Is Grounding Transitive and Irreflexive?

I. Schaffer's Counterexamples to Transitivity

A number of authors we have read (including a past time slice of Schaffer) assume the following to be true:

> *Transitivity*: For any facts $[p]$, $[q]$, and $[r]$, if $[p]$ partially grounds $[q]$ and $[q]$ partially grounds $[r]$, then $[p]$ partially grounds $[r]$.

Schaffer now thinks that Transitivity is false.

> For the purposes of his article, Schaffer takes grounding to be a *singular-singular relation* between *facts* (rather than a *singular-plural relation* between *entities of arbitrary ontological category*, as he really believes).

Schaffer's 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, with a minor dent in it. Let "shape S" refer to that sphere's maximally determinate shape. Then Schaffer thinks the following are plausible:

    > (DS_1) [The thing has a dent] partially grounds [The thing has shape S].

    > (DS_2) [The thing has shape S] partially grounds [The thing is more-or-less spherical].

    > (DS_3) [The thing has a dent] does NOT partially ground [The thing is more-or-less spherical].

    Why believe (DS_2)? Recall that Rosen proposed the following:

    > > the *Determinable-Determinate Link*: If G is a determinate of the determinable F and a is G, then $[a$ is G] fully grounds $[a$ is F].

- *counterexample #2*: The Third Member

    Let S = {a, b, c} (i.e. let S be the set whose all and only members are a, b, and 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) [The 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) [The 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, grounding is not a *binary relation* between two facts, but rather a *quaternary relation* of the following form:

> The fact that p rather than p^* 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. ("... rather than ..." is not a sentential connective.)

> The two additional relata can't be facts, since the above entails that $<p^*>$ and $<q^*>$ are not true.

> At one point Schaffer speaks of "possible facts," but this isn't right either: he needs there to be contrastive grounding claims in which $<p^*>$ is necessarily false. (For example: $<p^*> = <c \notin S>$.)

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:

> $[p|p^*]$ $=_{df}$ the fact that p rather than p^*.

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

> *Differential Transitivity*: For any 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 why Transitivity is so appealing while avoiding the counterexamples to Transitivity.

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 $<q^*> \neq <q^{**}>$.

- *counterexample #1*: The Dented Sphere

  Let S^* be the maximally specific (more perfectly spherical) shape that the thing would have if it did not have a dent, and let S^{**} be a completely different flat-as-a-pancake maximally specific shape.

  > (DS_1^*) [The thing has a dent | the thing has no dent] partially grounds [The thing has shape S | the thing has shape S^*].

  > (DS_2^*) [The thing has shape S | the thing has shape S^*] does NOT partially ground [The thing is more-or-less spherical | the thing is not more-or-less spherical].

  > (DS_2^{**}) [The thing has shape S | the thing has shape S^{**}] partially grounds [The thing is more-or-less spherical | the thing 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^*) [The creature was produced from the meeting of this sperm and that ovum | the 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^{**}) [The creature is in this intrinsic physical state | the 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 also extremely metaphysically extravagant.

If grounding is the fundamental structuring relation on reality, and if grounding is only a relation between differences and not between absolute 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.

> It also probably means that we need to revise logic so that it concerns entailment relations between *propositional differences* rather than entailment relations between *propositions*.

Also, I don't see why we can't generate versions of Schaffer's counterexamples within the contrastive framework. For example, if we work with sets of contrasts instead of single contrasts, 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}].

Thus it would be better if we could find a simpler way of either avoiding Schaffer's counterexamples or explaining why we find Transitivity so compelling. Reconsider:

> (TM_3) [$c \in S$] does NOT partially ground [S has finitely many members].

Schaffer has two ways of motivating this claim, neither of which is convincing:

> "S would be finite either way, with or without c as a member." But metaphysical dependence is not counterfactual dependence. (Nor is it counterpossible dependence, which is what we have here.)

> "If anything, S remains finite not because of but *despite* taking on c as an additional member." But we shouldn't think of partial grounds as each *pushing* the grounded fact into being true. (Schaffer's use of the phrase "helps ground" as synonymous with "partially grounds" is misleading him here.)

Basically I think Schaffer is working with an incorrect conception of what a partial grounds is. If we follow Fine in defining partial grounds in terms of full grounds, then a partial ground of [p] is something that is *part of* a full ground of [p]. But the following 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].

So we should hold that (TM_3) is false. We might deny (DS_3) and (CM_3) for similar reasons. (I also think there is room to accept (CM_3) but deny (CM_1).)

IV. Jenkins on Irreflexivity

Almost every author we have read has also assumed the following to be true:

Irreflexivity: For any entity *x*, it's not the case that *x* fully grounds *x*.

(Note: here I follow Jenkins in taking grounding to be a *relation* between *entities of arbitrary ontological category*.)

Jenkins thinks that it is a mistake to simply assume that Irreflexivity is true. She thinks there should be room to endorse the following two claims at the same time:

(D)   S's pain is metaphysically dependent upon some brain state

(I)   S's pain state is identical to that brain state.

At the very least, she thinks there should be room to endorse (D) but be non-committal on (I).

You might think that Fine's notion of a *weak ground* could help here.

However, presumably Jenkins is imagining a case in which someone holds (D) but denies the reverse dependence claim (i.e. denies <S's brain state is metaphysically dependent upon S's pain state>). But if "dependent" means "weakly dependent," then such a person is being inconsistent.

According to Jenkins, the best argument for Irreflexivity is:

P1.   The word "dependence" (and its synonyms) is quasi-irreflexive: it always sounds bad to say "*x* metaphysically depends on *x*" or "*x* metaphysically grounds itself." [*premise*]

P2.   The best explanation of why the word "dependence" is quasi-irreflexive is that the dependence relation is irreflexive. [*premise*]

C.   So, the dependence relation is irreflexive. [*from P1 and P2 by inference to the best explanation*]

Jenkins denies P2. She thinks that if we treat the semantics of the phrase "depends on" as hyperintensional, we can hold that utterances of "*x* metaphysically depends on *x*" are always false despite the dependence relation itself not being irreflexive.

"depends on" is *hyperintensional* $=_{df}$ that phrase creates contexts into which one cannot always substitute necessarily co-extensive terms salva veritate.

Jenkins denies that *relations* (as opposed to *expressions used to pick out those relations*) can be hyperintensional: even if *being-a-triangle-to-the-left-of* and *being-a-trilateral-to-the-left-of* are different relations, it makes no sense to say that one of these relations both holds between two things and does not hold between the same two things.

Jenkins sketches four options for how to provide the desired sort of hyperintensional semantics for "depends on" (pp. 271-274). But the main one that she spends some time developing is as follows:

- *option #1*: Take "depends on" to pick out a four-place dependence relation between (*i*) a state of affairs, (*ii*) a (possibly identical) state of affairs, (*iii*) a feature/aspect of the first state of affairs, and (*iv*) a feature/aspect of the second state of affairs.

This relation might hold between (*i*) S's pain (which is identical to brain state B), (*ii*) brain state B, (*iii*) the pain-y aspect of the state in question, and (*iv*) the brain-y aspect of the state in question.

Yet: "when you utter, 'S's pain depends on S's pain,' your second presentation of B as 'S's pain' means that the context supplies the pain-y aspect of B in the fourth argument place" (p. 272).

objection: Isn't this really to propose that dependence is a two-place relation between aspects of states of affairs?

Jenkins' reply: The surface appearance is of a relation that holds between states of affairs themselves, so it is preferable to include (*i*) and (*ii*) among the relata in addition to (*iii*) and (*iv*).