Cognitive Science for the Revisionary Metaphysician

David Rose

Many philosophers insist that the revisionary metaphysician—i.e., the metaphysician who offers a metaphysical theory which conflicts with folk intuitions—bears a special burden to explain why certain folk intuitions are mistaken. But though it is widely agreed that the revisionary metaphysician incurs such an explanatory burden, many philosophers think that the revisionist is unlikely to be able to successfully discharge this explanatory burden (e.g., Paul, 2012, p. 22; Hirsch, 2002, p. 117; and Korman, 2009). My plan is to offer some resources to the revisionary metaphysician to meet this explanatory burden. Specifically, my proposal is that evidence from cognitive science can help the revisionary metaphysician discharge the explanatory burden of providing a plausible account of how the folk have gone wrong. I'm not going to merely engage in a discussion of the abstract prospects of how cognitive science *might* end up helping discharge this explanatory burden. Instead, by taking up a concrete illustration, my strategy will be to show how cognitive science can *actually* help the revisionary metaphysician discharge this explanatory burden. In particular, I will consider metaphysical disputes over composition and persistence and various charges of violating folk intuitions. I'll then discuss a range of empirical evidence which suggests that the folk operate with a benighted teleological view of composition and persistence and go on to argue that there is a debunking explanation for folk intuitions of composition and persistence. Given an empirically informed understanding of the folk view of composition and persistence, the revisionary metaphysician has the resources to offer a plausible debunking explanation of folk intuitions. In this way, I'll take myself to have illustrated one key way in which evidence from cognitive science can help the revisionary metaphysician discharge the explanatory burden of providing a plausible account of how the folk have gone wrong.

Though my main goal is to illustrate how cognitive science can contribute to metaphysics by helping discharge the explanatory burden put to the revisionary metaphysician, I have another goal. Recently, Dan Korman and Chad Carmichael (2017) have provided a range of objections against the particular debunking explanation I'll be focusing on. Two objections are particularly troubling. The first is that the teleological view of composition that the folk operate with may well be legitimate. If this is right, then it will undercut the attempt to debunk folk intuitions and leave the explanatory burden faced by the revisionary metaphysician untouched. The second is that, in the studies I'll be discussing, the folk don't report their intuitions about the relevant cases. Instead, they merely provide answers. If this is right, then the relevant folk intuitions don't deserve to be debunked. The studies tell us nothing about what the folk intuit. Since the debunking argument has as its focus folk intuitions and since the studies allegedly don't tell us anything about what the folk actually intuit, the debunking argument fails. If either of these two objections is right, the illustration of how cognitive science

can help the revisionary metaphysician discharge the explanatory burden will be a failure. So my other goal will be to address these two objections.

The Plan: I will begin, in Section I, with some stage setting, discussing how I'll be understanding intuitions and their targets. I'll also set out one reason why conflict with folk intuitions gives rise to an explanatory burden and briefly set out a discussion of metaphysical disputes over composition and persistence and the explanatory burden that arises for the revisionary metaphysician in connection with these disputes. In Section II, I'll illustrate how cognitive science can help the revisionary metaphysician discharge the explanatory burden in the case of composition and persistence. I'll then respond to two main objections in Section III.

I. Stage Setting

I want to begin with a bit of stage setting before getting on to the illustration of how cognitive science can help the revisionary metaphysician discharge the explanatory burden (Section II). To this end, I want to briefly set out:

- How I'll be understanding intuitions
- How I'll be understanding the target of intuitions
- A rationale for why folk intuitions might be taken seriously and the explanatory burden that arises when a theory conflicts with folk intuitions
- The main metaphysical disputes I will focus on (i.e., composition and persistence)

Having accomplished this, Section II will present the kind of teleological view that the folk operate with (i.e., promiscuous teleomentalism), some of the evidence suggesting that teleological considerations play a key role in folk intuition of composition and persistence, and the debunking argument for folk intuitions of composition and persistence.

1.1. Intuitions

What are intuitions? There's an important debate over how intuitions are best characterized with a wide range of proposals on offer (e.g., Bealer 1998; Cappelen 2012; Deutsch 2015; Devitt 2015; Pust 2016; Sosa 1998; Weinberg 2014; Williamson 2007). That debate is a swamp, which I won't wade into here. So, I'm simply going to set out the way I'll be understanding intuitions.

I'll be adopting an inclusive account of intuitions (Williamson, 2007; Stich, forthcoming) and will take intuitions to be spontaneous judgments—which immediately arise without any awareness of their origin and without having gone through any conscious process of reflection or reasoning—that some person, object, event, etc. described in a scenario has (or lacks) some interesting or important property or relation (Stich, forthcoming). Understanding intuitions in this way reflects how they are understood within dual-processing models of cognition (e.g., Epstein, 1994; Sloman, 1996; Chaiken and Trope, 1999; Kahneman and Frederick, 2002, Stanovich and West, 2000) and is analogous to how they are understood in linguistics (Stich, forthcoming).

Linguists typically gather data by presenting native speakers with sentences and asking participants, for instance, whether the target sentence is grammatical. Often the target sentence will elicit an intuitive judgment about whether it is grammatical, that is an intuition about grammaticality that arises spontaneously without the subject being aware of its origin or of having gone through any conscious process of reflection or reasoning. "Colorless green ideas sleep furiously" is a familiar example. We have the intuition that it is grammatical (though meaningless): the judgment that it is grammatical arises spontaneously and immediately without our engaging in any conscious reflection or reasoning. Similarly, philosophers present scenarios or "thought experiments" intended to elicit intuitive judgments from their audience. To take one example, in Trolley cases, a scenario is presented in which a protagonist in the scenario is faced with a decision to flip a switch to divert a trolley onto a sidetrack. If the switch is not flipped, the trolley will kill five people on the main track; if it is flipped, the trolley will kill only one person who is on the sidetrack. The audience is then asked whether it would be morally permissible to flip the switch. Many people offer a judgment which arises spontaneously and immediately without being aware of its origin or of having gone through any conscious process of reflection or reasoning (e.g., Hauser, Young and Cushman, 2008). In short, they intuit whether or not it is morally permissible to flip the switch.

1.2. The Target of Intuitions

What is the target of intuitions? For present purposes, I take it that intuitions can have one of two targets. The first target is *mentalist* where intuitions have as their target in-the-head psychological entities, most notably concepts; the second target is *extra-mentalist*, where intuitions have as their target outside-the-head non-psychological entities (Goldman and Pust, 1998).

Which view one takes on the target of intuitions depends, in part, on what philosophical project is being undertaken. If one's project is to engage in conceptual analysis, such as an analysis of the concept of causation, knowledge and the like, then insofar as the theorist takes intuitions to play a role in conceptual analysis, intuitions will be targeted at uncovering the features of the relevant concept, its content or its extension. But if one's project is to understand the outside-the-head phenomena themselves, for instance, the nature of causation, the nature of knowledge and the like, then intuitions will have as their target outside-the-head non-psychological entities, the phenomena themselves.

There's some controversy over whether the appropriate target for intuitions is mentalist or extra-mentalist. Goldman (2007) claims that the only legitimate target for intuitions is mentalist since it is deeply puzzling how intuitions could provide evidence about the extra-mentalist phenomena themselves (e.g., knowledge, causation, etc.). So intuitions, insofar as they play a legitimate role in philosophical theorizing, do so largely in the course of conceptual analysis. But as Stich and Tobia (forthcoming) note, "[F]or most of human history, perception posed a comparable mystery, and the appeal to intuition in mathematics still does" (p. 11). So while we

may lack an account of how intuitions could be linked to extra-mentalist phenomena, this shouldn't lead to skepticism that they can be legitimately used in this way. And as Sosa (2007) points out, intuitions are often used in this way. That is, philosophers who rely on intuitions often take the content of the intuition to be about the world, and not merely about what is in one's head, and so on this view the content of the intuition is taken to be true (provided the intuition hasn't been triggered in error or is due to a bias, etc.).

In the metaphysical disputes I'll be discussing below, it is not always clear what target for intuitions the theorist has in mind. For present purposes, I'll simply assume that they take the target of intuitions to be extra-mentalist. There are two reasons for this. First, given the mereological disputes I'll be discussing, it is more natural to understand the appeal to folk intuitions as being useful insofar as they serve as a guide to what there is in the world. For instance, mereological nihilism—the view that composition never occurs—holds that there are no composite objects. It's hard to make sense of this view if it is born out of an analysis of our concept of composition. Second, conceptual analysis has fallen out of favor for quite some time[1] and so it seems reasonable to take contemporary metaphysicians, unclear as they are as to what they take the targets of intuitions to be, to assume that intuitions are targeted at the extra-mentalist phenomena themselves.

1.3. Taking Folk Intuitions Seriously and The Explanatory Burden

Why might folk intuitions be taken seriously? And why think an explanatory burden arises for those who put forward theories that conflict with folk intuitions? A number of different rationales could be offered for why folk intuitions might be taken seriously. But since my main goal is to illustrate how cognitive science can help the revisionary metaphysician discharge the explanatory burden of providing a plausible explanation of how the folk have gone wrong, I'm only going to focus on one rationale. Lewis (1986) tells us that "Common sense is a settled body of theory— unsystematic folk theory—which at any rate we do believe; and I presume that we are reasonable to believe it. (Most of it.)" (p. 134). So if it is reasonable to believe common sense, then a theory that conflicts badly with it would appear to have some explaining to do. Specifically, a theory which conflicts with it should give us reasons for thinking that the relevant aspect of the folk view is wrong and tell us just how it is wrong. Indeed, as Korman notes "[V]irtually everyone agrees that, even after having presented the arguments for their positions, proponents of revisionary philosophical theories—that is, those that deviate from the pretheoretical conception—are required to provide some sort of account of the conflict between their theories and the pretheoretical beliefs of non-philosophers ("the folk")" (Korman, 2009, p. 242). That is, the revisionary metaphysician, in offering a metaphysical theory which departs

[1] Though see e.g., Jackson, 1998 and Kriegel, 2017

from common sense or folk intuitions accrues an explanatory burden in that she is required to provide a plausible account of how the folk have gone wrong.[2]

1.4. Mereology and The Explanatory Burden

To illustrate how cognitive science can help the revisionary metaphysician discharge the explanatory burden, I'm going to focus on two issues connected with mereology. Mereology is roughly concerned with parthood relations, the relations of part to whole and the relations of part to part within a whole. Specifically, I'm going to focus on disputes over the question of when mereological composition occurs—when do the parts make a whole?—and a connected question over how a whole—an object—persists through alterations to its parts.

Metaphysical theories of composition and persistence are often charged with violating folk intuitions. In short: a number of metaphysical theories of composition and persistence are revisionary in that they allegedly conflict with folk intuitions. With respect to composition, one example of a revisionary theory is universalism. The universalist thinks that composition occurs under any circumstance whatsoever. It is completely unrestricted. It always occurs. On this view, there exists, for instance, a fusion of my nose and a doorknob, a fusion of a trout and a turkey, and even a fusion of the moon and a piece of cheese. Perhaps unsurprisingly, universalism is typically charged with violating folk intuitions since presumably the folk do not recognize the kind of fusions that the universalist recognizes. Universalism is thus typically regarded as a revisionary metaphysical theory.[3] And indeed one of the main objections against universalism is that it violates folk intuitions, though the charges are typically disputed.[4] Thus the task put to the universalist is to provide some plausible explanation of how it is that the folk have gone wrong.

So too with persistence. Again to take just one example, Burke's (1994) sortal based account of persistence is typically charged with violating folk intuitions. On Burke's view, when a sculptor takes a piece of copper and fashions it into a statue, the piece of copper is destroyed, and in its place there comes to exist a new piece of copper which is in turn identical to the resultant statue. One main objection against Burke's sortal based account is that it violates folk intuitions. Nobody, not even children, thinks that an object is destroyed upon merely assuming a certain shape (Lowe, 1995). Burke however disputes these charges.[5] Insofar as this account does conflict with folk intuitions, it counts as a revisionary metaphysical theory. Given this, the

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[2] This isn't to say metaphysicians are the only philosophers confronted with this kind of explanatory burden. For instance it also arises in ethics (Mackie, 1977; see also Rose and Nichols, forthcoming, for an overview).

[3] I'm focusing on universalism simply for illustrative purposes. A number of other views have also been charged with violating folk intuitions and so count as revisionary metaphysical theories. For an overview see Rose and Schaffer, 2017.

[4] See Rose and Schaffer, 2017

[5] Here again, I've only focused on Burke's view for illustrative purposes. For more see Rose (2015) and Sidelle (2002).

metaphysician who embraces such a view of persistence is faced with the task of providing some plausible explanation of how it is that the folk have gone wrong.

In general, if a metaphysical theory is revisionary, then the theorist will often be confronted with the explanatory burden. But if this is the case, how might the revisionary metaphysician discharge the explanatory burden? One way would be to argue that the theory doesn't conflict with the relevant folk intuitions.[6] On this way of proceeding, the alleged conflict between the relevant folk intuitions and the deliverances of the theory would only be apparent, not genuine. Another way would be for the revisionist to embrace the conflict between the relevant folk intuitions and the deliverances of the theory as being genuine and seek out an empirically informed debunking explanation of the relevant folk intuitions. This is my preferred strategy. So, moving on to this, I want to now discuss the particular view of composition and persistence—folk mereology—I take the folk to be operating with and some of the evidence supporting this before getting on to the debunking explanation.

II. Promiscuous Teleomentalism, Folk Mereology and Debunking

2.1. Promiscuous Teleomentalism

My view is that the folk heavily indulge in promiscuous teleomentalist thinking. There are two parts to this view. The first is that the folk are promiscuous teleologists in that teleological considerations inform their understanding of artifacts, organisms and even non-living natural things like rocks. Second, the specific teleological view the folk adopt is teleomentalism where teleology is understood psychologically, in terms of intentions, goals and purposes.[7] In other words, the folk view reality as a whole as being infused with agency and purpose and thus the folk indulge in promiscuous teleological thinking because they are promiscuous telelomentalists.

Why think that the folk are promiscuous teleomentalists? There are two relevant lines of psychological research. One concerns promiscuous teleology; the other concerns teleomentalism underwriting promiscuous teleological thinking. I'll briefly discuss each line of evidence (for further details see Rose, 2015 and Rose and Schaffer, 2017).

First, regarding promiscuous teleology, it has been found that children insist that lions are for "going to the zoo", that clouds are "for raining" (Bloom, 2007, p. 150), that "mountains exist to give animals a place to climb" and that rocks are pointy "so that animals won't sit on them and

[6] See Rose and Schaffer (2017) and Rose (2015) for documentation of a number of philosophers claiming that their view doesn't really conflict with folk intuitions.

[7] This contrasts with teleonaturalism where teleological claims are to be understood in ways that do not refer to the intentions, goals, or purposes of psychological agents' (see Allen and Bekoff, 1994, p. 13 for a discussion of teleonaturalism and teleomentalism). Though teleonaturalism may be a respectable form of teleology, I would note that this is a stipulated/revisionary idea introduced to legitimize certain uses of teleology in biology, and was never intended to correspond to the actual concept the folk operate with.

smash them" (Kelemen, 1999, pgs. 1444-1445). Promiscuous teleological thinking isn't merely confined to children. Instead, it extends into adulthood. For instance, Lombrozo et al (2007) found that adults with Alzheimer's disease, who tend to suffer from deficits in background causal beliefs, naturally default to accepting promiscuous teleological explanations. Even those without cognitive deficits, such as college educated adults, accept promiscuous teleological explanations such as "the sun radiates heat because warmth nurtures life", "fungi grow in forests to help decomposition", and "lightning occurs to release electricity" with ease. In fact, even professional physical scientists naturally accept promiscuous teleological explanations when their cognitive resources are limited, such as when in a speeded task. This research suggests that promiscuous teleological thinking emerges early in childhood and is retained into adulthood. And though it may be masked in certain kinds of cases (e.g., as with professional physical scientist explicitly considering the acceptability of promiscuous teleological explanations), it is retained nonetheless. It represents a deep-seated, natural default perspective on the world.

Second, concerning teleomentalism, the evidence suggests that the folk take an agentive perspective on reality as a whole. Importantly, teleomentalism isn't tied into any particular background religious views. In this way, teleomentalism is open to all. For instance, Kelemen and DiYanni (2005) report a strong tendency among children—both from religious and nonreligious backgrounds—to an 'intuitive theism' in which nature is viewed as an artifact of a creator, as well as a significant correlation between viewing something teleologically and regarding it as created. Moreover, in recent research by Rottman et al (2016), they found that even Chinese people, despite being in a largely atheistic culture, succumb to promiscuous teleological thinking. Though background religious views don't appear to be heavily tied into promiscuous teleological thinking, endorsement of background Gaia beliefs (Kelemen et al., 2013; see also Kelemen, 2012)—beliefs that nature is a living, powerful, goal directed being—has been shown to significantly predict peoples tendency to engage in promiscuous teleological thinking. On top of all this, decades of research in science education has found that an agentive perspective on reality is one of the main obstacles students confront—religious and non-religious alike—in acquiring a proper understanding of natural selection (see Kelemen, 2012 for an overview). We have what Pascal Boyer (2001) has called a "hypertrophy of social cognition"— a willingness to attribute purpose, agency and design, even when it is inappropriate to do so—and are "hypersensitive to signs of purpose, design and agency, so much so that we see purpose where all that really exists is artifice or accident" (Bloom, 2007, p. 150). In short: the evidence suggests that promiscuous teleological thinking is underwritten by teleomentalism.

So research in psychology suggest that the folk are promiscuous teleomentalists. The main question now is whether promiscuous teleomentalism plays a role folk mereology. I'll take this up next.

2.2. Folk Mereology

I won't rehearse the full details of the work on folk mereology (see Rose, 2015 and Rose and Schaffer, 2017 for further details). Instead, I will discuss some of the highlights to set out some support for the view that promiscuous teleomentalist thinking underwrites folk intuitions of composition and persistence. First, composition.

Beginning with artifacts, people were given a case featuring an unfamiliar artifact, a "gollywag". They were told about two individuals, Smith and Jones, experimenting with the gollywags. In one case, the no purpose case, participants were told that Jones superglues some of the gollywags together. In the purpose case, people were again told that Jones superglued the gollywags together. But they were also told that Jones had a sore back, placed the superglued gollywags on his chair, sat on them for the rest of the day and no longer had a sore back. In both cases a disagreement ensues between Smith and Jones with Smith saying that the gollywags do not compose an object and Jones saying they do. Whether the gollywags had a purpose strongly affected people's intuitions about whether composition had occurred: people were significantly more inclined to think that composition had occurred when the gollywags had a purpose.

It turns out that teleological considerations aren't merely confined to intuitions about composition when considering artifacts. They also play a role in intuitions about composition when considering biological organisms and non-living natural things like rocks. Concerning biological organisms, people were again told that Smith and Jones are experimenting, but this time with mice. In one case Jones superglues some mice together; in another case he superglues them together, runs them through a maze, and finds that they are very successful at detecting bombs. In the former case, the superglued mice had no purpose; in the latter case, they did. Again, there was an impact of teleology on intuitions about composition with people being significantly more inclined to think that the superglued mice composed an object when they had a purpose. For the cases involving non-living natural things, rocks, people were told about an individual who lives on the side of a mountain. One evening an avalanche occurs and rocks are scattered across the individual's front lawn. What was varied was whether the protagonist thought that the scattered plurality of rocks had no purpose, thought they had a purpose, or arranged them for a purpose. The key finding was that when the scattered plurality of rocks had no purpose people denied that composition had occurred but when the protagonist thought the arrangement of rocks had a purpose or arranged them for a purpose people thought that composition had occurred.

Promiscuous teleology also plays a significant role in intuitions about persistence. In one study people were told about an individual, John, who is hiking and spots a glowing rock. The rock houses a special sort of microorganism which feeds off minerals in the rock's interior. But the microorganisms can't access the minerals deep in the rock's interior. The microorganisms begin dying and the rock begins fading. So John tries an experiment. He smashes the rock into three pieces with a hammer. In one case, the microorganisms continue dying and the thing fades to black. In the other case, the microorganisms can access the minerals and the thing resumes

glowing. In the former case people thought the rock did not survive the smashing; in the latter case people thought the rock survived the smashing. So even when turning to persistence, we continue to see a pattern of promiscuous teleological intuitions.

Turning now to teleomentalism, one of the main reasons for thinking that promiscuous teleology is underwritten by teleomentalism comes from the background research in psychology. But there is some more direct evidence. In particular the same case concerning persistence (discussed above) was rerun. But this time people's background Gaia beliefs were assessed.[8] Utilizing a causal modeling procedure, it was found that Gaia beliefs caused people's teleologically laden intuitions about persistence. This suggest that the tendency toward promiscuous teleology is underwritten by teleomentalism. Taken together, the evidence from Rose (2015) and Rose and Schaffer (2017) suggests that folk intuitions of composition and persistence are tied into promiscuous teleomentalism.[9]

2.3. Debunking Folk Mereological Intuitions and Meeting the Explanatory Burden

We saw that the revisionary metaphysician, in offering a metaphysical theory that conflicts with folk intuitions, is often faced with an explanatory burden in that she is required to provide a plausible explanation of how the folk could have gone wrong. And one case where we see the explanatory burden put forth is in disputes over mereology, specifically in discussions of composition and persistence. While one typical strategy for meeting the explanatory burden is to deny that there is any conflict between the deliverances of the theory and folk intuitions, my suggestion was that the revisionary metaphysician might do better to confront the explanatory burden head on and seek out an empirically informed debunking explanation of the relevant folk intuitions. Having discussed some empirical evidence suggesting that the folk operate with a promiscuous teleomenatlist view of composition and persistence, I will now consider how the revisionary metaphysician might debunk these aspects of folk mereology and discharge the explanatory burden.

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[8] Kelemen et al (2013) utilize the following probes as a measure of belief that reality as a whole is infused with agency (i.e., Gaia beliefs):
(1) I believe Nature is driven to preserve living things
(2) I believe the Earth is alive
(3) I believe that Nature is a powerful being
(4) I believe the Earth is driven to provide optimal conditions for Life
In the study under consideration only (1) was used (see Rose, 2015, p. 118). See Dink and Rips (2017) for a critical discussion of whether these measures, especially (3), tap in to background beliefs about agentive forces affecting the natural world.

[9] Some recent work on folk intuitions about causation has also found that Gaia beliefs cause people's promiscuous teleological causal intuitions (Rose, 2017). I would also add, though not pursue in any detail here, that it may be that folk mereology is underwritten by causal intuitions. The idea here is that people understand composition and persistence causally and given that causal intuitions are tied into promiscuous teleomentalism, it may be that these promiscuous teleomentalist tendencies run through causal intuitions to affect both composition and persistence intuitions.

My view is that at least one constraint on a metaphysical theory is that it shouldn't conflict with what our best science says about the world. This isn't to say that every metaphysical question is answerable to our best science. Nor is it to say that metaphysical theorizing is entirely held hostage by our best science (Ladyman and Ross, 2007). Instead I am only making the more modest claim that metaphysics, insofar as it is appropriate to the issue at hand, should be constrained, in part, by what our best science says about the world. In this way, I view science and metaphysics as enjoying a joint partnership, mutually informing one another (Paul, 2012). That said, there is an obvious respect in which promiscuous teleomentalism conflicts with what our best science says about the world. Teleology has, for the most part, been purged from the natural sciences.[10] Indeed, the rejection of a teleological perspective on all of the natural world traces at least as far back to the emergence of modern science from medieval Aristotelianism. It's arguably due, at least in part, to the rejection of a teleological perspective on all of the natural world that science has made great strides over the past several hundred years. Not to put too fine a point on it, the rejection of an agentive, teleological perspective on the natural world is also one reason why modern day intelligent design "science" is widely rejected. If scientists were to accept some version of intelligent design along with the agentive, teleological perspective on all of the natural world that comes along with it, science would slip into the dark ages. In short: it is widely agreed that a teleological perspective where all of nature—every rock and cloud—is infused with agency and purpose is part of a "superseded, pre-scientific muddle about how the world works" (Hawthorne and Nolan, 2006; see also e.g., Mayr, 1998; Allen and Bekoff, 1994).

So for the metaphysician who views herself as allied to the sciences, she ought to reject a teleological perspective on the natural world and as such the folk view of composition and persistence since it is encrusted with the muck and funk of an outmoded teleological perspective. Indeed, as Laurie Paul (2012) notes: "after drawing on experience to develop a theory, in evaluating it we need to look back at the natural science just in case our ordinary experience of the world conflicts with what our best natural science says about the world. If it does conflict, then often the assumptions based on ordinary experience should be rejected" (p. 17). Given the conflict between the teleological commitments of the folk in the cases of composition and persistence and the (presumptive) commitments of the revisionary metaphysician who views herself as allied with the sciences, in the specific cases of composition and persistence, there looks to be a basis to debunk folk intuitions.

Debunking can be fleshed out in different ways depending on one's background epistemological view. To take just one example, Nichols (2014) explores one option for debunking—process debunking— which is based on identifying epistemically defective

[10] Teleological notions play a role in biology and there is a dispute over whether appeals to teleology in biology might be naturalistically respectable (see Allen, 2009 and Allen and Bekoff, 1994 for overviews). But whether or not there is some revised, naturalistically respectable view of teleology to be had in biology, it's agreed that promiscuous teleomentalism is not one such view.

processes generating certain intuitions and is naturally viewed as being tied into reliabilism. But whatever one's preferred epistemological view for supplying debunking arguments, debunking should be aided by a metaphysical assessment (Schaffer, forthcoming). And I would add, as I've already noted, that certain metaphysical assessments should be informed and guided by our best science. In the case of folk mereology, our best science helps issue a clear metaphysical assessment: teleological infused intuitions fail to fit reality. On this basis, they deserve to be debunked.

Operating with a fairly neutral background epistemology, I view the situation as follows: conformity with folk intuitions confers prima facie justification on a theory, perhaps because, as Lewis (1986) points out, it's often reasonable to believe most of the deliverances of common sense. But once we have empirically assessed the relevant folk intuitions, in this case, two aspects of folk mereology—composition and persistence— we see that they are tied to a promiscuous teleomentalist outlook on reality. As such, they fail to fit reality. The assessment that promiscuous teleomentalism—and thereby folk mereological intuitions—fail to fit reality is a metaphysical assessment, one which is aided by what our best science says about the world. Given this, and thinking of folk intuitions as testifying as to what the relevant extra-mentalist phenomena is like, the intuitional testimony lacks ultima facie justification once we learn from cognitive science that the folk have a promiscuous teleomentalist view of the issue. In other words the evidence from cognitive science, coupled with a metaphysical assessment aided by our best science, helps supply an undermining defeater (Pollock, 1987) for folk intuitions of composition and persistence, which substantially strips these intuitions of their evidential credentials with respect to the extra-mentalist phenomena at hand, thereby cutting them off from achieving ultima facie justification.

Concerning the explanatory burden faced by the revisionary metaphysician in the case of composition and persistence, the revisionary metaphysician has the resources to discharge the explanatory burden. Armed with the results delivered from cognitive science and a background commitment to metaphysical theorizing being constrained, in part, by what our best science has to say about the world, she has an explanation as to how the folk have gone wrong in the case of composition and persistence. She has the resources to supply an undermining defeater for folk intuitions about composition and persistence, debunk the relevant folk intuitions and meet the explanatory burden. In this way, evidence from cognitive science can help the revisionary metaphysician discharge the explanatory burden of providing a plausible account of how the folk have gone wrong.

III. Objections

Having set out the specific illustration of how cognitive science can help the revisionary metaphysician discharge the explanatory burden, I now want to consider two main objections. If either of these is right, it will undercut the debunking explanation set out above.

3.1. Legitimate Teleology

The first main objection is that the teleological view the folk operate with may well be entirely legitimate (Korman and Carmichael, 2017). Folk intuitions of composition don't appear to be best explained by claiming that the folk are working with anything like the crude, superstitious view embodied in promiscuous teleomentalism. Rather there is something much more innocuous at work. Folk intuitions of composition, far from being tied into promiscuous teleomentalism, are tied into an assessment of creative intentions. On this view, the intentions of a creator play a significant role in folk intuitions of composition. For instance, if a sculptor was fashioning some copper into a statue with the intention of creating a statue, it would be entirely appropriate to use the creators intention—to create a statue—as a guide to whether the arrangement of copper composes a statue. And as Korman and Carmichael (2017) note, in all of the cases concerning composition in Rose and Schaffer (2017)—cases involving artifacts, biological organisms and even non-living natural things like rocks—the key difference between the purpose and no purpose versions of the cases lies in a difference between whether the relevant agent has or lacks the relevant creative intention.

As I understand the objection, at least two considerations must be in play in each of Rose and Schaffer's composition cases. The first is that there should be an agent and that this agent should either have or lack an intention to create some further thing. The second is that in every case where participants are considering whether an agent has an intention to create something, they are treating the thing as an artifact. A few brief remarks on these points. When considering artifacts, consulting an agent's creative intentions is arguably relevant in considering the question of whether the arrangement of some parts compose some further object. But creative intentions would be irrelevant when considering composition if there is either no agent or if the would-be composite is a non-artifact. Since most would presumably agree that the creative intentions of an agent are relevant when considering composition for artifacts, it must be the case that creative intentions play a role in cases involving non-artifacts because people are construing the would-be composite as an artifact.

Concerning the cases of composition, Korman and Carmichael are right that in each case, whether it involved an artifact, organism or non-living natural thing, there was an agent with (or without) an intention to create some further thing.[11] Given this, it may well be that participants are construing the would-be composite as an artifact.

I think the creative intentions account fails to provide a satisfactory explanation of folk mereological intuitions. First, it is not even clear that it can provide a general account of folk

[11] One exception to this is the Avalance Accorded Function case from Rose and Schaffer (2017) since in this case the relevant agent didn't plausibly intend to *create* a rock garden from the scattered arrangement of rocks. He only accorded the plurality of rocks scattered across his lawn the purpose of being a rock garden. Korman and Carmichael maintain though that the agent at least has an intention that the scattered plurality of rocks be a rock garden (see Endnote V).

intuitions of composition. Given that Korman and Carmichael only put it to work in attempting to provide an alternative explanation of the Rose and Schaffer results, it is unclear how the creative intentions account would extend to other cases of composition. How do the folk make composition judgments when no (actual) agent is involved in the case? What about when the would-be composite isn't plausibly construed as an artifact? What about when the agent's intention is unsuccessful? We would need a lot more detail regarding their account to answer these and related questions.

Perhaps the creative intentions account isn't aimed at providing a general account of folk intuitions of composition. In that case we would need some alternative account of folk intuitions of composition for cases in which the creative intentions account is ill suited. But the view that folk intuitions of composition are tied into promiscuous teleomentalism is aimed at providing a general account of folk intuitions of composition. It thus provides a simpler, more general account of folk intuitions of composition.

Second, the creative intentions account doesn't provide a plausible explanation of folk intuitions about persistence. In those case, there was a human agent involved but the relevant agent lacked creative intentions. For instance, in the rock smashing cases, John smashes the glowing rock—which is fading as the microorganisms can't access minerals deep in the rocks interior—into three pieces. In one case (see Rose, 2015), the microorganisms all begin dying and the thing fades to black; in the other case, the microorganisms can access the minerals after the smashing and the thing resumes glowing. It's doubtful that in either of these cases John had an intention to create anything. Even assuming that John did possess some creative intention, it seems that in both cases John presumably possesses either the intention to create a glowing rock, a better situation for the microorganisms or both. Yet, people make different persistence judgments in this case. If creative intentions play a role in persistence judgments as well, then since they are held fixed across these cases, we shouldn't see any difference in persistence judgments. But we do. So there's good reason to think that the creative intentions account fails to fit the pattern of findings from this case.[12]

Perhaps the creative intentions account isn't aimed at providing a more general account of folk mereological intuitions. Korman and Carmichael only focused on folk intuitions about composition in the Rose and Schaffer cases so perhaps they think that there must be some alternative account for why the folk have teleologically laden intuitions when considering persistence. On my proposal, however, there is a single view underwriting both aspects of folk mereology i.e., composition and persistence. That is, promiscuous teleomentalism underwrites folk mereological intuitions and so provides a unifying explanation of the processes underwriting folk intuitions of composition and persistence. Given this and given that it

[12] I would flag that I'm assuming creative intentions are held fixed across these cases. But they may not be. Given that a probe assessing creative intentions wasn't used for this study, it's an open empirical question whether people actually view the creative intentions similarly in the cases.

provides a smooth, simple fit to the data, we're owed some explanation of what might be going on in the persistence cases since the creative intentions account is inadequate. But Korman and Carmichael offer no such proposal.

Korman and Carmichael might point out that nonetheless even in the persistence cases involving rocks there is an agent involved and so plausibly the agent's intentions, whatever they are, may still be guiding folk judgments. Moreover, they might note, the folk are nonetheless construing the relevant things in terms of artifacts. So agent intentions are playing some yet to be specified role and moreover in each case, people treat the relevant thing as an artifact. However, I would point out two things. First, it is implausible that people treat the glowing rock as an artifact. Nobody created the glowing rock. John found it by the side of a trail. To insist that the folk treat the rock as an artifact would be to saddle the folk with the kind of "uncharitable" view that Korman and Carmichael want to avoid. Second, I doubt that the creative intentions of a human agent are playing a role in the persistence cases because Gaia beliefs cause teleologically laden persistence intuitions (see Rose, 2015). So an (actual) agent's creative intentions are not playing a role in underwriting teleologically laden persistence intuitions. Instead, and in line with my hypothesis, promiscuous teleomentalism looks to be underwriting these intuitions. Given that, and it's coherence with background work in psychology, promiscuous teleomentalism also plausibly underwrites folk intuitions of composition. In short: promiscuous teleomentalism drives, plays a general role in, folk mereological intuitions and the folk don't treat every collection of things as an artifact. Thus, I maintain the claim that the folk operate with a benighted view of composition and persistence. Folk mereology is unfit for real metaphysics.

3.2. Answers, Not Intuitions

The second objection I want to consider is that the folk, in responding to the prompts in the experiments, aren't reporting their intuitions. Instead they are merely reporting their answers.[13] If this is right, then folk mereological *intuitions* wouldn't be debunked (Korman & Carmichael, 2017).

This kind of objection tends to be broad in scope.[14] If right, it wouldn't simply threaten the work on folk mereology. Instead it would extend to every claim anyone ever makes about folk intuitions, including any claim philosophers make about folk intuitions. No one would be in a position to speak to the content of folk intuitions. As a general criticism, I think there are good

[13] Of course, reporting an intuition is to report a kind of answer. Korman and Carmichael are using "reporting an answer"" in the sense of "not reporting an intuition".

[14] Though Korman and Carmichael only raise it for the Rose and Schaffer studies, it is easily extended to any study (see e.g., Bengson, 2013).

reasons to be suspicious of such a claim. I also think that, in the specific case of folk mereology, there is good reason to doubt that the folk are reporting answers and not intuitions.

Korman and Carmichael claim that, in contrast to reporting intuitions, giving answers involves reporting considered judgments after talking one's self out of their intuitive reactions (p. 7). This suggests that reporting an answer, as opposed to an intuition, involves something like the following: Upon having an intuition, a subject would, for instance, have to bring some background considerations to bear on the task, leading her to suppress reporting the intuition and instead report an answer which is independent of the intuition. This is a somewhat complicated procedure which would surely require a good deal of cognitive effort to execute. And indeed, there is some reason for thinking that the folk have a difficult time executing such a process. Take the Cognitive Reflectivity Test (CRT) developed by Frederick (2005). Here's one test item from the CRT:

> A bat and a ball cost $1.10 in total. The bat costs $1.00 more than the ball. How much does the ball cost?

This question has an incorrect but intuitive answer, $.10. To arrive at the correct answer, $.05, one needs to suppress the intuitive judgment, bring background knowledge of algebra to bear on the case and report the answer delivered from the algebraic computation. Reporting an answer as opposed to an intuition requires a good deal of cognitive effort. And it turns out that in general, the majority of people fail the CRT (i.e., they report the intuitive but incorrect answer for one or more items). Indeed, even those who score high on the CRT (i.e., give the correct answer to each item) are not immune from giving intuitive responses. For instance, one study found that 38% of those scoring high on the CRT commit the conjunction fallacy, that some thing possessing two properties is more probable than that thing possessing a single property (Ochssler, Roider and Schmitz, 2009). Since the majority of people fail the CRT and since some people who score high on the CRT even naturally default to reporting intuitions in some cases, there is good reason to think that, as a default, in any given study probing folk intuitions, people are reporting intuitions and not answers.

In general, I think the claim that people are reporting answers and not intuitions should be viewed with suspicion. There is good reason for thinking that people do indeed tend to report intuitions and that it takes a good deal of cognitive effort to do otherwise. And in the specific case of folk mereology, I also think that the claim that the folk are reporting answers and not intuitions fails.

One reason it fails is because when one looks at work on folk teleology in psychology, one finds that at a very young age children naturally offer and accept promiscuous teleological explanations, for instance, thinking that "mountains exist to give people a place to climb". It's doubtful that children aren't reporting intuitions in this case. It is implausible that they are going through something like the kind of complicated cognitive procedure suggested above in order to provide answers as opposed to intuitions. And since adults display teleologically

laden responses which reflect these childhood tendencies, there is good reason for thinking that they are indeed reporting intuitions, not answers. Moreover, even though some groups of individuals tend to avoid explicit teleological thinking, such as professional physical scientists, these same individuals naturally default to a teleological thinking when their cognitive resources are limited, such as when in a speeded task. This suggest that teleological thinking is an intuitive default, suppressed only by engaging in a good deal of cognitive effort. Given that folk mereological intuitions reflect this default aspect of intuitive teleological thinking, this suggest that their judgments reflect their intuitions and not merely their answers.

IV. Conclusion

The revisionary metaphysician—in offering a theory that conflicts with folk intuitions—is typically confronted with an explanatory burden in that she is required to provide a plausible explanation of how the folk have gone wrong. My suggestion was that evidence from cognitive science can help the revisionary metaphysician discharge this explanatory burden. I illustrated this by taking up metaphysical disputes over mereological composition and persistence. I then discussed evidence from cognitive science which suggests that the folk are promiscuous teleomentalists and that promiscuous teleomentalist thinking underwrites folk intuitions of composition and persistence. On the basis of this, I went on to argue that there is a debunking explanation for folk intuitions. I then responded to two main objections to the debunking argument I set out, finding both objections to be insufficient to undercut the debunking argument put forth. Thus, I uphold the view that folk mereological intuitions concerning composition and persistence deserve to be debunked. In this way, I take myself to have illustrated one key role cognitive science can play in metaphysics; namely by helping the revisionary metaphysician discharge the explanatory burden of providing a plausible explanation of how the folk have gone wrong.[15]

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