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DISCUSSION

REVISITING THE EPISTEMIC REGRESS OF DISPOSITIONS

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Pandispositionalists have not refuted the charge that their ideology precludes knowledge of the external world. Their replies boil down to the claim that some dispositions (viz introspectively accessible properties of epistemic subjects) can be detected without the mediation of their effects. But this reply is ineffective if the regress is restated in terms of mind-independent domains of science.

Keywords: dispositions, pandispositionalism, regress.

Pandispositionalists believe that all properties are causal powers or pure dispositions and no property is categorical or has a categorical aspect. Some years ago, Richard Swinburne argued that this view involves a devastating epistemic regress that renders nature unknowable. Swinburne's core idea was the following:

> Claims to recognize powers [. . .] need justification in terms of the effects which objects typically produce, and that involves justification in terms of the presence or absence of properties. But if properties are nothing but potentialities to contribute to powers, one could only justifiably attribute such properties to objects if one had observed their effects. And so on *ad infinitum*. The regress is vicious (Swinburne 1980: 317).

To illustrate, take the belief that *x* is fragile. I'm only justified to attribute fragility to *x* if I saw *x* break, or I saw some things break and I have reason to think that *x* is sufficiently similar to those things. However, if all properties are dispositions, then *being broken* is also a disposition, so the fact that I'm justified to attribute fragility to *x* implies that for some *y*, I was earlier justified to attribute the disposition of being broken to *y*. But that, in turn, requires having observed the manifestation of *being broken*. . . and so on ad infinitum.

I'll use the concept of epistemic mediation to state the argument formally:

Property *F* is epistemically mediated by property $G =_{df}$.

Knowing that something is *F* requires prior knowledge that something is (or was) *G*.

'Property *F* is epistemically mediated' is shorthand for 'Property *F* is epistemically mediated by some property *G*.' If a property is not epistemically mediated, I'll call it 'epistemically basic'.

Swinburne's argument can be reconstructed in the following form:

(1) All properties are dispositions.
(2) Every disposition is epistemically mediated.
(3) Therefore, no property is known to be instantiated.

The inference relies on the tacit premise that a backward-infinite series of prior knowledge states is impossible.[1]

Extant pandispositionalist replies to the regress attack (2). Here's a typical rejoinder:

> The error of the regress argument lies in the premise that [. . .] in order to attribute causal properties by appeal to certain effects, properties associated with these effects must invariably be attributed by appeal to further effects. That is not the case, and is not required on the pandispositionalist view of properties. [. . .] Every case of warranted causal property attribution is facilitated by some properties that are known independently of a knowledge of their further effects. [. . .] Consider the everyday use of simple measurement devices. One attributes properties such as ambient temperatures and pressures by appealing to effects registered on instruments such as thermometers and barometers. The properties one associates with these effects (specific states or settings of measurement devices) constitute what one might call perceptually direct properties, since the relevant immediate effects of their instances are perceptual states on the part of the observer (Chakravartty 2007: 136–7).

Shoemaker (1980: 323) and Bird (2007: 134) give essentially the same reply. Shoemaker, just like Chakravartty, takes regress-stoppers to be perceptual states, while Bird is willing to countenance dispositional belief states or '*sui generis* states of knowledge' as well. As far as I know, these three references exhaust everything that pandispositionalists have had to say about Swinburne's regress.

The gist of these replies is that (2) is false because some mental dispositions are epistemically basic—we know of them in virtue of instantiating them.

This response misses the point of Swinburne's original argument, because the regress can be rebuilt even if one accepts epistemically basic mental dispositions. But before I defend this contention, let me note that both sides in this debate appear to presuppose some sort of foundationalist epistemology. Specifically, they accept the existence of epistemically basic properties, that is,

[1] More precisely, the implicit premise is that series like this are impossible: *S* consciously entertains belief B_1 at t_1, *S* consciously entertains belief B_2 at t_2 ..., for $t_1 > t_2 > \ldots$ If the t_i series does not converge, the impossibility is obvious. If it does converge, then *S* consciously entertains an infinite number of beliefs in a finite amount of time, which is also impossible. I'm presupposing that all knowledge states discussed here involve the subject's consciously entertaining a belief: If at *t*, *S* knows that *x* is *F*, then *S* consciously entertains the corresponding belief at *t*.

they accept the existence of properties that one can know of without knowing anything else. Rejecting foundationalism may allow one to sidestep the debate. Or it may not.[2] In any case, this issue is too complex to explore here. Since all participants are committed to epistemically basic properties, I proceed under the assumption that there are such properties. With this proviso in mind, the regress can be repaired by looking at the way dispositions are individuated.

Dispositions have characteristic effects. For example, the characteristic effect of fragility is breaking, and the characteristic effect of flammability is burning. Dispositions are individuated by their characteristic effects. For example, we identify fragility as the disposition to break when struck. Although such first-pass characterizations are not counterexample-proof and they do not amount to semantic analyses, they indicate the essential causal roles of the properties in question. You cannot know that something is fragile without knowing that it is disposed to break.

If *D* is a worldly disposition (a disposition of an external object, as opposed to a mental property of epistemic subjects) and if the characteristic effect *E* of *D* is a worldly property (i.e., *E* is likewise a property of external objects and not a mental property of epistemic subjects), then knowing that something is disposed to bring about *E* requires prior knowledge that something is, or was, *E*. For example, knowing that water is disposed to freeze requires knowing that water once froze. Generally:

(4) For any worldly disposition *D*, knowing that *D* is instantiated requires prior knowledge that some characteristic effect *E* of *D* is, or was, instantiated.

P is a worldly property $=_{df}$ *P* is a property of external objects, not a property of epistemic subjects.

Admittedly, one can imagine cases where (4) fails. A newly developed virus that has not infected anyone may nonetheless be known to be deadly. However, such disposition attributions are parasitic on prior observations concerning other, nomologically related, dispositions. Biologists have seen similar viruses at work, they are familiar with the dispositions of the virus' parts, they know the laws of biochemistry etc. Such cases can be accommodated by making (4) a bit more complex, but I will leave it as it is, because precision only adds clutter.

Pandispositionalist refutations of Swinburne allege that some worldly dispositions have epistemically basic characteristic effects. Call such putative dispositions 'regress-stoppers'. The characteristic effects of regress-stoppers cannot

[2] It is sufficient for the reductio if the following limited form of foundationalism holds: (LF) For some property *F* of external objects, there is no property *G* of external objects such that *F* is epistemically mediated by *G*. This thesis is compatible with antifoundationalism. It is conceivable that (LF) is true yet knowing that something is *F* needs justification that does not concern the properties of external objects.

be worldly properties, because, by (4), worldly dispositions are epistemically mediated and hence, by definition, they are not epistemically basic. So for any regress-stopper D, the characteristic effect E of D is some change in the epistemic subject S.[3] Consider three possibilities regarding the nature of the change in question:

(5) The characteristic effect of our candidate regress-stopper D is S's coming to believe that some external object has D.
(6) The characteristic effect of D is S's coming to believe that some external object has some property F ($F \neq D$).
(7) The characteristic effect of D is S's coming to believe that she is experiencing a certain arrangement of qualia (or sense data etc.).

These possibilities are, in fact, exhaustive. To see why, let $\ulcorner a \text{ is } F \urcorner$ be the content of the mental state that is the characteristic effect of D,[4] and consider the following options:

(8a) a is an external object.
(8b) a is the epistemic subject herself, or some part of her mind.
(9a) $F = D$.
(9b) $F \neq D$.

(5) corresponds to the conjunction of (8a) and (9a), (6) corresponds to the conjunction of (8a) and (9b), and (7) corresponds to the conjunction of (8b) and (9b). The conjunction of (8b) and (9a) is ruled out, since D, being a worldly disposition, cannot be a property of the epistemic subject.

(7) may not be the only way to make sense of the conjunction of (8b) and (9b). The conjunction asserts that the characteristic effect of D is a mental state directed at the subject or at some part of her mind. (7) uses qualia to make this claim specific. Different specifications may be possible, but I don't think that the details make much difference.

The story so far: (5)–(7) appear to exhaust the pandispositionalist's options with respect to regress-stoppers. But (5)–(7) are all unacceptable, or so I'll argue now.

Characteristic effects help us individuate dispositions in the sense that if E is the characteristic effect of D, then our best first-pass hypothesis about the nature of D is that some x has D iff x brings about E under D-specific conditions C_D. Consequently, if one of (5)–(7) describes the characteristic effect of a regress-stopper D, with D being a worldly disposition, then our best first-pass hypothesis about the nature of D is that the bearers of D bring about one

[3] For simplicity, I pretend that each disposition has a single characteristic effect.

[4] If the characteristic effect of D is a mental state without propositional content (e.g., a perceptual state with nonconceptual content), then let $\ulcorner a \text{ is } F \urcorner$ be the content of the belief that S comes to have when she makes sense of the experience that is the characteristic effect of D.

of the states described by (5)–(7) under *D*-specific conditions C_D. For example, if *D* is the disposition of water to freeze at o°C, then (5)–(7) imply the following first-pass hypotheses about the nature of *D*:

(10) x is disposed to freeze at o°C $=_{df}$ It is o°C $\Box\!\!\rightarrow$ *x* makes us believe that *x* is disposed to freeze at o°C.
(11) *x* is disposed to freeze at o°C $=_{df}$ It is o°C $\Box\!\!\rightarrow$ *x* makes us believe that *x* is hard, cold etc.
(12) *x* is disposed to freeze at o°C $=_{df}$ It is o°C $\Box\!\!\rightarrow$ *x* makes us experience hard, cold (etc.) qualia.

I submit that these putative definitions are crazy, with the possible exception of (12), which is reminiscent of the idealism of Berkeley or the phenomenalism of Mill (theories that are, arguably, a bit crazy). Dispositions of external objects are not individuated by reference to our perceptual, doxastic, and epistemic states. Or, at any rate, only idealists and phenomenalists are entitled to think that they are.

Granted, it might be the case that even though (10)–(12) are implausible, some of their analogues, featuring other worldly dispositions, are not. But pandispositionalist rejoinders to Swinburne's regress do not help us to think of such cases. The only concrete example, hinted at by Chakravartty in the passage I quoted, concerns properties of measuring devices such as thermometers and barometers. But it is unclear why such properties would give rise to analogues of (10)–(12) that are more plausible than (10)–(12). Take a mercury thermometer's disposition to read 'o°C' when the temperature is o°C. The relevant analogues of (10)–(12) are the following:

(13) *x* is disposed to read 'o°C' at o°C $=_{df}$
It is o°C $\Box\!\!\rightarrow$ *x* makes us believe that *x* reads 'o°C'.
(14) *x* is disposed to read 'o°C' at o°C $=_{df}$
It is o°C $\Box\!\!\rightarrow$ *x* makes us believe that a thin metallic line ends at a 'o°C'-shaped mark.
(15) *x* is disposed to read 'o°C' at o°C $=_{df}$
It is o°C $\Box\!\!\rightarrow$ *x* makes us experience thin, metallic, 'o°C'-shaped (etc.) qualia.

These aren't any better than (10)–(12). In fact, they sound worse, with the possible exception of (15), which has the same idealist/phenomenalist overtones as (12).

To recapitulate: Pandispositionalists need worldly dispositions with epistemically basic characteristic effects to stop Swinburne's regress. But such dispositions do not seem to be in the offing unless one buys into an idealist or phenomenalist metaphysic that, in turn, renders the mind-independent world nonexistent or unknowable. So pandispositionalist responses to Swinburne's regress do not render the external world knowable after all.

In response, the interlocutor could argue that there are perfectly respectable worldly dispositions whose charactertistic manifestations are mental states. Colours are prime examples. Colours are often thought to be dispositions that are instantiated by external objects and have colour-sensations as their characteristic effects. Other secondary qualities, perhaps phenomenal space as well, can be treated in an analogous fashion. So the pandispositionalist can easily anchor our knowledge of the external world in worldly dispositions that have characteristic mental effects. Colours and other secondary qualities give us the 'manifest image' that mediates our knowledge of the mind-independent world.

This sort of empiricism doesn't really block Swinburne's regress, however. To see why, consider fundamental physical dispositions such as charge and mass. The following premise is *prima facie* plausible:

(16) Fundamental physical dispositions are epistemically mediated by the fundamental physical properties that are their characteristic effects.

For example, gravitational mass is epistemically mediated by gravitational attraction, which is a fundamental physical property (or a conjunction of such properties).[5]

(16) follows from two plausible claims: premise (4), which says that worldly dispositions are epistemically mediated by their characteristic effects, and the assumption that the characteristic effects of fundamental physical dispositions are fundamental physical properties.

In conjunction with pandispositionalism, (16) entails that no fundamental physical property is known to be instantiated. By definition, property F is epistemically mediated by property G iff knowing at t that F is instantiated requires knowing, at some $t^* < t$, that G is instantiated. So if you know at t that some fundamental physical property F is instantiated, then you knew, at some $t^* < t$, that some fundamental physical property G was instantiated. Likewise for G. And so on. Since a backward-infinite series of knowledge states is impossible,[6] no fundamental physical property is known to be instantiated.

The same follows for any branch of science where reference to subjects is absent from the definition of the dispositions in question. For any branch B of science, if every disposition studied by B has some property studied by B as its characteristic effect and no property studied by B is a mental property, then it is unknowable, under pandispositionalism, whether any of the dispositions studied by B is instantiated.

[5] Namely, a conjunction of spatiotemporal relations. (Spatiotemporal relations are non-fundamental in various candidate fundamental physical theories such as string theory and loop quantum gravity, but that doesn't affect my point about the plausibility of (16).)

[6] See fn.1.

More formally, let *B* be some branch of science and let *L*(*B*) be the collection of natural laws that describe the nomic profile of the properties studied by *B*. I assume that *L*(*B*) contains the characteristic effects of the dispositions studied by *B*, in other words, the characteristic effects of a given disposition *D* feature in the laws that describe the nomic role of *D*. My point could be made without this assumption, but it simplifies the discussion.

Let's say that the domain of branch *B* of science is *mind-independent* iff *L*(*B*) does not mention mental states. The domain of fundamental physics seems mind-independent in this sense, since fundamental physical laws do not mention mental states (as far as we can currently tell). Since epistemically basic dispositions must be mental states, no disposition studied by *B* is epistemically basic if the domain of *B* is mind-independent:

(17) For any branch *B* of natural science, if the domain of *B* is mind-independent, then the dispositions studied by *B* are epistemically mediated by properties studied by *B*.

Given pandispositionalism, premise (17), and premise (4), it follows that

(18) For any branch *B* of natural science, if the domain of *B* is mind-independent, then it is unknowable whether any property studied by *B* is instantiated.

The pandispositionalist can challenge this revised version of the regress in two ways. First, she can deny (4), the thesis that worldly dispositions are epistemically mediated by their characteristic effects. As we saw, this principle is hard to challenge. It is hard to see, for example, how one could know that something has gravitational mass without ever having observed gravitational attraction.[7]

Alternatively, the pandispositionalist could suggest that the dispositions studied by mind-independent domains of science have mental characteristic effects as well as worldly ones. For example, gravitational mass has both a worldly characteristic effect, namely gravitational attraction, and a mental one, namely the experience of gravitational attraction (a complicated quale, say). The latter is epistemically basic and it stops the regress.

This suggestion sounds peculiar, because the nature of gravitational mass doesn't seem to have anything to do with human mentality, hence qualia can hardly be among the characteristic effects of gravity. But the fix is ineffective even if we disregard this problem.

Call 'straddlers' those putative worldly dispositions that have both worldly characteristic effects and mental ones, straddling the divide between those

[7] As mentioned earlier (p. 3), justified disposition ascription can occur without prior observation of the relevant characteristic effects, but such cases are parasitic on knowledge that satisfies (4).

dispositions that tend to bring about changes in the external world and those that tend to bring about mental states. Any straddler *D* has a worldly characteristic effect E_{WORLDLY} and an epistemically basic mental characteristic effect E_{MENTAL} (e.g., a quale). The gist of the pandispositionalist proposal is that some fundamental physical dispositions (or, generally, some dispositions in some mind-independent domain of science) are straddlers.

In order for a fundamental physical straddler *D* to stop the regress induced by (16) while also granting us knowledge about the external world, we would need to know, when we observe *D* at work, that something in the external world instantiates E_{WORLDLY}. Otherwise we won't know about the mind-independent effects of *D*. By assumption, E_{WORLDLY} is a fundamental physical property, because *D* is a fundamental physical disposition and the worldly characteristic effects of fundamental physical dispositions are fundamental physical properties. Moreover, E_{WORLDLY} is a disposition if pandispositionalism is true. So knowing that E_{WORLDLY} is instantiated requires prior knowledge that some fundamental physical property *F*, namely one of the worldly characteristic effects of E_{WORLDLY}, is, or was, instantiated. But *F* is also a disposition. . . etc. Straddlers do not block the regress.

In conclusion: Extant pandispositionalist replies to Swinburne's regress appeal to dispositions that have characteristic mental effects. Such dispositions, however, are unable to grant us knowledge of mind-independent domains of science. Pandispositionalism continues to render the mind-independent world unknowable.[8]

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