On Some Counterexamples to the Transitivity of Grounding

Jon Erling Litland

University of Oslo

Follow this and additional works at: https://commons.pacificu.edu/eip

Recommended Citation
http://dx.doi.org/10.7710/1526-0569.1453
On Some Counterexamples to the Transitivity of Grounding

Jon Erling Litland

Published online: 31 January 2013
© Jon Erling Litland 2013

Abstract

I discuss three recent counterexamples to the transitivity of grounding due to Jonathan Schaffer. I argue that the counterexamples don’t work and draw some conclusions about the relationship between grounding and explanation.

1. Introduction

Metaphysical grounding is a hot topic. While there is significant disagreement on particulars\(^1\) there has been broad agreement that grounding is irreflexive, asymmetric and reflexive.\(^2\) Recently, however, Schaffer (2012) has proposed three counterexamples to the thesis that (partial) grounding is transitive. None of these counterexamples withstand scrutiny—or so I’ll argue.

My goal isn’t just to swat down the counterexamples; nor is the point just to show that there is some transitive relation of grounding.\(^3\) The main moral of my resolution of the counterexamples is that grounding corresponds to (metaphysical) “explanation how” in the following sense: when \(\phi\) is grounded in \(\psi\) then \(\psi\) is a way for it to be the case that \(\phi\). If we

---

\(^1\) See, e.g., the essays collected in Correia and Schnieder, 2012.

\(^2\) Though see Jenkins, 2011.

\(^3\) That is trivial: take transitive closures.
understand grounding in this way it’s possible to prove that grounding is transitive (see section 3).4

2. The Notion of Ground

I take grounding to be metaphysical explanation: to say that φ grounds ψ is to say that φ provides a metaphysical explanation of ψ. What’s in question is constitutive explanation: if ψ grounds φ then its being the case that φ consists in its being the case that ψ. This is the notion of grounding brought to prominence by Fine (2001, 2012a,b) and it’s the notion of grounding that Schaffer takes not to be transitive.5 I’ll adopt Fine’s notation and use “Δ < φ” to state that Δ fully grounds φ.6 This relation of ground is plural on the left: φ0, φ1, . . . can jointly ground ψ. In what follows I’ll use Δ, Γ, . . . for sets of facts and φ0, φ1, . . ., ψ0, ψ1, . . . for individual facts.

The grounding is full in the sense that if Δ < φ, then Δ provides a complete explanation of φ; nothing need be added to Δ in order to have a complete explanation of φ. This notion is taken to be transitive in the sense that it satisfies Cut:

\[ \frac{\Delta_0 \prec \phi_0, \Delta_1 \prec \phi_1, . . ., \phi_0, \phi_1, . . ., \Gamma \prec \phi}{\Delta_0, \Delta_1, . . ., \Gamma \prec \phi} \]

Cut

We say that φ is a partial ground of ψ (φ ≺ ψ) iff there are some further facts φ0, φ1, . . . such that φ, φ0, φ1, . . . ≺ ψ.7 Schaffer’s counterexamples are directed at the transitivity of

---

4 (Raven, forthcoming) has also recently taken these counterexamples (and other “non-orthodox” views on ground) to task. As we’ll see, I take issue with his treatment of two of the counterexamples—see footnotes 15 and 19.

5 In this paper I follow Schaffer in taking grounding to be a relation between facts (or states-of-affairs). My own preference is to treat grounding as a sentential operator—as in (Fine, 2012b). For what it’s worth I think the counterexamples are easier to deal with when grounding is treated by means of a sentential operator.

6 This is Fine’s notation for strict (i.e., asymmetric) full ground, but none of the counterexamples turn on strictness (though see footnote 17). (For more on these notions see Fine, 2012a,b).

7 The differences between the different notions of partial ground in (Fine, 2012b) do not matter here.
strict partial ground, but since Cut for < entails that < is transitive they would also be counterexamples to Cut. 8

Grounding is usually taken to be non-monotonic: if Δ < ϕ it doesn’t follow that Δ, ψ < ϕ. This might be explained as follows. Since grounding is a form of explanation the grounds for ϕ all have to be relevant to ϕ. For instance, its raining grounds the fact that it’s raining or snowing, but the facts that it is raining and that it is overcast in Oslo don’t ground the fact that it’s raining or snowing—the fact that it is overcast in Oslo has nothing to do with the fact that it is raining or snowing.

Crucially, this doesn’t mean that one cannot add some ψ to Δ and still have a satisfactory explanation of ϕ. Even if Δ provides a complete explanation of ϕ, ψ might still relevant to explaining ϕ. For an example: suppose both ϕ and ψ are the case. Then ϕ ∨ (ϕ ∧ ψ) is grounded both in ϕ alone and in ϕ, ψ taken together. 9 This example is noteworthy also because it shows that strict partial grounds aren’t necessary conditions for what they ground. Even if ψ hadn’t been the case ϕ ∨ (ϕ ∧ ψ) would have been the case (as long as ϕ is still the case).

3. The Dented Sphere

Schaffer’s counterexamples turn on trying to show that relevance isn’t preserved across chains of grounding. The first counterexample goes as follows. 10 Imagine a slightly dented sphere—a say. a has a fully determinate shape—S, let’s say. a also has a determinable shape—let’s say it’s more-or-less spherical. Consider now the following partial grounding claims.

(1) The fact that a has the particular dent it does grounds the fact that a has shape S. 11

8 Thanks to Paul Hovda for helping me see that on an earlier formulation of Cut, Cut wouldn’t entail the transitivity of <.

9 The principle of “Amalgamation” of (Fine, 2012b) ensures that this happens often. If the Δi taken individually strictly fully grounds ϕ, then the Δi taken collectively strictly fully ground ϕ.

10 This counterexample is also endorsed by (Trogdon, forthcoming).

11 Schaffer uses “has a dent” instead of “has the particular dent it does”. But the grounding claim “The fact that a has a dent grounds the fact that a has shape S” is surely false. What grounds a’s having shape S is not
The fact that \( a \) has shape \( S \) grounds the fact that \( a \) is more-or-less spherical. These claims both seem acceptable. Transitivity would give us:

\[
\text{(3) The fact that } a \text{ has the particular dent it does grounds the fact that } a \text{ is more-or-less spherical.}
\]

Schaffer doesn’t approve.

\[
\text{(3) is implausible, since the presence of the dent makes no difference to the more-or-less sphericity of the thing. The thing would be more-or-less spherical either way. The presence of the dent in no way helps to support the more-or-less sphericity of the thing, but is if anything a threat to the more-or-less sphericity of the thing. The thing is more-or-less spherical } \text{ despite} \text{ the minor dent, not because of it. (Schaffer, 2012)}
\]

It’s easy to see how this gives rise to a counterexample to \textit{Cut}. For consider the relationship between these partial grounding claims and the full grounding claims that witness them. Without loss of generality we may assume that what underlies the partial grounding claim (1) is the following full grounding claim:

\[
\text{(1') The fact that } a \text{ has the particular dent it has together with the fact that } a \text{ is elsewhere shaped like } S' \text{ fully grounds that it has shape } S
\]

Since (2) is already a full grounding claim, \textit{Cut} now gives us:

\[
\text{(3') The fact that } a \text{ has the particular dent it has together with the fact that } a \text{ is elsewhere shaped like } S' \text{ grounds that it is more-or-less spherical.}
\]

While I can hear (3) as somewhat problematic, (3’) seems completely unproblematic. I don’t see how \( a \)’s having the particular dent it actually has “makes no difference” to \( a \)’s being more-or-less spherical: in this case \( a \)’s being more-or-less spherical just consists in its having the particular dent it does together with its being shaped like \( S' \) elsewhere. Since (3)

\[a \text{’s having some-or-other dent—even one exactly like the one it in fact has—but rather its having the particular (type of) dent it has. We have to distinguish between claims of the forms } \exists x \phi < \psi \text{ and } \exists (\phi < \psi).\]

Alternatively put, when grounding is at issue we have to distinguish between the property of having a dent and the property of being dented.
follows immediately from (3’) by the definition of partial ground (3) has to be unproblematic too.

We might grant Schaffer that it’s true that \( a \) would have been spherical even without the presence of the dent. We might even grant him the modal claim that the shape \( S' \) is such that, necessarily, if \( a \) has shape \( S' \), then \( a \)’s having shape \( S' \) grounds \( a \)’s being more or less spherical. But this doesn’t mean that \( a \)’s having the particular dent it in fact has doesn’t contribute to actually making \( S \) more-or-less spherical. For \( a \) actually has shape \( S \) and having shape \( S \) consists, in part, in having the (type of) dent \( a \) actually has. As we noted above the strict partial grounds for \( \phi \) don’t have to be necessary for \( \phi \); in particular, \( \psi \) can be a strict partial ground for \( \phi \) even though \( \phi \) is strictly fully grounded in \( \Delta \) and \( \psi \) isn’t amongst the \( \Delta \).

Even though it fails this counterexample is valuable because it tells us something about the type of explanation grounding is associated with. We can grant Schaffer that \( a \)’s having the particular dent it in fact has makes no difference to whether the state-of-affairs of \( a \)’s being more-or-less spherical obtains or not. But it doesn’t follow from this that \( a \)’s having the particular dent it has makes no difference to the obtaining of the state-of-affairs of \( a \)’s being more-or-less spherical: it makes a difference to how it obtains. \( a \)’s having the particular dent it does is part of the way in which \( a \) is more-or-less spherical. While the grounds for \( \phi \) explain \( \phi \), what is to be explained is not why \( \phi \) is the case (as opposed to not the case); rather, what is to be explained is how it is the case that \( \phi \). That question is answered by specifying (part of) a way in which it is the case that \( \phi \).

It’s not terribly important to reserve the name “grounding” for the type of explanation-how sketched above; in particular, it’s not important to deny the name “grounding” to the non-transitive relation Schaffer is interested in studying. What is important is that (a) this notion of explanation has a reasonable claim to be labeled grounding; and (b) that the transitivity of this type of explanation isn’t just a result of taking the transitive closure.

A case can be made for both these claims. For one might think that grounding and the notion of a way for a state of affairs to obtain are intimately related in the following way.

LINKAGE: \( \phi_0, \phi_1, \ldots < \phi \) iff (1) any ways for \( \phi_0, \phi_1, \ldots \) to obtain collectively constitutive a way for \( \phi \) to obtain; and (2) it’s not the case that there are some \( \theta_0, \theta_1, \ldots \) such that any ways for \( \theta_0, \theta_1, \ldots, \phi \) to obtain collectively constitute a way for \( \phi \) to
obtain, for some \( i \).\(^{12}\)

If (LINKAGE) is correct \textit{Cut} immediately follows.

To take a representative case: suppose \( \psi_0, \psi_1, \ldots, \phi < \psi \) and \( \phi_0, \phi_1, \ldots < \phi \). So let \( v_0, v_1, \ldots \) be some ways for \( \psi_0, \psi_1, \ldots \) to obtain and let \( w_0, w_1, \ldots \) be some ways for \( \phi_0, \phi_1, \ldots \) to obtain. Since \( \phi_0, \phi_1, \ldots < \phi, w_0, w_1, \ldots \) collectively constitute a way for \( \phi \) to be the case. But then it follows by \( \psi_0, \psi_1, \ldots, \phi < \psi \) that \( v_0, v_1 \ldots, w_0, w_1, \ldots \) collectively constitutive a way for \( \psi \) to be the case.

Next suppose that there are some \( \theta_0, \theta_1, \ldots \) such that any ways for \( \theta_0, \theta_1, \ldots, \psi \) to obtain collectively constitute a way for some \( \sigma \in \phi_0, \phi_1, \ldots, \psi_0, \psi_1, \ldots \) to be the case. If \( \sigma \) is \( \psi_i \) for some \( i \) we contradict \( \psi_0, \psi_1, \ldots, \phi < \psi \) (by the second clause of (LINKAGE)). So suppose \( \sigma \) is \( \phi_i \), for some \( i \). But then it follows by similar reasoning as above that any ways for \( \psi_0, \psi_1, \ldots, \phi, \theta_0, \theta_1, \ldots \) to be the case is a way for \( \phi_i \) to be the case. But this contradicts that \( \psi_0, \psi_1, \ldots, \phi < \psi \) (again by the second clause of (LINKAGE)).

The idea that the grounds for \( \phi \) are the ways for \( \phi \) to be the case can be made surprisingly precise. A similar idea forms the basis for the semantics for the Pure Logic of Ground (Fine, 2012b) and also for the semantics for counterfactual conditionals in (Fine, forthcoming).\(^{13}\)

This talk of \textit{ways} for a state of affairs to obtain—or: different \textit{obtainings} of a state-of-affairs—can be taken in two quite different ways. First, we can take the way in which a state-of-affairs \( F \) obtains to be an entity distinct from the state-of-affairs \( F \).\(^{14}\) Second, we can take such talk to be cashed out in terms of explanation-how. If we do the former, one could argue that we don’t need explanation-how as a distinct form of explanation: when its being the case that \( \phi \) grounds its being the case that \( \psi \), what is explained is why the particular obtaining of \( \psi \) exists (rather than not).

\(^{12}\) The latter clause is necessary to ensure the asymmetry of grounding.

\(^{13}\) Indeed, for those familiar with the Pure Logic of Ground the above argument for \textit{Cut} should look familiar. It essentially replicates the proof that \textit{Cut} is valid with respect to the semantics presented in (Fine, 2012b).

\(^{14}\) One might say that the obtaining of a state-of-affairs stands to the state of affairs as a particularized property (trope) stands to the property.
My preference is to take the notion of explaining-how as primitive. This view is very natural if one treats grounding as a sentential operator: for instance, it makes it much easier to say that a (contingent) disjunction could be grounded in a different disjunct than the one in which it in fact is grounded. In the remainder of the paper my talk of “obtainings” is officially to be read in this way. For the purposes of blocking Schaffer’s counterexamples, however, we don’t have to choose between the two readings: they don’t threaten the idea that grounding as a relation between obtainings is transitive.

If the above considerations are correct the next two counterexamples are spurious. There is nevertheless much to be learned by trying to understand exactly what goes wrong in those counterexamples.

4. The Third Member

In the next counterexample, Schaffer asks us to consider a set $S$ with three distinct members $a, b, c$. He then endorses the following claims:

(4) The fact that $c$ is a member of $S$ grounds the fact that $S$ has exactly three members.

(5) The fact that $S$ has exactly three members grounds the fact that $S$ has finitely many members.

Transitivity now yields:

(6) The fact that $c$ is a member of $S$ grounds the fact that $S$ has finitely many members.

Schaffer doesn’t like this:

(6) is implausible, since $c$’s being a member of $S$ in no way helps contribute to the fact that $S$ is finite. $S$ would be finite either way, with or without $c$ as a member. If anything, $S$ remains finite not because of but despite taking on $c$ as an additional member. (Schaffer, 2012)

One might worry that since sets have their members essentially we cannot make sense of the supposition that $S$ doesn’t have $c$ as a member; if that’s right Schaffer’s reasoning wouldn’t even make any sense. This worry is easily circumvented, however: instead of considering the set $S$ just consider a property that contingently is only instantiated by $a, b, c$ but could
have been instantiated by only $a$, $b$. For simplicity I’ll continue working with Schaffer’s example.

Here the resolution lies in distinguishing two notions of finitude.\(^{15}\)

**EXACT FINITUDE:** For $S$ to be finite is for $S$ to have 0 members or for $S$ to have exactly 1 member or for $S$ to have exactly 2 members or . . .

**INEXACT FINITUDE:** For $S$ to be finite is for $S$ to have 0 members or for $S$ to have at most 1 member or for $S$ to have at most 2 members or . . .

These two alternatives are indeed (classically) equivalent. Now, classical equivalence does not entail that one has all and only the same grounds. For instance, the sentence “it’s raining or not raining” is classically equivalent to “it’s snowing or not snowing”. But while the fact that it is raining does ground that it is raining or not raining it does not ground that it is snowing or not snowing.

And so it is here, too: (Inexact Finitude) differs from (Exact Finitude) in terms of grounding. If we take finitude to be defined by (Exact Finitude) then (5) is acceptable, but then so is (6). On the other hand, if we take finitude to be defined as in (Inexact Finitude), then while (6) indeed isn’t acceptable, neither is (5). It might be instructive to see why (5) is false if we take “finitude” in this way.

To show that (5) is false when “finitude” is interpreted as inexact finitude I will assume the transitivity of grounding. This is dialectically acceptable: the goal now is not to convince

\(^{15}\) (Raven, forthcoming) takes the problem to be that the set’s “having exactly three members has nothing to do with which members it has, only with how many members it has. How many members it has needn’t depend upon any particular member of it. For example, that set \{a, b, c\} has exactly three members might be grounded in its being one-one mappable to some or other three-membered set.” This seems a very implausible account of what grounds that a set $S$ has exactly three members. The claim that \{a, b, c\} has exactly three members is now grounded in the existence of a bijection and the existence of some or other exactly three-membered set.” This is possible to circumvent this problem by treating “mappable” in a modal fashion, but the present solution is neater.
the skeptic that grounding is transitive; the point is just to give an explanation for why (5) is false.

Let’s first note that if $S$’s having exactly three members were to ground that $S$ is inexactly finite, then this would have to be by grounding that $S$ has at most $n$ members for some $n$. (A ground for a disjunction passes through a disjunct.) Now, the claim that $S$ has exactly three members is partly grounded in the fact that $c \in S$. By the transitivity of grounding, then, the fact that $c \in S$ is a partial ground for the fact that $S$ has at most $n$ members. Without loss of generality, let’s assume that $n = 3$.

The claim that $S$ has at most three members is the following claim.\(^{16}\)

\[ (1) \quad \exists xyz(\forall v(v \notin S \lor v = x \lor v = y \lor x = z) \]

A ground for an existential generalization is a ground for one of the true instances. Instantiating with $a, b, c$ we get

\[ (2) \quad \forall v(v \notin S \lor v = a \lor v = b \lor x = c) \]

We then get that $c \in S$ has to ground (2).

What grounds a universal generalization $\forall x \phi$? I follow (Fine, 2012a) in holding that the immediate grounds are the instances $\phi(a)$, $\phi(b)$, $\phi(c)$ . . . together with the fact $T(a, b, c, . . . )$ that $a, b, c . . .$ are all and only the objects there are. If the fact $c \in S$ grounds (2) it does so by grounding one of the immediate grounds for (2). (Grounds for $\forall x \phi$ are filtered through the immediate grounds for $\forall x \phi$.) How could that be?

Presumably the fact that $c \in S$ doesn’t contribute to grounding the fact that $a, b, c, . . .$ are all and only the objects there are. ($c$’s existing helps ground the fact that $a, b, c . . .$ are all and only the objects there, but $c$’s being a member of $S$ would seem to play no role.)

So if $c \in S$ is to ground (2) it can only be by grounding one of the instances. Such an instance is of the form

\[ 16 \text{ I write this out in terms of conjunction, disjunction and negation. Nobody knows how to deal with grounds for (bi) conditionals.} \]
\[ d \notin S \vee d = a \vee d = b \vee d = c \]

Clearly, the fact that \( c \in S \) has nothing to do with the truth of any of these disjuncts. The fact that \( c \in S \) is irrelevant to the identity-claims\(^{17}\) and that \( c \in S \) is clearly irrelevant to the fact that \( d \notin S \).

5. The Cat’s Meow

It’s usually accepted that an existentially quantified truth is grounded in its true instances.\(^{18}\) It’s a virtue of Schaffer’s last counterexample that it forces us to think hard about what this actually means.

Imagine that Cadmus the cat is meowing and suppose that origin essentialism is true (Kripke, 1980). Then Schaffer thinks we should accept

\[(7) \quad \text{The fact that the creature was produced from the meeting of this sperm and that ovum grounds the fact that Cadmus is meowing.}\]

\[(8) \quad \text{The fact that Cadmus is meowing grounds the fact that something is meowing.}\]

Transitivity would now give us

\[(9) \quad \text{The fact that the creature was produced from the meeting of this sperm and that ovum grounds the fact that something is meowing.}\]

Schaffer objects:

the present extrinsic and historical fact that the creature was produced from the meeting of this sperm and that ovum (as opposed to some other sperm-and-ovum duo) makes no difference to the creature’s present intrinsic physical state, which is

\(^{17}\) The only potential counterexample is if \( a = d = S \). For one might hold that the identity of a set is grounded in the identities of its members and the fact that they are its members. The problem is that if \( a = d = S \), then \( a \) is a self-membered set, and in the case of self-membered sets the principle that the identity of a set is grounded in the identities of its members and the fact that they are its members is deeply problematic. For if \( a \in a \), this principle gives us that \( a = a \) is a partial ground for \( a = a \), contradicting the asymmetry of grounding.

\(^{18}\) Though one should be wary of the problems of (Fine, 2010).
what is crucial to its ability to witness the existence generalization that something is meowing. Whether the creature counts as Cadmus or some other cat, it is meowing all the same. The fact that the creature was produced from the meeting of this sperm and that ovum helps make it be *Cadmus* meowing, but doesn’t help make it be *Cadmus* meowing. (Schaffer, 2012)

One thing we could do here is just to deny (7). And there is something right about this. After all, the creature in question *just is* Cadmus (not just “counts as Cadmus”). What does the fact that Cadmus derived from this sperm and that ovum have to do with the fact that he is meowing? Whether he meows only turns on whether he is, well, meowing; it doesn’t turn on how he originated. Facts about what something essentially is needn’t be parts of the grounds for how that thing is.

This is right as far as it goes but that’s not as far as the heart of the counterexample. In general, one might think that facts involving certain “complex” individuals ultimately are grounded in facts not involving those very individuals. In this particular example, we may consider the matter which constitutes Cadmus and we might want to say that it’s partly in virtue of this matter’s having such-and-such a causal history that Cadmus is meowing. Making the appropriate changes throughout we can recreate Schaffer’s counterexample. For simplicity I will therefore continue to work with Schaffer’s formulation.

Where, then, is the problem? Schaffer’s crucial move is in the line:

> makes no difference to the creature’s present intrinsic physical state, which is what is crucial to its ability to witness the existence generalization that something is meowing.

This is not correct. While the only features of Cadmus that are relevant to his meowing are his intrinsic features, it is still *Cadmus* that is doing the meowing and when there is

---

19 This is the line taken in (Raven, forthcoming).

20 (Raven, forthcoming) considers and rejects—correctly in my view—a superficially similar view. The view in question is that what differentiates the fact that Cadmus is meowing from the (let’s assume) qualitatively identical fact that Tibbles is meowing is that Cadmus has a certain essential property and that Tibbles has a different essential property. The present idea differs from this along two lines. First, we consider a property of the matter which constitutes Cadmus and not a property of Cadmus himself. Second, the property is not an essential property of the matter.
something that is meowing there is some *particular* something that is meowing. The particular doing the meowing here is *Cadmus*.

To see this, distinguish between there being meowing and there being *something* that meows. What has to be grounded is not just that there is meowing, what has to be grounded is that there is a *particular* something or other that is meowing. And while I would agree that the fact that it is *Cadmus* that is meowing is irrelevant to explaining the fact that there is meowing the fact that it is *Cadmus* that is meowing *is* relevant to explaining that there is a *particular* something or other that is meowing.

It might help to put the point like this. The intrinsic state, $S$, of the creature is such that, necessarily, for all $b$, if $b$ is in intrinsic state $S$ then $b$’s being in intrinsic state $S$ grounds there being something that meows. In this sense the intrinsic state of the creature is all that matters to witnessing the existential generalization. But this hardly shows that Cadmus is irrelevant: in the actual world it is *Cadmus* that is in the relevant intrinsic state. The intrinsic state is the state of *something*—Cadmus in this case. While it is true that anything that fills the role—is in the relevant intrinsic state—will do equally well, we shouldn’t conclude from this that what fills the role is explanatorily irrelevant.

Putting it in the terms of the section 3, we can grant Schaffer that while its being *Cadmus* that is meowing makes no difference to whether the state-of-affairs that somebody is meowing obtains, *Cadmus’* meowing nevertheless makes a difference to the obtaining of the state-of-affairs that something is meowing. *Cadmus’* meowing is the way in which the state-of-affairs that there is somebody who is meowing obtains.

Above I’ve assumed that the only thing that meows is Cadmus and one could deny this. One could, e.g., say that Cadmus differs from the mereological sum of the atoms that are parts of Cadmus and that both the mereological sum and Cadmus meows. Or one could say—because of the Problem of the Many (see e.g., Weatherson, 2009)—that there are several distinct (though almost identical) meowing cats present. This does not help. For if Cadmus isn’t the only thing meowing then he is still one of the things meowing and so still contributes to making it the case that there is a particular something or other that is meowing.

---

21 Or distinguish between the truth of “meoweth” and the truth of “there is something that meows” (cf Quine, 1960).
meowing. The causal history of the matter constituting him is therefore still part of the way in which the state-of-affairs that there is something in particular that is meowing obtains.

6. Conclusion

If (LINKAGE) is correct there cannot be any counterexamples to the transitivity of grounding. I’ll hazard the guess that putative counterexamples to the transitivity of grounding only show that some subtle distinction has been overlooked. In helping elicit such distinctions Schaffer’s examples are exemplary; may future ones prove equally instructive.

Acknowledgements

Thanks to Tim Button, Michael Raven, Louis deRosset and Jonathan Schaffer for helpful comments on earlier drafts.

References


