Phil. 256: Becausal Relations
Sept. 22, 2021

Meeting 3: Transitivity of Grounding

I. Schaffer's Counterexamples to Transitivity

A number of authors have offered putative counterexamples to the following widely accepted principle:

> *Transitivity (of partial grounding)*: For all facts [*p*], [*q*], and [*r*], if [*p*] partially grounds [*q*], and [*q*] partially grounds [*r*], then [*p*] partially grounds [*r*].

We'll be focusing on Schaffer's counterexamples. His general motivation for denying Transitivity:

> Roughly speaking, *grounding* is the metaphysical analogue of *causation*.
>
> Almost everyone agrees that there are counterexamples to the transitivity of causation.
>
> So, we should expect there to be counterexamples to the transitivity of grounding.

Schaffer provides three counterexamples to Transitivity:

- *counterexample #1*: The Dented Sphere

  Imagine a slightly imperfect sphere—call it O—with a minor dent—call it D—in it. Let 'H' refer to the sphere's maximally determinate shape. Then Schaffer thinks the following are plausible:

  (DS_1) [O has dent D] partially grounds [O has shape H].

  (DS_2) [O has shape H] partially grounds [O is more-or-less spherical].

  (DS_3) [O has dent D] does NOT partially ground [O is more-or-less spherical].

  Why believe (DS_2)? This is a case of a thing's having a determinable property being grounded in its having a determinate of that determinable.

  Why believe (DS_3)? "[T]he presence of the dent makes no difference to the more-or-less sphericality 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 sphericality of the thing, but if anything is a *threat* to the more-or-less sphericality of the thing. The thing is more-or-less spherical *despite* the minor dent, not because of it" (p. 127).

- *counterexample #2*: The Third Member

  Let S be the set {*a*, *b*, *c*}. Then Schaffer thinks the following are plausible:

  (TM_1) [*c* is a member of S] partially grounds [S has exactly three members].

  (TM_2) [S has exactly three members] partially grounds [S has finitely many members].

  (TM_3) [*c* is a member of S] does NOT partially ground [S has finitely many members].

- *counterexample #3*: The Cat's Meow

  Suppose Cadmus the cat is meowing. If we assume the essentiality of origins, then Schaffer thinks the following are plausible:

  (CM_1) [That creature was produced from the meeting of this sperm and that ovum] partially grounds [Cadmus the cat is meowing].

  (CM_2) [Cadmus the cat is meowing] partially grounds [Something is meowing].

  (CM_3) [That creature was produced from the meeting of this sperm and that ovum] does NOT partially ground [Something is meowing].

II. Schaffer on Contrastive Grounding

Schaffer proposes a *contrastive treatment of grounding*, inspired by the *contrastive treatment of causation* defended by him and others.

On one version of this proposal, partial grounding is not a *binary relation* between grounds and grounded, but rather a *quaternary relation* of the following form (ignoring, for the time being, cases in which we have a plurality in one of these slots):

(Q) The fact that p rather than p^* partially grounds the fact that q rather than q^*.

There is a bit of a puzzle here: what ontological category are the two additional relata?

> Strictly speaking, "the fact that p rather than p^*" is not grammatical (for example, the italicized material in "the fact that it is raining *rather than it is snowing*" is infelicitous).
>
> And the two additional relata can't be facts, since Q entails that $<p^*>$ and $<q^*>$ are not true.
>
> > (Note: I use '$<p>$' to denote the proposition that p.)
>
> At one point Schaffer speaks of "possible facts," but that isn't right either: he needs there to be contrastive grounding claims in which $<p^*>$ is necessarily false (as when $<p^*> = <c \notin S>$).

Luckily, this issue is resolved when Schaffer switches (in §3.2) to thinking of grounding not as a quaternary relation between facts and two other mysterious entities, but rather as a binary relation between *differences*.

Let us notate these differences as follows:

> '$[p|p^*]$' is shorthand for 'the fact that (it is the case that) p rather than (its being the case that) p^*'.

Then Schaffer's central claim is that Transitivity is false, but the following closely related principle is true:

> *Differential Transitivity (of partial grounding)*: For all differences $[p|p^*]$, $[q|q^*]$, and $[r|r^*]$, if $[p|p^*]$ partially grounds $[q|q^*]$, and $[q|q^*]$ partially grounds $[r|r^*]$, then $[p|p^*]$ partially grounds $[r|r^*]$.

This gives Schaffer a nice way of explaining the appeal of Transitivity while avoiding its counterexamples.

In each of his examples, Schaffer insists that we are illicitly taking $<[p|p^*]$ partially grounds $[q|q^*]>$ and $<[q|q^{**}]$ partially grounds $[r|r^*]>$ to entail $<[p|p^*]$ partially grounds $[r|r^*]>$ when $[q|q^*] \neq [q|q^{**}]$.

- *counterexample #1*: The Dented Sphere

  Let H^m be the maximally specific (more perfectly spherical) shape that O would have if it did not have dent D, and let H^f be a completely different flat-as-a-pancake maximally specific shape.

  (DS_1^*) [O has dent D|O does not have D] partially grounds [O has shape H|O has shape H^m].

  (DS_2^*) [O has shape H|O has shape H^m] does NOT partially ground [O is more-or-less spherical|O is not more-or-less spherical].

  (DS_2^{**}) [O has shape H|O has shape H^f] partially grounds [O is more-or-less spherical|O is not more-or-less spherical].

- *counterexample #2*: The Third Member

  (TM_1^*) $[c \in S|c \notin S]$ partially grounds [S has exactly 3 members|S has exactly 2 members].

  (TM_2^*) [S has exactly 3 members|S has exactly 2 members] does NOT partially ground [S has finitely many members|S has infinitely many members].

  (TM_2^{**}) [S has exactly 3 members|S has exactly $\aleph_0$ members] partially grounds [S has finitely many members|S has infinitely many members].

- *counterexample #3*: The Cat's Meow

  (CM_1^*) [That creature was produced from the meeting of this sperm and that ovum|That creature was produced from the meeting of a different sperm and a different ovum] partially grounds [Cadmus the cat is meowing|Clix the cat is meowing].

  (CM_2^*) [Cadmus the cat is meowing|Clix the cat is meowing] does NOT partially ground [Something is meowing|Nothing is meowing].

  (CM_2^{**}) [That creature is in this intrinsic physical state|That creature is in that intrinsic physical state] partially grounds [Something is meowing|Nothing is meowing].

III. A World of Differences?

Schaffer's contrastive proposal has its attractions. However, it faces two problems:

- *first problem*: The proposal is metaphysical extravagant.

  If grounding is the fundamental structuring relation on reality, and if grounding is only a relation between differences and not between facts on their own, *then reality is fundamentally made up of differences*.

  This involves a pretty radical reconception of the metaphysical nature of the world.

  > Moreover, it probably means that we are going to face significant pressure to also go contrastivist about *fundamentality*, *truth*, *entailment*, *modality*, and *essence*, among others.

- *second problem*: We can generate versions of Schaffer's counterexamples within his own contrastive framework.

  A fully general version of Schaffer's framework is going to need to allow for pluralities of contrasts in addition to single contrasts. But now consider:

  (TM_1') [$c \in S|c \notin S$] partially grounds [S has exactly 3 members|S has no members, S has exactly 1 member, S has exactly 2 members, S has exactly 4 members, . . . , S has exactly $\aleph_0$ members, S has exactly $\aleph_1$ members, . . .].

  (TM_2') [S has exactly 3 members|S has no members, S has exactly 1 member, S has exactly 2 members, S has exactly 4 members, . . . , S has exactly $\aleph_0$ members, S has exactly $\aleph_1$ members, . . .] partially grounds [S has finitely many members|S has infinitely many members].

  (TM_3') [$c \in S|c \notin S$] does NOT partially ground [S has finitely many members|S has infinitely many members].

  I put forward that the contrastive claims (TM_1'), (TM_2'), and (TM_3') are just as plausible as the non-contrastive claims (TM_1), (TM_2), and (TM_3). So the underlying puzzle generated by Schaffer's cases is not solved by moving to a contrastive conception of grounding.

IV. The Straightforward Response to Schaffer

Given our reservations about Schaffer's contrastivist maneuver, it would be better to find a simpler way of either avoiding Schaffer's counterexamples or explaining why we find Transitivity so compelling.

The most straightforward way of replying to Schaffer is to point out that the following claim of full grounding (within a non-contrastive framework) is very plausible:

($TM_3^\dagger$) [$a \in S$], [$b \in S$], [$c \in S$], [S has no members other than a, b, c] fully ground [S has finitely many members].

But then, given the standard way of defining partial grounding in terms of full grounding, we may conclude that [$c \in S$] does partially ground [S has finitely many members], and hence (TM_3) is false.

Similarly, if O^- is what remains of O when we take away D (or, if you prefer, is the fusion of all parts of O that do not overlap with D), H^- is the maximally determinate shape of O^-, and H^D is the maximally determinate shape of D, then the following claim of non-contrastive full grounding is also very plausible:

($DS_3^\dagger$) [O has dent D], [D has shape H^D], [O^- is what remains of O when D is taken away], [O^- has shape H^-] fully ground [O is more-or-less spherical].

Given the standard way of defining partial grounding, we can conclude that Schaffer is wrong to insist upon

(DS_3) [O has dent D] does NOT partially ground [O is more-or-less spherical].

Schaffer has two ways of motivating (DS_3), neither of which is convincing:

- *first rationale*: "[T]he presence of the dent makes no difference to the more-or-less sphericality of the thing. The thing would be more-or-less spherical either way" (p. 127).

  problem: Metaphysical dependence is not counterfactual covariation, so this is a bogus test. Even if O is more-or-less spherical in the nearest possible world in which it lacks D, this doesn't rule out the possibility that [O has D] is part of what grounds [O is more-or-less spherical] in the actual world.

  > Compare: [There are 13 people in this room] grounds [The number of people in this room is either odd or divisible by 2] even though the latter fact would have still obtained even if the former fact had not.

- *second rationale*: "The presence of the dent in no way helps to support the more-or-less sphericality of the thing, but if anything is a *threat* to the more-or-less sphericality of the thing. The thing is more-or-less spherical *despite* the minor dent, not because of it" (p. 127, underlining mine).

  problem: We shouldn't think of partial grounds as each making a *pro tanto* contribution toward whatever it is that is grounded—as each constituting a metaphysical force vector in a given direction that, together with the other partial grounds, sums up to a given metaphysical effect if their net total is greater than the sum of metaphysical force vectors in the other direction (the anti-grounds?).

  > Here Schaffer is being misled by the common (but problematic) practice of taking 'helps to ground' to be another way of saying 'partially grounds', which tempts us to think of partial grounds as each *pushing* the grounding fact into being true.
  >
  > On the metaphysical-force-vector model, partial grounding would be prior to full grounding.
  >
  > Moreover, on that model, a full collection of partial grounds would never directly ground [q], but rather would only ground [q] by way intermediate facts such as [There is more of a net metaphysical push in favor of <q> being the case than against <q> being the case], which means all grounding structures would be densely mediated (since we can ask about what metaphysical force vectors in turn ground those intermediate facts).

  Instead, we should think of partial grounds as being part of a full collection of grounds. And when we do, (TM_3) and (DS_3) lose their plausibility.

This same response can be used in Cat's Meow to argue that if (CM_1) is true, then (CM_3) is also true. But here I think a different response is also available: it's not entirely clear to me that we need to accept (CM_1).

> The assumption here seems to be that every fact about Cadmus is partially grounded in each fact essential to Cadmus' origin. But why think this? Maybe some facts about Cadmus entail that certain facts about Cadmus' origin obtain without being partially grounded in those origin-of-Cadmus facts.
>
> On one version of *reasons fundamentalism*, at least some facts of the form [[p] is a reason for agent A to ϕ in circumstance C] are ungrounded. But Schaffer's assumption would rule out such a position, since it requires (when A is a human agent) that this fact be partially grounded in some fact about the ovum and sperm that led to A. Can reasons fundamentalism really be refuted that easily?

V. Cohen's Reply

Cohen offers a reply to Schaffer's counterexamples that can be seen as a fallback response for people who are fine with the metaphysical-force-vector model of grounding that I attributed to Schaffer.

Cohen draws a distinction between:

> a fact that *partly grounds* [*p*]: a fact that does "some of the actual grounding work" on its own (p. 80);
>
> a fact that *is a partial ground of* [*p*]: a fact that is part of a plurality of facts that together fully ground [*p*].

I reject this distinction, because I think it relies on a problematic metaphysical-force-vector way of understanding the connection between the *partly grounds* and *fully grounds* relations.

Some cases that Cohen offers in support of her distinction:

- [The painting combines elements from Greek and Japanese mythologies] partly grounds [The painting is original], whereas [The painting incorporates elements from Japanese mythology] is merely a partial ground of [The painting is original] without partly grounding that fact.
- [I told a lie] partly grounds [My action was wrong], whereas [I said something untrue] is merely a partial ground of [My action was wrong] without partly grounding that fact.

But I think it's telling that, in both of these cases, the grounding facts all plausibly do their "grounding work" by way of grounding intermediate facts about the balance of some commodity (reasons for and against action, factors counting toward and against a work's originality) which in turn ground the grounded fact on which Cohen focuses. I think Cohen has confused *the work a fact does on its own in grounding one of those intermediate facts* with *the work a fact does on its own in grounding the final grounded fact.*

But let's suppose I'm wrong about this and that Cohen's distinction makes sense. Then we have a nice way of replying to Schaffer even if we grant to him the metaphysical-force-vector model of how grounding works:

> For example, in the Third Member, we might insist that [*c* is a member of S] is a partial ground of but does not partly ground [S has finitely many members], since it doesn't do any grounding work on its own. This allows us to hold onto the transitivity of the *being a partial ground of* relation while explaining away our tendency to be moved by Schaffer's would-be counterexample.

VI. Richardson's Challenge to Transitivity

Richardson brings up an importantly different set of cases that also raise worries for Transitivity. He has us imagine two philosophers who appear to have fundamentally different views about the nature of morality:

- Tye is a *social constructivist about morality* who holds the following:
  - (T_1) The moral facts are partially grounded in social facts.
  - (T_2) The social facts are partially grounded in biological facts.
  - (T_3) The moral facts are NOT partially grounded in biological facts.
- Megan is a *biological naturalist about morality* who holds the following:
  - (M_1) The moral facts are partially grounded in social facts.
  - (M_2) The social facts are partially grounded in biological facts.
  - (M_3) The moral facts are partially grounded in biological facts.

But how can this be possible if Transitivity holds? That principle appears to rule out Tye's position.

Richardson's solution is to distinguish two types of grounding, *how-grounding* and *why-grounding*, each of which provides an answer to a distinctive explanatory question, and both of which can be analyzed in terms of a prior notion of *metaphysical explanation*.

- *How-grounding* is a non-contrastive explanatory relation that answers the question, "How is it the case that *q*?" It can be analyzed in terms of a proposition's *subject matter*, which in turn is analyzed in terms of *ways* for a proposition to be true, which in turn is analyzed in terms of *truthmaking*, which in turn is analyzed in terms of *metaphysical explanation*, but I had a very hard time figuring out how the overall analysis is supposed to go.

  (One thing that tripped me up: presumably how-grounding is a relation between facts, but we are told what it is for a proposition not a fact to have a subject matter, and this is defined in terms of truthmaking, which for Fine is a relation between facts and sentences.)

- *Why-grounding* is a contrastive explanatory relation that answers the question, "Why is it the case that *q* rather than its being the case that *q**?" It can be analyzed as follows:

  [*p*|*p**] partially why-grounds [*q*|*q**] $=_{df}$ [*p*] partially metaphysically explains [*q*];
  if [*q*] were not to obtain, then [*p*] would not partially metaphysically explain [*q**]; and
  if [*p*] were not to obtain, then [*p**] would not partially metaphysically explain [*q*].

  (Are we assuming here that if [*q*] were not to obtain, then [*q**] would obtain, and if [*p*] were not to obtain, then [*p**] would obtain?)

Whereas how-grounding is *transitive* relation between facts (because metaphysical explanation is transitive), why-grounding is a *non-transitive* relation between differences (because of the counterfactuals in the analysis).

This allows Richardson to account for the Tye and Megan cases as follows. There is no difference between their views about how-grounding; they both hold that *certain biological facts* how-ground *certain social facts*, which in turn how-ground *certain moral facts*. It is with regard to why-grounding that their views differ:

- Tye holds:
  - (T_1*) The moral differences are partially why-grounded in social differences.
  - (T_2*) The social differences are partially why-grounded in biological differences.
  - (T_3*) The moral differences are NOT partially why-grounded in biological differences.
- Megan holds:
  - (M_1*) The moral differences are NOT partially why-grounded in social differences.
  - (M_2*) The social differences are partially why-grounded in biological differences.
  - (M_3*) The moral differences are partially why-grounded in biological differences.

  (I don't see how we get M_1*, especially if "[t]he social facts are a way station, a minor stop on the journey to the moral facts" [p. 1401].)

One thing that puzzles me about this strategy, however, is the way in which it makes use of a more basic relation of *metaphysical explanation*. Why can't we reformulate our original puzzle involving Tye and Megan except with 'grounded in' replaced by 'metaphysically explained by' in (T_1)–(T_3) and (M_1)–(M_3)? I don't see how appealing to how- vs. why-grounding helps resolve *that* puzzle.

A different strategy for diffusing the Tye and Megan puzzle is to deny that Tye holds (T_3) and then to find some other way of differentiating their positions, such as:

1. Megan presumably holds that moral facts are *fully* grounded in biological facts, but Tye appears to hold that the morally relevant social facts are *partially* but not *fully* grounded in biological facts.

2. The social facts to which Tye and Megan each appeal will be very different (Tye's will be facts about the attitudes and decisions of various groups of people, whereas Megan's will be facts about the biological upshot for people of various actions and attitudes—if those even count as social facts).

3. It's not entirely clear that Megan does hold that moral facts are grounded in social facts.