Reason in Kant's Theory of Cognition

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Abstract

This paper reconstructs and defends Kant's argument for the transcendental status of reason's principles of the systematic unity of nature in the Appendix to the Transcendental Dialectic. On the present account, these principles are neither mere methodological recommendations for conducting scientific inquiry nor do they have the normative force of categorical imperatives, two extant interpretations of Kant's discussion of reason in the Appendix. Instead, they are regulative yet transcendental principles restricted to theoretical cognition. The principles of the systematic unity of nature count as transcendental in virtue of their role as conditions of the inferential articulation of empirical concepts.

Keywords: Appendix to the Transcendental Dialectic; reason and understanding; inferentialism; regulative and constitutive; conceptualism

1. Introduction

One of the definitive slogans in Kant's *Critique of Pure Reason* assigns coordinate status to sensory and conceptual elements in knowledge: "Thoughts without content are empty, intuitions without concepts are blind" (A51/B75).[1] In an oft-repeated narrative in the history of philosophy, Kant overcomes an opposition between sensualists (such as Epicurus and Locke) and intellectualists (Plato in antiquity, Leibniz in modernity). The former had reduced all reality to sense impressions; the latter intellectualized appearances as merely confused conceptions. Kant's Copernican Revolution bridges this divide by reconceiving knowable reality as first emerging through the joint activity of the senses and the understanding. On what is sometimes called Kant's 'two-factor' view of knowledge, the understanding supplies conceptual form to the sensory matter of cognition.

Yet, in both the Introduction to the Transcendental Dialectic and its final paragraph, Kant suggests that not two but three different sources are at play in the cognitive process:

[1] References to Kant's works are from the Academy Edition of Kant's texts. The *Critique of Pure Reason* is cited by the standard paginations for the first (A) and second (B) editions. Other texts are cited by volume and page numbers. Translations are taken from the Cambridge Kant series, with occasional modifications. The following abbreviations are used: [P]: *Prolegomena to any Future Metaphysics*; [CPJ]: *Critique of the Power of Judgment*.

"All our cognition starts from the senses, goes from there to the understanding, and ends with reason" (A298/B355; A702/B730). In much of Kant's account of synthetic *a priori* cognition, however, there is little evident concern with the contribution of reason. In contrast to his treatment of sensibility and understanding, Kant's primary concern with reason seems to be to expose various deceptions concerning, God, the soul, and the world as a totality that arise from its quest for completeness in knowledge. Only in a short appendix following his assault on speculative metaphysics does he sketch reason's virtuous function. Unfortunately, Kant's account of reason's positive role has left many readers of the Appendix to the Transcendental Dialectic (henceforth, Appendix) unconvinced, as he appears to equivocate between characterizing reason's principles as merely methodological rules and as necessary conditions of cognition (A667/B695; A663/B691).

The object of this paper is to reconstruct and defend Kant's argument for the transcendental status of reason's principles, in particular those he labels principles of genera, species, and continuity. I argue that these principles do not carry a merely methodological recommendation for how we ought to conduct scientific inquiry, as the dominant interpretation of the Appendix holds.[2] Nor are they transcendental in virtue of being a kind of practical principle, as others have recently argued.[3] Rather, they are necessary conditions for conceptual cognition as such. They complete Kant's theory of the conceptual in virtue of expressing the general form of syllogistic inference presupposed in all empirical judgment, and consequently relate necessarily to any use of the understanding.[4]

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[2] Wartenberg (1979), Butts (1986), Kitcher (1986), Morrison (1989), Guyer (1990), Gracyk (1991), Zuckert (2017), Willaschek (2018, 107–120). The transcendental/methodological dichotomy with respect to interpretations of the Appendix is due to Geiger (2003).
[3] Grier (2001, chap. 8), Ostaric (2009), Mudd (2017).
[4] This paper touches on a central debate in recent literature between conceptualist and nonconceptualist interpretations of Kant. The terms describe at least two distinct axes along which the debate divides. On one, conceptualism is the thesis that all content of intuitions is conceptual, and thus that all cognitive relation to objects is conceptually determined; nonconceptualism about content is the denial of the foregoing thesis, with the consequence that some intuitions ground a non-conceptual cognitive relation of the subject to given

On the present interpretation, the force of the 'Appendix problem' is partially mitigated once we emphasize inferential relations among concepts rather than referential relations of concepts to singular objects in Kant's semantic theory. That is, the present paper defends the perspective that, for Kant, the meaning of a concept is fixed by its inferential role in a system of concepts.[5] The principles of systematic unity enjoy transcendental status not in virtue of being conditions of veridical reference to objects via intuitions but in virtue of being conditions of the inferential articulation of concepts of objects. But if what a concept is, essentially consists in the inferences it licenses, such conditions cannot have the status of mere heuristics for putting thoughts in order. They must rather be transcendental in the sense of being conditions of conceptual content. From this perspective, one obstacle to claiming necessity for the principles of reason, that there cannot be schemata serving as rules establishing their relation to intuitions, disappears. Notoriously, though, it gives rise to a thicket of problems, such as whether the first *Critique* can accommodate principles that are not object constituting and yet transcendental, and what exactly Kant's argument in support of such principles is.

The paper is divided as follows: in the next section, I discuss some textual problems arising from the first part of the Appendix ("On the regulative use of the ideas of pure reason") and examine two leading interpretative proposals.[6] I then turn to the relation

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objects. On the second axis, conceptualism holds that all production of intuitions is partly dependent on the understanding, and nonconceptualism is its denial. Settling either of these disputes is not the aim of this paper. My sympathies lie with the conceptualist camp on both issues. While this paper lends support to conceptualist readings of Kant, for the purposes of interpreting the Appendix I try to keep the debate at arm's length. For a survey of the debate, see McLear (2014). Conceptualist readings of Kant include Geiger (2003), Ginsborg (2006), and Grüne (2009). For opposing views, see Rohs (2001), Hanna (2005), and Allais (2009).

[5] Pippin (1982) and Rosenberg (2005) are some of the important proponents of inferentialist readings of Kant, and of the first *Critique* generally as a project in semantics. Geiger (2003) has brought this perspective to bear on the Appendix. The present paper agrees with and builds on Geiger's work.

[6] I restrict my focus here to the first part of the Appendix. As McLaughlin (2014, 558) observes, Kant offers some guidance in the *Prolegomena* about how to read the Appendix. Kant tells us that the first part, dealing with the concepts of genera, species, and continuity,

between reason and understanding, focusing on Kant's claim that 'the understanding constitutes an object for reason, just as sensibility does for the understanding' (A664/B692). Finally, I address a further dilemma resulting from the Appendix, namely whether regulative principles can be transcendental.

2. The textual situation of the Appendix to the Transcendental Dialectic

The Appendix has long troubled readers of the first *Critique*. By that stage of the Transcendental Dialectic, Kant's purpose seems to have been negative: to undercut the special metaphysics of psychology, cosmology, and theology by pointing out illegitimate uses of pure reason in these fields. Kant is typically read as arguing that, whereas the joint operation of sensibility and understanding is necessary for empirical cognition, the activity of reason unmoored from sensibility only misleads.

Yet, after several hundred pages of exposing the dialectical illusions generated by reason, Kant abruptly turns in an appendix to reason's legitimate and even indispensable use. His strategy now appears to amount to a stripping-away argument, to identify erroneous, transcendent uses of reason in order to restore its good, immanent function:

> Everything grounded in the nature of our powers must be purposive and consistent with their correct use, if only we can guard against a certain misunderstanding and find out their proper direction. Thus the transcendental ideas too will presumably have a good and consequently immanent use, even though, if their significance is misunderstood and they are taken for concepts of real things, they can be transcendent in their application and for that very reason deceptive. (A642-3/B670-1)

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and with the demand for a unified account of nature, is "more closely related to the content of metaphysics" than is the second, "supererogatory" part, dealing with the transcendent concepts of God, soul, and world (P 4:364). Following McLaughlin, I read the first and second parts of the Appendix separately.

Kant now suggests that the criticism of reason was never meant to be uniformly negative, and that the very same ideas that generate illusions have, when used properly, a constructive function. To this end, in the first part of the Appendix, he rehabilitates three principles of reason, those of genera, species, and continuity.[7] These principles directly relate not to the transcendental ideas of God, world, and soul but to the idea "of the form of a whole of cognition" (A645/B673). The logical principle or law of genera demands a search for similarities among natural kinds, or for general covering laws for particular laws. The principle of species prescribes the opposite procedure, to articulate finer distinctions among concepts, or to find more particular laws under any general law. Together, they entail the principle of continuity, that the system of natural kinds or empirical laws resulting from the search for both increasing generality and specificity should yield a maximally dense conceptual scheme in which the transition from one concept to another expresses minimal differences. In other words, the logical principles of genera, species, and continuity demand a representation of nature as a well-ordered hierarchy of forms.

In the process of restoring reason to its proper office, however, Kant makes some rather strong claims. He describes the principles of systematic unity as "transcendental presuppositions" and as "synthetic propositions *a priori*," and finds these to have "objective but indeterminate validity," and sometimes just unqualified objective validity (A651/B679; A663/B691). Kant argues that the merely logical prescriptions of reason must be grounded upon transcendental principles of the organization of nature. This is allegedly because, without transcendental principles of systematic unity, "the use of the understanding through

[7] Kant uses a variety of terms to refer to these principles: 'homogeneity,' 'specification,' and 'continuity'; 'sameness of kind,' 'variety,' and 'affinity'; 'unity,' 'manifoldness,' and 'relatedness,' among others. McLaughlin (2014, 562) draws up a helpful chart of Kant's various labels for the principles of genera, species, and continuity in their logical, transcendental, experiential, and practical functions, adding that, "there seems to be no philosophically interesting difference in the terminological variety of phrases." I agree with McLaughlin's opinion. To avoid confusion, I use the terms 'genera,' 'species,' and 'continuity' throughout the paper.

the former [i.e. merely logical prescription] would only mislead, since the prescription would perhaps take a path directly opposed to nature" (A660/B688). Transcendental status for reason's principles is necessary to secure self-consistency in the understanding's operations by ruling out the prospect of a cognitively unmanageable variety in nature. Consequently, reason's principles now seem to share the features of necessity and indispensability that marked the principles of the understanding as conditions of possible experience. Kant claims darkly that, without such transcendental presuppositions, "we would have no reason, and without that, no coherent use of the understanding, and, lacking that, no sufficient mark of empirical truth" (A651/B679).

Worse, Kant appears to make contradictory claims on behalf of reason's principles. He officially designates them as 'regulative,' but also characterizes them as necessary, transcendental, and objectively valid, terms that up to this point in the *Critique* seem to have meant 'constitutive.' Similarly, the claim that the systematic unity of nature must be presupposed as objectively valid conflicts with his earlier view in the Dialectic, that the demand to seek unity among empirical laws "does not prescribe any law to objects… but rather is merely a subjective law of economy for the provision of our understanding" (A306/B362). Within the Appendix too, Kant appears to go back and forth between treating rational principles as subjective, methodological aids, and as objective conditions. We are left wondering whether reason's demand for completeness is an expedient guideline for easing cognitive burdens, or whether it compels assent to the belief that nature is in fact well-ordered in the way we represent it. In brief, by blurring the distinctions between constitutive and regulative, objective and subjective, between the claims of understanding restricted to spatio-temporal conditions and those of pure reason, Kant threatens to undermine the negative project of the Dialectic, one crucial part of which hinges on showing how metaphysical error results from confusing regulative, subjective principles for constitutive, objective ones (A296–7/B353–4).

Scholars have long noted this circumstance with justified alarm.[8] The leading strategy to save Kant from himself has been to favour his weaker formulations of reason's principles as merely methodological rules over the stronger ones as transcendental conditions. On this approach, Kant's characterizations of the principles of genera, species, and continuity as transcendental is unfortunate, for his arguments fail to establish them as anything more than useful assumptions for scientific inquiry. Distinguishing the requirements of ordinary and scientific experience, many scholars thus limit Kant's concerns in the Appendix to issues of good scientific practice.[9] As ultimately illusory but pragmatically useful devices, reason's

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[8] Kemp Smith (1962, 547) dismisses the entire first part of the Appendix as extremely self-contradictory, an opinion shared by Bennett (1974, 274–5). Kitcher (1986, 207) likewise finds Kant's account "obscure" and that "one is inclined to think that the Appendix simply contradicts what Kant has said earlier in the [*Critique of Pure Reason*]." Allison (2004, 435) and Guyer (1990, 33) are similarly pessimistic. Neiman (1994, 57) confesses having trouble making sense of Kant's assertion that reason is required for the coherent use of the understanding, concluding that it shows that Kant is no more immune than the rest of us to falling into transcendental illusion. Longuenesse (2005, 233) argues that, even the guiding role Kant allots to reason is redundant, for, on her view, the Analytic of Concepts together with its appendix—the Amphiboly chapter—suffice to secure the kind of systematicity Kant wants for empirical knowledge. In a charitable study of the internal tensions arising from the Appendix, Horstmann (1998, 544) too admits that Kant's account of the regulative role of reason is anything but convincing, concluding that Kant ultimately is not able to ground its transcendental function. Less charitable is Zocher (1958, 58): "It is thus the lack of unity in the conception of the ideas, or – if one wishes to judge more sharply – rather a rupture in the Kantian doctrine of ideas itself, which explains the incompleteness of the deduction [of the ideas] and the unsteadiness in the formulation of the statements about their meaning and their possibility." Meer's (2019) recent study of the Appendix thoroughly examines its place within the structure of the first *Critique*, and serves as a useful guide to the problem of how regulative and yet transcendental principles might be possible within the constraints of the book. But it does not advance the debate of whether, and if so, how, Kant is justified in claiming transcendental status for reason's principles.

[9] McFarland (1970, 29) takes Kant's transcendental designation of reason's principles to refer narrowly to their status as conditions for scientific knowledge. Wartenberg (1979, 411–2) likewise interprets it as a commitment of the hypothetico-deductive method for the sake of theory construction. Butts (1986) and Kitcher (1986) too treat the Appendix as dealing specifically with issues of scientific methodology. Gracyk (1991, 206) takes the principles of genera, species, and continuity as necessary for the activity of fitting theories to observation. McLaughlin (2014, 556) sums up the methodological approach thus: after exposing the dialectical inferences based on reason's ideas, Kant "turns around and begins to recycle these hazardous materials," and argues that "empirical science is very lucky that we have these dangerous ideas because they are not only useful for scientific research, but perhaps also normatively constitutive of the scientific enterprise."

principles and its idea of nature as a systematically unified whole may be seen as 'optimistic placeholders,' to borrow Rachel Zuckert's (2017, 89) phrase, which encourage a realist attitude toward theoretical entities posited in science, even though critical philosophy reminds us that such notions exceed the bounds of possible knowledge.

While the methodological interpretation of the Appendix has been valuable for highlighting Kant's relevance to philosophy of science, it faces at least two major problems. First, it struggles to account for those passages where Kant does expound the stronger, transcendental claim on behalf of reason. These passages lead Guyer (2014, 195), for instance, to a negative opinion of the Appendix as a whole, that nothing in it offers a good answer to the question of what reason contributes that amounts to a "sufficient mark of empirical truth," as Kant claims. The best Kant leaves us with, for Guyer, is an account of its heuristic use in empirical research. A second problem is that such strategies typically imply a sharp separation of ordinary and scientific cognition. I do not find that to be a plausible account of the *Critique*, or of Kant's critical project in general. I incline instead toward the interpretative standpoint recommended by Karl Ameriks, that the critical philosophy aims at a balanced relation between the manifest and scientific images. On Ameriks's view, Kant intends to present a unified picture of human experience, so that "scientific theory, elementary common knowledge, and philosophical interpretation are… all intertwined" (2001, 33).

Dissatisfaction with the methodological interpretation has led some scholars to anchor reason's principles in more robustly normative considerations rooted in Kant's practical philosophy. Michelle Grier's reading of the Appendix rests on treating reason's directives to the understanding as having the status of necessary illusions. For her, "the regulative function of the principle of systematic unity is itself parasitic upon the transcendental and illusory postulation that nature, as an object of our knowledge, is already given as a complete whole" (2001, 275). From this standpoint, she suggests a parallel between Kant's views on

speculative and practical reason. Just as practical reason freely issues principles from its own nature to which reason must submit itself, speculative reason issues similar principles which are binding for cognition despite not being determinative of objects (2001, 285–6). Some have pushed the analogy between theoretical and practical reason further still to cast reason's theoretical principles as having an imperatival character. Thus, Sasha Mudd (2017) argues that the normativity of the ideas of reason, tacitly accepted by methodological interpretations, implies that the principle of systematicity should be taken as a species of practical principle, and thus as binding categorically. And Lara Ostaric (2009, 167) contends that, "the Appendix shows that our practical ends are always implicit in all our knowledge acquisition and all our theoretical investigation of nature."

One animating thought behind these interpretations is that the Appendix is in service of Kant's interest in unifying theoretical and practical reason. Mudd (2017, 82–3) explicitly ties the imperatival interpretation of the principles of systematic unity to an account of Kant's "Critical reconceptualization of reason" as a unified, self-determining power. I certainly agree that Kant is committed to the unity of reason, and that the discussion of reason in the Appendix plays a key role in the transition from theoretical to practical philosophy.[10] Yet, I hesitate to draw the principles of theoretical and practical reason too close together, for acknowledging their distinctive places in human nature is equally important to Kant. One source of trouble for this strategy is that theoretical principles differ from practical principles in the force of the 'ought' with which they bind agents. While theoretical principles govern the cognition of appearances, and thus depend on objects given in sensibility, the categorical imperative is absolutely unconditioned in its claims upon the will of every rational agent. Anticipating such interpretations, Margaret Morrison (1989, 167) succinctly underscored

[10] I agree with Longuenesse (2005, 233–4) that part of Kant's motivation in the Appendix is to prepare a transition to the practical postulates of reason and therewith from nature to freedom. Longuenesse rightly does not take Kant's systematic motives, though, as transmitting normative force to his arguments for the theoretical validity of reason's ideas.

their crucial shortcoming, namely an insufficient appreciation of the vast difference between the respective necessity attaching to practical and theoretical principles: whereas imperatives express the objective necessity of the acts they govern for any rational being, "the use of theoretical reason… is determined by the nature of the *object* under investigation." Troubles arising from Kant's account in the Appendix have to be addressed within the narrower context of his theory of cognition.

We are again confronted with the claims of reason in empirical cognition. To readers who have been convinced by Kant's distinction between the secure epistemic standing of empirically instantiable concepts and the illusions produced by uninstantiable ideas, the Appendix remains unsettling. Kant is himself acutely aware of the conundrum:

> What is strange about these principles, and what alone concerns us, is this: that they seem to be transcendental, and even though they contain mere ideas to be followed in the empirical use of reason, which reason can follow only asymptotically, as it were, i.e., merely by approximation, without ever reaching them, yet these principles, as synthetic propositions *a priori,* nevertheless have objective but indeterminate validity, and serve as a rule of possible experience, and can even be used with good success, as heuristic principles, in actually elaborating it; and yet one cannot bring about a transcendental deduction of them, which, as has been proved above, is always impossible in regard to ideas. (A663/B691).

This passage encapsulates the key tensions in the Appendix: are regulative principles genuinely transcendental, or do they only masquerade as such? Is their value merely instrumental, or are they truly conditions of possible experience? In what follows, I reconstruct Kant's argument for the stronger of these options. My position aligns in the recent literature most closely with Ido Geiger's (2003). Resting on a firmly conceptualist view of Kantian cognition, Geiger highlights meaning holism as one of its consequences, and the Appendix as the locus in the first *Critique* where Kant spells it out. Geiger (2003, 290)

attributes to Kant the thesis that, "*a necessary condition of meaningfulness of an empirical concept is conceptual relations within a systematic whole of concepts*." Put differently, any empirical cognition presupposes a unified hierarchy of concepts because the meaning of any empirical concept is only determined by its relations to other concepts. For Geiger (2003, 274), Kant only discharges this claim in the Appendix, which thus "completes the theory of empirical meaning and truth of the *Critique of Pure Reason*."[11] By contrast, methodological interpretations of reason's principles, according to Geiger, are committed to the view that the content of everyday observational concepts can be cashed out in nonconceptual terms. As he puts it, such interpretations amount to "classical empiricist' views of content, on which "all empirical concepts owe their content or meaning… to individual impingements of reality on our senses" (2003, 287).[12]

My account supports Geiger's by emphasizing a more fundamental feature of Kant's argument in the Appendix of which meaning holism is a consequence: that the content of any concept consists in the inferences its licenses. In contrast to Geiger, I bracket the vexed issue of whether the semantic contribution of intuitions presupposes conceptual synthesis, and focus instead on Kant's account of the internal relation of reason and understanding such that

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[11] In his latest book, *Kant and the Claims of the Empirical World* (2022), Geiger develops his interpretation of Kant's theory of cognition in the context of the *Critique of the Power of Judgment*. He proceeds from residual dissatisfaction with the Appendix account of the assumption of nature's systematic unity, as suggested by Kant himself in the Introduction to the third *Critique* (CPJ 5:168). Geiger (2022, 46) thus approaches the third *Critique* as having evolved out of the Appendix and as addressing the same problems of empirical meaning and the unity of nature. For present purposes, I restrict my focus to the first *Critique*, and so do not engage in detail with Geiger's book.

[12] Defending a version of the methodological interpretation that builds on Grier's view of the idea of the systematic unity of nature as a necessary illusion, Pickering (2011, 439–42) criticizes Geiger's reading of the Appendix by targeting its reliance on a strong conceptualist reading of Kant. Thus, he rejects Geiger's view that, for Kant, the meaning of an observational concept is wholly due to its relations to other concepts, so that perceptual experience without empirical concepts would be impossible, by pointing to passages where Kant certainly seems to suggest otherwise. These objections concern deeper issues such as whether unconceptualized sensations are cognitively significant. To reiterate, my sympathies lie with conceptualist positions on these questions, though for the purposes of this paper I leave open the issue of the contentfulness of intuitions.

the former places necessary conditions on the latter. In what follows, I argue that, for Kant, the assumption of thoroughgoing unity among empirical concepts is grounded in the nature of reason as a faculty of inference, considered apart from any relation to sensibility. Reason's idea of the systematic unity of nature, contained in its principles of genera, species, and continuity, expresses a basic rule on any cognition that given intuitions be determinable by empirical concepts in a way that preserves the possibility of valid inferences to lower species and higher genus concepts. I turn, first, to the question of the objective validity of reason's principles, or what their transcendental function amounts to; and second, to whether the first *Critique* permits transcendental principles that are regulative rather than constitutive.

3. Reason and understanding

The clue to the transcendentality of reason's principles lies in Kant's analogy between the relation of sensibility and understanding on the one hand and of understanding and reason on the other: "The understanding constitutes an object for reason, just as sensibility does for the understanding" (A664/B692). In the first part of the Appendix, Kant argues that the transcendental function of reason consists in the role of its principles as necessary conditions of the proper operation of the understanding. Without the principles of genera, species, and continuity, he writes, we would have "no coherent use of the understanding," and thus "no sufficient mark of empirical truth," and consequently "we simply have to presuppose the systematic unity of nature as objectively valid and necessary" (A651/B679).[13] Kant's

[13] Caimi (1995, 312–5) identifies this passage as Kant's deduction of the idea of systematic unity. Calling this a deduction is textually awkward, to put it mildly, for Kant not only denies a deduction for ideas in the first half of the Appendix, but also goes on to give a deduction of the ideas of God, soul, and world, rather than of the systematic unity of nature, and only in the second half (A663/B691; A670–1/B698–9). But I agree with Caimi that, despite the instability of the text, Kant should not be taken to deny absolutely the possibility of a grounding argument for the idea of the systematic unity of nature, but only as denying an "objective deduction" of the sort he has given for the categories. Caimi argues that a deduction is ruled out only when ideas as taken as "quasi-objective" concepts. But as "orientational concepts" (*Richtungsbegriffe*), ideas do serve a necessary function, and thus

argument for this thesis establishes the transcendental status of the principles of systematic unity: they are necessary presuppositions of the explication of conceptual content in virtue of determining possible ways concepts of objects may be used. In other words, they are presuppositions of any inferential use of concepts of the understanding by which we extend the field of cognition beyond their merely referential uses.

Kant's claim concerning the relation between reason and understanding is not new in the Appendix, but echoes the Introduction and Book One of the Dialectic. In general, Kant uses the terms '*Vernunft*' and '*Verstand*' to mark a nominal distinction within a single cognitive faculty (*Erkenntnisvermögen*) based on two kinds of concept and two kinds of associated principle. Reason produces its own concepts—ideas—which are distinguished from concepts of the understanding inasmuch as for ideas no object can be given in sensibility (A320/B377). It also generates its own principles; indeed, reason just is the "faculty of principles," or the power of cognizing "the particular in the universal through concepts." In contrast to the principles of the understanding, whose legitimate use depends on objects being given in intuition, reason's principles are so-called "absolutely," for these are strictly rules for subsuming one concept under another, never an intuition under a concept (A299–301/B356–8). Kant thus articulates a parallel relation between principles corresponding, respectively, to concepts of the understanding and to ideas. Just as the principles of pure understanding express rules contained in the categories for unifying sensible manifolds, principles of reason express rules contained in ideas for unifying particular empirical concepts. One might say that reason (*Vernunft*) names the cognitive

require an argument, albeit of a different sort. On Caimi's interpretation, the passage at A651/B679 fits the bill. Bondeli (1996, 175–7) similarly casts Kant's argument as a kind of "subjective" deduction that only aims at an "as-if objectivity" for the ideas. I will not argue whether the argument of the first part of the Appendix amounts to a deduction—I confess ignorance about the exact criteria an argument must satisfy in order to count as a deduction. But I do think that on pages A651–63/B679–91 Kant offers a compelling argument for the claim that the logical use of the principles of reason presupposes their transcendental counterparts, and this is the focus of my discussion.

power in general, considered apart from the sensible conditions to which the understanding (*Verstand*) is restricted.

Furthermore, Kant ascribes to both reason and understanding a transcendental or "real" function in addition to a logical one. That is, they are not only sources of the logical acts of syllogistic inference and concept formation, respectively, but also make claims on our cognitive relation to the world in virtue of containing "the origin of certain concepts and principles." Kant has painstakingly argued in the Transcendental Analytic for the objective validity of concepts of the understanding, albeit restricted to spatio-temporal conditions. In the Dialectic, he now claims that reason too generates its own pure concepts, and that the key to discovering their transcendental function similarly lies in their proper logical use (A299/B355–6). Just as the logical form of judgments serves as a clue to the categories, the logical form of syllogisms, "if applied to the synthetic unity of intuitions under the authority of the categories," yields pure concepts of reason, which will "determine the use of the understanding according to principles" (A321/B378). In other words, the structure of syllogistic inference expresses certain *a priori* concepts that relate to empirical cognition but are drawn neither from sensibility nor understanding. These concepts of reason can be shown to be implicit in ordinary material inferences involving categorially unified intuitions. The sense in which the understanding is an object for reason, for Kant, amounts to this: "If the understanding may be a faculty of the unity of appearances by means of rules, then reason is the faculty of the unity of the rules of understanding under principles" (A302/B359). This special "unity of reason," Kant submits, "is of an altogether different kind than any unity that can be achieved by the understanding" (A303/B359). One way to frame the task of the Dialectic, then, is by asking whether the unity of concepts instituted by reason is a necessary and *a priori* condition of empirical cognition, or whether it is essentially deceptive and only heuristically usable in certain contexts of inquiry.

In its merely logical use, the pure concept of reason grounds the principle, "to find the unconditioned for conditioned cognitions of the understanding" (A307/B364). That is, for any conclusion of a syllogism, reason's principle directs the search for the totality of grounds that would make the cognition true. For instance, for the conclusion, 'Caius is mortal,' from the premises, 'All humans are mortal' and 'Caius is human,' the logical use of reason's principle entails the complete articulation of marks contained under the concepts 'humanity' and 'mortality.' As Kant emphasizes, the conclusion itself can be drawn merely from experience, for the understanding is already in possession of the concepts involved in the syllogism. What reason contributes, as a faculty of cognition from principles in the strict sense, is the "universality of cognition," by displaying that the predicate ('is mortal') that is restricted to a given object is contained under the whole domain of another concept ('humanity') (A321-2/B378-9). The process of explication could continue further. Caius's humanity may be traced to his animality as a still more general reason for his mortality, and his animality to the domain of the concept 'living being.' Such a process of articulation leads to the idea of an unconditioned totality of conditions for any cognition. That is, it points to a 'concept' that is not itself contained in the domain of another concept, and thus to the complete, not-further-conditioned ground of any claim.[14]

Now, in the Introduction to the Dialectic, Kant indicates that the merely logical principle of reason can become a metaphysical principle once we introduce the assumption that when a conditioned cognition is given, then so is the totality of real conditions inferable from it also given (A307–8/B364). That is, the logical principle of reason can be converted into a metaphysical principle that posits the existence of an unconditioned totality as the ground of conditioned objects. Such a "supreme principle of pure reason," however, would

[14] Kant's formulation of the relation between the unconditioned and the totality of conditions is not always straightforward. See Willaschek (2018, 177–82) for a convincing defence of what Kant wants to hold, namely that the two notions are equivalent.

be transcendent, inasmuch as "no adequate empirical use" could be made of it (A308/B365). Previewing the negative part of the Dialectic, Kant concludes the Introduction by stating that the demand of human reason to seek completeness in cognition has been mistaken for an actual completeness in the series of conditions of objects themselves (A309/B366). What reason naturally and rightly seeks is a special kind of unity of the understanding, which, under the uncritical attitude of the transcendental realist, exposed over the next several hundred pages, is misunderstood as a special kind of unity of nature.

In the Appendix, Kant begins anew with the merely logical use of reason. Armed with critical awareness of how reason gives rise to transcendental illusion, he now aims to legitimate its quest for the unconditioned ground of any cognition by restricting it to its proper object, namely to the mere form of an empirical conceptual scheme. This form is expressed generally in the idea of the systematic unity of nature, whose partial expressions are the principles of genera, species, and continuity. Kant's grounding argument for the transcendental status of these principles begins by recalling the "rational unity among rules" that reason should institute in the understanding. Taking the problem of the unity of causal powers as an example, Kant observes that we naturally strive to reduce the various kinds of causal action attributed to substances to the fewest sources possible, and ideally to a single root power. In the case of psychological substance, a fundamental power is thus posited as the common causality of acts of remembering, distinguishing, imagining, desiring, and so on. Now, this theoretical goal could simply amount to hypothesis formation for the sake of guiding research. Yet, Kant denies that the idea of a fundamental power functions merely "as a problem for hypothetical use." Moreover, we somehow learn this by attending to the "transcendental use of the understanding." Kant offers a piece of empirical-psychological evidence for his claim: the presupposition of unity among causal powers is present even in the absence of any attempt to seek it and persists in the face of repeated failures to discover it.

"The parsimony of principles," thus, "is not merely a principle of economy for reason, but becomes an inner law of its nature" (A650/B678).

So far, Kant's claim about parsimony is suitably modest—that it is just part of the nature of reason to seek unity and simplicity in explanations, as attested in actual empirical research. But he immediately adds a much stronger thesis:

> In fact it cannot even be seen how there could be a logical principle of rational unity among rules unless a transcendental principle is presupposed, through which such a systematic unity, as pertaining to the object itself, is assumed *a priori* as necessary. (A650/B678)

Kant now contends that the logical use of reason in empirical thinking is not possible without a transcendental presupposition. That is, the use of reason in searching for greater unity among concepts of causal powers requires positing a necessary, real unity. Specifically, he suggests that a transcendental principle is required to supply the warrant for the use of the logical principle by ruling out the possibility that the variety of causal powers might in fact be disunified. As long as the prospect of nature being actually fragmented remains a live option, reason would proceed "directly contrary to its vocation, since it would set as its goal an idea that entirely contradicts the arrangement of nature" (A651/B679). The argument appears to be that we must presuppose the systematic unity of nature for the sake of the coherence of inquiry.

If this were Kant's reasoning, his claim that logical principles of unity must presuppose transcendental ones would rest on flimsy grounds. In the context of a related discussion in the *Critique of the Power of Judgment,* Guyer has persuasively objected that what is rationally required to judge appearances as conforming to empirical laws is only the weaker condition that we have no reason to believe that nature is chaotic, not the stronger condition that nature be systematically ordered. If Kant's concern is to vindicate systematic inquiry, all he needs is an absence of evidence that nature is radically disordered. Without a

positive reason to suspect disorder, Kant's transcendental principle, Guyer remarks, "does nothing but transform our own need for systematicity into a self-serving delusion." And "a delusion," he adds, "is no rational basis for action" (1997, 41–44).

Kant's claim in the Appendix, however, is not just that empirical research might be incoherent unless we presuppose that nature is systematically organized. Rather it is also that without such a presupposition, there would not be any "sufficient mark of empirical truth" (A651/B679). That is, for Kant, the transcendental principle furnishes conditions for the truth-aptness of empirical concepts. The deeper justification for the transcendental versions of the principles of genera, species, and continuity has to do with their status as necessary elements of concept formation and use.

The key here lies in Kant's view, repeated in his discussion of each of the three principles, that what constitutes one's possession and use of a concept just is one's grasp of the inferences it licenses, or of knowing what else follows from applying a concept. Thus, with respect to the principle of genera Kant claims that, if nature were so materially diverse that no human understanding could possibly establish any similarity among objects, then "the logical law of genera would not obtain at all, no concept of a genus, nor any other universal concept, indeed no understanding at all would obtain" (A654/B682). Kant here does not argue that for any two species there should be a higher genus because reason's internal law is to seek completeness in the series of conditions. Rather, his point is that, were unities of lower concepts under higher ones not reflected in the form of nature considered as the sum of appearances, the understanding would not stand in a truth-apt relation to sensible objects, because no attribution of a predicate to an object would warrant further claims about it. The judgment, 'this is gold,' licenses the judgments, 'this is a metal,' and 'this dissolves in aqua regia.' These inferences are only possible under the assumption that 'gold' falls under the whole domain of more general concepts, in this case 'metal' and 'soluble in aqua regia.' For Kant, a transcendental principle grounding the possibility of valid inferences from any

empirical judgment is thus presupposed in the merely logical use of the concept of genus that the understanding tacitly employs in forming empirical concepts: "sameness of kind is necessarily presupposed in the manifold of a possible experience… because without it no empirical concepts and hence no experience would be possible" (A654/B682).

Kant repeats a similar argument for the principle of species, that for any empirical concept further subspecies can be found. This principle looks in the opposite direction from the principle of genera, expressing finer determinations in content as opposed to greater generality resulting from fewer shared marks. Indeed, conceptual determination proceeds without limit, for the articulation of any concept leads to narrower concepts, but never to a lowest, not-further-articulable concept. For Kant, a representation that did not contain under itself further universals would not count as a conceptual representation, for any relation it would have to an object would not be mediate but immediate. That is, it would be an intuition and not a concept. But the human understanding, Kant reminds us, "never cognizes through mere intuition but always yet again through lower concepts" (A655–6/B683–4).

Now, as with the law of genera, Kant argues, this merely logical feature of the understanding, that each of its representations entails an endless series of lower representations expressing finer varieties in content, "would be without sense or application if it were not grounded on a transcendental law" (A656/B684). Here, Kant makes it clear that, by calling the principle of species transcendental, he does not mean to commit himself to an actually infinite variety of things in nature. Rather, what he means is that the principle of species, like the principle of genera, expresses an *a priori* condition of empirical concept application. No amount of empirical investigation could vindicate the peculiarity of the human understanding that its concepts always contain subspecies. Instead, only through a critique of the use of the cognitive faculty do we discover that it essentially consists in articulating sensorily given manifolds through an indefinitely extended series of more general and more particular mediate representations. To have a (human) understanding is to be able

to unify sensible marks under universal concepts in a way that licenses further inferences about the object so constituted. Thus, Kant concludes,

> we have an understanding only under the presupposition of varieties in nature, just as we have one only under the condition that nature's objects have in themselves a sameness of kind, because it is just the manifoldness of what can be grasped together under a concept that constitutes use of this concept and the business of the understanding. (A657/B685)

Reason, as the capacity for inferring in general, is the source of certain formal conditions on the use of empirical concepts. Kant identifies these as the principles of sameness of kind and variety, or genera and species, and a third principle resulting from their unification, that of continuity, or the affinity of all transitions between genus and species concepts through an infinitesimal gradation of marks. With these three principles, Kant writes, "reason prepares [*bereitet*] the field for the understanding" (A657/B685). Put differently, reason's conditions are presupposed in the understanding's determination of sensibly given materials; they are not introduced subsequent to experience.

According to Kant, then, reason's idea of the systematic unity of nature and the principles through which it is expressed are transcendental inasmuch as they express necessary conditions of the use of the understanding. The principles of genera, species, and continuity are not merely methodological devices for the sake of generating hypotheses to guide experiments and observations. To be sure, examples drawn from empirical science abound in the Appendix—the idea of a fundamental psychological power, the reduction of types of salts to fewest genera, the unification of varieties of orbital motions around the Sun as conic sections. Yet, he insists that the claim to validity of these principles does not derive from "a hidden intention to initiate probes," even though their fruitfulness in research may count as an additional reason in their favour. Instead, they "carry their recommendation directly in themselves," in virtue of being presupposed in the understanding's

conceptualization of intuitions. The laws of the parsimony of causes, the diversity of effects, and the affinity among objects represented as causally interacting substances, are necessarily expressed in the form of the series of appearances produced by the understanding (A660–1/B688–9). With this function, however, reason's principles are implicated globally, and are not just limited to the higher reaches of natural science.[15]

Kant's thrice rehearsed argument from A650/B678 to A661/B689—once for each of the three principles—targets what we might call two-stage models of the cognitive process, implied in methodological readings of the Appendix. On those views, in the first stage, sensory data are worked up into empirical concepts and judgments through the combined activity of sensibility and understanding. Then, in the second stage, first-order judgments are organized for the sake of cognitive economy. While the first stage is properly objective, in virtue of dealing with sensible materials, the second is merely subjective, since it lacks a direct relation to them. Against such a model, however, Kant argues in the Appendix that reason's principles immanently condition the understanding. The principles of genera, species, and continuity do not simply make further use of the finished products of the

[15] See Geiger (2003, 291–3) for a response to the objection that Kant's reliance on examples from technical scientific research means that he must see them as restricted to scientific practice. In the *Critique of the Power of Judgment* Kant gives a psychological explanation of the difficulty in appreciating the expression of reason's ideas in our most basic empirical concepts: "To be sure, we no longer detect any noticeable pleasure in the comprehensibility of nature and the unity of its division into genera and species, by means of which alone empirical concepts are possible through which we cognize it in its particular laws; but it must certainly have been there in its time, and only because the most common experience would not be possible without it has it gradually become mixed up with mere cognition and is no longer specially noticed" (CPJ 5:187). We aren't struck by cognition of instances of long-established knowledge because these have become transparent to us, in the way that written and spoken words in natural language are transparent to fluent readers and speakers. But the psychological fact that I don't appreciate that my use of ordinary concepts such as 'yellow' or 'dog' presupposes a divisibility of nature into kinds is irrelevant to the critical question of whether formal concepts of genera and species are transcendental conditions of concept use. Geiger (2022, 35–7) further discusses this passage.

understanding, as it were, but play a necessary role in experience as formal constraints on empirical judgment.[16]

Once again, this is not an entirely new development in the first *Critique*. Already in the Postulates section of the Analytic of Principles, Kant had identified four scholastic principles as transcendental laws of nature that "belong to" the understanding: "Nothing happens through a mere accident" (*in mundo non datur casus*); "No necessity in nature is blind, but is rather conditioned, consequently comprehensible necessity" (*in mundo non datur fatum*); "there are no leaps in the series of appearances" (*in mundo non datur saltus*); "there is no gap or cleft between two appearances" (*in mundo non datur hiatus*) (A228–9/B280–2). Kant explicitly notes that the last two are versions of the principle of continuity—thus they combine the principles of genera and species—and that they immanently constrain inferences. Already at this stage, Kant acknowledges the role of reason as the faculty of cognition through principles in how the understanding relates to sensible data: "they [i.e. the rational principles] are all united simply in this, that they do not permit anything in empirical synthesis that could violate or infringe the understanding and the continuous connection of all appearances, i.e., the unity of its concepts" (A229/B282). The discussion in the Appendix resumes this thesis concerning the legitimate claims of reason in empirical concept use.

To be sure, understanding and reason occupy importantly different positions with respect to experience. The key difference is that, unlike for concepts and principles of the understanding, no object corresponding to an idea and its associated principles can ever be given in sensibility. Taking the case of the continuity of natural kinds, Kant offers two arguments for why it could never be exemplified. The first is that, if nature were actually

[16] Grier (2001, 277) recognizes this circumstance: "it is clear that this subjective condition of thought is, as it were, 'always already' presented to us in its objective form." Her position contrasts with McLaughlin's (2014, 556), for whom the perspective of the first part of the Appendix is: "How can I productively employ this stuff [i.e. the ideas] that I cannot get rid of anyway? Kant asks not merely what science would be missing without the ideas, but also to what use they can be put, since we have them anyway."

constituted by a continuous progression of forms separated by infinitesimal differences, there should be a true infinity of forms between any two species, and true infinities in nature are absurd. The second argument has to do with how the principle of continuity is employed in reasoning. Kant observes that, through this principle we do not learn what degree of conceptual separation (measured in terms of marks or characteristics) obtains between members of any two species, and hence what characteristics must be varied in order to move from one to the other. In fact, empirical synthesis in accordance with the rule of continuity does not even furnish any guarantee of affinity between objects. Thus, we can make "no determinate empirical use" of the law of continuity, and instead only receive from it a "general indication that we are to seek it [i.e. affinity among species]" (A661/B689).

Another way to capture the difference between the roles of reason and understanding, as Kant does a couple of pages later, is that, whereas sensible schemata—procedures for the exemplification or construction of empirical objects in time—can be formulated for the pure concepts of cause or substance, they are lacking for the ideas of reason. Were such procedures not to obtain in the former case, the validity of the categories would remain unsettled; one would not be able to determine the sensory manifold in accordance with categorial principles. Similarly, the principles of genera, species, and continuity require an intermediary to play the role of a schema, if the acts of reason are to have the same kind of validity as those of the understanding. But the imagination does not furnish schemata for reason. We do not possess spatialized, mechanical or mathematical procedures by which to classify concepts in a system of natural kinds. The best that is available to reason to mediate its relation to the understanding, Kant writes, is "an analogue of such a schema… which is the idea of a maximum of division and unification of the understanding's cognition in one principle" (A665/B693). This analogue of a schema, while inadequate for relating the idea of systematic unity to intuitions, suffices to establish the required relation of reason's principles to the understanding, by directing the latter to seek those empirical concepts which would

yield the maximum diversity of species under the fewest genera, and the most fruitful network of inferential relations. Through such a "schema of reason," we certainly do not cognize any object. Yet, it does lend to reason's principles a qualified objective validity in virtue of satisfying a general criterion of Kant's critical philosophy, that "every principle that establishes for the understanding a thoroughgoing unity of its use *a priori* is also valid." Thus, Kant claims that, despite relating to objects only indirectly, the principles of reason "also have objective reality" in virtue of determining the use of the understanding (A665/B693).

Textual problems persist in the Appendix, however. In the closing paragraphs of the first part, Kant appears to walk back his claims for the transcendentality of the principles of systematic unity. The laws of genera, species, and continuity, he suggests, might better be called maxims rather than principles, as they relate not to the constitution of the object but to the "interest of reason" in cognition. These "maxims of speculative reason" are innocuous as long as they are treated as regulative and subjective, not as constitutive and objective. Conflicts arise from their use in empirical research only due to a failure to keep that distinction in mind. For instance, some investigators emphasize similarities among phenomena, while others fixate on differences. Each camp believes their judgment to be the right one, even though neither rests securely on objective principles, but instead each merely carries a divergent expression of one and the same interest of reason in order (A666–7/B694–5). In brief, Kant once again seems to propose a modest, methodological interpretation of the principles of systematic unity.

The 'interest of reason' version of the principles of genera, species, and continuity may be added alongside their logical and transcendental versions, which derive from the structure of syllogistic inference and, as Kant spends much of the first part of the Appendix arguing, are closely interrelated. As transcendental presuppositions, these principles express reason's demand for the unconditioned by instituting in the understanding the form of a

conceptual scheme as a maximally dense order of natural kinds or empirical laws. In their merely heuristic function, however, the principles amount to mere maxims of research, which posit a similar system of laws and natural kinds, though only as hypotheses to guide the construction of theories. The latter use of reason's principles, however, is compatible with their standing as transcendental principles. Indeed, in returning to their methodological utility, Kant does not give any indication of a conflict between the use of principles as research maxims and as transcendental presuppositions, but only of a conflict between research maxims themselves, which is swiftly cleared up by noting that it results from confusing regulative principles for constitutive ones. That Kant regards the methodological use of ideas as distinct from but not at odds with their transcendental function is clear: the "ladder of continuity" as employed in empirical research, he says, "is nothing but an observance [*Befolgung*] of the principle of affinity resting on the interests of reason" (A668/B696). That is, the heuristic idea of a chain of species guiding, for example, Bonnet's natural history is only an expression in practice of the transcendental principle of continuity assumed in any empirical cognition. The methodological use of reason's principles is downstream from their more fundamental role in the structure of inferential thinking.

4. Regulative and transcendental principles

But a still further source of trouble confronts readers of the Appendix, having to do with Kant's labelling of reason's principles as both regulative and transcendental. McLaughlin (2014, 556) neatly sums up the problem: up to this point in the first *Critique*, "we really have no reason to suspect that something that is in any way considered to be *transcendental* need not also be *objective* and *constitutive* as well." That is, Kant's talk of regulative yet transcendental principles in the Appendix creates the impression that the term 'transcendental' might not have a stable meaning in the first *Critique*. Against the pessimistic view, I believe the term does have a consistent meaning, which permits its attribution to both

constitutive and regulative principles. The key to this question lies in rejecting the identification of 'transcendental' with 'constitutive,' and 'logical' with 'regulative.' The point has been made before but is worth reiterating given its centrality for the coherence of the first *Critique*.[17]

In general, a Kantian transcendental item specifies a necessary and *a priori* condition on cognition: "I call all cognition transcendental that is occupied not so much with objects, but rather with our mode of cognition of objects insofar as this is to be possible *a priori*" (B25). The title is most often associated with those principles that prescribe that any object of experience must take up spatial extent; possess definite degrees of secondary qualities; persist through alterations in those properties; that those alterations should have determinate causes; and that it stand in thoroughgoing connection with other possible objects—in short, the system of principles laid out in the Analytic. Yet, besides these object constituting principles of the understanding, Kant also ascribes the label to the regulative principles of genera, species, and continuity (in the Appendix), the causality of moral agents through freedom (in the second *Critique*), and the subjective principle of the purposiveness of nature for our cognition (third *Critique*). It appears that Kantian transcendental principles can be either constitutive or regulative, inviting a closer examination of this distinction.

The constitutive/regulative distinction first appears in Kant's account of the principles of the understanding. Kant labels 'constitutive' the mathematical principles (the Axioms and Anticipations), which ground the applicability of mathematics to appearances: any possible object of experience must be such as to have determinate extension in space and determinate

[17] See Willaschek (2018, 112–6) for criticisms of readings that collapse the distinctions between 'transcendental'/'logical,' and 'constitutive'/'regulative.' As he puts it, "we cannot simply identify transcendental and constitutive principles, because it is *transcendental* principles that can be employed either regulatively or constitutively." Other commentators who reject the identification of 'transcendental' and 'constitutive' include Caimi (1995), Grier (2001), and McLaughlin (2014). My strategy differs slightly insofar as it rests on a comparison of how Kant uses the regulative/constitutive distinction in the Analytic and the Appendix.

intensities of sensory qualities. The objective validity of these principles consists in their role in grounding the possibility of specifying truth conditions for judgments of objects *qua* magnitudes. By contrast, Kant accords a regulative status to the three Analogies of Experience. The principles of the determination of objects in time as perduring substances (persistence), as causes and effects (succession), and as reciprocally interacting objects (simultaneity) "will not be valid of the objects (of the appearances) constitutively but merely regulatively" (A180/B222). What distinguishes this group of principles, Kant explains, is that they concern relations of objects to one another rather than their perceived extensive and intensive magnitudes. Whereas the mathematical principles ground the possibility of judging a table as having definite spatial dimensions, or its hue as having a definite degree of saturation, the principles of persistence, succession, and simultaneity make it possible to situate the table as a member of a world. In other words, the analogical principles underwrite attributions to material objects such as tables a definite causal history, stable relations with chairs, floors, and humans, and conditions of decay and destruction. The reason for this difference lies in the circumstance that such properties cannot be subjected to rules of mathematical construction. That is, intuitions corresponding to the causal principle or the principle of conservation of substance cannot be exhibited *a priori,* as is the case for geometrical concepts. Unlike, for example, the spatial bounds of an object, which can be exhibited in a scale drawing, the properties of persistence through time or causal connection cannot be exhibited as metrical properties of any object of experience because they do not fall under rules of non-analogical construction.[18] Analogical principles are required rather for the

[18] See Shabel (2006, 97–113) for a discussion of Kant's thesis that mathematical cognition is distinguished from philosophical in virtue of being produced by the construction, rather than analysis, of its concepts (A713/B714). For Kant, while the concept 'triangle,' for instance, has an analytic definition as 'rectilinear figure contained by three straight lines,' its construction requires exhibiting its content in a singular representation corresponding to the definition, a demand expressed in the Euclidean geometer's use of diagrams to prove theorems.

possibility of conceiving objects as parts of a system. Consequently, Kant maintains that, "these principles [the Analogies]… can yield nothing but merely regulative principles" (A179/B222).

Kant's discussion involves a technical distinction between a mathematical and a philosophical analogy. Only the former supplies rules for exact construction of objects of the sort carried out by geometers. Unlike a mathematical analogy, where an unknown magnitude can be calculated from known magnitudes together with the identity of their relations, a philosophical analogy gives the relation to an unknown member but not that member itself. The causal principle, for instance, indicates that there must be a temporally prior cause responsible for a given effect but does not specify the causally efficacious object. Instead, it only provides "a rule for seeking it in experience" (A179/B222). The Analogies do not ground assertions about measurable properties of objects but rather provide constraints for the kinds of object that would fit a coherent story of the world as it appears to us. Yet, by stipulating the relational conditions that possible objects must meet in order to be part of this story, these principles take their place among the conditions that make empirical judgments possible, and thus warrant the title 'transcendental.'

Consequently, the validity of the regulative, analogical principles cannot consist, as it does for the constitutive, mathematical ones, in furnishing truth conditions for judgments of appearances *qua* intuited magnitudes. Their legitimate use instead rests in the provision of a different kind of validity condition, namely conditions under which empirical objects could be judged to stand in relations required for membership in a system. Judgments concerning this system—what Kant calls 'judgments of experience'—express relations of force, situation, and duration among its members. Inquiry into nature thus depends on both the constitutive, mathematical principles and the regulative, dynamical ones, which together make up the "philosophical part of pure cognition of nature," as Kant put it in the *Prolegomena* (P 4:295). What is significant for present purposes is that, for Kant, the

understanding's activity with respect to sensibility already involves both regulative and constitutive transcendental principles.

The distinction between constitutive and regulative principles recurs in the Appendix, following Kant's argument for why transcendental counterparts of logical principles of systematic unity must be presupposed. Having stated the main worry—that the principles of genera, species, and continuity seem to be transcendental even though they contain mere guidelines—Kant now reminds the reader that the dynamical principles of the understanding are also "merely regulative principles of intuition," whereas the mathematical ones are "constitutive in regard to intuition." Yet, he continues: "Despite this, the dynamical laws [i.e., the Analogies] we are thinking of are still constitutive in regard to experience, since they make possible *a priori* the concepts without which there is no experience" (A664/B692). Kant here distinguishes the status of the Analogies with respect to intuition from their status with respect to experience. As applied to intuitions, the Analogies serve a merely regulative function, since they are not the kind of principle that could provide a rule for mathematical construction. As applied to experience as an interconnected system of objects, however, the Analogies do have a constitutive function, for they are presupposed in the possibility of a connected whole of empirical cognitions.

The Analogies, thus, have a dual character, and their expression as constitutive or regulative depends on their role with respect to the cognition of singular objects as opposed to the connected experience of a world. Yet, this dual character should not in the least call into question their status as 'transcendental,' in the strictest sense of that term. They are transcendental in virtue of being conditions of our conceptual handle on objects. What this indicates is that the designation of a principle as constitutive or regulative depends on the context of analysis. In individuating objects in sense perception, certain *a priori* principles count as constitutive and others as regulative; with respect to the systematic form of experience, principles of the understanding that were regulative become constitutive. These

terms, in other words, do not have absolute senses but only relative ones. Equating being transcendental with being object constituting and then restricting it to principles of the understanding is at best misleading and at worst false.[19]

For present purposes, the upshot is that Kant's characterization of reason's principles as both regulative and transcendental should not be as troubling as it first seems. Nowhere in the first *Critique* has Kant explicitly declared 'transcendental' to mean 'constitutive,' or that transcendental principles must one and all be principles of the synthesis of sensory manifolds. What's more, he has already identified some transcendental principles—the Analogies—as regulative in a certain context. To be sure, Kant's treatment of reason's principles in the Appendix is far from straightforward. But that he calls them both 'regulative' and 'transcendental' should not be a source of interpretative trouble.

5. Conclusion

Kant's discussion of regulative *a priori* principles in the Appendix is, admittedly, brief, cryptic, and not entirely satisfactory. Most interpretations have restricted its relevance to matters of scientific methodology. Recent alternatives treat it in the context of Kant's concern with the unity of reason to argue that reason's theoretical principles normatively bind the understanding in much the same way as its practical principles bind the will. On the latter approaches, the principles of systematic unity are properly transcendental, though in the manner of principles of pure practical reason rather than those of the understanding. Each strategy sits uncomfortably with more basic features of Kant's system. By carving off from Kant's epistemology issues limited to natural science, the methodological reading implies too sharp a divide between ordinary and scientific cognition. The practical-normative approach, meanwhile, threatens to undermine Kant's firm distinction between the unconditional

[19] The corollary, that 'transcendental' and 'regulative' are mutually exclusive designations, is a widely held and equally misleading opinion, as Allison (2004, 424) notes.

bindingness of the moral law and the regulative force of theoretical principles. By contrast, I propose that the Appendix completes Kant's theory of cognition by elaborating the positive role of reason in supplying conditions of the inferential articulation of empirical concepts. It is in virtue of this function that reason's principles of systematic unity count as transcendental presuppositions of any use of the understanding.

The foregoing interpretation has broader significance for interpreting Kant's account of cognition, a topic that has generated considerable interest in recent years. To sketch briefly its systematic import: the reading I have presented suggests an organic rather than a linear relationship between the various acts of the cognitive faculty. On prevailing accounts of Kantian cognition, sensibility gives intuitions to the understanding, which determines intuitions by attributing properties to them. These views treat the contribution of reason as incidental to the primary aim of cognition of bringing the world into view through the joint operation of sensibility and understanding. Such a two-stage model implies a cognitive faculty lacking purposive unity, inasmuch as its different acts are not integrated toward a single end.[20] Yet, Kant begins each part of the Appendix by affirming the teleological nature of the cognitive faculty as a whole, and reminding us that reason's ideas and principles are "grounded in the nature of our powers" and therefore should have "their good and purposive vocation" (A642/B670; A669/B697). But if that is the case, one should expect reason's activity to be essentially caught up with that of understanding and judgment, rather than entering the stage *post hoc*. Against standard pictures of Kantian cognition, the present reading regards the divisions within the cognitive faculty as standing in reciprocal relations,

[20] Watkins and Willaschek's (2017) synoptic account of Kantian cognition focuses on the givenness of intuitions and their determination by the understanding, and only briefly discusses reason's role as limited to a scientific interest in cognitive economy. Tolley (2020, 3221) draws attention to such "two-step" views of Kantian cognition and notes Kant's gestures at reason's involvement, but nevertheless treats its contribution as an after-the-fact ordering of empirical judgments. Dörflinger (2000) and Fugate (2014) have defended organic models of Kant's philosophical psychology, and this paper lends support to their accounts.

so that each supplies partial conditions of the operation of the others, and none is conceivable without its relation to the whole *Erkenntnisvermögen*. On this model, Kant's distinction between two kinds of concept—of the understanding and of reason—tracks separate, necessary roles played by each in the cognitive faculty's unified encounter with sensory impingements. Consequently, Kant's aim in conducting a critique of the cognitive faculty requires articulating the constructive role played in this process by concepts of reason just as much as that of concepts of the understanding, a task begun in the Introduction to the Dialectic and only completed in its Appendix.[21]

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