The Subtraction Argument(s)

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ABSTRACT

The subtraction argument aims to show that there is an empty world, in the sense of a possible world with no concrete objects. The argument has been endorsed by several philosophers. I show that there are currently two versions of the argument around, and that only one of them is valid. I then sketch the main problem for the valid version of the argument.

The subtraction argument aims to establish that there is an empty world, in the sense of a possible world with no concrete objects. It was first put forward in the recent literature by Baldwin (1996) and refined in Rodriguez-Pereyra (1997).[1] In Paseau (2002) I complained that the argument is invalid; Lowe (2002) also offers some objections to it. These criticisms, however, seem to have encouraged rather than discouraged the opposition: Rodriguez-Pereyra (2002) responds to both these articles; Efird & Stoneham (2003) endorse a reformulation of the argument; Coggins (2003) takes a favourable view of the argument and considers its consequences for various metaphysics of modality; and Armstrong (2004, pp. 90-91) apparently also finds it attractive.[2]

Its recent popularity aside, the subtraction argument is of considerable importance for metaphysics. If the question 'Why is there anything at all?' is indeed the—or at least *a*—fundamental question of metaphysics, establishing that there could have been nothing blocks the response that there *must* have been something. Similarly, if the subtraction argument is sound, the existence of an empty world acts as an

[1] A proto-version of the subtraction argument can be found in Armstrong (1989, p. 24).

[2] More precisely: Armstrong says that he finds the contradictory of the subtraction thesis unattractive, citing Rodriguez-Pereyra (1997) in support. Amstrong (2004, p. 91) also gives a brief truthmaking argument in favour of the possibility of an empty world.

important constraint on a metaphysics of modality.[3] My aim here is to show that there are currently two versions of the argument around, and to sketch what I take to be the main problem for its only valid version, *viz*. that it does not provide an independent and suasive route to its conclusion.

To keep the focus on the key issues of validity and suasiveness, several subsidiary issues will be left unaddressed. In particular, I shall not consider whether the argument's conclusion has the same significance as the intuitive claim that there might have been nothing. Since the argument's proponents argue that spacetime points are not concrete,[4] they leave it open that an empty world could be a world containing nothing other than an infinite spacetime. But the conclusion that there could be an unoccupied spacetime is prima facie different from the claim that there could be nothing. I also limit myself to assessing the official, regimented versions of the argument rather than venturing upon an extensive reconstruction of the ideas or metaphors that inspire it. Since its proponents have taken pains to present the argument in regimented form, refining it as the need has arisen, it seems fair to focus attention on the given regimentations. In any case, as we shall see, the idea driving the argument is adequately captured by the latter of its two versions.

1. The Validity Debate

Rodriguez-Pereyra's version of the argument, which refines that of Baldwin (1996), has the following premises (1997, p. 164):

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[3] Several well known metaphysics of modality in fact deny the possibility of there being nothing; for example Lewis (1986, pp. 73-4) and Armstrong (1989, pp. 24-5 & 63-4). (Note that Armstrong (2004, pp. 89-91) represents a change of view in this respect, albeit a tentative one.)

[4] Baldwin (1996, p. 233) and Rodriguez-Pereyra (1997, pp. 164-5).

(A1*) There might be a world with a finite domain of concrete* objects.

(A2*) These objects are, each of them, things which might not exist.

(A3*) The non-existence of any one of these things does not necessitate the existence of any other such things.

A concrete* entity is concrete, has no members (i.e. is not a set or a class), and is a maximal occupant of a connected region.[5] Following Baldwin, Rodriguez-Pereyra then reasons as follows for the conclusion that there is an empty world:

> We start from a possible world w_1, accessible from the actual one, with a finite domain of concrete* objects, and then, after picking any of its concrete* members x_1, we remove it completely, i.e. we remove x_1 and *all* its parts, and pass to a possible world w_2 exactly like w_1, except that x_1 has been removed completely. Thus w_2 lacks not only x_1 and its parts, but also anything whose non-existence is implied by that of x_1. We repeat this procedure until we arrive at a world w_{nil} in which there are no concrete* objects. (1997, p. 164)

The idea is that we start from a world with only finitely many concrete* entities, and then so to speak remove them (and all their parts) one by one to obtain an empty world.[6]

In my earlier note (Paseau 2002), I argued that there are two readings of (A3*). Let us label the finitely many concrete* entities of which the first two premises speak x_1 to x_n. On the first of my suggested readings, the non-existence of any one of the x_i does not necessitate the existence of any other given one of these x_i nor, more

[5] Rodriguez-Pereyra's reasons for recasting Baldwin's argument using the notion of a concrete* rather than a concrete entity are given in his (1997). Although these reasons are controversial, I present Rodriguez-Pereyra's version rather than Baldwin's, since I shall be discussing Rodriguez-Pereyra's response to the criticisms in my (2002). My points below apply to both versions.

[6] Talk of 'subtraction', 'removal', etc., is obviously metaphorical and easily eliminated, as we will shortly see.

generally, the existence of any other concrete* object *o*. This first reading may thus be formalised as follows in a possible worlds logic:[7]

(α) $\forall x_i \forall o \exists w[\neg(x_i \text{ exists in } w) \wedge \neg(o \text{ exists in } w)]$

On the second reading I suggested, the non-existence of any one of the x_i does not necessitate that there is even one of the x_i, which is equivalent to there being a world containing none of the x_i. So the second reading may be formalised as:

(β) $\exists w \forall x_i[\neg(x_i \text{ exists in } w)]$

I then proceeded to argue that the subtraction argument is invalid on either reading (α) or (β) of (A3*) by producing a simple countermodel for it. In this model, all the premises of the argument are true (with the third premise taken as either (α) or (β)), but the conclusion is false.[8] My conclusion was therefore that the subtraction argument whose third premise is read as either (α) or (β) is invalid.

Rodriguez-Pereyra does not question the invalidity of the argument with (α) or (β) as its third premise. He replies instead that I overlooked the intended reading of (A3*):

> [Paseau] distinguishes two readings of the third premiss and shows that on either reading the argument does not come out valid. But neither of those is the intended reading. On the intended reading premiss (A3*) says that the non-existence of each of those concreta* does not necessitate the existence of any

[7] Perhaps more literal would be the equivalent '$\forall x_i \neg\exists o \forall w[\neg(x_i \text{ exists in } w) \rightarrow (o \text{ exists in } w)]$'.
[8] See my (2002) or footnote 13 below for details of the simple model.

> other concreta*, not merely that of the concreta* of which the first two premisses speak. This reading makes the argument valid. (2002, p. 172)[9]

This criticism is demonstrably off the mark, since in my reading (α) I explicitly considered the case in which the non-existence of the x_i does not necessitate the existence of any other concreta* whatsoever (witness the quantification over an arbitrary object *o*), and not merely of the x_i themselves (the concreta* of which the first two premises speak). Indeed I wrote:

> And, as the counterexample also shows, the argument is invalid even if we understand (A3*) as stating that the non-existence of any one of the x_i does not necessitate the existence of any other concrete* object whatsoever (and not just any other one of the x_i). (2002, p. 74)

And in the next sentence I put the point informally as follows:

> Informally, the reason for the invalidity is that any of the x_i and any other object might have both jointly failed to exist without there being a null world. (2002, p. 74)

Thus the reading Rodriguez-Pereyra claims that I overlooked is considered *verbatim* in my article.[10] In any case, setting this aside, immediately following this passage Rodriguez-Pereyra proceeds to offer a possible worlds gloss on what he claims was his intended understanding of (A3*). His gloss is as follows (w_1 here being the world containing the finitely many x_i):

[9] In a footnote to this passage, Rodriguez-Pereyra suggests that Baldwin also intended this kind of reading.

[10] I first gave the restricted version of this reading before following it up explicitly with the more general reading formalised here because the expression ‘any other such things’ in (A3*) could conceivably be read as referring back to the x_i—but not necessarily, as I noted.

> ...for all worlds w and for all the concreta* x_i in w_1, if x_i exists in w then if there is a world w^* where x_i does not exist, then there is a world w^{**} where the only existing concreta* are those of w except x_i (i.e. w^{**} is such that for every concrete* object y, y exists in w^{**} if and only if $y \neq x_i$ and y exists in w). (2002, p. 172)

The formalisation of this gloss (taking it as understood that the x_i are in w_1) is:

(γ) $\forall w \forall x_i[x_i \text{ exists in } w \rightarrow \{\exists w^*(\neg(x_i \text{ exists in } w^*)) \rightarrow \exists w^{**} \forall y(y \text{ exists in } w^{**} \leftrightarrow y \neq x_i \wedge y \text{ exists in } w)\}]$

That is to say: if x_i is a contingent concrete* entity in w then there is a world w^{**} which contains all the entities in w apart from x_i. In other words, (γ) states that we can subtract a contingent concretum* x_i from any world containing it.

Now there is an immediate discrepancy between (A3*) and Rodriguez-Pereyra's possible worlds gloss on it, which he claims was the intended reading of (A3*). Observe that the contingency condition (γ) places on x_i—that x_i can be subtracted from any world w if there is a world w^* in which x_i does not exist—does not appear in (A3*). And in fact, as we will see in the next section, (A3*) (or equally Baldwin's (A3)) simply cannot be glossed as (γ) or any similar principle. Before we turn to that, note that the version of the subtraction argument whose premises are possible worlds formulations of (A1*) and (A2*) together with (γ) is valid, as is easily verified. In sum, Rodriguez-Pereyra's reply to the invalidity objection is that the argument with the third premise (A3*) spelled out as (α) or (β) may well be invalid, but that (γ) is the correct interpretation of this premise, and that on this interpretation, the argument is valid—and indeed sound.

2. Two Subtraction Arguments

The *original* subtraction argument consisted of premises (A1*), (A2*), and (A3*) (or (A1)-(A3) in Baldwin's version). The *new* subtraction argument, in contrast, consists of premises (A1*), (A2*), and (γ).[11] To show that this terminology is warranted and that the two arguments are indeed distinct, it suffices to show that (γ) is *not* a permissible reading of (A3*), despite what Rodriguez-Pereyra maintains. Once this is established, we shall examine the new subtraction argument in the next section. The reason for focusing on the new argument once it has been shown distinct from the original one is that it is the only one of the two that is valid, as Rodriguez-Pereyra now recognises.

I claim that any permissible interpretation of (A3*) in a possible worlds logic must have an existential quantifier as its leading world quantifier. If this is right, it follows that (γ) is not a valid reading of (A3*), since the leading world quantifier in (γ) is universal rather than existential. Now recall (A3*)'s statement:

> The non-existence of any one of these things does not necessitate the existence of any other such things.

This statement contains two occurrences of 'any', whose standard logical translation is as a quantifier (e.g. 'If any politician lies, he is dismissed from office'). The standard reading of 'any' clearly applies here, since we are quantifying over 'one of these things' in the first part of the sentence and over 'other such things' in the second. Maintaining neutrality on the kinds of quantifier in question, let us represent

[11] Or, if you prefer, it consists of (γ) and possible worlds formalisations of (A1*) and (A2*); the distinctness of (γ) and (A3*) does not lie in the fact that one is a formal and the other an informal statement.

the first quantifier as ‘Q’ and the second as ‘Q^*’. Our only interpretative choices are thus whether to give the first and second quantifiers, corresponding to ‘any one of these things’ and ‘any other such things’, narrow or wide scope respectively, and which one to give wider scope to when they both have wide scope. So the five in-principle-possible types of readings of (A3*) are:

(NN) $[(Qx_i)(\ldots x_i \ldots)]$ does not necessitate $[(Q^*o)(\_\_ \; o \; \_\_)]$

(WN) $(Qx_i)[(\ldots x_i \ldots)$ does not necessitate $(Q^*o)(\_\_ \; o \; \_\_)]$

(NW) $(Q^*o)[(Qx_i)(\ldots x_i \ldots)$ does not necessitate $(\_\_ \; o \; \_\_)]$

(WW1) $(Qx_i)(Q^*o)[(\ldots x_i \ldots)$ does not necessitate $(\_\_ \; o \; \_\_)]$

(WW2) $(Q^*o)(Qx_i)[(\ldots x_i \ldots)$ does not necessitate $(\_\_ \; o \; \_\_)]$

Now the formula

A does not necessitate B

is equivalent to:

not-[A necessitates B]

Interpreting necessitation in terms of universal quantification over possible worlds and conditionalisation, as standard, results in:

not-[$\forall w(A$ holds at $w \rightarrow B$ holds at $w)$]

Now notice that each of (NN), (WN), (NW), (WW1) and (WW2) contains a formula of the form ‘A does not necessitate B’, so that these five in-principle-possible readings of (A3*) take the form:

(NN) $\neg(\forall w)[(Qx_i)(\ldots x_i \ldots) \to (Q^*o)(\_\_\ o\ \_\_)]$

(WN) $(Qx_i)(\neg\forall w)[(\ldots x_i \ldots) \to (Q^*o)(\_\_\ o\ \_\_)]$

(NW) $(Q^*o)(\neg\forall w)[(Qx_i)(\ldots x_i \ldots) \to (\_\_\ o\ \_\_)]$

(WW1) $(Qx_i)(Q^*o)(\neg\forall w)[(\ldots x_i \ldots) \to (\_\_o\_\_)]$

(WW2) $(Q^*o)(Qx_i)(\neg\forall w)[(\ldots x_i \ldots) \to (\_\_o\_\_)]$

Hence any permissible interpretation of (A3*) must have a negated universal, or equivalently an existential, quantifier as its leading world quantifier. The equivalence, of course, follows from the fact that statements of the form '…¬∀*w*(…)' are logically equivalent to those of the form '…∃*w*¬(…)'. This shows that the leading world quantifier of any admissible possible world interpretation of (A3*) cannot be universal, whichever of the interpretative options one takes. Interpretation (γ), however, does have this form: its leading world quantifier *is* universal. Thus (γ) does not meet this necessary condition on a permissible possible worlds interpretation of (A3*), and so is not a permissible interpretation of that premise. In contrast, readings (α) and (β) both have this form, and hence meet this necessary (but not sufficient) condition.[12]

We now also see why (γ) is a very strong premise. The claim that *any* world containing any of the (contingent) x_i has the subtraction property (with respect to x_i)—principle (γ)—is obviously much stronger than the claim that *some* world has it. It is certainly much stronger than the existential claim embodied in (A3*) (be it cashed out as either (α) or (β)), which in possible worlds terms requires only that a *single* world have the stated property. That is essentially why the new subtraction argument (but

[12] (α) is an interpretation of type (WW) and (β) is equivalent to an interpretation of type (NN).

not the original one) is valid.[13] In response to the objection that the original argument with premises (A1*), (A2*) and (A3*) was invalid, Rodriguez-Pereyra claimed that (γ) was the correct—and intended—formalisation of (A3*). As we have just seen, however, this is not tenable. The original argument *was* invalid, even if the new one is valid.

You might think that this issue about exactly how to interpret (A3*) is trifling. Not so. The difference between the interpretations is crucial given that the informal reasoning for the conclusion that there is an empty world (see the quotation from Rodriguez-Pereyra at the start of section 1) uses an assumption that is much stronger than the official premise. A proponent of the argument who declares (A3*) as his official premise and then uses (γ) in reasoning for his conclusion will have pulled the wool over our eyes if (A3*)'s plausibility is much greater than that of (γ), as is apparently the case. Indeed, I suggest that this is the reason so many people have been taken in by the subtraction argument. Its official premises (A1*)-(A3*) (or (A1)-(A3) in Baldwin's version) seem acceptable, and its proponents' informal talk of how a 'subtraction' process gets us from the premises to the conclusion seems valid. But this

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[13] In the presence of (A1*) and (A2*), principle (γ) implies both (α) and (β) since it entails the existence of an empty world, which provides an instance for the existential world claims made in (α) and (β). That neither (α) nor (β) entails (γ), and thus that (γ) is strictly stronger than either (or both) of them in the presence of (A1*) and (A2*), follows from the fact that, even in conjunction with (A1*) and (A2*), (α) and (β) have a model in which there is no empty world. The model in my (2002), for instance, serves as a model in which both (α) and (β) but not (γ) are true; the members of its domain are: $\{x_1\}$, $\{x_2\}$, $\{o\}$, $\{x_1, x_2\}$, $\{x_1, o\}$, $\{x_2, o\}$, $\{x_1, x_2, o\}$. Note also that readings (α) and (β) do not even guarantee the existence of a world with a single concrete object. Someone might therefore object that however (A3*) is read, it must be read in such a way that it guarantees at least the existence of one-object worlds, if not a null world. However, this would be to confuse the official regimentation of the argument with its proponents' rhetoric. My point is precisely that the argument has seemed suasive because of a mismatch between the two, as I explain in the next paragraph. That (A3*) does not even guarantee the existence of a one-concretum* world serves as a further illustration of the gulf between the argument's official premises and its accompanying rhetoric.

informal talk of subtraction in fact helps itself to a premise that is much stronger, and prima facie far less plausible, than any of the official ones—namely, principle (γ). This is why we need to be literal-minded and on our guard about what exactly is being assumed when presented with versions of the argument.

3. The New Subtraction Argument

The first half of this article has shown that the original version of the argument was invalid, and that it cannot be interpreted as the new (and this time valid) argument. I now want to sketch what I think is the main obstacle for the new version of the subtraction argument. The obstacle, I believe, is that the new argument does not provide an independent route to the conclusion that there is an empty world.

If the new subtraction argument is to be suasive, anyone who doubts or is open-minded about the existence of an empty world must be capable of being persuaded of (γ), or some other principle along these lines. Let us call any principle such as (γ) that allows each of the x_i to be subtracted from any world in which it appears (perhaps given some further conditions, e.g. contingency of the x_i) a *subtraction thesis*. Putting the discussion in terms of a subtraction thesis rather one of its specific versions, such as (γ), allows us to generalise over all the versions of the new subtraction argument.[14] Now the weaker claim that we can subtract a (contingent) concretum* (or at least one of the x_i) from any world containing at least two concreta* seems fairly plausible. Let us grant it for the sake of argument. How do we get from this claim to the stronger claim expressed by a subtraction thesis?

[14] But the reader is welcome to understand the general notion of a 'subtraction thesis' as (γ) itself if that aids comprehension.

One might posit analogies. For instance, Armstrong mentions the analogy of the army and its soldiers: the army could have lacked any given soldier and still existed, but it could not have lacked all of them and still existed.[15] Analogously, if a possible world cannot have its last concretum* subtracted and still remain a possible world, the subtraction thesis is false. If, however, a possible world is like a room, which could be emptied of its occupants without ceasing to exist, then the thesis is true. The hard work, of course, goes into showing which analogy is the more appropriate of the two. Evidently, then, the analogising approach is limited by its nature, precisely because it is always open to ask of any given analogy whether it is really appropriate or not. A purely analogising approach is incapable of offering a short-cut to the desired conclusion.

Baldwin (1996, pp. 235-7) also considers some analogies in favour of a subtraction thesis—thinking it is captured by his (A3)—but thinks that they all fail. His only positive reason for the thesis—he concedes that “it is not, however, easy to think of a direct argument for this premiss” (1996, p. 235)—is that “the abstract conception of a possibility does appear to permit a possibility which is not a possibility of, or for, anything—namely the possibility that there be nothing at all.” (1996, p. 236). This reason, however, obviously restates what is to be proved rather than proving it, and therefore provides no justification for the subtraction thesis. Rodriguez-Pereyra (1997, p. 161) endorses Baldwin’s discussion on this point more or less without comment, which again takes us no further. Can the proponent of the subtraction argument do any better?

The most promising approach, it seems, is to argue that the plausibility of the weaker claim that many-concreta* worlds have the subtraction property lends support

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[15] Assume that we can tell the story in such a way that it is uncontroversial that the army no longer exists when all its soldiers have disbanded.

to the subtraction thesis. The idea is that anyone who rejects the subtraction thesis or is agnostic about it must explain why, if worlds with two or more concreta* have the subtraction property, one-concretum* worlds are, or might be, different. A suggestion for the principle underlying this explanatory pressure might thus be:[16]

(P1) If one thinks that a principle is true in most cases, but might have some exceptions, one incurs the burden of explaining why these cases might be exceptional.

Now (P1) cannot be right, since it places an unreasonable burden on intellectual caution. Suppose I have reliably observed the voting behaviour of most British women, the exception being Scots. I therefore have good reason to believe that British women, with the possible Scotch exceptions, vote Labour. Since I don’t like to stick my neck out and speculate on matters about which I am ignorant, I make no claims about the politics of Scottish women. Have I thereby incurred an explanatory burden? I think not. I am, after all, merely displaying due intellectual caution. Only if I categorically judged that Scottish women do *not* vote Labour would I presumably incur an explanatory or justificatory burden for so thinking. One might accordingly suggest that what is needed instead of (P1) is the following:

(P2) If one thinks that a principle is true in most cases, but false in some others, one incurs the burden of explaining why these cases are exceptional.

[16] I am indebted here to correspondence with David Efird and Tom Stoneham, who suggested that a principle along these lines might underpin (one version of) the subtraction thesis. Note that the ‘might’ in principles (P1) and (P3) expresses a form of epistemic possibility.

Whether or not (P2) is acceptable, however, it cannot be wielded against someone who is agnostic about whether one-concretum* worlds have the subtraction property. If (P2) is acceptable, perhaps the most that follows is that anyone who is disposed to *deny* the subtraction thesis, as opposed to being agnostic about it, faces a burden of proof. This suggests that to maintain some hope of converting the agnostic we need:

(P3) If one thinks that a principle is true in most cases, but might have some exceptions in relevantly similar cases to the ones for which it is true, one incurs the burden of explaining why these cases might be exceptional.

It might be objected that (P3) is too strong for the same reason as (P1): the explanatory burden it places on intellectual caution is undeserved. But even if we grant (P3), it is clear that the debate will now shift to the question of whether one-concretum* worlds are relevantly similar to many-concreta* worlds. Anyone who is at least agnostic about the subtraction thesis, you might think, will be inclined to see a strikingly relevant difference when it comes to subtraction between worlds with just one concretum* and worlds with at least two concreta*. Having just one entity as opposed to having more than one seems to be a highly relevant distinction for whether we can subtract something from a world and still be left with a world. For what it is worth, my own intuitions on the question of whether one can subtract its only concretum* from a one-concretum* world are none other than my intuitions about whether there is an empty world. If that is true more generally, the new subtraction argument cannot be suasive. It will lack the capacity to sway anyone who is agnostic on the issue of whether one-concretum* worlds have the subtraction property. The reason is that a subtraction premise will have no source of plausibility independent of the existence of an empty world, or at least no source that does not itself directly motivate the existence of an empty world. It seems, then, that the new version of the subtraction argument is unpersuasive to the agnostic and redundant for anyone who might find its third premise acceptable.

Let me illustrate and further strengthen this point by explaining what a typical relationalist and substantivalist about spacetime will think of the new argument. A relationalist—roughly someone who thinks of spacetime as an abstraction from geometric relations between bodies—might well accept that we can subtract a (contingent) concretum* from any world containing at least two concreta*. Lacking any further motivation or antecedent reasons for it, however, the typical relationalist will balk at, or at least question, the idea that the subtraction thesis can be generalised to cover one-concretum* worlds. What he will want to know is precisely why this generalisation to the much more controversial case is acceptable. By contrast, a substantivalist, who maintains roughly that spacetime has an existence independent of any object occupying it, will be inclined to accept the (metaphysical) possibility of a world devoid of concrete objects and containing only spacetime points (recall that this would count as an empty world in Baldwin's and Rodriguez-Pereyra's sense), and will concomitantly be inclined to accept a subtraction thesis. But on this view, the subtraction argument's premises and conclusion all fall out of the background metaphysics itself. The plausibility of the argument's premises stems from a substantivalist conception of spacetime, and this conception itself suffices to establish the existence of an empty world directly. Thus for the substantivalist just as for the relationalist, the subtraction argument apparently fails to provide an independent justificatory route to the existence of an empty world.

4. Conclusion

The subtraction argument, as originally stated, is invalid. The new subtraction argument (replacing (A3*) with (γ), or some similar principle) is valid, but apparently at the cost of independent plausibility to its third premise. If the argument is to be effective, the locus of the debate will be over whether one can be convinced that one-concretum* worlds have the subtraction property independently of being convinced of the existence of an empty world, or of some background conception that motivates both directly. The way to settle that debate might be to find a principle along the lines of (P3) to settle the issue of the burden of proof. (P3) itself, I have suggested, does not take us very far in that direction. More generally, motivation for (γ) (or some similar principle) independent of views from which the existence of an empty world follows directly—consequently bypassing the need for the subtraction argument—looks thin on the ground. Establishing the existence of an empty world does not look like it will be the work of some snappy argument along these lines.

I don't pretend, of course, to have conclusively demonstrated that one cannot independently motivate (γ) or any such similar principle. Furthermore, as explained, the proponents of the subtraction argument are in a stronger dialectical position vis-à-vis those who reject a subtraction thesis like (γ) than those who are agnostic about it. My charge is a relatively modest one: since the usual reasons for believing a subtraction thesis along the lines of (γ) seem fairly evidently to presuppose the existence of an empty world, or at least to stem from sources directly motivating the existence of an empty world, the burden of proof, I claim, now lies with the argument's proponents. They must dispel the suspicion that the argument is incapable of convincing agnostics that an empty world exists, or at least of giving them a new reason for so thinking. If they cannot do so, the new version of the subtraction argument will have failed in its aim of providing an independent route to the existence of an empty world.[17]

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