a, 219) uses it as evidence for her controversial interpretation of TD and in particular of the understanding's effect upon sensibility. The recent debate around nonconceptual content in Kant (Wenzel 2005; Hanna 2005, 2008, 2011; Allais 2009; Grüne 2009, 2011; Griffith 2012; Schulting 2012a, forthcoming a; Tolley 2013) is directly related to this footnote insofar as it might be read as supporting a conceptual account of what the Transcendental Aesthetic (TAe) first presented as nonconceptual. And lastly, this issue has also proven to be relevant to the recent discussion around the role of constructions in geometry (Shabel 2003; Friedman 2012), because the epistemological significance of an apparent need to resort to diagrams in Euclidean geometric reasoning depends upon the extent to which space is independent of conceptual content.[1]

Although a considerable amount of literature has already been devoted to the footnote, there is however little consensus around its interpretation. This article seeks to address the problematic interpretative issues that the footnote raises, by reference to key readings in the literature. Following the identification of three central problems of interpretation in section 1, section 2 identifies two main interpretative strands (which we label the *Conceptualist* and the *Nonconceptualist* approaches) in terms of their understanding of one of these problems, and their response to the other two. The problems faced by these approaches are examined in more detail in section 3, once the notion of "unity of space" (B160n) has been clarified by reference to TAe. This leads

1. If spatiality cannot be formalized and thereby represented in purely conceptual terms, then geometry, as the science of space, cannot proceed without spatial representations playing a central role in geometric proofs. There are, however, different views as to how diagrams function in geometric proofs, with a prominent Platonic view that one somehow accesses the truth by "seeing" it in a geometric representation (Brown 2008, 26–50). This is incompatible with Kant's view of the role of diagrams in geometry as involving constructions through which the objects of geometry are determined by means of synthesis. For Kant, a synthetic geometric judgment is not made by first drawing a diagram and then observing (in the mind's eye, if this diagram is drawn in thought) the truth of a certain geometric proposition. Rather, it is in drawing an intuitive representation of the diagram that the synthetic proposition is formed, because the act of drawing consists in the act of synthesizing a region of space according to the rules of Euclidean geometry. Through inferences guided by this construction, it is possible to establish the truth of a geometric proposition (A716–17/B744–45).

to viewing a broadly nonconceptualist approach as the most promising interpretation: the principal idea at the core of our proposal is presented in section 4, and we show how it provides an account of Kant's distinction between "form of intuition" and "formal intuition" in the second part of the B-version of TD (sec. 26). This idea is then further developed to examine the related issues of the concept of space (section 5), the role of the categories in determining space through synthesis (section 6), and the role of the imagination in the synthesis of space (section 7). Finally, in section 8, the proposed interpretation is used to clarify our responses to the issues raised in the three problems identified at the outset.

1. Interpretative Problems

The footnote, appended to B160, reads:[2]

> Space, represented as *object* (as is really required in geometry), contains more than the mere form of intuition, namely the *comprehension* of the manifold given in accordance with the form of sensibility in an *intuitive* representation, so that the *form of intuition* merely gives the manifold, but the *formal intuition* gives unity of the representation. In the Aesthetic, I ascribed this unity merely to sensibility, only in order to note that it precedes all concepts, though to be sure it presupposes a synthesis, which does not belong to the senses but through which all concepts of space or time first become possible. For since through it [that is, through synthesis] (in that the understanding determines the sensibility) space and time are first *given* as intuitions, the unity of this *a priori* intuition belongs to space and time, and not to the concept of the understanding. (§24; translation amended)[3]

2. All quotations from the *Critique of Pure Reason* (henceforth CPR) are from Kant 1998. We follow the standard way of reference to the A/B editions of CPR. All other works by Kant are referred to by reference to the respective volumes of Kant 1900– (abbreviated AA), followed by volume and page numbers.

3. The text in the *Akademische Ausgabe* (AA 3:125n) reads:

> Der Raum, als *Gegenstand* vorgestellt (wie man es wirklich in der Geometrie bedarf), enthält mehr als bloße Form der Anschauung, nämlich *Zusammenfassung* des Mannigfaltigen nach der Form der Sinnlichkeit Gegebenen in eine *anschauliche* Vorstellung, so daß die *Form der Anschauung* bloß Mannigfaltiges, die *formale Anschauung* aber Einheit der Vorstellung giebt. Diese Einheit hatte ich in der Ästhetik bloß zur Sinnlichkeit gezählt, um nur zu bemerken, daß sie vor allem Begriffe vorhergehe, ob sie zwar eine Synthesis, die nicht den Sinnen angehört, durch welche aber alle Begriffe von Raum und Zeit zuerst möglich werden, voraussetzt. Denn da durch sie (indem der Verstand die Sinnlichkeit

Lorne Falkenstein describes this footnote as "so obscure that it can be made to serve the needs of any interpretation whatsoever." He continues, "From a contradiction anything follows, and any text that contains two assertions like (a) 'this unity [of space and time] . . . presupposes a synthesis . . . through which all concepts of space and time are first made possible', and (b) 'the unity of this intuition [of space and time] belongs a priori to space and time and not to the intellectual concept' is close enough to exhibiting a contradiction that it makes it possible to get virtually any conclusion one pleases out of the passage with only minor effort" (Falkenstein 1995, 91). Three issues can be identified that are potentially the source of interpretative disagreements:

1. The apparently contradictory nature of the second sentence of the footnote: while it is claimed that the unity of space "precedes all concepts," it also "presupposes a synthesis," and moreover, this synthesis makes "concepts of space and time first become possible." There is a prima facie tension here, for, according to Kant, every synthetic activity involves the understanding (B130), that is, the faculty which unites manifolds under concepts. So if the unity of space precedes all concepts, then it should surely not presuppose a synthesis.[4]
2. At the outset of the footnote, the statement that space is represented as an object could be interpreted as implying that it is indeed to be seen as an object. However, this would

bestimmt) der Raum oder die Zeit als Anschauungen zuerst *gegeben* werden, so gehört die Einheit dieser Anschauung a priori zum Raume und der Zeit und nicht zum Begriffe des Verstandes (§ 24).

4. The tension is prima facie because it could be argued (Allais 2009, 396) that not all synthesis requires concepts and the understanding, and that the understanding is first required to bring the synthesis to concepts (B103/A78). That is to say, the synthesis of apprehension and reproduction, discussed in the A-Deduction, might be taken as not, or not directly, involving the understanding. However, we would argue that in view of Kant's main claim that the "same function," that is, the "same understanding," "by means of the very same actions," "gives unity to the different representations *in a judgment*" and "gives unity to the mere synthesis of different representations *in an intuition*" "by means of . . . synthetic unity" (B104–5/A79), and Kant's further claims that the synthesis of the imagination is "an effect of the understanding" (B152) and "depends on" the understanding (B164), it is hard to see how the act of synthesis can be seen as independent of the understanding, and thus as preceding the concepts of the understanding. So if, as Kant maintains, the unity of space precedes concepts (whether in general or the categories), then it cannot presuppose a synthesis.

contradict Kant's attacks upon the Newtonian view that there is such a thing as an object "space" (A39/B56). Also, in the Amphiboly of concepts of reflection, Kant refers to the representation of space as an "empty intuition without an object," that is, an *ens imaginarium* (B348/A292).[5] This would appear to exclude the possibility of space being represented as an object.

3. In the final sentence of the footnote, the unity of space is presented as belonging to space, and since space is an a priori intuition, this means that the unity is internal to the intuition. However, in the main text, at B161, we find Kant describing the "*unity of the synthesis*" of the manifold of space (or time) as "already given *a priori*, although with (not in) these intuitions." Since the unity in the footnote is also described as presupposing a synthesis, how can the unity of this synthesis belong to space, if this synthesis itself is not given in space? That is, the worry is that the unity of space is grounded in a synthesis that is external to space (according to B161), while this unity belongs to space (according to B160n), which suggests it does not involve reference to anything external to space. The extent to which the unity that belongs to space is not imposed on it through synthesis, and is therefore nonconceptual (since synthesis implies unification under a concept—see above), thus requires further examination.

As we shall see below, these issues are related to the distinction Kant introduces in the footnote between space as "form of intuition" and as "formal intuition." This distinction has been the subject of some discussion, in particular in response to Longuenesse's (1998a, 212–27) controversial claim that despite Kant's explicitly contradistinguishing them, the two notions can be fused into one. We shall argue that there are good grounds for keeping the two apart, although they are perhaps not

5. See also Refl. 4673 (AA 17:638–39): "Space is not an object of intuitions (an object or its determination), but the intuition itself, which precedes all objects and [*crossed out*: through which] in which if the latter are posited [*und wodurch es worin die selbe gestellt*], the appearance of them is possible" (Kant 2005, 155). We note also that in the First Antinomy, Kant underscores the fact that space is "not a real object that can be outwardly intuited" (A429n/B457n).

as distinct as they are considered to be according to a more traditional reading, which takes the distinction at face value.[6]

2. Main Interpretative Strands

Let us start with the first issue of the contrast between the claim (A) that the unity of space is prior to all concepts, and the claim (B) that the unity of space requires a synthesis. A first interpretation emphasizes claim (B). This is the option chosen by those interpreters who claim that the unity of space is to be understood as produced by the spontaneity of the understanding by means of a priori concepts. We shall call this the *Conceptualist* interpretation.

The motivation behind this interpretation involves, first, simply arguing that the unity of space is the unity of a manifold of representations in intuition and that, as such, it must be a *synthetic unity*. Such a unity is understood by Kant as logically anteceding (in transcendental logic), that is, grounding, *analytic unity* (B133n). This is what Kant explains when he introduces the synthetic unity of apperception as the highest principle of all knowledge in the B-Deduction: "The *analytical* unity of apperception is only possible under the presupposition of some *synthetic* one" (B133). The analytic and synthetic unities of apperception are not two separate functions of thought, but are two formally separable aspects of one and the same function of the understanding (see B104–5). The analytical unity of apperception refers to Kant's well-known claim at the start of the main argument of the B-version of TD that I must be able to accompany my representations with an 'I think' (B131–32). The analytic unity of apperception is defined as the *sameness or homogeneity* of representations with regard to the 'I think' accompanying them. All my representations express the same feature of being accompanied by the common representation 'I think'. By contrast, the synthetic feature of apperception is the *combinatory* nature of the unity of consciousness that comprises the various, heterogeneous representations under the common representation 'I think'. Only to the extent that various representations are put together can they share the common representation

6. The standard understanding of the notion of formal intuition sees it as a conceptual determination of the form of intuition (Allison 1983, 97; 2004, 116; Falkenstein 1995, 383n31). Falkenstein writes, "Since, as B129–30 points out, all combination is an intellectual act, it naturally follows that the formal 'intuition' of space will be a discursive, intellectual representation ([that is, a representation relating to the understanding,] and hence not an intuition, properly speaking, at all)."

'I think' and can the 'I think' accompany them "conjointly" (Van Cleve 1999, 80), which accounts for the grounding of the analytic unity of apperception on the a priori synthesis of one's various representations. Thus, while "the analytical unity of consciousness pertains to all common concepts as such" (B133n), a synthetic unity necessarily precedes the analytic unity as its logical condition according to transcendental logic, that is, as a necessary enabling condition. For it is necessary that the multiplicity of representations be gathered by means of a synthesis to first ground a concept's analytic relation to the representations to which it applies. For example, the concept "red" can be applied to a multiplicity of red-colored objects on the grounds that those objects have been taken together as having the characteristic "red." It is thus that, according to Kant, the synthetic unity precedes any *concept*, to which by definition attaches an "analytic unity of consciousness" (B133n).[7] This is a statement that Kant makes about manifolds in general in the first part of the B-Deduction (secs. 15–20), where the manifold is considered independently of its specific spatiotemporal nature. The additional claim that synthetic unity requires a synthesis is made by Kant at B130–31. Kant shows here that there is a reciprocity between the representation of this synthetic unity and its product, namely, the combination of representations constituting the synthesized manifold. A combination in the manifold is made possible insofar as the representation of the synthetic unity has been "added" to the manifold, which requires what Kant calls a "higher" unity, that is, the original-synthetic unity of apperception.

7. More specifically, we read Kant's claim, at B133, that analytic unity of apperception or consciousness presupposes an a priori synthetic unity as a claim about the biconditional that analytic unity of consciousness in regard to my representations obtains if and only if representations have been synthetically combined in one unitary representation (which Kant calls the 'I think') by means of an a priori act of synthesis. A priori synthesis is the "antecedently conceived" (B133n) condition of the analytic unity of self-consciousness. It is thus a necessary condition of analytic unity of apperception, that is, "for me to represent the *identity of the consciousness in these representations* itself" (B133). But a priori synthesis is also a sufficient condition for the representation of the analytical identity of self-consciousness. For no *a priori* synthesis fails to result in an analytic unity of apperception, since considering my representations as belonging to my analytical identity of self-consciousness "means . . . the same as that I unite them in a self-consciousness" (B134) by means of an a priori synthetic unity. See further Schulting (2012b) for an interpretation of the relation between the synthetic and analytic unities of apperception.

Building upon this connection between synthetic and analytic unity, recently Hermann Cohen's (1907; 1987) neo-Kantian[8] interpretation of CPR has been revived in a paper by Éric Dufour (2003) that applies Cohen's general approach to the issue of interpreting the footnote.[9] Dufour claims that the unity we are after is that which makes geometry possible and produces the concepts of space and, as such, must therefore be the unity of the synthesis of space, that is, a synthetic unity. This unity, like the synthetic unity of the synthesis of any manifold, stands in reciprocal relation to the analytic unity of apperception, which it grounds (B133), and hence amounts to a conceptual unity. As Dufour shows, this interpretation has the benefit of explaining much of the content of the footnote in a fairly straightforward fashion. That is, the geometric unity presupposes a synthesis insofar as there must be a synthesis of space, which gives rise to it as synthetic unity. It thus apparently makes all concepts of space possible. This would seem to provide an explanation of claim (B).

Upon closer examination, however, this conceptualist interpretation can really only validly claim in this way that geometric figures (subspaces, or conceptual determinations of space) are the result of a synthesis (Dufour 2003, 77),[10] given Dufour's conceptualist reading that synthesis is strictly reciprocal to conceptual unity, and thus that syntheses always issue in concepts. On the assumption that synthesis is strictly reciprocal to conceptual unity, it cannot validly claim that space as a whole is the result of a synthesis, since space is described by Kant as not being a concept, in particular because it is infinite in magnitude (A25/B39–40).

8. Cohen was the founder of the Marburg school of neo-Kantianism, which was continued by Paul Natorp and Ernst Cassirer, among others.

9. Cohen himself does not actually say much about the footnote (see, for example, Cohen 1907, 62), although Dufour (2003, 78–79) does not believe this reflects any unease on Cohen's part with regard to its compatibility with his overall interpretation. Although Cohen's interpretation of TAe as pointing forward to the Transcendental Logic is echoed in the reading that is proposed in this article, our interpretation diverges from Cohen's core claims about space. Cohen (1987, 141) asserts that space (and time) can be represented only as *quanta continua* because the understanding, by means of the productive imagination, "is active in them," and that space and time originate in synthesis (1987, 99). For Cohen, space as pure intuition is a scientific abstraction, when regarded as detached from the synthesis of the understanding (1987, 141). We shall see further below in what ways this interpretation is flawed.

10. "It is indeed the understanding which 'produces' (*hervorbringen*) succession. . . . The same goes for space when the understanding is applied *via* inner sense to outer sense" (Dufour 2003, 77n; our translation).

That is to say, the content of a concept is characterized by Kant in terms of marks that are related to it as partial representations (AA 9:58). We would, however, not be able to complete a synthesis of an infinite number of such partial representations. Thus, while concepts are generated by synthesis of a finite number of partial representations, this cannot be the case for space, given that space is an infinite given magnitude. Space as infinite given magnitude cannot, therefore, be the *product* of a synthesis considered as strictly reciprocal to conceptual unity. However, Dufour (2003, 76) draws upon the use of the description "concept of space" in the Metaphysical Exposition (ME) of TAe as grist to his conceptualist mill insofar as it can be taken to imply that space (as a whole) requires a synthesis. That is to say, he recognizes that the representation of space is an intuition, but he follows Cohen (1987, 170) in taking Kant to have understood space and time as "*according to their concept*, not concepts, but intuitions" (Dufour 2003, 76; our translation and emphasis added).

The issue here, however, is the status of the concept (in the singular) of space as an intuition, and with respect to this, we can see that Dufour's strategy clashes directly with claim (A). For by identifying space as discussed in TAe as in effect involving the unity of a concept, he cannot also say of *this* concept, that the unity of space precedes it. And yet, the footnote claims that it is true for all concepts (in the plural) of space that the unity of space precedes them. We are therefore owed an explanation as to exactly what the unity of space might be on Dufour's conceptualist interpretation, such that it precedes *any* concept of space.

Not all conceptualists, however, fall foul of the above-mentioned problem, and indeed, it is noteworthy that Longuenesse has an answer to this question, which involves somewhat revising the standard conceptualist view. That is, Longuenesse (1998a, 241ff.) has it that the intuition of space is indeed produced by the understanding, but in a way that involves a role of the understanding that is prediscursive,[11] in the sense of being prior to the application of any particular concepts of space in a judgment about space, but not prior to the application of the categories. While her approach implies having to accept a controversial notion of an initial application of the categories of the understanding that does not entail subsumption of a manifold under the categories in a judgment, it is worth noting that (a) this finds its place in a well-argued overall interpretation

11. Fichant (1998, 92) describes the appeal to a "pre-discursive understanding" as an "interpretative artefact" that is "massively external to the Kantian thesis of the duality of the 'origins' of knowledge" (our translation).

of the capacity to judge, and (b) that Longuenesse is not alone in considering the need for a role for the understanding that is prior to concept subsumption. Indeed, Michael Friedman also identifies a prediscursive role for the understanding. He understands the representation of space as resulting from "an original synthesis [that] precedes all (schematized) categories or pure concepts of the understanding" (Friedman 2012, 248), where schematized categories must be understood as the categories functioning in an actual empirical judgment. Insofar as the understanding, by way of its action of original synthesis, is involved in the generation of the intuition of space, these approaches are "conceptualist" as we have defined the term, but it is important to note that on Longuenesse's and Friedman's accounts the understanding's role is considered prediscursive, that is, prior to any actual conceptual unification in an actual judgment. These latter interpretations are therefore described as "broadly conceptualist" as opposed to the Dufour/Cohen reading, which is "strictly conceptualist."

As an alternative to the conceptualist interpretation such as Dufour's, one can emphasize claim (A), that is, the claim that the unity of space is prior to all concepts. This *Nonconceptualist* option is preferred by interpreters such as Arthur Melnick (1973, 11), Falkenstein (1995, 9), and Henry Allison (2004, 113; 2000; 2012).[12] As Allison (2004, 192) notes, the main support for such a move lies in other texts than the footnote (for example, in TAe), as the footnote is usually thought to pose problems for the nonconceptualist, with its emphasis upon the need for a synthesis. Indeed, the standard nonconceptualist response to interpretative problem 1 from the footnote is to insist that what Kant is referring to when he says that a synthesis is required for the unity of space is the need for syntheses in the construction of geometric figures, not for the unity of space as such. And the justification for this move lies in the opening sentence of the footnote, which indicates that we are indeed dealing with space "as is really required in geometry" (B160n). Michel Fichant (1997, 36–38), for instance, takes this line, but not without noting that there are terminological obscurities in the footnote. For

12. Although the constraints of Jill Buroker's (2006, 130) book restrict her to a short section on the interpretation of the footnote, it is interesting to note that she clearly differentiates the unity given to space and time by the understanding from the unicity of space and time as forms of our sensibility. For similar reasons, Sebastian Gardner's (1999, 84–85) discussion is also brief, but suggests that he takes a nonconceptualist line too.

example, the second sentence clearly states that it is the unity of space that somehow requires a synthesis, not the unities of geometric constructions. As with the conceptualist option, a clarification is called for as to what the unity of space discussed in the footnote amounts to.

It is also worth noting that, as with Dufour's conceptualist interpretation (see above), there is again an equivocation over the use of the singular and plural: for the conceptualist, this concerns the *concept* versus *concepts* of space; for the nonconceptualist, the equivocation concerns the *unity* of space versus *unities* of spatial constructions. Indeed, for the nonconceptualist, the need for a synthesis can be explained for unities of spatial constructs but not for the unity of space. The demand for another account to explain in what sense a synthesis is needed for the unity of space *as a whole* is ignored by the nonconceptualists, whose interpretations discuss only the unities of parts of space. This equivocation over whether unities of parts or the whole of space are at stake parallels that characterizing the conceptualist interpretation insofar as, according to the conceptualist interpretation, what is clearly true for concepts of space, such as geometrical concepts (that is, that they are the result of a synthesis), is taken as therefore true of the concept of space (as a whole).

As with the conceptualist option, there is a more controversial interpretation that avoids the problem of this equivocation for the nonconceptualist. This option might be characterized as "radical" in contrast to the "traditional" nonconceptualist interpretation just described, and its chief exponent is Heidegger. Heidegger's (1991; 1995) radical interpretation gives pride of place to a faculty of the imagination that is no longer simply serving the faculty of the understanding, but is autonomous. This interpretation is justified by appealing to the central role Kant attributes to the imagination in the A-version of TD. Since problem 1 is that of explaining how the unity of space can presuppose a synthesis while making all concepts of space possible, if, with Heidegger, one views the synthesis referred to in the footnote as the sole work of the imagination, and not of the understanding, this problem disappears. Heidegger's interpretation of Kant is generally considered as involving a selective attitude toward the available textual evidence. But it is nevertheless of philosophical interest in its potential threat for the Kantian project, as we shall see later (section 3.G).

The options in terms of the interpretation of the second sentence of the footnote can thus be summarized in the following table in which we also place the interpretation we shall present below:

Conceptualist about unity of space		**Nonconceptualist about unity of space**	
Strict:	*Broad:*	*Orthodox:*	*Radical:*
Cohen	Longuenesse	Melnick	Heidegger
		Falkenstein	
Dufour	Friedman	Allison	
		Fichant	
		+ This article	

The placement on the left reflects a greater role for concepts. Many more authors could, of course, be added to this table, but those included can be taken as paradigmatic for each category.

While this classification is based upon the stance taken toward problem 1, this has repercussions for problems 2 and 3 respectively. Recall that problem 2 is that of understanding how space can be considered an object, while problem 3 is that of understanding in what sense the unity of space belongs to space. As regards problem 2, the strict conceptualist must unequivocally endorse the thesis that space is an object insofar as space is, after all, a product of the understanding derived from a concept of space, given that Kant defines "object" as the objective unity of one's representations (B137), which he equates with the transcendental unity of apperception (TUA) (B139). Conversely, concerning problem 3, the nonconceptualist is committed to viewing the notion of the unity of space as belonging to space, since it is, after all, a nonconceptual unity.

Leaving aside any further examination of problems 2 and 3 at this stage (we return to them in section 8), we will now turn from a brief review of the geography of the interpretative positions to a first examination of the "unity of space" as required by the issues raised by both conceptualist and nonconceptualist options, and examine to what extent these options are able to account for it.

3. Which Unity of Space?

Unity of intuition

A. "Unity" in TAe

In the footnote, Kant addresses the unity of space and claims that "in the Aesthetic, I ascribed this unity merely to sensibility" (B160n). What then is this unity supposedly discussed in TAe to which Kant refers here? In fact, reading the Aesthetic, we do not find any *explicit* use of the term "unity". We therefore look for *implicit* references to unity, first in the Transcendental Exposition (henceforth TE) of the concept of space

(B40–41), which identifies the "transcendental function" (Gardner 1999, 121) of space, that is, its role as grounding some form of a priori knowledge. In that section, however, all we find is that geometrical knowledge is grounded in the fact that the representation of space must be an intuition and must be a priori (B40). That the representation of space possesses these characteristics is, however, what ME set about to show, by exhibiting in what way space, understood as an a priori intuition, can provide the ground for geometry. This suggests that if there is a notion of unity to be found in TAe, it is in ME.

Unicity of intuition

B. "Unicity"

The unity we are after is however such that it "precedes all concepts" (B160n). Geometry, on the other hand, like any other form of objective knowledge, involves conceptual determinations in the sense that geometrically determinate spaces are conceptual determinations of space. Geometrically determinate spaces do not have a unity that "precedes all concepts" since they require geometric concepts (which are a priori) for their determination, which occurs by virtue of the construction of geometric objects (A162–63/B203–4). The unity of space that precedes all concepts in TAe cannot therefore simply be the unity of a geometrically determinate space. Nevertheless, if the unity at issue characterizes space, it also has a role to play in grounding the possibility of geometry.[13]

Importantly, geometry is also mentioned in ME, a fact which is prima facie puzzling as Kant clearly wants to separate the presentation of the nature of space in that section from an examination of its transcendental role in the next. We shall return to this issue later below. For now, let us note that in ME, Kant argues that space is *single and prior to its parts*, and therefore is an intuition rather than a discursive concept (B39/A25; compare B136n). What Kant means by that is that any determinate space can only be represented by reference to a single prior indeterminate space of which it is a part. This dependence is not characteristic of concepts, which are obtained by synthesis of manifolds of representations, that is, defined by reference to their parts or partial conceptual representations or marks (AA 9:58).

Insofar as, for the transcendental idealist, space is nothing beyond the representations of space (A28/B44), this priority of the whole over

13. It would be a ground that would serve as foundation for any representation of spatial manifolds, whether geometrically determinate or not.

the parts is characteristic of space: the fact that I can represent a region of space only by reference to the whole of space implies that space as a whole is a prior condition of the possibility of something like a region of space. We note that there are independent grounds for holding such a view about space, namely, monism about space, according to which the whole of space is metaphysically prior to its parts (Schaffer 2010, 35–36). For the sake of brevity, and to refer to the different order of priority characterizing conceptual representations, we shall call "mereological inversion" the property an entity has insofar as any representation of a determinate part of it depends upon a reference to the whole of it. On this definition, space possesses the property of mereological inversion. Mereological inversion contains a notion of "unity of space," although it is not spelled out explicitly: it is insofar as parts of space share a common origin in the "single all-encompassing space [*einigen all-befassenden Raume*]" (B39/A25) that they can be said to form a unity.[14] This unity is not that which Kant identifies in the Analytic of CPR as a condition for knowledge, as it is not that unity established through a synthesis, that is, a *synthetic* unity. On the contrary, it is first characterizable as the *analytic* unity of that which is unique: since there is only one space, all spatial regions therefore share a common origin; they analytically share the *same* characteristic—spatiality. We understand by "spatiality" the set of properties of space that characterize its unity. Similarly, any manifold in space is related to any other manifold in space precisely through its belonging to the same unique space. This is the unity of what Kant calls a *totum analyticum* (Refl. 3789, AA 17:293).[15] An important feature of this unity is that it implies *infinite divisibility* as no limit can be imposed on the process of determining parts. Moreover, this unity is that of something that is given as *infinite*,[16] hence not complete, while it would seem that a synthesis, as understood in the context of the analysis of discursively possible knowledge, can bind only a completed set of representations, as they must be

14. We note that the German *einigen* could be translated as "unitary" here, in contrast to *einzigen*, which would more properly be translated as "single". See our translation of Kant's text *On Kästner's Treatises* (Kant 2014). See also further below.

15. The analyticity referred to here is not conceptual, but that of an intuition. As Cohen (1907, 29) notes, "this unity [*Einigkeit*], out of which the manifold unfolds, goes beyond the methodology of the concept" (our translation).

16. Fichant (1997, 33–34) provides an illuminating analysis of space as a "quantum," and moreover an "original" quantum (as opposed to a determinate one), which he contrasts with the notion of *quantitas*.

apprehended together and reproduced by a spontaneous finite act of thought (A100–2).[17]

To summarize, the unity of space in question is characterized through the properties of:

The unicity of space

1. *singularity*: one can only represent a single, unique space;
2. *mereological inversion*: the whole of space precedes its parts (which entails the property of *infinite divisibility*);
3. *infinity*: the magnitude of space is infinite.

These three properties of singularity, mereological inversion, and infinity characterize space as a *unicity*, the term we shall use to indicate the sui generis unity of space. Although these are metaphysical characteristics of space, they have a transcendental role in cognition, which Kant spells out for instance in Refl. 4673 from the *Duisburg Nachlaß* from the 1770s. There, Kant claims that "the capacity to receive several impressions of outer objects, or the susceptibility to them, has no limits in itself" (AA 17:641 [Kant 2005, 156–57]). That is to say, space enables the representation of pluralities of representations of external objects whatever they may be, that is, however large or fine grained. But there is more to this transcendental role: the unicity of space defines a *structure of space* that characterizes the relations between regions of space. Kant presents space as the condition for the representation of things as "outside and next to one another" (A23/B38), which defines the structure of space in terms of the notion of exteriority (we shall say more about this further below).

In most of CPR, Kant retains the emphatic use of the word "unity" for synthetic unity, and thus it makes sense to use a distinct word, "unicity", for what is discussed in TAe concerning the unity of space.[18] This

17. By contrast, concepts, whose extensions may be infinite, are finite with respect to their intension insofar as they have a finite set of marks. The search for further subordinate concepts (that is, concepts with additional marks defining the extension of a given concept) can be pursued ad infinitum, as Kant explains in the Vienna Logic: "For someone who accepts *species infima*, these *subdivisiones* will finally have an end. Since we have just shown, however, . . . that in the nature of the thing every *species* can always contain further *species inferiores*, we will never come upon such concepts, whose sub-contained concepts cannot be divided again. Subdivision must proceed to infinity, then, although many a subdivision has an end, of course, *comparative*, for us" (AA 24:927 [Kant 1992, 368]). But the important point is that when we turn from extensions to consider intensions, we find that an infinite concept cannot be grasped by the human mind (compare Allison 1983, 93).

18. Prior to CPR, Kant appears to use "unity" explicitly in connection with space at least on one occasion. In a *Reflexion* that is probably part of the *Duisburg Nachlass* (Refl. 4756, AA 17:700) and presents a sketch of the later argument of TAe, Kant suggests that

unicity appears to be the only plausible candidate for the unity we are after and to which Kant refers in the footnote. Moreover, Kant himself, in a response to an article by the mathematician Abraham Kästner on the representation of space, refers to the parts of space as belonging "to one space [*ein* (*einiger*) *Raum*]" (AA 20:419), that is, to a space that is single or *unitary* (*einiger*), whereby the unity in question, which we call unicity, is that of "eines eintzigen [Raum]" (ibid.), that is, that of a *unique* (*einzigen*) space. Friedman (2000a, 198) underscores this notion of a "distinctly intuitive" unity of space that is not conceptual (compare Kjosavik 2009, 19).[19] We also note that Georg Mohr (1998, 112–13), who examines the case of time, identifies an analogous notion of temporal unity in TAe. It is this unicity of space that Kant identifies in his analysis of the impossibility of constructing a figure enclosed in two straight lines as arising from "the conditions of space and its determinations," and not from "the concept in itself" (A220–21/B268).[20] That is to say, it is the nature of spatiality (here, its topological features) independently of any synthesis of space under the categories that is at stake here.

C. The Conceptualist Reading of the Unity of Space

However, evidently the nature of the investigation in TAe is such that it is only the contribution of sensibility that is at stake there. By contrast, the Analytic's examination of the contribution of the understanding to cognition shows that insofar as cognition should arise from it, every sensible manifold must be synthesized under TUA, that is, under the principle of the original-synthetic unity of all of a given subject's representations that must be able to be accompanied by an 'I think' (B131–32).

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unity, which he gives as one of the characteristics of space, entails that space is an intuition and not a concept of the understanding: "Space . . . 5. Unity, hence [*mithin*] a pure intuition and not a concept of the understanding" (Kant 2005, 181). To avoid confusion between spatial unity, which is not a concept of the understanding as made clear in the above passage, and a unity that *is* grounded in the understanding, we use *unicity* for the former unity.

19. Longuenesse (1998b, 83; 2005, 36) also highlights this unicity, but for her both the unity and unicity of space are brought about by the understanding, whereas we understand space's unicity as precisely *not* brought about by the understanding but rather as characterizing space essentially.

20. Importantly, both the "conditions of space" and its "determination" play an explanatory role here. This leaves room for a non-Euclidean geometry with different determinations of space (see note 73 below).

The relevant issue here between the conceptualist and the nonconceptualist is that of the relation between the two types of unity, that is, the unicity of space and the unity that is imposed on space by TUA. The conceptualist would have it that there is only one notion of unity in Kant, namely, the unity defined by TUA, which as we have seen with the conceptualist approach, is a synthetic unity that is coextensive with a conceptual (analytical) unity. As a result, on the conceptualist approach, it must be the case that the unicity of space is a product of TUA,[21] so that the unity described in ME, although originally presented as being ascribable to sensibility, is, as the footnote allegedly reveals, in fact ascribable to the understanding. The problem this approach raises is that it is not clear whether it can, after all, satisfactorily explain the second sentence of the footnote. Indeed, if the unity of space requires a synthesis and every synthesis is dependent on TUA (B130–31; B131–36), the unity of space is dependent upon TUA. Consequently, given the reciprocity between TUA and conceptual unity, the unity of space is defined by a concept, namely, the concept of space (by which Kant means a concept of that which is given in the intuition of space), which is presented in ME. The content of this concept is the set of characteristics of the intuition of space as they are given in ME. But then it is not clear why this unity could be said to *precede* all concepts of space. This is not only, as observed earlier, because the very concept of space from TAe would be one such concept. But it is also because it must be possible to define conceptually any region of space, if space as a whole is so defined. So why would the unity of space that is defined by the whole of space be needed to define a region of space? All that is required to define such a region, if the logic of this conceptualist approach is adopted, is to add to the general concept of space some marks defining the limits of the region in question. Nonconceptualists will of course have an answer to that question, as we shall see below, as they can draw on the properties of the unicity of space.

D. Longuenesse's Middle of the Road Approach

The problem flagged above with the conceptualism of the Marburg school interpretation, which Dufour defends, can however be obviated without abandoning the thrust of the conceptualist approach, namely, by retaining a role for the understanding in defining the unity of space as it is identified in ME. This is Longuenesse's approach. Longuenesse does

21. As is indeed claimed by Longuenesse. See note 19 above.

not in fact construct her interpretation of CPR centrally around her understanding of the footnote. It is therefore all the more remarkable that her interpretation should provide her with a coherent understanding of it (Longuenesse 1998a, 215–25).

As we have noted earlier, Longuenesse (1998a) proposes to introduce a prediscursive role for TUA, whereby the unity of space results from a prediscursive "determination of sensibility by the understanding" (1998a, 222–23). Longuenesse's proposal follows from her broader proposal for the interpretation of the guiding thread that Kant presents in the Metaphysical Deduction of the categories (MD) (see B104–5). This leads her to interpret the role of the understanding in its effect upon sensibility as involving the capacity to judge as a precondition for "the *analysis* of the sensible into empirical concepts" (Longuenesse 1998a, 64). That is to say, the sensible manifold is compared, reflected upon, and abstracted by the understanding so that concepts can be formed on the basis of this procedure, which can subsequently be discursively employed in judgments. This effect of the understanding upon sensibility, which Kant says is the "first application" of the understanding (B152), is brought about through the imagination's *synthesis speciosa*, that is, the transcendental synthesis of the imagination, in such a way that the manifold in sensibility be available for subsumption under a concept according to the categories (Longuenesse 1998a, 244). For Longuenesse, such a subsumption need not happen however: if it were to happen, it would involve a second synthesis, the *synthesis intellectualis* (1998a, 245).

What are the implications of her reading for the intuition of space? Longuenesse's differentiating of a first prediscursive synthesis (1998a, 72) from any conceptual determination through a second intellectual synthesis (which happens in the context of discursive judgment) leads her to assign to this first prediscursive synthesis the function of *generating* the pure intuition of space (1998a, 219). In Longuenesse's view, space and time are therefore "the first, most original 'effect of the understanding on sensibility' " (1998a, 223; compare Longuenesse 2000, 103).[22] For our immediate purposes, it is important to note that on Longuenesse's reading the synthesis that generates the unity of space does not involve a concept of space. Longuenesse (1998a, 224) would argue, in line with the

22. This is confirmed by Longuenesse's (2000; 2005, 29–37) replies to Allison's (2000) critique of her position. Space and time, Longuenesse (2005, 34) states, "are forms of a sensibility affected by the understanding, and thus they are the product of *synthesis speciosa*, the transcendental synthesis of imagination."

footnote's claim, that unity precedes all concepts. However, for Longuenesse, the role of the understanding involves the functions of judgment since the understanding is a "*faculty for judging*" (A69/B94), and as such the categories, being nothing but these functions of judgment insofar as the determination of empirical intuitions is concerned (B143), are already implicitly involved, namely, as mere functions for judging (Longuenesse 2000; 2005). This is however an application of the categories in a Pickwickian sense, namely, in a merely guiding role,[23] while the imagination plays the key role in the logical process of comparison, reflection, and abstraction, as Longuenesse argues.

With this interpretation of the *synthesis speciosa* as that which first generates space, there seems little "spatial" content left in Longuenesse's notion of space. With Longuenesse's interpretation, sensibility is given a key role, but not one that reflects the phenomenology of space, the *spatiality* of space so to speak (compare Buchdahl 1969, 579–82). While Longuenesse (2000, 104; 2005, 34) claims that "the qualitative features of spatiality and temporality depend on our sensibility," she has nothing more to say about these. Correlatively, it is difficult to see how Longuenesse's interpretation can accommodate the actual infinity of space, although she claims that it does (Longuenesse 1998a, 267). Indeed, if the understanding were to produce space by affecting sensibility, it is not clear how an actual infinity is a possibility here: the understanding can certainly have no grasp of such an infinity, let alone be responsible for the imagination's ability to generate it. Here, it seems that Longuenesse is actually less sensitive to the problem of infinity than the neo-Kantians of the Marburg school. The latter at least recognize a role for infinity in cognition insofar as their notion of empirical object is defined as the limit

23. The guiding role of the categories consists in their "guid[ing] the ordering of our representations of . . . objects so that we can form concepts of them and combine those concepts in judgments" (Longuenesse 2005, 82; see also Longuenesse 2005, 24 and 1998a, 123). Longuenesse distinguishes between two stages of application of the categories: the first stage concerns the noted guiding role of the categories, so that by means of the process of reflection, comparison, and abstraction, representations are first conceptualized for use in judgments, and the second stage concerns the effective application of the categories in judgment, that is, the subsumption of objects under categories in a judgment (Longuenesse 2005, 24–26). Notice that, according to Longuenesse, the categories do not just guide representations of objects in intuition with a view to forming concepts of them, but the categories themselves are also first generated by the same process of reflection. This view of the categories is interpretively highly controversial. For a critique, see Allison (2000; 2012) and Schulting (2012b, 33–38).

of an infinite sequence of successive determinations.[24] Similarly to Longuenesse's, Friedman's (2012, 246–49) account of the footnote does not involve a concept of space either but, as we noted before, a role for the understanding that is prior to the schematization of the categories.

E. The Conceptualist Approach and the "Unicity" of Space

It is not clear however that conceptualist strategies—even the more promising broad conceptualism of Longuenesse and Friedman—are able to account for the role that the unicity of space plays in our cognition. We noted above that in TAe the reason for Kant's introduction of the issue of geometrical knowledge in ME was not clear, particularly since the B-edition of CPR introduces the distinction between metaphysical and transcendental expositions, but retains the mention of geometry in the former. Looking at the sentences in TAe preceding the introduction of geometry is, however, instructive. Kant says that space is "essentially single" and that "the manifold in it, thus also the general concept of spaces in general, rests merely on limitations" (B39/A25).[25] "From this," says Kant, "it follows that in respect to it an *a priori* intuition . . . grounds all concepts of it." The next sentence then explains that "thus . . . all geometric principles . . . are . . . derived *a priori* with apodictic certainty" (ibid.). This suggests that the fact that space is single is relevant to its being able to ground concepts (in particular geometrical concepts) of it. This single space is then implicitly assumed as given in TE when Kant says that "geometry is a science that determines the properties of space" (B40), that is, of the *one* space, but this property of singularity is not properly explained by a conceptualist approach for which the unity of

24. We note however that, in her treatment of the principle of complete determination, discussed by Kant in the chapter on the transcendental Ideal (esp. A581–82/B609–10), Longuenesse does acknowledge, in a similar fashion, the distinction between, on the one hand, the indeterminate whole of spatiotemporal reality, as an infinite sphere of the concept of a spatiotemporal object (an expression used by Longuenesse, which reveals her strong affinity with the neo-Kantian school) and, on the other, all appearances, that is, actual spatiotemporal objects, as its determinations. Longuenesse (2005, 223) says that what is at issue here concerns "the whole of reality that grounds the representation of the complete determination of things [and] is the indeterminate whole of reality given in space and time, presupposed in any empirical use of the understanding giving rise to discursively represented *realities* or positive determinations of things (as appearances)." Thus, the determination of any possible object in space and time is the division of the infinite sphere "of the concept: 'object given in space and time', that is to say, 'object of experience'" (Longuenesse 2005, 218).

25. Compare Refl. 4212, AA 17:458–59; A169/B211.

space is generated by the understanding. What would be lost in terms of objective knowledge of space without this property of singularity? We note two problems in particular:

(i) Without it, geometry would have to deal with multiple non-interacting spaces, while it is clear that our science of geometry always operates with the assumption of a unique background space. That is to say, a priori spatial representations can only ground geometrical constructions insofar as such constructions can be carried out without requiring different spaces. Further, our objective experience is that of *one world of outer sense*. That is, objectivity requires the singularity of the whole domain of outer sense. Without this singularity, we could indeed have a form of objectivity, but it would be one in which we would simultaneously view ourselves as belonging to different worlds or domains of outer sense that are completely independent of one another.

(ii) At the level of empirical knowledge, what would be lost is also our understanding of the *particular* in outer sense. This touches upon the meaning of Kant's concept of the "transcendental object," which "concerns nothing but that unity which must be encountered in a manifold of cognition insofar as it stands in relation to an object" (A109). With several spaces, the object could be separated into an irreducible multiplicity in the different spaces, because there would be objective spatial determinations in each space. These could not be viewed as belonging to *one* object without assuming that these spaces are related, that is, that they all belong to some underlying unique "meta-space."[26] By excluding this possibility, Kant in effect takes it to be a feature of objectivity that there is a unique world of outer sense (compare Brandt 1998, 93). So the singularity of space is the unity of space as a *particular*, namely, as the form of outer sense, being the condition of possibility of representing an object. But conceptualist interpretations cannot explain how such particularity is obtained from the universality of a concept of space or of any

26. This would also have important ethical consequences as I, as agent, would belong to distinct worlds, and my behavior could, in principle, be distinct in these different worlds.

> other operation of the understanding, since the understanding is the faculty of concepts, that is, of the general or universal: it can specify from a formal point of view that space is a particular, but that does not provide us with a representation of the particular.

But aside from the singularity of space, the whole structure we have defined as the unicity of space, through which geometric constructions are made possible, is required, as Emily Carson (1997, 508) shows, to provide a ground for the axioms of geometry: "Construction in pure intuition reveals the form of (really) possible objects of empirical intuition, thus of objects of possible experience." And this is what the objectivity of geometry amounts to. What Carson identifies here is a notion of possibility defined in terms of construction in pure intuition and one that is to be differentiated from logical possibility. Only Euclidean geometry, or at least a geometry that is approximately Euclidean so that the differences at our scale are not perceptible, is possible on this understanding of possibility. Again, it is a notion of *particularity* that is at stake here: the world of outer sense has a particular form, that is, the form of the particulars in it, and this form is specified by the axioms of Euclidean geometry.

F. A Further Problem for the Conceptualist Approach

Finally, there is a systematic reason for doubting that a conceptualist approach to the notion of the unity of space does justice to this notion. Indeed, it is no coincidence that the issue of the unity of space is discussed in a footnote to the second part of the B-version of TD, the so-called "second step" of the B-Deduction. Without entering into the details of the complex issue of the structure of the argument of the B-Deduction, we assume it is fairly well established that it has two parts (Henrich 1969; Baum 1986; Evans 1990; Allison 1996), and that the second part, unlike the first, refers to the particular spatiotemporal nature of our human sensibility (B145). If the second part of the argument of TD is required, there are strong grounds for assuming that it is because the structure of space itself is not merely the result of a synthesis of any arbitrary manifold in intuition brought about by the spontaneity of the understanding. Rather, the issue seems to involve a recognition that since our intuition has a spatial form, the special question of this form's conformity to the categories arises, which thus calls for a deduction that legitimates the use of, not only the latter (which occurs in the so-called first step), but also the

concept of space itself in the second step (see B120/A88).[27] We understand the very proof-structure of the B-Deduction as making sense only insofar as space is recognized as having a structure that is *independent of* the synthetic unity established by the categories, namely, as having its own unicity, so that the problem of unification under the categories of any manifold given within such a structure arises as a further question for the second part of TD. This second step can, in particular, be viewed as relevant to the possibility of geometry. Indeed, while TAe has shown that space as a priori intuition is a necessary condition for the possibility of geometry, this does not provide all the conditions for the possibility of this science. As with all knowledge, there is a role for the understanding, and here it must be its role to bring space under the categories, so that the construction of geometric figures is made possible. If the unity of space that is at issue in TAe were already that of a categorial synthetic unity, as Dufour claims, then there would be no task left for a deduction of the concept of space in the second step of TD.[28]

G. The Nonconceptualist Reading of the Unity of Space

Recognizing the transcendental function of the unicity of space thus strongly suggests viewing the unicity of space as being in essence nonconceptual. Unicity is a feature of space as the form of intuition. This leads some commentators to single out the unicity of space as having a key epistemological role. Thus Fichant (1997, 22–25) emphasizes the radicality of Kant's idea of the notion of an "original representation of space" (B40) in TAe that is precategorial. Fichant (1997, 24–25) also puts emphasis upon the independence of TAe from the Transcendental Analytic. But in terms of the footnote, what is prima facie puzzling for the nonconceptualist is that a nonconceptual unity could be claimed to pre-

27. In TD, Kant claims that time (and space) are indeed brought under the categories by the transcendental synthesis of the imagination (B151), and as a result, all that is in time (and all that is in space) also falls under the categories (B150). How time is brought to the categories is an issue that is addressed in the chapter on Schematism (A137–40/B176–80), but Kant does not say anything explicitly about space, a point we shall discuss further below.

28. In Longuenesse's case, it seems her reading of the *synthesis speciosa* as generating space, by means of a first application of the categories in their guiding role, which only in a second instance requires an intellectual synthesis that results in a judgment, appears in fact to reverse the order of the proof in the B-Deduction, which by contrast moves *from* the argument concerning intellectual synthesis in the first step *to* the argument concerning figurative synthesis in the second step (compare Allison 2000; 2012).

suppose a synthesis, while synthesis (in Kant's sense) must be taken to be strictly reciprocal to conceptual (analytical) unity (see again section 2 above).

Here, we should note that some commentators appeal to a substantial alteration of Kant's views between the publication of the A-edition and that of the B-edition. That is to say, the A-edition of TAe in which the sections do not carry titles featuring the word "concept" would present a nonconceptual notion of unity of space, while the B-edition introduces the notion of the "concept" of space (B37; B40), with Kant changing "we will consider space first" (A23) into "we will expound the concept of space first" (B38), as Reinhard Brandt (1998, 91) points out. Brandt takes this to mean that the B-version ensures that the unity of space is ultimately guaranteed by the understanding, *instead* of being the nonconceptual unity that characterizes the A-edition.

That there is a shift in text between the A- and the B-edition in this regard is clear. But whether we should interpret this as meaning that Kant changed his mind on this issue is another matter. Indeed, the passage discussed above about the unicity of space (B39/A25) remains unchanged in the B-edition TAe. So there is a notion of spatial unicity that is nonconceptual even in the B-version of TAe. If this is indeed the unity that Kant is discussing in the footnote, the issue of reconciling this with the claim that it "requires a synthesis" still has to be addressed.

Heidegger (1991) argues that the unity in question cannot belong to the senses if it is to involve a synthesis, and that since it is not conceptual, it must therefore be assigned to the imagination viewed as an independent faculty.[29] The imagination thereby acquires a central role that serves Heidegger's radical aims of enlisting Kant as a forerunner of his notion of finitude: through this notion, Heidegger wants to deny traditional notions of transcendence for human beings, for example, our claimed ability to know timeless truths. Indeed, for Heidegger, the understanding does not provide us with an ultimate objectifying principle that lies beyond the conditions of time (such as the unity of apperception), but rather, it is the imagination that ultimately governs the process of

29. Heidegger (1991, 142) supports his interpretation by drawing attention to Kant's use of the term "synopsis" to refer to the function of sensibility in apprehending a manifold (A94). He does not, however, seem to fully appreciate the implication of Kant's not using the word "synthesis" here, as we shall see later. In particular, this synopsis is clearly carried out by the senses, not the imagination. Heidegger (1995) however introduces a new term "syndosis", which represents a function of the faculty of sensibility. On these issues, see further note 42 below.

cognition as the "mediating center" between the faculties of understanding and sensibility. Since Heidegger (1991, 176) interprets the imagination as having an "inner temporal character," this concurs with his understanding of the finitude of *Dasein* as temporality (Heidegger 1976, 234).

Heidegger's interpretation can, among other things, be criticized for bestowing an overinflated status upon a tripartite division sensibility-imagination-understanding. Although the A-Deduction (which Heidegger focuses upon) has Kant saying that "we therefore have a pure imagination, as a fundamental faculty of the human soul, that grounds all cognition *a priori*" (A124), he also states, further in the same paragraph, that "on them [that is, the categories] is grounded . . . all formal unity in the synthesis of the imagination" (A125). The imagination's synthesis is therefore governed by the categories, and hence by the understanding and TUA (A119). So even if the A-Deduction presents a tripartite division of the faculties "*sense*, *imagination*, and *apperception*" (A115), the latter two are intimately connected, with TUA providing a ground for the synthesis of imagination through the categories.[30] The introduction of the imagination into the debate may be a fruitful move, as we shall see, but Heidegger's interpretation, which views it as independent of the understanding, should thus be rejected on Kantian grounds. For Kant, any spontaneity that apparently belongs to the imagination is only the spontaneity of an apperceiving subject in conformity with the categories and thus with the pure understanding (A119; compare B151–52 and B162n):[31] a synthesis a priori brought about by an autonomous faculty of imagination is excluded by the roles Kant apportions to the cognitive faculties.

One might nevertheless worry that this Kantian critique of Heidegger's proposal ultimately relies upon a model of cognition that can be challenged on philosophical or systematic grounds. The challenge would be that if intuition and concept are indeed distinct sources of knowledge, the unity of space, and even the synthesis grounding it, could be argued to be independent of the categories. Without pausing to examine the possible grounds for such a challenge, let us note its implications. TUA, through which any given manifold acquires objective status, would have

30. It is also the case that the imagination and sensibility are intimately connected ("the synthesis of the imagination, although exercised *a priori*, is nevertheless always sensible" [A124]), but this issue will be discussed further on in the article.

31. On this point, we agree with Banham's (2006, 127–30) critique of Heidegger.

to "harmonize" with this independent unity of space.[32] As we have just seen, in Heidegger's interpretation, the ground of the unity of space is located in an autonomous faculty of imagination.[33] The contingency of the resulting knowledge announces the "tearing apart," as it were, of the Kantian a priori, which is meant to be the ground of the objectivity of knowledge: if some harmony is required between these two sources of knowledge, which itself is not guaranteed by a higher necessary principle, it is no longer possible to provide a necessary ground of empirical knowledge. This is certainly a consequence that is germane to Heidegger's philosophical aims: the *a priori* would then serve rather to indicate in what ways human cognition is constrained by contingent conditions, and this would be one feature of our essential *finitude*.[34] It follows that,

32. The worry here would be that TUA may not be compatible with the unity of space: this could mean either (i) that different regions of space could not be brought together into one realm of objective knowledge, or, viceversa, (ii) that TUA refers to something that cannot belong to space. These may seem like far-fetched possibilities. In fact, (i) is the case of an essentially heterogeneous nature with local laws only, while (ii) could be instantiated by the case of a nature that can be grasped only by reference to some nonnatural, for example, supernatural, entities or causes. The problem is that such possibilities could not be excluded, which would make knowledge contingent upon their not actually being instantiated. Although the first case seems implausible, note that Heidegger's criticisms of the Kantian/neo-Kantian project in connection with time amount to the denial of the very possibility of something like eternal laws (Heidegger 1991, 277–78). Rather, for Heidegger we are located in our finite temporality, so that the very notion of the unity of time as defining an eternity is not within our grasp. Although Kant does not consider such cases of discrepancies between the unity of space and TUA, the worry they give rise to is analogous to that which Kant voices when dealing with the reproductive function of the imagination. He points out that "if this unity of association did not also have an objective ground . . . then it would also be entirely contingent whether appearances fit into a connection of human cognitions" (A121–22). In effect, such a connection would rely upon a contingent harmony, which would invalidate any claims about necessary knowledge.

33. The unity of space could then be understood in terms of an impoverished notion of spatiality, where the latter is defined in terms of what Hubert Dreyfus (1991, 99) calls the "nexus of equipment."

34. The story is presented in a very summary form, but the key idea is that any claim to necessity is invalid, since contingency pervades all knowledge because of our reliance upon the entirely contingent conditions of sensibility. We take it to be Kant's singular achievement to have made sense of the role of the nonconceptual in knowledge or experience and to have assigned it a role in the constitution of the a priori. Compare the problems that Heinrich Rickert (1909) and Emil Lask (1912) ran into without a notion of the nonconceptual, when trying to reconcile the realm of values with the realm of reality, and how this led to Heidegger's formulating his original ideas about the analytic of *Dasein* (see Friedman 2000b, 35–37).

aside from being very questionable as an interpretation of Kant's text, Heidegger's interpretation is not attractive as an account of Kant's project as a whole. If this brief excursion into Heidegger's writings on Kant has not provided a satisfactory account of how the unity of space could presuppose a synthesis, it has thrown up a problem for the nonconceptualist, namely, that of accommodating a unity of space that is independent of TUA, while not threatening the latter's unique role as the highest principle of all knowledge.

4. The Need for a Synthesis and the Distinction between "Formal Intuition" and "Form of Intuition"

The dialectical situation is the following. So far, we have identified an analytical notion of unicity of space in TAe. While conceptualist approaches (Cohen, Dufour, Longuenesse, Friedman) can account for how it is that the unity of space requires a synthesis, they do not appear able to account for the epistemic role of a unity of space, as described in TAe, namely, a unity that precedes all concepts.

The nonconceptualist approach is, however, faced with two challenges, namely, that of explaining how the unity of space presupposes a synthesis and how it stands with respect to TUA. Rejecting Heidegger's radical nonconceptualist interpretation leads us to develop a nonconceptual interpretation that draws upon existing traditional nonconceptual approaches (Allison and Fichant in particular). Its key feature is to provide a novel reading based upon the observation that the two challenges we have flagged are interrelated. In presenting this interpretation, we shall, in particular, contrast it with the broad conceptualist approach that emerged as the more plausible conceptualist interpretation from our analysis in the previous section.

In discussing the key claim that the unity of space "presupposes a synthesis" (B160n), we have so far assumed that Kant is describing the unicity of space (as presented in TAe) as requiring a synthesis, for without a synthesis there would be no such unity (and it should be clear that an *a priori* synthesis is meant here). This understanding of "presupposes a synthesis" however overlooks that the introduction of a dependence relation here necessarily refers to the faculty of understanding. That is, what is at stake is *the grasp of the unicity of space by the faculty of understanding*. What one usually fails to see here, however, is that "to presuppose" does not amount to "to be generated by." As often in interpreting Kant, the danger of confusing a justificatory with a genetic issue rears its ugly head

here. Allison, who is particularly attentive to these matters, stresses in another context the importance of the "as" structure in differentiating such issues (Allison 1990, 37). And indeed, the footnote clearly states that the topic at stake is that of space "represented *as* object" (emphasis added; compare Allison 2012, 48). Leaving aside for the time being the issue of how exactly to interpret "object" here, what is clear is that what is at stake is space, in particular the unity of space, *insofar as* it is grasped by the faculty of understanding.

To clarify our interpretation of this claim, consider the statement at the start of TD in its B-version, namely, that "the I think must be able to accompany all my representations" (B131), the principle of TUA. This proposition does not mean that any representation whatsoever has to fulfill this requirement. Only those representations that I *take as my* representations need ever be accompanied by my 'I think'. A strict reciprocity obtains between the indexicals 'I' and 'my'. Any other representations of which I am not occurrently conscious or of which I could not be conscious are, as such, not representations that 'I' (*stricto sensu*) represent; that is, these representations are or could be *represented*, but they are not thereby *thought* by an accompanying 'I' (*stricto sensu*). The principle of apperception is not a principle of the possession of representations, or even a principle of representation (an interpretative mistake that goes back to Karl Reinhold; see Ameriks 2000). Kant makes this point clear by adding that if representations did not fulfill this requirement, they "would be nothing for me" (B132), and not that they would not exist. Kant does not make an existential claim here; nor does he make a claim about an absolutely necessary entailment between representations and the 'I think'.[35]

A similar situation arises in the footnote. It is insofar as the unicity of space *is to be something for me*, and therefore to contribute to my experience of an objective world, that it requires a synthesis. Put differently, insofar as I *take* the unicity of space *as* a unity of a spatial region, it requires a synthesis. This means that, in the abstract context of transcendental analysis, one could in principle very well consider spatial representations where the unicity of space does not fulfill this requirement, for example, when we consider space as an infinite given magnitude. However, such representations would play no role in cognition other than in these abstract considerations if they could not be brought under TUA through

35. See further on this Schulting (2012b).

a synthesis. Therefore, although what Kant refers to in the second sentence of the footnote is the unicity of space, this is only to remind us that *insofar as* it is grasped by the understanding, the unicity of space presupposes a synthesis. That is, the unicity of space has a function in discursive knowledge through the grasping of this unicity of space by the understanding as a unity *for* the understanding, which grasping involves a synthesis.

The use of "to be sure" (*zwar*) in Kant's footnote is telling here. This is an expression that typically characterizes a discussion in which someone concedes a point that he recognizes. But with whom is Kant discussing these issues? We would argue that he is agreeing with the reader who has just made sense of the earlier part of TD. Why? Because the key claim of TD's first part is that TUA, which is the highest point to which the possibility of all cognition is to be referred, is a synthetic unity (B133–34) (see again section 2 above). Therefore, if space and its sui generis unity are to play a role in cognition, as Kant claims in the second step of TD, there must be a synthesis of space serving as constraint on the analytic unity of apperception so that perception of objects is made possible.[36] Such a synthesis would, moreover, be a condition of all concepts of space, in line with Kant's claims in the footnote. As a result, the two challenges for a nonconceptualist interpretation we flagged at the outset in this section can be met: we have an understanding of why a synthesis is required, namely, to grasp the unicity of space as a unity; and the role of TUA as highest principle of all knowledge is not threatened by the unicity of space because it can be brought under TUA through this synthesis.

The unicity of space is thus relevant to cognition insofar as it is *taken as a unity*, and this "taking as" is precisely reflected in the requirement of a synthesis. It is this synthesis-requiring unity that defines the notion of *formal intuition* that Kant differentiates, in the first sentence of the footnote, from that of a mere *form of intuition*, which "merely gives the

36. TUA only enables the cognition of an object in general. Insofar as the perception of empirical spatial objects is possible, a further analysis of the conditions of such perceptual knowledge is required. What comes into play here is the synthesis of the imagination, or the figurative synthesis introduced by Kant in sec. 24 of the B-Deduction, which is the synthesis that determines space. This latter synthesis serves as a further constraint on TUA, in order to enable the cognition of spatially located empirical objects. It is also for this reason that Kant divides the B-Deduction into two consecutive argumentative steps, corresponding to the two kinds of cognitive constraint on our representations of objects.

manifold."[37] That is, from the perspective of the understanding—which is indeed the perspective of the footnote—if the spatial manifold that is brought under TUA through a synthesis defines a notion of *formal intuition*, in contrast, without such a synthesis it is the form of a mere manifold of appearances, namely, the *form of intuition*.[38]

This account of form of intuition and formal intuition disagrees with Longuenesse (1998a, 212–27; 2005, 67–73), who has argued that the pure intuition of space of TAe, which is the form of intuition, and formal intuition are not really distinct; that is to say, she claims that space as pure intuition just *is* a formal intuition. The reason for Longuenesse's conflation of the two notions can be found in her claim, which we discussed above, that the synthesis of the imagination (*synthesis speciosa*) is in fact responsible for the *production* of space (and time) in its very givenness (2005, 76–77). This claim leads Longuenesse to read TAe as already describing the formal intuition of space, a claim that is hard to square with Kant's explicitly presenting TAe as dealing with the "pure form of sensible intuitions" (B34/A20; see also Allison 1983, 97). Moreover, Longuenesse's conflation of form of intuition and formal intuition collapses the distinction Kant explicitly makes between the merely given manifold (which at any rate has the necessary form of intuition) and the determinate manifold (formal intuition), which Kant is keen to bring out in the footnote.[39] And why would Kant make a point of dis-

37. The notion of "form of intuition" we are using here is incompatible with interpretations of it as involving rules, since we understand rules to be involved only at the level of the synthesis of space. Thus, Peter Krausser (1973, 282) claims that the form of intuition is to be understood as a set of rules, and therefore as the form of intuit*ing* rather than of the intuit*ed*. This latter distinction was examined by Patricia Kitcher (1990, 37) as one between "process form" and "product form." The former notion is proposed by Kitcher to answer the question of how sensations are ordered spatially and how an intuitive representation in space is constituted. Krausser does not view the rules defining the "process form" as a kind of spatial schematism but wants these rules to be distinct from the rules defined by the categories and implemented through the transcendental synthesis of the imagination. Rather, the latter rules operate "in conjunction" with the first to produce formal intuitions. Such an interpretation leaves it unclear how these rules stand with respect to TUA. Furthermore, it overlooks the important phenomenological dimension of the form of space, that *wherein* the manifold is represented.

38. To mark the contrast with the notion of "formal intuition," Melnick (1973, 11) refers to space as a "pre-intuition."

39. Konstantin Pollok (2008, 333–34) appears to make a similar conflation. He writes: "The synthesis of apperception is required not only for providing the manifoldness with a *conceptual* form, but also for the specifically *spatiotemporal* form it happens to possess. This manifoldness has a *material* aspect, the brute sensation by which the subject is

tinguishing between the "form of intuition" and "formal intuition" if they were not really distinct, as Longuenesse suggests? Longuenesse is indeed aware of the need to provide some account of Kant's distinction. Her solution, however, which involves appealing to the epigenesis of space, is problematic (Longuenesse 1998a, 222; 2005, 28–29; 2000, 104), since her claim that "form of space" refers to the unknown ground of the formal intuitions of space, where "ground" refers to the genesis of such intuitions, has no firm basis in CPR.[40]

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affected and a *formal* aspect, the 'transcendental synthesis of the *imagination*, which is an effect of the understanding on sensibility' (B152), by which the sensation obtains its spatio-temporal structure in the first place." Also, Pollok (2008, 334n25) makes the puzzling claim that "the purely 'given' elements of experience" are "mere effects on our sensibility (brute sensations) that are not even possessed of spatio-temporal form." This is puzzling insofar as any sensation must at least have the form of time to be able to be "received" at all. It appears that Pollok, like Longuenesse (2005, 72), sees the distinction between receptivity/givenness and spontaneity/synthesis as mapping onto the distinction between matter and form, so that any form (form of intuition and formal intuition) would be the result of the synthesis of the understanding (hence, Longuenesse's conflation of form of intuition and formal intuition), and the givenness of the underlying matter or material aspect of experience would just be a brute fact or some amorphous raw material. Two observations are in order: (1) it is not just that the effect of the understanding is that it determines any given manifold by giving it some form, also the matter of what is given is determined qua matter (under the categories of quality); (2) one should be careful not to conflate the empirical and transcendental levels of analysis: readings à la Longuenesse and Pollok run the risk of committing Kant to some phenomenalist form of idealism, whereby the objects of outer sense are constructed out of mere sensations.

40. Longuenesse draws upon Kant's response to Johann Eberhard in Disc as evidence for her claim. There are however no grounds for thinking that what Kant refers to as the "first formal ground" and the "ground of the possibility of sensory intuition" (Disc, AA 8:222 [Kant 2002, 312]) is what CPR refers to as "form of intuition." The fact that it is innate, moreover, suggests that it cannot be the form of space as a priori representation (the spatial manifold that Kant alludes to in the footnote). The text of Disc, AA 8:222, is more problematic in its use of the terminology "formal intuition," which does not, on our interpretation, refer to the same notion of "formal intuition" as in CPR. Indeed, in his response to Eberhard, Kant expressly contrasts formal intuition to empirical concepts, which depend upon the categories. We would therefore contend that Kant is here using "formal intuition" loosely (as he does in CPR, A268), and would back up that view with the following three observations. (1) The context is one of a discussion of the acquisition of a priori representations in response to Eberhard's Leibnizian views. In this context, the issue is not whether a representation of space functions as a unity or not, that is, it is not the issue at stake in the footnote. Rather, the point that Kant is making is that this intuition is an "originally acquired representation" (Disc, AA 8:222 [Kant 2002, 313]). By contrast, in the footnote, a formal intuition is described as containing a unity that "requires a synthesis." (2) Kant refers in the same sentence to this formal intuition as a "form," and similarly on the previous page (Disc, AA 8:221). Finally, (3) we note the use of the qual-

That there is a transcendental role (that is, not a mere epigenetic one) for a notion of space as mere form of intuition that is *independent of the understanding or even the imagination* is confirmed by Kant's referring to the "*synopsis* of the manifold *a priori* through sense" in the Transition to the transcendental deduction of the categories (A94/B127). Heidegger makes this notion of synopsis into a cornerstone of his interpretation of Kant's notion of space and correctly connects it with the notion of form of intuition as Kant presented it in TAe (A94–95/B127).[41] However, he then wrongly attributes it to the activity of the imagination (Heidegger 1991, 141–44).[42] In fact, the synopsis is the receptive gathering of sensi-

ification "long" in Kant's claim that this formal intuition "long precedes the determinate *concepts* of things" (Disc, AA 8:222 [Kant 2002, 313]). This certainly leaves room for the suggestion that the inclusion of the word "long" introduces a significant difference to Kant's claim in the footnote that the unity of formal intuition "precedes all concepts." The distinction would precisely lie in the fact that if the form of intuition is at stake, this must be brought under TUA (thus defining the formal intuition of space in the sense of CPR) to function as background for objective empirical determinations. That this is not spelled out by Kant lies in the fact that the determination of the form as formal intuition is always to be understood in terms of the determination of possible empirical or sensible manifolds in space of which it is a condition. Longuenesse's appeal to the epigenesis of the form of space is an interpretative move that parallels her understanding of a prediscursive role for the understanding. In both cases, she is making use of Kant's gestures toward genetic grounds of our a priori intuitions, on the one hand, and toward a possible common root of the understanding and sensibility, on the other. Just as much as her understanding of the notion of form of space makes use of the first ground, her notion of a prediscursive role for the understanding that generates the forms of space and time goes a long way toward addressing the second issue. In that sense, Longuenesse's interpretative stance is informed by a concern for the grounds of Kant's system that is not dissimilar to that of the German Idealists. In agreement with Fichant (1998, 92), we view Longuenesse's introduction of the notion of a prediscursive role for the understanding as one of the most problematic aspects of her interpretation.

41. See Banham (2006, 10–12) for discussion.

42. Heidegger does however argue for a synthetic unity, one of a sort that is not due to the imagination, let alone the understanding, in an illuminating section of his lectures on Kant's CPR (Heidegger 1995) devoted to our footnote. There, Heidegger refers to space and time as wholes that have their proper unity (*Einigkeit*), a unity that is not "an additional [*nachträgliches*] product of a subsequent unification" (1995, 134; our translation). Heidegger (1995, 135) refers to "syndosis" as a better term than "synopsis," which still suggests that I "intuit the manifold together one after another [*hintereinander zusammenschaue*]" (our translation). Syndosis, by contrast, signifies the already-togetherness of the given manifolds of space and time: "this unity of the syndosis is not the unity, which belongs to the synthesis of the understanding in concepts, that is, to the categories. Rather, this synthetic unity of concepts, of categories, presupposes the former originally intuiting syndotical unity" (Heidegger 1995, 135; our translation). We agree with Heideg-

ble manifolds as aggregates of representations within the spatial form of intuition whereby they are not yet represented *as* anything. It is only through a *synthesis* that sensible manifolds are represented *as* manifolds of representations of an object, and that space is determined as formal intuition. If the distinction between form of intuition and formal intuition appears at this stage in Kant's analysis, it is because it only makes sense from the point of view of the understanding. But this must also mean that TAe can now, *retrospectively*, be viewed as dealing with space both as form of intuition and as formal intuition.

In this sense, Longuenesse (2005, 34) is right to say, contra Allison's reading of her interpretation, that she does not intend to see section 26 as a "revision," but rather as a "re-reading" of TAe: "Everything that was said in the Transcendental Aesthetic about the nature of space and time stands, but it is brought into new light by the argument of the Deduction. . . . Space and time, then, are forms of sensibility, just as Kant maintained in the Transcendental Aesthetic. But they are forms of a sensibility affected by the understanding, and thus they are the product of *synthesis speciosa*, the transcendental synthesis of imagination." We agree that nothing of what was said in TAe is retracted by Kant in section 26 of TD (contra Dörflinger 2010, 71 and 75–76n3). The point on which we however fundamentally disagree with Longuenesse concerns the claim in the latter clause in the above quotation, namely, her claim that the *forms of sensibility themselves*, rather than their *unity*, are the product of the imagination. We distinguish between the mere form in which manifold sensations of outer (or merely inner) sense are *given* and the way they are taken *as* unified manifolds, which constitutes space (and time) as formal intuitions. Importantly, this distinction is not just a distinction between the matter of the manifold and the form of a pure intuition independently of this matter (which in a way would be endorsed by Longuenesse; compare Longuenesse 2005, 71–72), but is a qualitative distinction between the unicity of space as a given infinite magnitude and space *taken as* a unified intuition, only the latter of which requires the fulfillment of the condition of an act of synthesis.

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ger's account insofar as he does not speak of the imagination's role. Heidegger is right that the givenness is a necessary condition for the possibility of the function of combination carried out by TUA; combination requires combinability in the given. We do not agree, however, with Heidegger's general implication that the syndotic unity of the manifold would have a *grounding* role in this respect.

5. The Concept of Space

Having presented the key claim of our nonconceptualist interpretation, we need to clarify what characterizes space as a nonconceptual unity. To do this amounts to forming a concept of space. In the titles of ME in the B-edition of CPR, Kant's use of the terminology "concept of space" is prima facie puzzling.[43] Insofar as Kant is precisely going to claim that "space is not a discursive, or as is said, general concept of relations of things in general" (A24/B39), this would seem tantamount to a contradiction, for in this statement, Kant is referring to the representation of space and claiming that it is not a concept, so how can he also talk about the "concept of space"? The usual way of dealing with this problem is to treat it as a sloppy piece of writing, that is, as standing for "representation" (compare Fichant 2004, 534n8). In support of this view, one might well point to the somewhat sloppy use of certain terms that one occasionally finds in CPR (for example, the use of "appearance"). But often one finds that there are distinct specific meanings attached to these terms within the context in which they appear, which could explain why such terms appear in two different guises in the same passage. Aside from that, it is worth noting that Kant has already referred to "representation" as a general term including both concepts and intuitions in the earlier part of TAe (A20/B34),[44] so it is not clear why he would revert to "concept" to mean "representation."

And indeed, when we look more carefully at the use of "concept," it is noticeable that when Kant says that "space is not a discursive . . . concept" (A24/B39), it is space itself that is at stake, not its representation. What Kant has in mind here is a view of space as consisting of relational properties, as Leibniz would have it. Whatever the nature of space might be, it is always possible to form a concept of it, and this is what ME discusses. However, forming a concept of space does not imply that space is thereby fully captured conceptually, a point that the Dufour/Cohen interpretation overlooks. By rejecting this, we are saying that the concept in question is rather a description of the content of the represen-

43. Brandt (1998, 91) notes that "concept" appears more prominently in the B-edition. It is nevertheless the case that the term is also used in the A-edition at least once (A26/B42; heading), even though it is arguably unclear whether this use refers to the concept of space or the outcomes of the analysis of the representation of space in the metaphysical and transcendental expositions.

44. See the *Stufenleiter* at A320/B376, where Kant points out that while "representation" is the genus, concept and intuition are species of "representation."

tation of space, that is, of *spatiality* (spatialness). And since the content in question is a priori, such a concept is acquired in transcendental reflection.[45] In TAe, characterizations of the intuition of space, *qua form of intuition*, are presented. These represent marks of a concept of space *qua form*.

What are what Kant would call the "marks" (that is, the characteristics arising from an analysis) of the concept of space? They are the apriority (A23–24/B38–39) and intuitive nature (A24–25/B39–40) of space. The latter, more specifically, is characterized in terms that are the opposite of those of conceptual representations. As analyzed above (section 3.B), the characteristics of singularity, infinity, and mereological inversion identified in TAe constitute the unicity of space, which is what the unity of space amounts to prior to any involvement of the understanding. But, in addition to the unicity of space, four properties of space characterize it as a priori intuition:

(1) There is a property that Kant only mentions in the Anticipations of Perception. This is the property of *continuity*.[46] Understood by Kant in terms of flowing quantities and viscosity (Posy 2008, 185–86),[47] continuity is a topological feature characterizing the fullness of space: there are no gaps in

45. This comports with the regulative function of transcendental enquiry. Here, the analogy with Carl Posy's distinction between *modeling* scientific enquiry and the scientific enquiry itself is useful (Posy 2008, 180–81). At the level of transcendental philosophy, when we reflect on "intuition," we abstract from its cognitive role as "receptivity" (Posy 2008, 180). Some commentators have pointed out the difficulties that Kant is seemingly confronted with in trying to describe the properties of space, among which is the key property that it is not conceptual (Fichant 1997, 23), for we could say that space is nonconceptual only by employing concepts.

46. Kant mistakenly takes continuity to follow from the infinite divisibility of space (A169–70/B211–12; A527/B555). As Friedman (1992, 60ff.) points out, he thereby does not differentiate the topological property of *everywhere denseness* (which follows from the infinite divisibility of space) from that of *continuity*. Indeed, it was not until Dedekind (1963) that the notion of continuity was given a clear formal definition. Vuillemin (1967, 333) notes the absence of a mention of this property in TAe, but interprets this as implying that it is a nonintuitive feature of space.

47. Friedman (1992, 78) claims that this Eulerian conception of continuity defined in terms of flow is not generally sufficient to allow for continuous curves that are nondifferentiable at an infinite number of points. Examples of such curves are fractal objects such as the Koch curve. It is not clear that this is a real shortcoming though, as such curves are obtained as limits of curves that are differentiable except at a finite number of points. The issue then reduces to that of Kant's notion of infinity and the extent to which he can allow for such infinite objects (on this, see Posy 2008).

it, that is, "one can never represent that there is no space" (B38/A24). In what follows, we shall add the property of continuity to the defining characteristics of the unicity of space.

(2) Next, space is characterized as enabling the representation of one thing as outside another (A23/B38; in the above-quoted *Duisburg Nachlaß* fragment, Kant specifies as one of the characteristics of space that it is also a "means for ordering [outer things]"; AA 17:641 [Kant 2005, 157]). In particular, this feature enables the representation of mere numerical difference, as Kant points out in the Amphiboly (A263–64/B319–20). This property defines the way in which the parts of space are related to one another. It amounts to a further characterization of the topology of space,[48] which we shall refer to as *externality*.[49]

(3) The construction of geometric objects (B39/A25) does not depend upon where or how they are located in space. This requires that spatial properties should not be dependent

48. Friedman (1992, 60ff.) makes much of the fact that such topological features as *everywhere denseness* and *continuity* can be represented in polyadic logic. That a more advanced logic than the one Kant used should enable the formalization of certain features of spatial intuitions does not, however, imply that spatial intuition can be replaced with conceptual representations, since the phenomenological aspect of space is not captured by such a logic. It is possible to understand the logical formula without having any understanding of the spatial property it represents; what is missing though in such a logical formula is the phenomenological content that requires having a spatial intuition. There is therefore a sense in which Luitzen Brouwer (2005) is correct in pointing out that topology is not formalizable. Brouwer (2005, 93n57, 103n63, 132–33) contrasts mathematical "primordial intuition" with what he describes as a "mathematical system of the second order," namely, mathematical "constructive possibilities," that is, all mathematical judgments; in other words, the primordial intuition is irreducible to second-order logical description. A related issue is that the formalizations of many topological and geometric notions do not define concepts in the Kantian sense. That is, they do not provide a set of marks defining a concept under which a possible object could be brought.

49. In a topological space, this feature is captured formally by the notion of *normality*. Rudolf Carnap (1922, 23) claims that the topological features of what he calls "intuitive space" are the only ones to be intuited. According to Thomas Mormann (2008, 46), one should understand these as "local topological properties of space." While this "local" nature of topological properties is arguably also a feature of the notions of exteriority examined by Kant, the further Carnapian claim that anything nonlocal (which, for Carnap, will be the geometric properties of space) is a matter of convention overlooks the fact that the construction of geometric figures requires that an infinite space be represented in intuition.

upon spatial location, that is, that space is *homogeneous*. The geometrical properties of invariance under translation and rotation follows from this.

(4) Finally, Kant characterizes space as enabling the representation of what is outside me (A23/B38), which we refer to as the property of *centered externality*. Together with the uniqueness of space, this means that, as noted above (section 3.E), space defines outer sense. It is the form of all possible reality of outer sense.[50]

These additional "topological" features of *continuity*, *externality*, *homogeneity*, and *centered externality* contribute to a fairly well-defined concept of space acquired through transcendental reflection,[51] which amounts to a proper phenomenological investigation into the nature of space (Fichant 2004, 532 and 550).[52]

One might then ask why geometry is mentioned in ME. This is to bring out how the characteristics of space as a unicity, in particular the fact that it is single and that all spaces are parts of it, explain how it grounds the possibility of all spatial representations. Kant focuses upon geometry because the focus of CPR is synthetic a priori knowledge, but the claims about synthetic a priori knowledge that are made in CPR also have implications for the synthetic a posteriori knowledge of empirical objects of

50. To call this property of centered externality "topological" requires a broad notion of what "topological" means. We use this term insofar as what is at stake is the property of X being outside Y, even though in this case only one of the terms is an object and the other a subject. This is the notion of "outside" involved in the very definition of "outer sense." Note that this property has a phenomenological feature, namely, one that relates directly to my embodiment. The possibility of representing something as outside me is key to my being able to orient myself as an embodied creature (see DDS, AA 2:377–83). Here, importantly, Kant refers to the "feeling" (*Gefühl*) of orientation, which is an aspect of Kant's somewhat covert awareness of the issue of the embodied self (compare Onof 2010).

51. The term "topological" is here used in a broad sense rather than to refer to the mathematical discipline of topology: topological features are those pertaining to how the parts of something are arranged. See also the previous note.

52. Fichant (2004, 532) points out that Kant could be taken to task by a phenomenologist for appearing to steer his whole discussion of space around the identification of transcendental features. Edmund Husserl, on the contrary, claims that the eidetic reduction must precede the transcendental one, while the Munich school of phenomenology distanced itself from Husserl's transcendental turn (Moran 2000, 77). Nevertheless, we agree with Jocelyn Benoist's (2004, 528) analysis of the nature of Kant's investigation, namely, that Kant proposes a "doctrine of the appearing (or the 'phenomenon')," which clearly amounts to a "phenomenological" investigation. See also Parsons (1992) and Carson (1997).

outer sense. So the characteristics of space define the realm of possible spatial determinations: in any determinate spatial intuition, there is an intuition of space as the locus of these determinations and this is the formal intuition of space.

More specifically, we can see how each property of space as form of intuition that we identified above defines a determination of space in its function as background to all objective spatial representations:

(a) The unicity of space (in particular its singularity and mereological inversion) defines space as the unique horizon for all possible objects of outer sense and all geometric constructions, since all spaces occupied by such objects must be parts of this single space. The infinity of space as form of outer sense is required so that the determination of space can enable the representation of any object however far and however large, and any geometric construction however extended it may be (see again AA 17:641). As Kant shows in the Axioms of Intuition (B203), the representation of "the homogeneous manifold in intuition in general, insofar as through it the representation of an object first becomes possible, is the concept of a magnitude (*Quanti*)." The *quantitas* (quantity) of such a magnitude (quantum) is determined through the synthesis of composition (that is, one of aggregation; B201n), which can be completed only for finite magnitudes. It is therefore not possible to cognize an infinite object. What conceptual thought can do, however, is to consider "the synthesis of a series insofar as it is never complete" (A510/B538), that is, to consider the concept of a potential infinite defined through the notion of *progressus in indefinitum* (A511/B539). Thus, in his response to Kästner, Kant differentiates the potential infinity of space, which is required by the geometer as ground for his or her determinations of space, from the actual infinity of space that is presupposed as subjectively and originally given (see further Onof and Schulting 2014).

(b) But equally, through the infinite divisibility implied by the mereological structure of space, the determination of space enables the representation of any object however fine grained or small it may be. Insofar as the consideration of such limitlessly small parts of space is the consideration of

the infinitely small, conceptual thought is again confronted with a notion of infinity in intuition.

(c) The property of continuity of space means that we cannot represent anything like the absence of space (B38/A24). That there are no gaps means that space is necessary for any representation in outer sense. Discursive thought can grasp the continuous texture of space by a type of synthesis whose generation is "a progress in time" (A170/B211), so that this grasp is dependent upon the grasp of time as continuous.[53] This seems to point to the issue of dealing with how the continuity of time is brought under TUA. But here we encounter the problem that it is not possible to represent time without drawing a line in space, as Kant asserts frequently (for example, B154). So any determination of the continuity of time refers back to that of space. What gets us out of a potential vicious circle here is the observation that this notion of continuity is discussed in the Anticipations of Perception (A167–70/B209–12). Here, we see the continuity of time as the condition for the representation of the continuous variation of the "intensive magnitude" of a possible sensation. The continuity of time can thus be grasped (indirectly) as the transcendental condition of the continuous variation experienced in our sensory inputs. The fine-grainedness of this variation is not limited: it is a potentially infinitely fine resolution, as defined by a regress *in infinitum* (compare A510–14/B538–42). We thus get an underdetermination here that mirrors that of the potential infinite of the extensive magnitude of space.[54]

53. Compare Posy (2008, 184–85). Posy points out that Kant took over Leonhard Euler's visual depiction of motion. The continuity of space is thus intimately bound up with the possibility of the productive synthesis. See, by way of comparison, Kant's description of the productive synthesis of imagination in terms of motion as an action of the subject at B155 and B155n.

54. The apparent complexity of this determination of space through the categories of quality is not surprising: unlike the case of the infinite magnitude of space, we are dealing with the infinitely fine structure of some possible empirical intuition. This cannot be grasped directly through a synthesis of composition, even if reiterated indefinitely. Rather, this infinitely fine structure is grasped by referring to a possible empirical synthesis.

(d) The topological property of spatial externality implies that the determination of space must enable the (simultaneous) representation of any plurality of objects whose only difference is numerical. To enable this, discursive thought can formulate the relational concept of mutual exteriority of the components of a partition of space.[55]

(e) An additional requirement for geometry is that there be no location specificity to constructions in space: when I construct a triangle, there is no reference to where it is constructed, which means that space must be *homogeneous* with respect to the basic transformations of geometry, which are translation and rotation.[56]

(f) An additional requirement for outer sense is that it be possible to represent objects outside me: this is ensured through the property of *centered externality*.

That we are able to form such a rich concept of space is evidence of an intimate phenomenological acquaintance with space. But it also explains why it is possible to determine space under the twelve categories. That is, the knowledge of spatiality that is contained in the concept of space is the key to the possibility of bringing the unicity of space under TUA, thereby determining space *as* the form of outer sense. This follows from the observations above as to how the characteristics of the unicity of space each define determinations of space as background to all determinations of objects in outer sense.

The phenomenological acquaintance with space that enables this is therefore comparable to the "hidden art in the depths of the human soul" (B180/A141) in the case of time that underpins the schematism of our understanding. What Kant is drawing our attention to are the limits of transcendental investigation when it comes to identifying grounds for our ability to bring time under TUA. What our notion of phenomenal acquaintance points to is the phenomenal dimension of our ability to

55. Such a formal characterization only amounts to bringing a topological structure under a concept: it does not in any way exhaust the nature of this structure. See note 48 above about the formalization of topology.

56. Interestingly, this notion of homogeneity as involving qualitatively identical parts, and whose role in mathematics is discussed by Sutherland (2004), is replaced by a more "conceptual" interpretation in Longuenesse (1998a). We understand this as consonant with Longuenesse's neglect of the nature of (spatial) intuition *independently of* the understanding.

bring the unicity of space under TUA.[57] We examine the result of bringing the unicity of space under TUA, that is, the a priori determinations of space under the twelve categories, in the next section.

6. How Is the Unity of Space Determined under the Categories?

Kant would appear to have more to say about the determination of the unity of time than for space. In the chapter on Schematism, the way in which each category is able to produce a corresponding type of unity of time is described in terms of schemata, which are defined as "transcendental time-determination[s]" (A139/B178).[58] As for space, although in the Schematism chapter schemata of "pure sensible concepts" in space (geometrical concepts) are briefly mentioned as "rule[s] of the synthesis of the imagination with regard to pure shapes in space" (B180/A141), this does not amount to categorial determinations definitive of the unity of space as a whole. What this does bring out is that the categorial deter-

57. An interesting new interpretation of the footnote by James Messina (2014) has come to our attention shortly prior to the publication of this article. There is no space to examine his interpretation in detail, but we note his concern with the "brute given" (Messina 2014, 8) arguably characterizing nonconceptualist interpretations such as our own. Messina (2014, 19) claims that if space were such a "brute given," there would be a "contingent" "fit between the unity of space as our form of intuition and the OSUA [Original-Synthetic Unity of Apperception]." For Messina, such contingency would have consequences for the very possibility of self-consciousness. This contingency and the implications for the possibility of self-consciousness concern however *conceptual* modalities, as Messina himself notes when he considers nonhuman beings with the same kind of understanding but different forms of intuition. But Kant does not claim a conceptual necessity for his a priori conditions of discursive knowledge, for the a priori defines only what is *necessary for human beings* (compare Gardner 1999, 122). As a result, it is not relevant for the truth of the analysis of the a priori conditions of human discursive knowledge that there could be "non-human discursive beings whose forms of intuition lack unity" (Messina 2014, 19). While Messina (2014, 34) seeks further grounds for rejecting the notion of the "brute given" in the development of the pre-Critical Kant's understanding of space, his analysis of Kant's pre-Critical writings serves mainly to connect the unity of space with an intellectual intuition. Messina then suggests that there is evidence that Kant replaces this divine intuition with the discursive understanding. But his attempt to fend off the criticism that Kant changed rather to an understanding of the unity of space as defining an "analytic truth" requiring no further ground (as the nonconceptualist would claim) (Messina 2014, 38–39n56) is not convincing.

58. On the issue of the role of determinations of space in the Schematism chapter of CPR, see Onof (2008).

mination of regions of space, unlike that of the intervals of time, is mediated by pure sensible concepts.[59]

The previous section has shown how the determination of space as formal intuition is a determination of it as a necessary condition of all spatial determinations, whether geometric or empirical. Examining the conditions for such spatial determinations, we found that they corresponded to an underdetermination of space as a whole (through notions of potential infinity). We can now examine more carefully, albeit briefly, how each of the twelve categories of quantity (unity, plurality, totality), quality (reality, negation, limitation), relation (inherence and subsistence, causality and dependence, community) and modality (possibility, existence, necessity) is involved in determining space:

(1) In terms of *quantity*, space is the unique background that acts as horizon for the representation of all objects. This universality means that space is thus determined under the category of *unity*. Further, it is always possible to carry out a partition of space (for example, what is on my left and what is on my right), so that space is also determined under the category of *plurality*. Space, which has an infinite magnitude, cannot simply be brought under the category of *totality* in terms of a discursive determination, which is always finite. But, as we saw above, Kant distinguishes between actual and potential infinities. If we thus consider a series of spaces, for example, with each term of the series double the size of the previous term in all directions, we obtain a progress *in infinitum* (A510/B538). As in the case of the division of matter to infinity, "the further members . . . are themselves . . . given prior to this" series (A513/B541). This defines how space is determined under the category of *totality*.

(2) In terms of *quality*, all sensation in an empirical intuition has a particular degree of intensity, which corresponds to a reality in outer sense (B209/A168; compare B182/A143). Since space is the form of outer sense, it is thereby determined under the category of *reality* as the form of all that is real in outer sense: "perception thus represents . . . something real

59. This is in line with the idea that space is the form of outer sense, so that empirical objects or, more precisely, sensations as referring to such objects are always involved (either directly or indirectly) (see Butts 1981).

in space" and "only what is represented in it can count as real" (A374). Space is however not itself any thing: as "pure space," it is an "*ens imaginarium*" (B347/A291). In other words, space as "pure (merely formal) intuition" (B207) does not itself contain sensations (B44/A29), and hence *pure* space is not an intensive magnitude by means of which it would correspond to a real object or to an absolute reality (A37/B54). It is thus as "empty intuition without an object" (B348/A292) that it is determined under the category of *negation*, where negation corresponds to zero degree intensity and to the absence of reality (B208, B209–10/A168) or to "nothing" (B347/A291).[60] Since space itself is no intensive magnitude, it can be determined only through the intensive magnitude of that which fills it, that is, what corresponds to sensation in outer sense, namely, matter. In the chapter on Dynamics in the *Metaphysical Foundations of Natural Science*, Kant examines the filling of space by matter. This is the spatial equivalent of the filling of time by space, which is the key to the determination of time under the categories of quality (B182/A143). Kant thus shows that "matter fills its space through the repulsive forces of all of its parts, that is, through an expansive force of its own, having a determinate degree, such that smaller or larger degrees can be thought to infinity" (AA 4:499; Kant 2002, 211). By considering an endless increase of this degree, we define a progression *in infinitum*, through which space as a whole is determined (as that which is thus filled) under the category of *limitation*.

(3) In terms of *relation*, space is determined under the category of *inherence and subsistence* as the homogeneous "container" to which all parts of space refer: this is a consequence of the mereological inversion property through which every determinate space refers to the background space of which it is a part. This then raises the question: how is a particular region of space determined? As Kant repeatedly emphasizes (for example, B154), it is through construction in intuition, that is, in this container space, that a particular region of space is determined. What he thereby underlines is the

60. "Nothing" here means "a concept of the absence of an object," and so points to empty space.

role played by the intuition of space in providing the ground for any particular determination of space. That is, any particular region of space is determined as dependent, or grounded, on the whole of space, in which it necessarily inheres. In this way, the relation of the whole of space to a determinate space is determined under the category of *causality and dependence*. Further, any division of space defines a partition of it, which provides a determination of the regions therein under the category of *community*: any particular region of space is in *community* with the rest of space, or put differently, all regions of space are simultaneous (see, by way of comparison, B256–57).[61] To determine the whole of space under the category of community, it is necessary, as in the case of the category of totality, to consider a progression defined by a series of such determinations. Here, each step of the progression divides space into two regions in community, whereby each of the regions conditions the other. This division can be characterized either as a right-left or a foreground-background division. By making the one region (for example, foreground) smaller at each step of the progression, space (for example, background) as a whole is determined through a progression *in infinitum*.[62]

(4) In terms of *modality*, recall that space is the condition of possibility of all perceptions of appearances in outer sense. To think space under the category of *possibility/impossibility* is to think of it as the enabling ground of all outer sense. As such, space is determined under this category. Space is not determined as itself an existing object (A429n/B457n). However, as the ground of all that exists in outer sense, it is determined under the category of *existence* or *actuality*. If space is thus defined as a necessary condition of the actuality of objects in outer sense, space is determined under the category of *necessity* in a conditional sense.

61. It is important to note this independence of time: the categories of relation are not applied here as dynamical categories because space is considered in its independence from time.

62. Note that, as for the category of totality, the progression is *in infinitum* because the whole of space is given prior to it (A510–13/B538–41).

In the above outline of how space is determined under the categories, notice that the determination involves an inevitable appeal to potential infinities in the case of the third categories of the groups of categories of quantity, quality, and relation. This is a feature of space insofar as it provides a *horizon* for objects of outer sense.[63]

7. The Synthesis Grounding the Unity of Space

Having now given an interpretation of how the unicity of space is grasped as a unity by means of TUA under the categories, the question arises as to the nature of the synthesis that is involved in bringing space under the categories. We need to find a way of interpreting the synthesis grounding the unity of space in such a way that it involves an application of the categories, so that all concepts of space (that is, concepts of determinate regions of space in outer sense or geometric concepts) are thereby conditioned by TUA and that through this synthesis all concepts of space and time first become possible, as Kant indeed claims in the footnote. The footnote is appended to the section where Kant examines the synthesis of apprehension and claims that its unity must conform to the categories (B161). But this synthesis operates upon empirical rather than a priori representations: it is that by which the manifold of representations in an empirical intuition is brought together as a manifold of representations insofar as an empirical object is represented by means of it (B160). What does this mean? Apprehension is the function through which any manifold is taken as referring to an as-yet indeterminate object: the mere givenness of the manifold involves only the receptivity of sensibility, but its being taken to refer to an object, by means of the synthesis of apprehension, is the first logical step in Kant's analysis of the constitution of objectivity. This step is more clearly separated out in the A-version of TD, where it logically precedes the reproduction and the recognition of the manifold under a concept, through which it is taken as the manifold of a *determinate* object.

What can be said of the role of space in apprehension? Every representation of outer sense is given in space as form of intuition. The unicity of space ensures that it is the same space for all these represen-

63. More specifically, the infinite magnitude, infinite divisibility, and mereological inversion of space account for these potential infinities, while the status of the *conditional* necessity of space for the possibility of empirical reality is how space is defined under the third category of modality.

tations. However, *pace* Friedman (2012, 243–44),[64] this is not sufficient to explain why the manifold of representations is taken as referring to the same space. The important move that we identified earlier as explaining the apparent obscurity of the second sentence of the footnote is now this: the unicity of space must be *taken* as a unity, which means that I must, as cognizing subject, *take* the space of all these representations of outer sense as one. In the pure receptivity of the "mere manifold" (space as "mere form of intuition") (B160n; translation amended), there is no conceptual grasp that the space in question is unitary. The conceptual grasp of space as unitary involves a separate role for the spontaneity of the understanding.

Evidence of Kant's awareness of this issue is mainly found in the A-version of TD where Kant says, "Now *this* synthesis of apprehension must also be exercised *a priori*" (A99; emphasis added). Kant presents this pure synthesis as an a priori version of the synthesis of apprehension of empirical manifolds and as serving to unify a priori manifolds (space and time). The *transcendental* function of this synthesis is, moreover, stated clearly: without it, we would have no a priori representations of space and time (A99–100), as the representations of space and time would be nothing *for me* without this synthesis.[65] All this is in line with the footnote: the formal intuitions of space and time are made possible by this pure synthesis. It therefore seems apposite to interpret the synthesis referred to in the footnote as this pure synthesis of apprehension.

In terms of the interpretative requirements we set out at the beginning (section 1), a worry may arise insofar as it is not obvious in what sense it can be said that "through [synthesis] all concepts of space . . . first become possible" (B160n). And indeed, the B-version of TD assigns a key role to the imagination that was already the focus of the A-version,

64. Friedman is led to this view by identifying metaphysical space (as form of space) with perspectival space, that is, by accounting for it in terms of the totality of possible subjective perspectives. This means that he has to appeal to TUA to bring all possible perspectives together. What he does not notice, however, is that the synthesis of all possible perspectives itself requires a background space and it is this space that as the form of intuition, that is, metaphysical space, is originally and subjectively given (Kant 2014, 309). Since his interpretation of this form involves TUA and thus a grasp of space as a unity, Friedman does not distinguish between having all spatial representations in the single given space and the grasp of this space as a unity for the understanding.

65. Kant adds (at A99–100) that the manifolds of space and time are contributed by sensibility. This confirms our reading against Longuenesse's, as it supports the view that space and time originate in sensibility *prior to* any synthesis.

namely, the transcendental synthesis of the imagination, also called "figurative synthesis," or *synthesis speciosa*, which determines "sensibility a priori" (B151–52) and makes the application of concepts to intuition possible (B151). It might seem as if the synthesis that the footnote mentions is not the synthesis of apprehension, as we argued above, but rather the synthesis of the imagination.

In fact, this does not conflict with our focus upon the pure synthesis of apprehension. For Kant clearly states that the imagination is the faculty "whose action exercised . . . upon perceptions I call apprehension" (A120). The synthesis of apprehension is the synthesis of the imagination in the domain of perceptions. As explained above, this involves *taking* the unicity of space *as unity*, thereby determining the formal intuition of space. Furthermore, we note that Kant no longer mentions the pure synthesis of apprehension in the A-Deduction after presenting it in A102, or at all in the B-Deduction, apart from a significant passage at B164. Here, Kant is going over the results of TD. And after reminding us that "that which connects the manifold of sensible intuition is imagination, which depends on the understanding for the unity of [the] intellectual synthesis [of sensible intuition] and on sensibility for the manifoldness of apprehension," he claims in the next sentence that "all possible perception depends on the synthesis of apprehension" and takes this to show that "all possible perceptions, . . . as far as their combination is concerned, stand under the categories" (B164–65). This entailment is possible only if the previous sentence's claims about the imagination are relevant here, that is, if the imagination is indeed what is at work in the pure synthesis of apprehension.[66]

8. Space "as Object" and the Unity of the Formal Intuition of Space as Belonging to Space

Having fleshed out our nonconceptual interpretation of the issues arising from problem 1, we now return to the second and third problems flagged at the outset (section 1). These concern the questions how it is that Kant considers space "as object" (B160n) (problem 2), and why it is that the unity of the formal intuition of space *belongs* to space and is not a conceptual unity coming from the understanding (problem 3).

66. For more on the relation between the synthesis of apprehension and the synthesis of the imagination, see Schulting (forthcoming b).

Starting with the first issue (problem 2), we have seen that space is determined under the categories by means of infinite progressions in the case of the third categories in each group of categories. That is, space as a whole cannot be grasped as a totality, through limitation, or in community, in a single determinate intuition: this is a consequence of the properties that we have denoted as the unicity of space. The synthesis of space does not, therefore, give rise to a concept of space that determines it as an object.[67] But the categorial determination of space, however incomplete, does enable the form of intuition to be grasped as a unity under TUA, thereby defining the *formal intuition* of space (in contrast to the mere form of intuition). Since TUA is "that unity through which all of the manifold given in an intuition is united in a concept of the object" (B139), and given that TUA determines the unity of space, it is possible to talk of space "as object" (B160n). Importantly, however, unlike spatiotemporal objects of experience, this does not mean that space itself *is* an object. Rather, since the intuition of space is grasped as a unity for the understanding, the formal intuition of space is an intuition of it *considered as though it were an object*. The kind of entity that can be considered an object while providing the necessary background for all objects of a given sense (here, outer sense), which is categorially determined exactly insofar as this enables the determination of particular objects within it, is what we could call a *horizonal object*. With such a notion, Kant's theory of space can properly be described as proto-phenomenological.[68]

Turning now to the second issue (problem 3), namely, Kant's assertion that the unity of the formal intuition of space is thereby also described as *belonging* to space, rather than to "the concept" (B161n), this issue is similarly a consequence of the nature of the categorial determination of space. As we have seen, the formal intuition of space is produced through the synthesis of apprehension of the unicity of space. The synthesis of apprehension unites the sensible manifold *in sensibility*, "in an empirical intuition" (B160), so that space as formal intuition is determined "*in accordance with the categories*" (B152) and at the same time is

67. Here, we note Fichant's (2004, 548) denial that there is such a concept. We agree that this notion of "concept" of space is not very useful, but still think it can be used even if it has only one referent. A similar uneasiness with the notion of concept can be found in Shabel (2003, 49), but the notion of "aesthetic concept" she introduces as an alternative is left quite vague.

68. In so doing, the suggestion is that Kant would have benefitted from having access to something like the phenomenological notion of "horizon" (see Welton 2000, 78) to clarify how space can be viewed as an object.

an intuition that must be regarded as *given* and as determined in its *givenness* rather than generated by the understanding ex nihilo, as it were. That is to say, the determination of space by virtue of the synthesis of apprehension (that is, the productive imagination in the domain of the sensible manifold) concerns the determination of the given manifold as objective, and so the generation of determinate spaces. It thus becomes clear that there is no discrepancy between the merely given manifold (space as form of intuition) and the determined manifold as constituting the formal intuition: both concern the same given manifold of representations, with the difference being that space as formal intuition concerns a unified intuition in contrast to the mere manifold of space as form of intuition. It is in this sense that the unity of space as formal intuition, although effected by the understanding by virtue of the imagination, *belongs* to the intuition, rather than to the categories or the concepts of the understanding, as Kant says in the footnote.

At the end of the footnote, Kant refers back to section 24, where indeed it is said that "the imagination, on account of the subjective condition under which alone it can give a corresponding intuition to the concepts of understanding, belongs to *sensibility*" (B151). Since the unity is imposed on the manifold by means of the imagination, and the imagination belongs to sensibility (or the empirical intuition), the unity of the formal intuition also belongs to the intuition and not to the (mere) concepts of the understanding. This is confirmed by Kant's assertion that "as figurative, [the synthesis of the imagination] is distinct from the intellectual synthesis without any imagination merely through the understanding" (B152). The distinction between the formal intuition, which, "as the understanding determines sensibility," "gives unity of the representation" (B160–61n), and the form of intuition, which "merely gives the manifold" (B160n), corresponds to the distinction, in section 24, between the imagination as "an exercise of spontaneity, which is *determining*," and sensibility as such, which is "merely *determinable*" (B151–52; emphasis added). The quintessentially transcendental distinction between the receptivity of a sensible manifold and the spontaneity of the act of the synthesis is thus reflected in the very distinction, in the footnote, between space (and time) as the form(s) of intuition and as formal intuition(s). Correlatively, one can see why the unity of space cannot belong "to the concept of the understanding" (B161n): the deter-

mination of space under the categories does not identify it as an instance of a general concept since space is essentially unique.[69]

However, the unity of space under TUA is not that of space as a form of intuition on our interpretation: it is only insofar as the unicity of space, which characterizes space as a form of intuition, is taken as a unity that we get to obtain the unity of space as formal intuition referred to in B161n. This explains why Kant also says at B161 that the unity of space is given *with* the intuition, not in it. That is, the unity of which Kant is speaking here is the unity that is effected in the sensible manifold, in accordance with TUA, and is conditional on an act of synthesis. This unity, as result of an act of synthesis, is not the unity of space, as form of intuition, which we have called the *unicity* of space and can be described as *internal* to space. In this way, the text of the footnote supports our nonconceptual interpretation that emphasizes the fact that the mere manifold of space, as a form of intuition, is independent of TUA.

There is more to say about the unity of space as formal intuition in regard to its role in Kant's theory of the object. In the A-version of TD, Kant explains how representations have their object and how appearances, which are "objects that can be given to us immediately" (A108) through intuition,[70] are themselves only representations that refer to an object that we cannot intuit, the "transcendental object = X" (A109). It is through the pure concept of the transcendental object that our empirical concepts relate to an object. But what ensures that concepts relate to particulars? It is the fact that we are related immediately to the object as located in a domain of the particular. For outer sense, this domain is space, and it is by grasping space in its unicity that we grasp the object as belonging to this single domain of all particulars of outer sense. Reference to a *particular* is not achieved through the particular set of conceptual determinations. These only enable the object to be identified in terms of the set of properties corresponding to these determinations. What first enables reference to a particular is the location of the object in space (and time). Space, as formal intuition, is a representation of the domain of all particulars in outer sense *as* particulars. Space is necessarily

69. Compare again Refl. 4756 (from around 1775–77), where Kant gives as one of the characteristics of space: "Unity, hence a pure intuition and not a concept of the understanding" (AA 17:700 [Kant 2005, 181]).

70. We recall that for Kant an intuition enables us to have an immediate representation of a particular, whereas concepts, as general representations, are always only mediately (via intuition or another concept) related to a particular (A68/B93; A320/B377).

underdetermined because particulars *qua* particulars cannot be grasped conceptually (the thoroughgoing determination of an object defines merely a regulative ideal; see A571–72/B599–600); and space is an intuition, because grasping any particular as particular means grasping it by means of an intuition, which must be spatial if it is a particular of outer sense.

It might be objected that it is possible to grasp a particular Roger Bannister under a singular concept; but we would argue, with Kant, that to grasp a particular under a singular concept does not constitute a grasp of that particular *as* a particular. Indeed, consider the grasp of Roger Bannister as "the first man to run a mile under four minutes." This does actually identify a singular object, but prior conditions exist for the concept attributable to this singular object to be singular. These are that there is a unique time, that is, that there is a unique referent of "first" (there are no other temporal dimensions in which there would also be other men with the same property) and a unique space (note that distinct spaces would have unrelated times, else a notion of superspace including them all would be implied, namely, the superspace of all simultaneous events in outer spaces, or at least one could argue this along the lines of Kant's arguments in TAe). Consequently, if we are to grasp Roger Bannister as a particular, we must have an intuition in space and time,[71] so that the unicity of space and time are part of this grasp. Because Kant characterizes intuitions as immediate representations, this means that this grasp must be immediate.[72]

Another important feature of the formal intuition of space is that it provides us with some basis for the axioms of geometry (and we note that there is nothing specifically Euclidean about this basis).[73] That is,

71. This intuition may be *of* Roger Bannister, or of any other state of affairs that we thereby take to be connected to the existence of Roger Bannister through some causal chain. This chain could involve reliable witnesses or empirical laws.

72. We thank an anonymous reviewer whose example we borrowed for getting us to think more carefully about this issue.

73. With reference to the passage discussed earlier, namely, B39/A25, where Kant asserts that space is not a discursive representation but a pure intuition, for "one can only represent a single [*einigen*] space, and if one speaks of many spaces, one understands by that only parts of one and the same unique space" and that "the manifold in [single space] . . . rests merely on limitations," Marcucci (2010, 38) notes that since the single space, as intuition, lies at the basis of determinate, circumscribed spatial regions, "it itself *cannot to the extent that it is an intuition have any dimensions*"; space as intuition rather "engenders [*dare origine*]" an "inestimable number of circumscribed spaces, which are precisely spaces with 1, 2, 3, . . . , n dimensions, exactly as is required when one talks of

insofar as geometry deals with objects (*quanta*), as opposed to arithmetic and algebra that deal with magnitude in general (*quantitas*), it requires axioms (Friedman 1992, 114). The topological features of space provide the tools for carrying out geometric constructions (see Fichant 2004, 548–49; Shabel 2003), while the properties of homogeneity (in translation and rotation) enable the formulation of postulates (for example, Euclid's first four postulates), which ensure the existence of points defined by these constructions (Sandmel 2008, 673).[74]

Conclusion

We have proposed an interpretation centered around a nonconceptualist approach to interpreting B160–61n, with the following specific claims:

1. Kant provides a properly phenomenological analysis of the form of our receptivity or outer sense that defines a clear notion of nonconceptual unity, namely, the unicity (defined by *singularity*, *infinity*, and *mereological inversion*) of the form of spatial intuition. This form has topological properties (*continuity*, *externality*, *centered externality*, and *homogeneity*), which account for the role of the unicity of space as the form of outer sense and as ground for geometric constructions.
2. To consider space as an object, as Kant does in the footnote, is to consider what and how this form of intuition contributes

curved space, no longer bound and conditioned by Euclidean geometry" (our translation). This suggests that Kantian space as pure intuition cannot be Euclidean, and is thus not vulnerable to being superseded by the discovery of non-Euclidean conceptions of space. From early on, Kant left open the possibility of multidimensional spaces, which would be studied by what, in *Living Forces*, Kant's first published work (1747), he calls "the highest geometry" (LF, AA 1:24–25). Unlike many present-day uses of the word "space," Kant's notion of space in TAe refers to a nonconceptual notion of spatiality that is amenable to different pairwise inconsistent conceptualizations, Euclidean or not, as Risjord (1990, 136) argues.

74. *Pace* Sandmel (2008), we do not include the property of homogeneity with respect to scale (equivalent to Euclid's fifth postulate), as this property is not needed to ensure the possibility of extending a line segment *by a given amount* (homogeneity in translation) or drawing a circle *with a given radius* (homogeneity in rotation) around a point (Friedman 1992, 86). A Euclidean (or quasi-Euclidean) geometry is arguably given a privileged status on grounds of simplicity. Its applicability to perception does not invalidate this a priori choice. We follow Sandmel, however, in viewing "modern 'geometries' [as] . . . not [being] geometries at all in the sense of their being theories of the space of our outer intuitions" (Sandmel 2008, 678).

to objective knowledge, namely, by regarding the unicity of space *as* a unity. This involves the pure synthesis of apprehension (the transcendental synthesis of the imagination in the domain of perceptions) that defines space as formal intuition. Space is thus determined through the categories, but without thereby losing its status as an intuition.

3. The determination of space has the function of enabling the representation of objects of outer sense *qua* particulars. The imagination plays the key role here, without its synthetic activity being independent of the understanding (unlike Heidegger's interpretation of the imagination as a quasi-autonomous faculty characterizing our human finitude). With Fichant and against Longuenesse and Friedman, we however maintain that a key characteristic of space is its nonconceptual unity, that is, the unicity of space, which is independent of the synthesis of the imagination and thus of determination by the understanding.

While we therefore uphold the existence of a nonconceptual unity of space, that is, the unicity of space, which is key to understanding how we can have knowledge of spatial appearances, this nonconceptual unity of space is a necessary but not a sufficient condition for such knowledge. That is to say, it is only insofar as the unicity of space is *taken as a unity* through a synthesis of the imagination in accordance with the categories that we can have spatial knowledge. This means that, while our proposed interpretation shows the independent function of a nonconceptual unicity of space as a condition of empirical knowledge, such nonconceptual content is relevant to the acquisition of objective knowledge only when determined in accordance with the functions of the understanding by means of the synthesis of the imagination. However, unlike conceptualist interpretations of the notion of "form of intuition," in our reading the unicity of space does not collapse into the synthetic unity of space, and hence into sensible content determined in accordance with the categories, which corresponds to space as formal intuition.

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