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The Logical Analysis Of Key Arguments In Leibniz And Kant

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ABSTRACT

This paper addresses two related issues of logic in the philosophy of Gottfried Leibniz. The first problem revolves around Leibniz’s struggle, throughout the period of his mature philosophy, to reconcile his metaphysics and epistemology with his antecedent theological commitments. Leibniz believes that for everything that happens there is a reason, and that the reason God does things is because they are the best that can be done. But if God must, by nature, do what is best, and if what is best is predetermined, then it seems that there may be no room for divine freedom, much less the human freedom Leibniz wished to prove. I conclude the first part of the paper by arguing that Leibniz’s defenses cannot withstand a contemporary logical analysis, and his project is doomed to fail.

In the second half of the paper, I explore Leibniz’s use of the traditional laws of logic – particularly the Principle of Non-Contradiction. I examine some criticisms of Leibniz’s employment of the principles by Kant and his allies and, in the end, determine that, while Leibniz ought to have been a bit more careful in his deployment of the principles, the Kantian criticisms are not devastating.
DEDICATION

This thesis is dedicated to the innumerable people who have helped and encouraged me throughout the years and, most of all, to my son, Henry.
LIST OF ABBREVIATIONS AND SYMBOLS

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INTRODUCTION

German philosopher Gottfried Wilhelm Leibniz has long been credited as one of the most important figures in the development of modern logic. Leibniz’s conceptions of analysis and modality, in the sense of possibility, necessity, and contingency, have influenced philosophers and logicians for hundreds of years. But the logical inferences made by Leibniz and the conclusions he subsequently drew from them are far from uncontroversial. Regarding modality, one of Leibniz’s primary goals throughout his mature work is to reconcile his ideas that God creates the best of all possible worlds and that everything happens for a reason with an account of contingency that allows for divine free will and avoids Spinozistic necessitarianism. With regard to analysis, Leibniz argues for a heavy reliance on rules of thought that date back as far as Aristotle. But some critics, including Immanuel Kant, argue that Leibniz’s fundamental logical rules are flawed. In what follows, I will address his work in the essays “On Contingency” and “Primary Truths,” as well as that of his critics, in order to argue that Leibniz fails with regard to his goal of avoiding necessitarianism, but is perhaps treated a bit uncharitably with regard to his assertion of fundamental principles of logic.
I. MODALITY OF THE BEST

In “On Contingency,”¹ written around 1686, Leibniz puts forward his theory of contingency and necessity, and attempts to reconcile the Principle of Sufficient Reason and the Principle of the Best with a metaphysics and epistemology that avoids necessitarianism.² That is, Leibniz wants to maintain divine and human freedom, and does not want to be stuck with the position that the actual world is the only way the world could possibly have been. He concurrently wants to hold that nothing happens without a reason, and that God creates the best of all possible worlds. In the end, I will argue, Leibniz's desiderata are contradictory, and his attachment to the Principle of the Best forces him into necessitarianism.

In the essay, Leibniz sets up a problem for himself: if it is necessary that “God does what is best,” is “what God does” necessary? Leibniz maintains that it is not. According to him, the necessity of the conditional “if it is the best, then God does it” does not entail the necessity of what God does. But Leibniz's solution is unsatisfying and seemingly incomplete. While Leibniz may be right in denying the initial inference, he fails to consider that the necessity of “God does what is best” combined with the necessity of either “what God does” or “what is best” does entail the necessity of the other. That is, if “God does what is best” is necessary and “what is


² It is important to note that there is significant textual evidence that Leibniz' views around the area in question changed considerably over the course of his career. For the sake of this essay, I will predominantly be considering texts Leibniz wrote in the later 1680s, though I will occasionally pull from later works.
best” is necessary, Leibniz cannot avoid the conclusion that “what God does” is necessary. This, of course, has far reaching consequences for Leibniz, who was committed throughout the period of his mature philosophy, at least publicly, to preserving divine freedom and avoiding necessitarianism.

Leibniz appeals frequently throughout his writings to the Principle of Sufficient Reason, or the idea that for everything that is, there is a reason or a cause. In “On Contingency,” Leibniz states the Principle of Sufficient Reason as follows:

Since we cannot know the true formal reason for existence in any particular case because it involves a progression to infinity, it is therefore sufficient for us to know the truth of contingent things a posteriori, that is, through experience, and yet, at the same time, to hold, universally or in general, that principle divinely implanted in our mind, confirmed both by reason and experience itself (to the extent that we can penetrate things), that nothing happens without a reason, as well as the principle of opposites, that that which has the more reason always happens [emphasis mine].

There's a lot going on in this passage. First, Leibniz is appealing to the “infinite analysis” conception of contingency. According to this account, all truths are in a sense, fundamentally analytic – at least in the mind of God. What creates (or supports) contingency is that the analysis of contingent things is infinite – that is, they are beyond the capabilities of the human mind.

Second, Leibniz here seems to assert versions of both of the following principles:

- **Principle of Sufficient Reason** – nothing happens without a reason
- **Principle of the Best** – that which has the more reason always happens

These statements are fairly representative of Leibniz's treatment of the principles on the whole and concur with much of what he has to say regarding them, though, as Adams notes, there are questions regarding the scope of these principles. It often seems that Leibniz moves freely

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3 Leibniz, 29.
between the Principle of Sufficient Reason and the principle that explains why God actualizes what he does – that is, why the world is the way it is. Let's call this idea the Principle of the Best.⁵ The Principle of the Best says that God chooses that which is best, so what exists does so because it is the best of all possibles. That is, everything that exists does so because God saw that it was best and chose to give it existence. The Principle of the Best is often seemingly disguised as the Principle of Sufficient Reason, as it is above, through the substitution of “has the more reason” for “is the best.”

There seem to be several compelling reasons Leibniz may have adopted the Principle of the Best. First, it is consistent with the popular theistic notion that God is, by his very nature, omnibenevolent or infinitely good. An infinitely good being, then, would clearly produce the best of all possible worlds. Second, it provides a somewhat satisfying answer to the problem of evil, or the question of how an omnipotent, omnibenevolent God could create a world in which so much apparent suffering exists. Thus, God did not create evil out of malice or imperfection, he simply created the best set of compossible facts, which necessarily includes some that we might find undesirable. This seeming benefit of Leibniz' system was famously ridiculed by Voltaire who, in his Candide,⁶ seems to utterly miss Leibniz's point. Voltaire, in construing the personal misfortune of his protagonists as evidence against the idea that God created the best of all possible worlds, merely restates the problem Leibniz is attempting to confront and ignores Leibniz's solution.⁷

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⁵ It should be noted that I'm not the first to use this terminology. It has been employed by Adams and others.


⁷ One might be tempted to argue that, for Leibniz, the evil that God not only allowed, but indeed created in the world, was functional in God's calculus of which possible world is best. This sort of argument asserts that some evil serves a crucial function in this best of all possible worlds, in the sense that virtues are themselves often responses to evil. It would, it is sometimes argued, be impossible for the world to be populated by the courageous were there no danger. In this way, evil plays an important role in the best of all possible worlds – that of enabling virtue. But
Another possible motivation for the Principle of the Best is that, by claiming that God creates the best of all possible worlds, Leibniz implies that there are other possible worlds that God could have created. Thus, at least according to Leibniz, God's omnipotence and free will are preserved and, as a result, the contingency of the actual world is preserved as well. This is the heart of Leibniz's attempt to overcome necessitarianism.

Returning to the passage from “On Contingency,” the phrase inserted between the statements of the principles in this instance is curious. What is “the principle of opposites” that Leibniz is asserting? It's tempting to pass over the phrase, leaving it unnoticed, as it looks at a quick glance like a confirmation of the priority for Leibniz of the Law of Contradiction (a.k.a. the Law of Non-Contradiction) or perhaps somehow a restatement of it. But here “the principle of opposites” is undoubtedly attached to his statement of the Principle of the Best (or “most reason”), in the phrase “... as well as the principle of opposites, that that which has the more reason always happens.”

Here it looks like the Principle of the Best is itself a statement of “the principle of opposites.” But how could the Principle of the Best be equivalent to a “principle of the opposites”? What could Leibniz even be referring to as this “principle of opposites”? If Leibniz is talking about the Law of Contradiction, is he then asserting the equivalence of the Law of

Leibniz rejects this idea. According to Murray and Greenberg, “Leibniz does not think that the permission of evil is morally justified on the grounds that such permission brings about a greater good that may not otherwise be achieved. Such an explanation, according to Leibniz, would make it the case that God would violate the Biblical injunction “not to do evil that good may come [Causa Dei 36 (S 121; G VI 444)].” It seems safe, then, to remove this potential motivation from consideration.


Non-Contradiction and the Principle of the Best, or that one can be derived from the other? Or does he mean to imply that *that which does not have more reason never happens*? This last option has promise.\(^8\)

If Leibniz thought that the POTB followed from the Principle of Identity or the Law of Contradiction, he wouldn't need to appeal to the principle's innateness. Rather, he could simply offer a proof or demonstration of the one derived from the other, through his usual practice of substitution. Of course, as noted earlier, Leibniz does assert that the Principle of Sufficient Reason is both innate and confirmed through reason and experience, so the fact that he asserts the innateness of the Principle of the Best does not guarantee that he doubts it can be demonstrated.

If these two principles end up *being* the same, then Leibniz' attempts to avoid necessitarianism are doomed. That is, since the PSR is (arguably) necessary, and “what is best” is (arguably) necessary, then “what God does” (what *is*) is necessary. The sufficient reason for contingent things is supposed to revolve around God's having chosen them for their being best. But if this is no real choice, it seems there is also no real contingency. If God necessarily chooses what is best, can there be any room for human freedom? Can there be room for divine freedom? Here, it seems, is Leibniz's trouble: If *God's choosing the best* and *what is best* are both necessary, then *what God chooses* is necessary. Later in “On Contingency,” Leibniz restates the problem:

Assuming that the proposition “the proposition that has the greater reason for existing [i.e., being true] exists [i.e., is true]” is necessary, we must see whether it then follows that the proposition that has the greater reason for existing [i.e., being true] is necessary. But it is justifiable to deny the consequence. For, if by definition a necessary proposition is one whose truth can be demonstrated with geometrical rigor, then indeed it could be

\(^8\) A negative formulation of the Principle of the Best such as this might be formalized as \(\forall x (\neg Bx \rightarrow \neg Gx)\) according to the scheme I will offer below.
the case that this proposition is demonstrable: “every truth and only a truth has greater reason,” or this: “God always acts with highest wisdom.” But from this one cannot demonstrate the proposition “contingent proposition A has greater reason [for being true]” or “contingent proposition A is in conformity with divine wisdom.” And therefore it does not follow that contingent proposition A is necessary. So, although one can concede that it is necessary for God to choose the best, or that the best is necessary, it does not follow that what is chosen is necessary, since there is no demonstration that it is the best. And here the distinction between necessity of the consequence [necessitas consequentiae] and necessity of the consequent [necessitas consequentis] is in some way relevant; in the end, the proposition in question is a necessity of the consequence, not of the consequent, because it is necessary once we grant the hypothesis that we take it to be the best, assuming that the best is necessarily chosen.9

Here, Leibniz seems to make the following claims:

1. every truth and only a truth has greater reason
2. God always acts with highest wisdom
3. it is necessary for God to choose the best
4. the best is necessary (Necessity of the Best)

Leibniz argues that these do not entail “what is chosen is necessary,” i.e. necessitarianism. Here Leibniz posits that the Principle of Sufficient Reason or the Principle of the Best could be necessary propositions, yet what is chosen could yet maintain its contingency. As Ariew and Garber reconstruct it, the question here is whether the proposition “□(If P is the best then God does P)” entails “if P is the best then □(God does P)”10 If this entailment holds, then Leibniz is forced into necessitarianism. If not, then he may have successfully avoided it, at least on this count. In the next section we will look at his proposed solution.

In Leibniz's scholastic language, the question is whether the necessity of the consequent follows from the necessity of the consequence. Leibniz contends that it does not follow. My

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9 Leibniz, 30.
10 Ibid.
intuitions are mixed on the validity of the inference that Leibniz here denies. It can be said in his favor that all of the most popular systems of modal logic support Leibniz' claim that 
\[ \Box(P \rightarrow Q) \] does not entail \( P \rightarrow \Box Q \), including the strongest common system, S5. All of those popular systems do however hold what is sometimes referred to as the “K axiom,” i.e., that 
\[ \Box(P \rightarrow Q) \] entails \( \Box P \rightarrow \Box Q \). So, if “God does what is best” and “what is best” are both necessary, then it is uncontroversial that, at least according to contemporary understandings of modality, “what God does” is necessary.

If the reader will permit, a change in symbolism may allow for some disambiguation. Shifting to first-order logic, and taking as our predicates \( B \) for “is the best” and \( G \) for “God does,” Ariew and Garber's reconstruction can be reformalized as the concern of whether

\[ \forall x \Box(Bx \rightarrow Gx) \] implies \[ \forall x (Bx \rightarrow \Box Gx) \]. It should be noted that the former figure does not seem to fully represent Leibniz's conception of the Principle of the Best. That is, according to several of his writings, notably his correspondence with Samuel Clarke, when Leibniz writes “God does what is best,” it should be read as “God does all and only that which is best.”

For evidence in support of this account, we can look to Leibniz' argument, in his second letter to Clarke, against Clarke's Newtonian account of the reality of space, wherein Leibniz asserts that “...if space was an absolute being, something would happen for which it would be impossible that there should be a sufficient reason – which is against my axiom. And I prove it thus: Space is something absolutely uniform, and without the things placed in it, one point of space absolutely does not differ in any respect whatsoever from another point of space. Now from this it follows (supposing space to be something in itself, besides the order of bodies among themselves) that it is impossible there should be a reason why God, preserving the same situations of bodies amongst themselves, should have placed them in space after one certain particular manner and not otherwise – why everything was not placed quite the contrary way, for instance, by changing east into west.” Here Leibniz seems committed to the idea that God does not (indeed, perhaps cannot) act in the case of ties or indifferences among possibilities. He also here seems to provide evidence for interpreting the bestness of those things which God chooses as their sufficient reasons. Leibniz is more explicit in his fourth letter, where he states unequivocally that “in absolutely indifferent things there is [no foundation for] choice, and consequently, no election or will, since choice must be founded on some reason or principle... A simple will without any motive is a fiction, not only contrary to God's perfection, but also chimerical and contradictory, inconsistent with the definition of the will...”

∀x □(Bx ↔ Gx), or ∀x □(Bx → Gx) & ∀x □(Gx → Bx). Given the modal distribution rule/K Axiom from above [□(P→Q) entails □P→□Q], we get ∀x (□Bx → □Gx) & ∀x (□Gx → □Bx).

It becomes clear then that, when combined with the necessity of God chooses what is best, the necessity of either what is best or of what is chosen guarantees the necessity of the other. Given that Leibniz's concern here is the preservation of divine free will, he almost certainly would not have conceded the necessity of what is chosen, but it seems worth pointing out that more is on the table than Ariew and Garber are taking into account.

Setting this aside, Leibniz's argument has a further problem. The following passage is at the heart of it:

But from this one cannot demonstrate the proposition “contingent proposition A has greater reason [for being true]” or “contingent proposition A is in conformity with divine wisdom.” And therefore it does not follow that contingent proposition A is necessary. So, although one can concede that it is necessary for God to choose the best, or that the best is necessary, it does not follow that what is chosen is necessary, since there is no demonstration that it is the best.

What does Leibniz mean when he says that “there is no demonstration that it is the best?” Does he mean no demonstration is possible, or simply that it's not extant? If his intention were the latter, he wouldn't be saying much at all. He must, then, mean that such a demonstration is impossible.

Moreover, it's clear at this point that Leibniz is exclusively disjoining, rather than conjoining, the two principles. Is that because he recognizes that the principles, taken together, certainly force him into necessitarianism? As noted above, if both that God chooses the best and what is the best are necessary, then the step to necessitarianism is unavoidable. Therefore, in order to avoid necessitarianism, Leibniz must either deny the necessity of what is the best or God chooses the best. Adams cites a note from the early 1690s, where Leibniz writes:
Or does this follow: ['t]his proposition is necessary: God does the best. Therefore that which God does is necessary'? The inference is not valid. For the conclusion follows the weaker part. But it is not demonstrable that a certain thing is the best, nor, therefore, [can it be demonstrated] what must be done. Or shall we rather say that this proposition too, 'God does the best', is not necessary but only certain? The previous opinion appears to be best, since this proposition: A is the best, is certain, but is not necessary since it cannot be demonstrated.12

Here, Leibniz seems to want to hold onto the necessity of “God does the best.” But it seems that to assert that “what is the best” is certain, but not necessary, is problematic. It complicates Leibniz's modal thinking, creating a realm of “the certain” which is distinct from the possible, the impossible, and the necessary. In several writings he speaks of and even sometimes seems to concede a hypothetical, or moral, necessity of what is best, while maintaining that what is best is still contingent as it is free from metaphysical necessitation. This leaves his system a bit messy, and this conception of contingency seems, at least arguably, trivial. As Adams points out:

> It is emphatically clear in the *Theodicy*, as in the rest of his work, that Leibniz is a compatibilist and a determinist. The solution of the problem of contingency that is most clearly developed in the *Theodicy*, that non-actual things are possible in themselves even if they are not possible in relation to God's will, is one that Leibniz also held, and never abandoned, in his private papers from 1673 on. It is a solution that imposes a minimum of qualification on the necessity of all things.13

This sort of picture, wherein things are possible in themselves but not available even as options to the omnipotent creator of the universe, seems very close to absolute, metaphysical necessitarianism – regardless of the name that it is given.

Leibniz often talks, as he does above, of things as being possible in themselves without regard to their relationship to the divine understanding or the possibility of God's actualizing them. But it seems quite strange to separate the possibility of actualization from Leibniz's


Predicate in Subject Principle or Principle of Conceptual Containment. This is, in effect, the same issue that Bertrand Russell points out when he says that, for Leibniz, “existence is alone among predicates” in not being subject to conceptual containment. But there seems to be a problem in that, while there are, in general, principled grounds for not considering existence to be predicable in a logical sense, it is a strange view to hold in respect of Leibniz's monadism. That is, while the bestness of some possible fact or thing (“fact” and “thing” both here being used in the loosest possible sense) may not be apparent to any human mind or understanding, that it is apparent to the mind of God would seem to indicate that the fact/thing's bestness is, in fact, a part of its complete concept. This seems, then, to lead to the necessity of what is best, in that the existence of anything which is not the best, or the nonexistence of anything which is the best, seem then to entail a contradiction, and thus, not be logically, or metaphysically, possible. Leibniz must have realized this and thus have been led to his “infinite analysis” account of contingency.

But contingency in this sense does not seem to be a compelling limitation on the necessity of the world as it actually is. Adams writes:

We may be tempted to object that the conception of the contingent as that which has some alternative that is possible in itself (if not in relation to God) does not really show how there can be any contingency in the Leibnizian universe, nor how God's choice among possible worlds can be free. For what is contingent in this Leibnizian sense may still be necessary by necessity of the consequent – that is, absolutely necessary – in the traditional (and twentieth century) sense. And God's choice of this world to actualize may be necessitated by His nature as perfectly good, even if other worlds remain possible in themselves. If this is all that Leibniz has to offer in defense of contingency, his system may be thought as necessitarian as Spinoza's.

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15 Adams (1982), 251-52.
While Adams is, in this excerpt, attempting to setup an appeal for greater charity towards Leibniz on this count, more charity here seems, to me, excessive. What Adams here considers a temptation seems to be precisely the way to go. Adams continues, noting that Leibniz was long committed to compatibilism, and pleading that it might be unfair to hold Leibniz to contemporary standards and conceptions of modality. But neither Adams nor Leibniz are unaware that an inch more charity here would be to concede the point to Leibniz. Indeed, elsewhere Adams has questioned Leibniz’s sincerity on this very matter.

In the end, it does not seem that Leibniz can maintain his prior commitments and concurrently hold off necessitarianism – at least not in terms of a contemporary conception of modality. Given the familiar account of Leibniz, relayed by Bertrand Russell and Adams among countless others, as the founder or godparent of contemporary modal logic, it does not seem unfair to examine Leibniz from within this system. Indeed, his entire system might be compromised by the assertion of unnecessary certainties. It does not seem like he has any options with which to hold onto the necessity of “what is best” and “God chooses the best” while avoiding the necessity of “what is chosen.” If, as it seems, this is the case, then Leibniz is certainly mired in necessitarianism, for, if there is no room even for divine freedom, then there must be only one way that the world could be – that is, how it in fact is. Certainly, then, there can be no room in Leibniz’s system for the human free will that he so long sought to protect, if meaningful freedom requires that necessitarianism be false.

Leibniz’s discussions on contingency and possibility were cutting edge at the time of their writing and remain somewhat mysterious today, even to those who study modal logic and metaphysics. That he may, at least in my view, have been mistaken in his reasoning in his attempt to save his antecedent commitments does not significantly damage his reputation as a
revolutionary in the realm of logic. In what follows, I will examine Leibniz’s treatment of the classical laws of thought. If he were to have made serious mistakes in this area, we might then be tempted to reconsider his legacy.
II. PRINCIPLE OF CONTRADICTION

Catherine Wilson, in her article, "Leibniz's Influence on Kant," lays out what she sees as Kant's objections to Leibniz's employment of the Principle of Contradiction – arguably the most fundamental principle in Leibniz's philosophy. According to Wilson, Kant has two main objections to the principle. Wilson's Kant objects that the Principle of Contradiction, as Leibniz uses it, is in one sense too strong a principle and, in another sense, too weak. As Wilson notes, Kant's criticisms of Leibniz regarding the Principle of Contradiction are primarily ontological, rather than logical. That is, they aren't (for the most part) really about the principle at all, but about what Kant views as a somewhat reckless employment of it by Leibniz.

But it is not clear that these Kantian objections are compelling or, indeed, necessarily supportable in the writing of Kant himself. In particular, the passage in Wilson's article which seems, at least to this writer, to imply a Kantian argument against Leibniz's conception of the Principle of Contradiction, based on attraction and repulsion in the natural world, may indeed have just been an example, tossed off by Wilson in support of the idea that Kant might find Leibniz’s use of the principle problematic in light of the behavior of matter in the natural world. That is, the point does not seem to have been made by Kant against Leibniz in the former's writing on natural science. Regardless, such an objection, were it offered, seems to be fatally

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flawed. In this paper, I will look at Leibniz's statements about the Principle of Contradiction in his own texts, explain the objections levelled against it by Wilson's Kant, and then adjudicate the objections. In the end, it seems that the objections, as stated by Wilson and interpreted by me, fail as a threat to Leibniz's principle in itself. That said, there is a meaningful criticism of Leibniz to be made in terms of his use of the principle, which is beyond the scope of this paper.

The Principle of Contradiction was, as noted above, fundamental to Leibniz's thinking, playing a critical role in much of his philosophical argumentation regarding metaphysics, epistemology, and science. In his essay, "Primary Truths," Leibniz gives an indication of his commitment to the principle:

The primary truths are those which assert the same thing of itself or deny the opposite of its opposite. For example, "A is A," "A is not not-A," or "if it is true that A is B, then it is false that A is not B or that A is not-B." Also, "every thing is as it is," "every thing is similar or equal to itself," "nothing is greater or less than itself," and others of this sort. Although they themselves may have their degrees of priority, nonetheless they can all be included under the name 'identities.'

Here, Leibniz seems to lay claim to several related, but arguably distinct principles in one quick passage. First off, he seems to assert two of the three classical laws of thought, i.e., the Law of Contradiction and the Law of Identity. Leibniz does not here seem to assert the third classical law of thought – the Law of Excluded Middle, or "either A or not A."

Regarding the law of identity, Leibniz seems to state it here in several different ways. First, he states that "A is A." This seems straightforward enough. Secondly, when he says that "everything is... equal to itself," it can easily be taken as another statement of A is A, or A = A. But the second half of the phrase "every thing is similar or equal to itself" is interesting.

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That everything is equal to itself seems, as noted, to be just a restatement of the Law of Identity, but the idea that everything is similar to itself could be read as a move by Leibniz toward a formulation of what has become known as Leibniz's Law. Specifically, it could be read as a statement of half of the biconditional that comprises Leibniz's Law as understood in a contemporary context. The conditional he is arguably dealing with here is known as the indiscernibility of identicals. The indiscernibility of identicals holds that, if it is the case that x and y refer to the same thing, then all properties and relations that apply to x apply to y, and vice versa, and also that all properties that do not apply to the one likewise do not apply to the other. Formally, that is, \( \forall xy (x = y \rightarrow \forall F (Fx \leftrightarrow Fy)) \). Moreover, the phrase "nothing is greater or less than itself" could also be read in support of this interpretation, as a negative existential version of the positive universal consequent above. That is, if "nothing is greater or less than itself," then \( \forall xy (x = y \rightarrow \neg \exists F (Fx & \neg Fy)) \).

Leibniz here seems to state the Principle of Contradiction in several ways, namely: "A is not not-A" and "if it is true that A is B, then it is false that A is not B or that A is not-B."

For the sake of clarity, we may address these individually, and formalize them as follows. The former iteration, "A is not not-A", might be treated several ways. For example, we could arguably symbolize it as any of the following: \( A = \neg (\neg A) \), \( A \equiv (\neg A) \), \( A \leftrightarrow (\neg A) \), \( \neg (A = \neg A) \), \( \neg (A \equiv \neg A) \) or \( \neg (A \leftrightarrow \neg A) \). These formalizations seem to be equivalent for our purposes.

Leibniz's second statement of the Principle of Contradiction in this passage is a bit more complicated. Leibniz says "if it is true that A is B, then it is false that A is not B or that A is not-B." We might formalize this statement as: \( (A = B) \rightarrow \neg [(A \neq B) \vee (A = \neg B)] \).

According to this approach, Leibniz is speaking simply of the "is" of identity. But this is perhaps
not an uncontroversial reading. Leibniz could also be construed here as addressing two different senses of "is" – the "is" of identity and the "is" of predication. Such a reading might be contraindicated by the impression that both senses of "is" appear as disjuncts of a single consequent (it is false that A is not B or that A is not-B) from the common antecedent "A is B." That is, in order for such an interpretation to make sense, Leibniz would have to be read as giving a pretty quick treatment to "A is B" which, rather than being read simply as $A = B$, should be read more closely as $(A = B) \lor (Ax \leftrightarrow Bx)$. In this reading, then, the entire construction would be read more accurately as: $[(A = B) \lor (Ax \leftrightarrow Bx)] \rightarrow \neg [(A \neq B) \land (Ax \land \neg Bx)]$.\(^{18}\)

Further, this passage is interesting for the phrase "although they themselves may have their degrees of priority, nonetheless they can all be included under the name 'identities.'" Here Leibniz perhaps concedes that there is no strict equivalency of what he is calling identities, but fails to explain what he does see as the relationship among these principles.

Laurence Horn, in his Stanford Encyclopedia of Philosophy Article on "Contradiction," notes that, elsewhere, Leibniz does affirm the priority of the law of non-contradiction, taking it as an "interdefinable" equivalent of the law of identity, but notes that, for Leibniz, the law of identity would be the "more basic formulation," due to its status as an affirmative rather than a negative proposition. Horn, abbreviating the Principle of Contradiction as 'LNC,' writes:

The role of LNC as the basic, indemonstrable “first principle” is affirmed by Leibniz, for whom LNC is taken as interdefinable with the Law of Identity that states that everything is identical to itself: “Nothing should be taken as first principles but experiences and the axiom of identity or (what is the same thing) contradiction, which is primitive, since otherwise there would be no difference between truth and falsehood, and all investigation would cease at once, if to say yes or no were a matter of indifference” (Leibniz 1696/Langley 1916: 13–14). For Leibniz, everybody—even “barbarians”—must tacitly assume LNC as part of innate knowledge implicitly called upon at every moment, thus demonstrating the insufficiency of Locke's empiricism (ibid., 77)... Leibniz regarded the Law of Identity ($A=A$ or $\forall x \ (x=x)$) as a more basic formulation than the Law of Non-Contradiction because the former is an affirmative principle while the latter, which rules

\[^{18}\text{Upon reflection, Leibniz could also be interpreted as intending (A=B v Ba) \rightarrow \neg(A \neq B & \neg Ba).}\]
out an $A$ which is not an $A$, can only be the most basic of the negative truths. However, Leibniz's assumption that LNC can be derived from the Law of Identity is not generally accepted. Indeed, while the Law of Identity is sometimes reckoned as one of the three indemonstrable principles along with LNC and LEM (the Law of Excluded Middle, discussed in §2), Aristotle does not himself advocate this position.\footnote{19}{Laurence Horn, "Contradiction," in The Stanford Encyclopedia of Philosophy (Spring 2012 Edition), ed. Edward N. Zalta.}

It does seem strange to imagine an attempt to derive any of the three principles from any one of the others. Where, after all, would the resources necessary for any such demonstration come from? All three might be asserted as metalinguistic principles whose justification is self-evident, and without which no other axioms may be proved. But such a move doesn't seem to be called for.

It does seem that Leibniz is wrong in thinking that the Law of Non-Contradiction can be derived from the Law of Identity. Any such derivation would, whether overtly or tacitly, require an appeal to some axiom or principle which itself depends on the LNC. Indeed, without the Principle of Contradiction on board, it is unclear where a meaningful conception of negation might even come from. It does seem, however, that once the Principle of Contradiction has been accepted, and with it a useful conception of negation, the third classical law of thought, the law of excluded middle, can be proven.

The Law of Non-Contradiction seems to warrant the use of several other principle without too much mental or logical contortion. First, the LNC strongly implies the legitimacy of \textit{reductio ad absurdum}. That is, if we know that $\sim (A \& \sim A)$ must be the case, then, that any assumption from which $A \& \sim A$ can be derived must be false is obvious. Likewise, the Principle

\footnote{20}{Horn continues with this amusing digression: "This did not stop the city of Berkeley, California from considering a petition drive to raise the principle that “every entity shall be identical to itself” to the status of statutory law, with violators (“any entity caught being unidentical to itself”) being subject to a fine of up to one tenth of a cent, although the attempt was ultimately unsuccessful. This may be seen as confirming that the Law of Identity is not a basic principle; after all, LNC and LEM advocates can retort, “Petition drive? We don't need no stinkin' petition drive!”}
of Contradiction seems to legitimize the introduction and elimination of double negations.

Indeed, in Leibniz's first formulation of the principle, "A is not not-A," he seems to explicitly endorse addition and removal of double negations himself.\(^{21}\) With the Principles of Identity and Non-Contradiction on board, as well as their derivatives in the form of negation, double negation and *reductio*, the only other logical tools required for a proof of the Law of Excluded Middle are those that allow for the conjunction of two or more established premises and for disjunctions from one established premise. If we allow for the moment that these rules are uncontroversial,\(^{22}\) a proof of the law of non-contradiction could then be given as follows:

1. \(~ (A \lor \sim A)\) Assumption for reductio
2. \(A\) Assumption for reductio
3. \(A \lor \sim A\) Disjunction Introduction (2)
4. \((A \lor \sim A) \land \sim (A \lor \sim A)\) Conjunction Introduction (1, 3)
5. \(\sim A\) Reductio (2, 4)
6. \(A \lor \sim A\) Disjunction Introduction (5)
7. \((A \lor \sim A) \land \sim (A \lor \sim A)\) Conjunction Introduction (1, 6)
8. \(\sim \sim (A \lor \sim A)\) Reductio (1, 7)
9. \(A \lor \sim A\) Double Negation Elimination (8)\(^{23}\)

\(^{21}\) It could be argued that "A is not not-A" should be read as a statement of the Principle of Identity, rather than the Principle of Contradiction, in which case the principle of double negation seems more directly to be coming from the former. But, as noted above, it seems to me that the Principle of Contradiction is itself necessary for a meaningful conception of negation. This seems to highlight the interrelatedness of the principles and gives some clue as to why Leibniz might have thought of them as being interdefinable.

\(^{22}\) This is likely easier in the case of conjunction than disjunction. It is my experience that many people find the standard introduction of disjunction rule overly permissive and disagreeable, though I do not, for the most part, share these worries.

\(^{23}\) Thanks to Professor Neil Manson for this proof strategy.
It seems then, that Leibniz's primary truths can, indeed, get much of the logical system off the ground. He seems right to focus on the Principles of Non-Contradiction and Identity as the foundation, as the third classical law seems to follow neatly from them. But as to the assertion that the first two are identical or derivable one from the other, he seems to me to be mistaken.

Wilson, in her article "Leibniz's influence on Kant," lays out two primary Kantian objections to Leibniz's use of the Law of Non-Contradiction. The principle is, according to Wilson's Kant, in one sense too strong and in another sense too weak. I will refer to these objections as the "too weak objection" and the "too strong objection."

The too weak objection asserts that the Principle of Contradiction "is too weak to ban nonentities from theories" and leads to “fictitious forces fabricated at will, which, not finding any obstacle in the principle of contradiction are poured forth in multitudes by those of speculative mind" such as Leibniz. For a more informative look, we can go to a passage from the Inaugural Dissertation, where Kant writes:

As for the latter spurious axiom, ["whatever is impossible contradicts itself,"] it originates from a rash conversion of the principle of contradiction. For to this primitive judgment the concept of time adheres to the extent that contradictorily opposed data being given at the same time in the same thing, the impossibility is plain, which is enounced thus: whatever simultaneously is and is not, is impossible. Here, as the intellect predicates something in a case given according to sensual laws, the judgment is perfectly true and obvious. On the contrary, converting this axiom, saying: whatever is impossible is and is not at the same time, or involves a contradiction, we predicate through sensual knowledge something concerning the object of reason generally, thus subjecting the intellectual conception of the possible and the impossible to the conditions of sensual knowledge, namely, to the relations of time; which certainly is true enough of the laws restricting and limiting the human intellect, but cannot be conceded objectively and generally by any means. Of course, our intellect perceives no impossibility except where

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24 Immanuel Kant, Inaugural Dissertation (1770), Section 28.

25 Wilson.

26 Kant's example here, or conversion of the axiom, that "whatever is impossible is and is not at the same time," is quite strange. Though qualified with "or involves a contradiction [emphasis mine]," the idea that Kant seems to imply here that impossibility in this sense entails (at least sometimes, perhaps?), somehow, an ontological contradiction is bizarre.
it can note the simultaneous enunciation of opposites concerning the same thing, that is, only where contradiction occurs. Wherever, therefore, this contradiction does not occur, there is no room for the judgment of impossibility by the human intellect. But that on this account it should be open to no intellect whatever, and hence that what does not involve contradiction is therefore possible, is concluded rashly by taking the subjective conditions of judgment for objective ones. It is for this reason that a host of fictitious forces, gotten up ad libitum, bursts, in the absence of self-contradiction, from any constructive, or, if you prefer, from every chimerical mind. For as a force is nothing but a relation of a substance a to something else b, an accident, as of a reason to the consequence, the possibility of any force does not rest in the identity of the cause and the effect, or the substance and the accident, and hence even the impossibility of forces made up falsely does not depend solely on contradiction. Therefore it is not permissible to assume as possible any original force unless the force be given by experience. Neither can the possibility be conceived a priori by any perspicacity of the intellect.27

There's a lot going on here, so I will attempt to unpack it a bit. Kant seems to be arguing that any proposition that would simultaneously be the case and not be the case, is impossible – at least in terms of the phenomenal realm and within the boundaries of the human intellect. Contradiction, as we understand it, is dependent upon time, which is merely a construction of the intellect or a necessary way for humans to make sense of the world. But to reason from this principle that all impossibility must entail such a contradiction is to force the habits and structures of sensory knowledge onto the objective realm of things as they are. Moreover, and more to the point of the too weak objection, we may only perceive contradictions in the world as we can perceive the world. That the human intellect fails to detect a contradiction in the sensible world sheds no light, for Kant, on the possibility of a proposition in the noumenal realm. And the lack of a perceivable contradiction, then, certainly gives no warrant for belief in the possibility (much less the actuality) of some relation not "given by experience."

Kant does seem to be on to something here. Given our limited epistemic view of the world, it could very well be the case that a great many things that seem intuitively possible are not. But this objection seems, at most, to merely qualify our conception of possibility. Given

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27 Kant, Section 28.
Kant's view of our epistemic limits with regard to the world as it is, such a qualification on our conception of possibility would seem to be the same qualification Kant would attach to all of our so-called knowledge. Moreover, Kant – at least Wilson's Kant – seems to fault the principle when it is really Leibniz's arguably reckless deployment of it that he finds fault with.

In Leibniz's own discussions of the Principle of Contradiction, it does not seem like he claims that such things as are non-contradictory necessarily exist, but rather that they are possibilities. There is no explicit contradiction, for example, in my being seven feet tall, or in the existence of unicorns, but it does not follow that, as a result of Leibniz' statement of the Principle of Contradiction, that he is committed to my seven-foot-tallness or to the ontological reality of unicorns. This variety of argument, which makes a move from conceivability to existence, is intuitively repulsive to me, and I would side with Kant in denouncing it. Given the admittedly strange character of Leibniz's metaphysical system as a whole, it would be less than surprising were a thorough investigation of Leibniz's writings to reveal many such abuses of the principle. As noted above, such an exploration is beyond the scope of this paper.

The second objection leveled by Wilson's Kant against Leibniz on the Principle of Contradiction is the too strong objection. The too strong objection asserts that, by accepting the principle, Leibniz "underrepresent[s] the extent of conflict in the world and its constructive aspects." Kant, she says:

...insists that opposing forces, "hindering and counteracting processes [,]" operate ceaselessly in nature and in history. The opposition of attractive and repulsive forces in physics produces the phenomena of matter... and "the opposition of good and evil principles in the human soul produces morality." 28

But Kant's objection to the principle on these grounds, at least as reconstructed by Wilson, seem less than compelling.

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28 Wilson.
Here, Kant (as interpreted by Wilson) seems to misconstrue the nature of negation, and to conflate it with another, not necessarily related conception of 'opposite.' This is particularly clear with regards to his example that "the opposition of attractive and repulsive forces in physics produces the phenomena of matter." He seems to think that simultaneous attraction and repulsion would be ruled out by Leibniz's Principle of Contradiction, but this seems wrong. That is, Wilson's Kant seems to confuse attraction and repulsion as being opposites in a logical sense that doesn't seem supportable.

It can be conceded that there is plainly a sense in which attraction and repulsion are opposites, but the sense in which this is the case is not negation at all. Attraction and repulsion are not opposites in the logical sense necessary to make such an argument work. The supposed argument is really that $A$ and $R$ seem to be opposites and, since it is the case that $A \& R$, it must not be the case that necessarily $\neg(P \& \neg P)$. But it is not the case that $\neg A = R$. Rather, I think the opposite of "attraction is happening" is "it is not the case that attraction is happening," so when Wilson's Kant thinks he's shown that matter would require $(A \& \neg A)$, and violate the principle, he's really only showing that $A \& R$, but as it isn't the case that $(R = \neg A)$, he hasn't shown anything at all. Thus, the argument from Wilson's Kant is unconvincing. This seems especially egregious in relation to Kant's argument from incongruent counterparts, where he obviously recognizes that "opposites" are possible in a sense that is certainly not reducible to $(P \& \neg P)$. Thus, if Kant himself, or Kant on Wilson's interpretation, are to be read as making such an argument, it seems to fail.

According to my reading of Catherine Wilson's article, there are two primary Kantian objections to Leibniz regarding the Principle of Contradiction – the too weak objection and the

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29 Kant, Section 28.
too strong objection. The too weak objection does, in fact, point out that the limitations of human sensory experience and our lack of epistemic access to the noumenal realm should incline us to be wary of ascribing possibility simply on the absence of perceived contradiction. That is, there may be impossibility that lies beyond the reach of our intellect. Moreover, absence of perceived contradiction should certainly not be construed as positive evidence for the actuality of a claim. Regarding the too strong objection, Wilson's interpretation of Kant seems misguided, at least in as much as the example of simultaneous attraction and repulsion of matter is manifested in the physical world is intended as evidence against Leibniz with regard to the Law of Non-Contradiction. In the end, while Kant makes a good point in that we should to some extent qualify our thinking regarding the link between an apparent lack of contradiction and our notion of possibility, and while Leibniz's logical inferences in this regard could use some policing in the form of a thorough analysis, the Wilsonian Kant does little to challenge the Principle of Contradiction itself. Rather, we are left with a justifiable warning regarding the principle's potential for abuse.
CONCLUSION

While the originality of Leibniz’s logical thinking cannot be doubted, his work in this area was far from flawless. Indeed, he seems to have failed in one of his main, lifelong goals – namely, at providing an account of contingency which would allow for God to necessarily create all and only what is best while maintaining His freedom in some important sense. That the KAxiom was unavailable to Leibniz seems not to be the sort of thing for which he ought to be held accountable, but it seems right for us to be critical of his attempts to create ad hoc a modal category of the certain but metaphysically contingent for the purposes of maintaining consistency among his beliefs. Likewise, while his fundamental principles of logic and reasoning seem indubitable to all but the most fashionable of Australians, he could certainly have been more careful in deploying the Law of Contradiction. Kant, it seems, is correct in his assessment that our human inability to detect contradiction ought to ward us away from ascribing possibility to those things that very well may not be possible on closer reflection. That said, Kant could have handled Leibniz a bit more charitably in places, lest he come close to absurdity himself.
LIST OF REFERENCES


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