BERLIN PAPER: Kant, pragmatism and epistemic constructivism

The philosophical debate progresses through formulating solutions to philosophical problems. This paper compares and contrasts two unlikely bedfellows: Kant and selected pragmatists, who share a generally constructivist approach to cognition. Yet, other than this minimal overlap, they seem, at first glance, to be not only different but sharply opposed. Kant is, for instance, an a priori thinker and, depending on how "pragmatism" is understood, pragmatists are uniformly a posteriori thinkers.

The central aim of this paper is to bring out the contribution of both Kant and pragmatism to a constructivist approach to cognition. I will not be arguing that Kant is a pragmatist nor that pragmatism is a form of Kantianism. I will rather be arguing that pragmatic constructivism goes further than Kantian constructivism, but that both fall short of what I will be calling a historical approach that remains to be worked out.

The paper begins in considering the relation of epistemic constructivism to forms of realism before turning to Kantianism and then to pragmatism. Kant is sometimes seen as a metaphysical realist. I argue that he rejects metaphysical realism in favor of epistemic constructivism. I suggest that, with some exceptions, like Kant classical and neo-analytic pragmatism reject representationalism in favor of constructivism. Constructivism takes different a priori, a posteriori as well as social and historical forms. In this respect, I argue two points. On the one hand, there are a posteriori reasons for rejecting an a priori constructivist approach to the cognitive problem. On the other hand, Kantian and pragmatic forms of constructivism fall short of historical constructivism

Constructivism vs. realism

This paper turns on comparing and contrasting Kantian and pragmatic views of "constructivism" as plausible approaches to cognition. We can begin by trying to get clear about these terms that are understood in different ways. Since constructivism reacts to realism, we can begin with realism.

Realism, like ice cream, comes in many flavors, including aesthetic or artistic realism, empirical realism, naïve or direct realism, anti-realism, and so on. Aesthetic or artistic realism is a style favored by some artists. Social realism is sometimes adopted Marxists on political grounds. The classical German idealists all favor types of empirical realism. Anti-realism is any form of the view that we do not and cannot know the real. Moore infamously claims, though he does not give any textual reference, that all idealists deny the existence of the external world. "Metaphysical realism" is any form of the claim to cognize reality or again the mind-independent world. Unless otherwise specified, by "realism" I will have in mind two points: there is a mind-independent world, or reality, also called the real; and in appropriate circumstances, we can grasp the real.

Realism, though not under that name, goes all the way back in the tradition until Parmenides. According to Bertrand Russell, in virtue of his argument from language to the world, Parmenides is the first philosopher.[1] It is more plausible that he is the first modern philosopher, or again the first one to hold an identifiably modern view about knowledge.

Metaphysical realism remains popular in the current debate, for instance in physics and interpretation theory. Stephen Weinberg, the quantum physicist, thinks that unless science uncovers the structure of the real world, it is not worth doing.[2] The conviction that "interpretation" yields knowledge beyond the endless interpretive debate is widely held in hermeneutics (Hans-Georg Gadamer, Martin Heidegger, Donald Davidson), aesthetics (Monroe Beardsley), legal interpretation (Antonin Scalia), and so on.

Parmenides' claim that thinking and being are the same is often understood as suggesting that at the point of cognition thought grasps reality.[3] This view echoes through the entire later tradition up to the present. For instance, in his internal realist phase, in rejecting the so-called God's eye view, Putnam argues that, like the fable of the blind men and the elephant, different observers have different vantage points on the same reality.

Metaphysical realism, which has always been widely popular, is both attacked and defended. Constructivism is a second-best approach that arises on the ruins of metaphysical realism. Those who think we do not and cannot cognize the real contrast realism with epistemic constructivism that I will be calling constructivism, or any form of the view that we know only what we in some sense "construct."

Constructivism arises in ancient pre-Socratic philosophy. Parmenides' claim for the unity of thought and being[4] can be understood in different ways. This view suggests no less than three crucial approaches to cognition: metaphysical realism, or the view that we know reality; scepticism, or the view that we do not and cannot know, for instance because we do not know reality; and constructivism, or the view that we do not know reality but know what we "construct." Constructivism comes into the modern tradition through Hobbes, Vico[5] and independently through Kant. Contemporary constructivists include the psychologist Piaget, defenders of the Copenhagen approach to quantum mechanics, educational theorists, psychology, avant-garde Russian art, and so on. In what follows I will be focusing on "constructivism" as a shared epistemic commitment in Kant, pragmatism and others.

On interpreting Kant's critical philosophy

This brief description of the distinction between constructivism and realism provides a standard common to Kant as well as many but not all forms of pragmatism. Kant is clearly

singularly important, one of the handful of really great thinkers, on some accounts even the single most important modern thinker. In different ways all or nearly all later innovations in the debate run through Kant. Though Kant is now and has always been enormously influential, it is no secret that there is very little agreement about his position. It seems safe to say that Kant is as difficult to interpret as he is important. In a sense there are as many versions of the critical philosophy as there are readers of it.

There are many difficulties in reading Kant. Here are some examples. He is not a careful writer. He appears to be inconsistent since he often fails to discard early texts when his view changes. He has trouble choosing between inconsistent alternatives. And so on.

Kant, who was aware that his position posed interpretive difficulties, suggested it is easy for those interested in the critical philosophy to grasp the whole. But there is not now and never has been agreement about the whole of the critical philosophy. A further difficulty derives from his claim that there was no philosophy worthy of the name before him. This suggests he perhaps inconsistently reacts to Hume, Wolff, Leibniz, Plato and others. Since he believed that he had forever brought philosophy to a high point and to an end, he absurdly insists nothing can be changed without reason itself falling to the ground. Yet later thinkers, who thought the debate was still open, were unwilling to accept the inference that in the critical philosophy philosophy itself comes to a high point and an end. Beginning with Reinhold, Fichte, and Hegel, later thinkers insisted that Kant belonged to the ongoing debate, and sought to isolate the Kantian wheat from the Kantian chaff as it were.

Many, perhaps all important thinkers evolve over time. Though Kant suggests his position is independent of the preceding tradition, he responds to key aspects of the philosophical debate. His response to Hume's attack on causality to defend Newtonian science is widely known. Elsewhere I have argued that in denying a reverse causal inference

from effect to cause, in rejecting intellectual intuition, and in denying cognition of reality Kant responds to Plato.

I do not want to repeat that argument here. Suffice it to say that the interest in metaphysical realism as the cognitive gold standard takes the form of representationalism, or the correct representation of reality in modern thinkers including Descartes, Locke and others.[6] Kant's view of representationalism evolves from an initial representationalism to a later constructivist approach.

To explain this point, it is useful to distinguish between three terms: "phenomenon," "appearance," and "representation." "Phenomenon" refers to the contents of mind of whatever kind. "Appearance" designates an unknown and unknowable cause of which it is the effect. "Representation" accurately or again correctly depicts the cause of which it is the effect. All appearances are representations but representations are appearances. The difference between an appearance and a representation is that the former denies and the latter affirms the anti-Platonic backward inference from effect to cause.

Plato affirms intellectual intuition that Kant denies. Kant, who follows the Platonic rejection of a backward causal inference but denies intellectual intuition, needs to explain cognition through another mechanism. Kant rejects as absurd the suggestion that there could be an appearance without anything that appears. He rather thinks that an appearance presupposes an unknowable cause, namely reality, also called the thing in itself, or noumenon, which it is the effect.[7]

Kant's early, representationalist view of cognition presupposes a legible account of representation as well as a growing realization of the inability to understand "representation." Kant begins as a representationalist and evolves into a constructivist. Kantian constructivism derives from his steady interest in cognition but growing dissatisfaction with a representational approach. Kant's interest in a representational approach to cognition is

signaled in the Herz letter (February 1782) early in the critical period. In his letter, Kant points to his identification with representationalism in writing:"I asked myself, namely, on what grounds rests the reference of what in us in called representation (Vorstellung) to the object (Gegenstand)?"[8]

In a fuller treatment, it would be necessary to analyse this important document in detail. Suffice it to say that the letter shows Kant's concern to justify representation as an effect caused by the cognitive object. Many observers think that, since this letter was written early in Kant's critical period, it is reasonable to take the letter as pointing to the concern Kant was occupied with in the Critique of Pure Reason. If this is correct, then it provides a reason for preferring the first edition of Kant's treatise to the second edition, where he has already clearly left representationalism behind in turning toward constructivism.

The mature Kant's interest in a representational approach to cognition as late as the critical period suggests that he is a kind of representationalist. Since this is a widely favored modern cognitive approach, Kant seems not to be breaking with representationalism that he is concerned to carry it to a new and higher level. Yet this is at most only part of the story. On inspection Kant's references to representation in his writings tell a different story. They depict a growing realization of the insuperable difficulty of and disillusionment with representationalism that is replaced as early as the second edition of the Critique of Pure Reason through a turn to constructivism.

Descartes, who is a representationalist, claims to overcome any legitimate doubt in infallibly inferring from the mind to the world. Before the onset of the critical period Kant, perhaps under the influence of Descartes, takes the representationalist approach as a given. In a pre-critical text, The Only Possible Argument in Support of A Demonstration of the Existence of God (1763), he suggests that "the word "representation" is understood with sufficient precision and employed with confidence, even though its meaning can never be

analysed by means of definition."[9] In the first edition of the Critique of Pure Reason he later writes that "all appearances, are not things, but rather nothing but representations, and they cannot exist at all outside our mind."[10] Yet his view quickly changes. In the Dohna Wundlacken Logic (1797) only slightly later in the critical period Kant explicitly denies that representation can even be defined.[11] And finally in the Jäsche Logic (1800), another text from slightly later in the critical period he claims that representation "cannot be explained at all."[12]

We can summarize this part of the discussion in putting Kant's turn from representationalism to constructivism in the historical context. I have been suggesting that we can usefully understand Kant's approach to cognition against a historical background stretching back to ancient philosophy. In Parmenides' wake, metaphysical realism nearly immediately between the cognitive standard. Plato follows Parmenides' suggestion that to know is to grasp or again to cognize reality, in short the world. For Plato this entails that, as Kant also thinks, since we cannot rely on a backwards inference from effect to cause, appearances do not represent. Kant, who, unlike Plato, denies intellectual intuition, initially follows the modern concern with representationalism. Yet, he later realizes that this approach fails to solve the post-Platonic version of the cognitive problem. The difficulty lies, as Plato already shows, in the insuperable difficulty of representing reality, or in Kantian language, in showing that the thing in itself can be represented. In other words, since he agrees with Plato's rejection of the backward causal inference, he rejects representationalism. More generally, Kant agrees with Plato but disagrees with modern thinkers since he concludes it is not possible but rather impossible to cognize metaphysical reality. This is the meaning of Kant's suggestion that the thing in itself can be thought but can neither appear nor be known. In other words, since an appearance is the appearance of something, reality appears, that is

appears in the form of sensation, but, since there is no intellectual intuition, can neither be represented nor known.

Kantian constructivism

If Kant had done no more than restate a form of the anti-Platonic approach, the critical philosophy would at most be the high point in a long series of modern forms of representationalism. Yet Kant not only restates the traditional approach, but also proposes a basically new strategy for cognition.

I turn now to Kantian constructivism, his alternative solution to the cognitive problem after he seeks but later gives up his initial effort to formulate a representational solution. "Kantian constructivism" refers to the so-called Copernican revolution in philosophy, a term that Kant never uses to describe his position, but that he briefly describes in the B introduction to the first Critique.

The Copernican Revolution is often mentioned but only rarely discussed in any detail. Hans Blumenberg, the author of an extremely detailed study of this theme, concludes that Kant probably never read Copernicus.[13] Yet, even if true, this would not be decisive. We recall that Kant also did not have detailed knowledge of Hume, who is obviously central to Kant's project. It is also unclear if Kant ever read Plato.

Kant's constructivism only emerges after the failure of his initial solution. It is a second-best solution that is frequently mentioned but not well understood. Here are three reasons why, at a time when the Tower of Babel is nearly finished, Kantian constructivism is still largely unknown. To begin with, he presents his new-found constructivism very rapidly without the detail nor care it deserves. Second, his constructivism lies in an uncertain relationship to his representational approach that in the context and even now is extremely

novel. And finally, Kant's effort to formulate a representational approach to cognition is sometimes taken as his main, indeed his only, cognitive approach.

Though Kantian Copernicanism is frequently mentioned, few writers devote more than minimal attention to Kantian constructivism. Observers often concentrate on the relation between Kant and Copernicus in neglecting to analyse Kant's Copernican insight. Hans Blumenberg, who to the best of my knowledge provides the most extensive analysis available, comes to the conclusion that Kant probably never read Copernicus. This suggestion is not helpful since it fails to come to grips with Kantian constructivism. Even if true, this point would not be decisive. We recall that Kant also did not have detailed knowledge of Hume, who is central to Kant's view of his project. It is also unclear if Kant ever read Plato.

There are at least four reasons to support a specifically Copernican reading of the critical philosophy. To begin with, Kant, as noted, was a convinced Newtonian, committed to defending modern science against Hume's attack on causality. Second, Kant possessed a strong grasp of and contributed to contemporary physics. He was, like Voltaire, not only committed to Newtonianism, but, unlike the former, obviously familiar with Newton's Principia. In the preface, which was added to the second edition in 1713, Roger Cotes suggests, according to Blumenberg for the first time,[14] that Newton proved from appearances that gravity belongs to all bodies.[15] Further, Kant's contemporaries, earlier Reinhold,[16] then later Schelling,[17] and surprisingly Marx,[18] drew attention to the link between the critical philosophy and the Copernican astronomical revolution. Finally, this relation can be verified from Kant's preface to the first Critique. In simplest terms, one can say that Kant generalizes Cotes's suggestion to relate Newton to Copernicus through a physical explanation of astronomical phenomena.

Kantian constructivism is described in a brief but important and well-known passage. This passage both points to Kant's Copernican turn as well as calls attention to constructivism

as an alternative to representationalism. It is not too much to say that this alternative was earlier anticipated in Parmenides' suggestion of the identity of thought and being; but it only emerges as an alternative approach to cognition after more than two millennia of effort that, as Kant points out, records no progress at all towards grasping an independent object, no progress at all in grasping reality.

Kant here takes stock of the present state of the cognitive debate. There is a strongly obsessive component to much philosophical debate, which is extremely repetitive. Though he is "officially" an a priori thinker, he very sensibly draws the lesson of more than two millennia of effort devoted to grasping reality. He proposes to abandon the traditional effort to grasp a mind-independent object in favor of a novel approach to cognition in independence of any grasp of a mind-dependent object.

If modern constructivism is the acceptable alternative to ancient representationalism, then the emergence of constructivism marks a decisive turning in the cognitive debate. In his reference to constructivism that is as brief as it is important, Kant makes two points that when taken together constitute his so-called Copernican revolution, On the one hand, according to Kant, there has never been progress toward cognizing a mind-independent object. This point suggests the failure to represent or more generally to cognize reality as well as the dependence of Kant's supposedly a priori approach on the a posteriori, or on experience. On the other hand, since, according to Kant, efforts to cognize reality by any means, including representationalism, have failed, he suggests as an experiment, hence speculatively, that we invert the relation of subject to object. In other words, rather than vainly continuing to seek to formulate a theory in which the subject depends on an independent object that we do not and cannot cognize, Kant proposes as an alternative to invert their relation in making the object dependent on the subject.

What is pragmatism?

Kant is very complicated. I do not claim that this is more than a plausible but simplified account of his approach to cognition.

After this simple sketch of the critical philosophy I come now to pragmatism. The term "pragmatism" is used very widely but apparently has no fixed meaning. Candidates for inclusion in the pragmatist fold range widely. At most there is a family resemblance between forms of pragmatism that can be described in many different ways. The term is currently used to refer to those pragmatists who descend from the classical American pragmatists, as well as self-styled analytic or neo-analytic pragmatists.

In part because the pragmatist debate is still underway, the differences between the views of the main representatives are so important as to threaten the idea that a single movement effectively includes such disparate thinkers. Different forms of pragmatism relate differently to different forms of constructivism and realism. Though there are exceptions, analytic pragmatism is broadly speaking metaphysically realist but non-constructivist, and classical pragmatism is constructivist but empirically realist.

There important differences between different types of classical and analytical pragmatism as well between forms of classical pragmatism. It has long been known that the early American pragmatists, who I am calling the classical pragmatists, hold disparate views. Long ago A. O. Lovejoy noted the existence of more than a dozen types of pragmatism.[19] As is often the case with respect to a live philosophical tendency, the main participants disagree. We see this with respect to their understanding of their relations to each other and to central members of the ongoing tradition. James, who was fiercely opposed to Hegel, differs in this respect from the later Peirce and Dewey. As he grew older Peirce came to think that his

differences with Hegel were mainly terminological. Dewey was throughout his career was closer to Hegel than to Kant.

The classical pragmatists share an interest in constructivism as the appropriate cognitive approach. This is not the case for analytic pragmatists, who appear often to turn to pragmatism in pursuing agendas not related or not clearly related to standard classical pragmatic concerns, such as constructivism. Analytic pragmatists, who often apparently repackage analytic wine in pragmatist bottles, include such well known analytic thinkers as the later Ludwig Wittgenstein, W. V. O. Quine, Wilfrid Sellars, Richard Rorty, Hillary Putnam, Robert Brandom, Huw Price, but not John McDowell, and so on. Putnam is best known for his life-long interest in types of realism. Wittgenstein is a philosopher of language. Rorty is an epistemic skeptic. And so on.

Those interested in analytic pragmatism are sometimes said to include Kant, the so-called first pragmatist.[20] Analytic pragmatists often take liberties in their use of the term that for Rorty refers to epistemic scepticism but for Putnam, who rejects both a God's eye view as well as verificationism, depends, as Dewey thinks, on warranted assertibility. Other analytic pragmatists look to Fregean semantics to grasp pragmatism. Brandom, for instance, who earlier described himself as a Hegelian, currently claims to be a pragmatist in linking pragmatism to Fregean semantics.[21]

Pragmatic constructivism

Classical pragmatists notoriously disagree among themselves. But they are comparatively unified compared to analytic pragmatists. The latter hold views extending over a large spectrum ranging from Rorty's skeptical denial of epistemic truth to Brandom's

inferentialist claim (closely following Davidson) that, as he says, reality makes our cognitive claims true or false.

Our concern here is not with one or another pragmatist or type of pragmatism but rather with the relation between Kant and pragmatism. The strong representationalist thrust of Western philosophy in the modern debate is resisted by Kant as well as classical pragmatists of all stripes and by some analytic pragmatists.

Pragmatism is usually understood as a post-Kantian effort to make out cognitive claims in denying representationalism and through a constructivist means. Representationalism, which is often attacked by pragmatists and non-pragmatists alike, is apparently assumed as the cognitive standard by analytic pragmatists at both ends of the spectrum who are respectively committed to scepticism on the one hand or inferentialist semantics on the other. But these are extreme instances, which are not representative of analytic pragmatism and even less representative of classical pragmatism. More moderate pragmatists, on the contrary, resist the siren calls of both scepticism and semantics to share the Kantian turn away from representationalism in turning toward constructivism.

Classical pragmatism, and by implication pragmatism of all kinds, is frequently described as a philosophical movement that includes those who accept some version of the Jamesian view that an ideology or proposition is correct if it works satisfactorily, where "to work" refers to the idea that our view of cognition is not refuted by the facts so speak. Two participants in a recent volume on Dewey make nearly identical claims that apply to classical pragmatism in general. Kersten Reich suggests that constructivists "see humans as observers, participants, and agents, who actively generate and transform the patterns through which they construct the realities that fit them."[22] Kenneth Stikkers' similarly thinks that our constructions of reality are not arbitrary but result from inquiry."[23]

Peirce offers an interesting example of pragmatist constructivism in his view of truth, not as grasping reality, but rather as what we come to believe in the long run, including through the process of scientific discovery. Peirce understands the "real" not as metaphysical reality but rather as what is given over time in experience. His view of the long run is linked to his view of "abduction," a term he coined to refer to the logic of scientific inquiry that proceeds through non-deductive inference in the context of discovery. Unlike, say, the context of justification, for instance the assessment of scientific theories that engages the logical empiricists, abduction belongs to the context of discovery in which we generate theories that are only later assessed. In two passages that could have come from Hegel he says that "[a]bduction is the process of forming explanatory hypotheses. It is the only logical operation which introduces any new idea"[24] and that abduction encompasses "all the operations by which theories and conceptions are engendered."[25] Dewey's insistence in his Logic on the pragmatic relation of theories to resolve specific problems,[26] the view of ideas as instruments or tools that guide our actions and can anticipate future results in terms of which they can be tested and evaluated, can be regarded as a restatement of the Peircean view.

Conclusion: Pragmatic constructivism today

I come now to my conclusion. I have argued two main points: on the one hand, Kant and pragmatism differ in many ways. On the other hand, they overlap in their shared conviction that, since representationalism fails, the road to cognition runs through constructivism. There are at least three different kinds of constructivism, that are respectively logical or quasi-logical, social, and finally historical.

Kantian constructivism, which formulates an a priori account of the conditions of cognition in general, has been effectively refuted through the evolution of modern

mathematics. Kant, who is an a priori thinker, proposes an a priori, quasi-logical form of constructivism ultimately based on his conception of mathematics. In the meantime, mathematics has lost its claim to certainty. Kant holds a traditional conception of mathematics as certain or apodictic. This claim, which traditional when he was active, was refuted in the nineteenth certainty not a priori but rather a posteriori by the discovery of non-Euclidean geometry.[27] The emergence of other geometries means Kant is wrong about mathematics, and wrong about his supposedly transcendental claim that we can discover a priori what is necessarily true a posteriori.

In the meantime, Kant's effort to construct an a priori conception of the world[28] and ourselves has given way to the social construction of views of the world and human beings in the social context. "Social constructivism," a term coined by Peter Berger and Thomas Luckmann, refers to the social situatedness in which humans develop and knowledge is constructed.[29]

Kant thought that later changes in his position were not possible, since he provided definitive solutions of all philosophical concern. According to Kant, as noted above, he both began and ended philosophy worthy of the name. The rise of social constructivism, or a social conception of constructivism, suggests that, in virtue of the shift from the a priori to the a posteriori, notably through the anthropological development of the post-Kantian subject, Kantian constructivism has in the meantime been replaced by pragmatic constructivism.

Social constructivism marks a further development but not the final step in the evolution of constructivism. Historical constructivism differs from both its constructivist relatives through its attention to the link between cognition and history, or cognition and the historical moment. Hegel is right that we think out of and are restricted by the limits of the historical moment. It follows that a further step in the cognitive process calls for a historical form of pragmatic constructivism.

I have emphasized the relation of Kant and pragmatism to a historical form of constructivism. It might be objected that we should rather turn toward the future of philosophy in turning away from, in simply ignoring the past. Yet we ignore the history of philosophy at our peril, since the past is the boundary of the future. It seems obvious that we need to know what has transpired in order to know what was accomplished and what remains to be done.

In conclusion I would like to suggest that the future of constructivism does not lie either in a logical or quasi-logical approach to cognition, nor again in a social approach. It rather lies in the historical rethinking, after Kant, and after pragmatism, in building as best we can on Kant, the pragmatists and others to formulate a post-representational, constructivist approach to cognition.

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1 See Bertrand Russell, A History of Philosophy, New York: Simon and Schuster, 1945, p. 150.

2 See Steven Weinberg, "The Revolution That Didn't Happen," *New York Review of Books*, October 8, 1998, 48–52.

3 See M. F. Burnyeat, "Idealism and Greek Philosophy: What Descartes Saw and Berkeley Missed," *Philosophical Review* 91 no. 1 (January 1982): 3–40.

4 See DK 28 B 3, Clem. Alex. strom. 440, 12; Plot. Enn. 5, 1, 8.

5 See Arthur Child, Making and Knowing in Hobbes, Vico, and Dewey, Los Angeles: University of California Press, 1953.

6 Kant is sometimes read as a representationalist. See, for a defense of a representationalist reading, A. B. Dickerson, Kant on Representation and Objectivity, New York: Cambridge University Press, 2004. He argues that Kant stands in the great Cartesian representationalist tradition. According to Dickerson, we are immediately aware of presentations that we cognize neither by inferring them as the causes of representations nor by constructing them out of representations, and of which we are made aware by apperception.

7 See Immanuel Kant, Critique of Pure Reason, trans. by Paul Guyer and Allen Wood, New York: Cambridge University Press, 1998, Bxxvii, p. 115.

8 Immanuel Kant, To Marcus Herz, February 21, 1772, in Correspondence, edited and translated by Arnulf Zweig, New York: Cambridge University Press, 1999, p. 133.

9 See "The Only Possible Argument in Support of a Demonstration of the Existence of God" (1763) in Immanuel Kant, Theoretical Philosophy 1755-1770 , New York: Cambridge University Press, 1992, p. 116.

10 Kant, Critique of Pure Reason, A 492, p. 511.

11 See Dohna-Wundlacken Logic (April 1792), in Kant, I., Lectures on Metaphysics, K. Ameriks, trans., New York: Cambridge University Press, 1997, §10, p. 27.

12 Jäsche Logic, in Immanuel Kant, Lectures on Logic, trans. J. Michael Young, New York: Cambridge University Press, 1992, p. 545.

13 See Hans Blumenberg, "What Is Copernican in Kant's Turning?," chapter 5 of The Genesis of the Copernican Revolution, translated by Robert M. Wallace, Cambridge: MIT Press, 1987, pp. 595-614.

14 See Blumenberg, The Genesis of the Copernican World, p. 603.

15 See Isaac Newton, Opera omnia, edited by S. Horsley, London: Excudebat J. Nichols, 1779-1785, II, p. xiv.

16 In the first letter of his Briefe über die Kantische Philosophie, which appeared in August 1786, hence before the second edition of the Kritik der reinen Vernunft, Reinhold refers to the relation between Kant and revolution (K. L. Reinhold, ‘‘Briefe über die Kantische Philosophie,’’ Teutscher Zeitschrift August 1786, 27, pp. 124-125), and then to Kant and Copernicus (ibid., p. 126.)

17 In a Nachruf on the occasion of Kant’s death, Schelling suggests that Kant intends to make a Copernican turn. ‘‘Ähnlich wie sein Landsmann Copernikus, der die Bewegung aus dem Centrum in die Peripherie verlegte, kehrte er zuerst von Grund aus der Vorstellung um, nach welcher das Subjekt unthätig und rühig empfangend, der Gegenstand aber wirksam ist: eine Umkehrung, die sich in alle Zweige des Wissens wie durch eine elektrische Wirkung fortleitete.’’ ‘‘Immanuel Kant’’ 1804, in Schellings Werke, Munich: Beck, 1958, vol. III, p. 599.

18 See Karl Marx, “The Leading Article in No. 179 of the Kölnische Zeitung,” in Marx Engels Collected Works, London: Lawrence and Wishart, 2010, vol.1, p. 201.

19 See Arthur O. Lovejoy, “The Thirteen Pragmatisms,” in Journal of Psychology and Scientific Methods, January 1908.

20 See Danielle Macbeth, “Varieties of Analytic Pragmatism,” in Philosophia 40 (1):27-39, March 2012.

21 “One of the fundamental methodological commitments governing the account presented here is pragmatism about the relations between semantics and pragmatics. Pragmatism in this sense is the view that what attributions of semantic contentfulness are for is explaining the normative

significance of intentional states such as beliefs and of speech acts such as assertions. Thus the criteria of adequacy to which semantic theory's concept of content must answer are to be set by the pragmatic theory, which deals with contentful intentional states and the sentences used to express them in speech acts." Robert Brandom, Making It Explicit, Cambridge: Harvard University Press, p. 143.

22 Kersten Reich, "Constructivism: Diversity of Approaches and Connections with Pragmatism," in John Dewey: Between Pragmatism and Constructivism, edited Larry Hickman, Stefan Neubert, and Kerstein Reich, New York: Fordham, 2009, p. 40.

23 Kenneth Stikkers, "Dialogue between pragmatism and constructivism," John Dewey: Between Pragmatism and Constructivism, p. 83.

24 Collected Papers of Charles Sanders Peirce, edited by Paul Weiss and Charles Hartshorne, Cambridge: Belknap Press, vol. V., 5.172

25 Collected Papers of Charles Sanders Peirce, vol. 5, 5.590.

26 John Dewey, Logic: The Theory of Inquiry, New York: Holt, Rinehart, and Winston, 1938, p. iv: "But in the proper interpretation of "pragmatic," namely the function of consequences as necessary tests of the validity of propositions, *provided* these consequences are operationally instituted and are such as to resolve the specific problem evoking the operations, the text that follows is thoroughly pragmatic."

27 See Morris Kline, Mathematics: The End of Certainty, New York: Oxford University Press, 1965.

28 See Michael Friedman, Kant's Construction of Nature: A Reading of the Metaphysical Foundations of Natural Science, New York: Cambridge University Press, 2013.

29 See Peter L. Berger and Thomas Luckmann, The Social Construction of Reality, New York: Random House, 1966.