Farbod Akhlaghi-Ghaffarokh (University of Oxford)

***Non-Realist Cognitivism, Truthmaking, and Ontological Cheating***

Category: Meta-ethical Robustness

*Abstract*:

Derek Parfit defended Non-Realist Cognitivism. On this novel view, normative claims concern irreducibly normative phenomena. Such claims can be true, some of them are true, and such claims ‘do not have their truth depend upon any feature of reality’, that is, their truth has ‘no ontological implications’. Normative facts and properties, Parfit claims, exist only in a ‘non-ontological’ sense of ‘exist’ and are not open to ‘ontological objections’.

Many argue Parfit’s view is objectionably unclear. Ralph Wedgwood has gone as far as to call it ‘barely comprehensible’. Suffice to say, interpreting Parfit’s claims regarding Non-Realist Cognitivism has proven very difficult. And such difficulty gives rise to the further worry that it is unclear how to assess the truth of Non-Realist Cognitivism if we are unsure how to understand it.

These objections to the intelligibility of Parfit’s Non-Realist Cognitivism are, I argue, too quick. But I suspect that underlying these claims is an attractive thought: by positing ‘non-ontological’ existence for normative (and some other) entities, Parfit is somehow *cheating*. For this suggestion *appears* to be made precisely to insulate Parfit’s form of Non-Naturalist Normative Realism from what some take to be decisive metaphysical objections against it.

Here, I first develop these intuitions of cheating into an objection to Non-Realist Cognitivism: that Parfit is guilty of what truthmaker theorists call *ontological cheating*. I maintain that this objection allows me to achieve my second aim, namely to reveal a reading of Parfit’s view that dispels the charge of his position being ‘barely comprehensible’. I argue, however, that Parfit’s view faces great difficulty in meeting the charge of ontological cheating and, as such, faces a novel strong objection targeted at a clear reading of the view.

I proceed as follows. In §1, I outline Parfit’s Non-Realist Cognitivism as he presents it and motivate concern with its plausibility.

I turn, in §2, to present the ontological cheating objection to Non-Realist Cognitivism. To see the objection, notice first that Parfit aims to insulate commitment to the existence of irreducibly normative facts, properties, and relations from ontological objections that plague Non-Naturalist Normative Realism. Parfit submits that irreducibly normative entities exist in a ‘non-ontological’ sense of ‘exist’, failing both to have any ‘ontological status’ or to be an ontological commitment in need of defence. Instead, normative properties are merely *pleonastic*, that is, claims about an action having a normative property adds nothing to the content of a claim made by using ordinary predication.

Making these moves appears to many as *some* form of cheating. For why does Parfit think that he can plausibly maintain that some claims about irreducibly normative facts, properties, and relations are true, but that the entities such claims are about have no ontological status and are not open to ontological objections?

The particular kind of cheating that one may suspect is going on here is what Ted Sider, David Armstrong, and others call *ontological cheating*. That is, Parfit appears to be accepting some claims as true whilst refusing to accept the ontology taken to be necessary to make true such claims – and, in doing so, illicitly evading ontological objections to his view. If Parfit is so cheating, then this is a strong reason to reject his view. Call this the ontological cheatingobjection.

The success of the ontological cheating objection depends upon the details of Parfit’s view. Whilst these have typically been taken to be unclear, I turn, in §3, to argue that my objection allows us to see how Parfit’s view can be made clearer than it has in the literature to date, insulating it from charges of objectionable obscurity and allowing us to evaluate the success of the ontological cheating objection.

For consider what Parfit calls,

(Alethic Realism): ‘All true claims are made to be true by the way in which these claims correctly describe, or correspond to, how things are in some part of reality.’ (AR)

Parfit maintains that so-called Robust Non-Naturalist Normative Realists, such as Shafer-Landau, Enoch, and Fitzpatrick, endorse (AR), whilst he rejects it. According to Parfit, the former theorists accept that all true claims are made true by the way that such claims correctly describe some part of reality, positing non-natural normative entities in the world as what makes normative claims true. Parfit, contrastingly, denies (AR) and maintains that true normative claims are not made true by any spatio-temporal part of reality nor by anything in some non-spatio-temporal realm. Instead, they are true without requiring any part of reality (abstract or concrete) to *make them* true.

Some have noted that rejecting (AR) forces Parfit to surrender a correspondence theory of truth. But none have noticed that rejecting (Alethic Realism) involves *more* than rejecting *that*. To see this, distinguish between *theories of truth* and *truthmaking*. The former provide accounts of whether truth is a property and, if so, what kind of property it is. The latter concerns whether true claims are such that there are entities in the world that make – or in virtue of which they are – true.

This well-known distinction is overlooked in the literature on Non-Realist Cognitivism. Raising it here shows that denying (AR) *also* involves rejecting the very motivation behind truthmaking theory in general:

(World-to-Truth): Necessarily, truth is not a fundamental feature of reality; what is true depends upon the world.

Principles like (World-to-Truth) are what motivate contemporary truthmaking theory and claims that such theorists make, such as that all truths supervene on being and that all truths are made true by something (or things) that exist.

To make sense of Parfit’s Non-Realist Cognitivism we must note that it *denies* (World-to-Truth). Instead, he maintains that some claims are true but fail to be *made true* by any feature of the world. Rather, he accepts,

(Truth-to-World): There are some truths that do not depend upon the world.

Parfit’s examples of the claims that (Truth-to-World) is true of are true normative, logical, mathematical, and necessity claims. All of these, on Parfit’s view, when true, are not true *in virtue* of how the world is. Parfit makes this explicit when claiming that,

If we are Non-Realist Cognitivists, we deny that such logical and modal claims are made to be true by there being some part of reality which these claims correctly describe, or to which they correspond. If there is any dependence here, this dependence would go the other way. It would be reality that must correspond to these truths. Not even an omnipotent God could have made it false that two plus two equals four.

The charge of ontological cheating, however, *assumes* (World-to-Truth). Parfit’s best response, then, is that he is not ontologically cheating since he denies that normative (and other) claims are ones that require any feature of reality to make them true. When it comes to such truths, Parfit may claim, there is no way to ontologically cheat: if true, these claims are true without needing the world to make them true.

Denying (World-to-Truth), Parfit’s defender may add, has independent plausibility: for there is *prima facie* good reason to eschew truthmakers for certain claims. For example, Trenton Merricks has argued we have good reason to deny that negative existentials, modals, and past and future claims have truth-makers. If so, there may be an independent, partner-in-innocence case the Non-Realist Cognitivism can make for their denial of (World-to-Truth).

I argue that this reading of Parfit has five significant advantages over those in the literature. First, it makes clear why Parfit thinks normative truths have no ontological implications (because their truth does not require truthmakers). Second, it clarifies why Parfit thinks truths about irreducibly normative phenomena face no ontological objections, since doubting the truth of them cannot be doubting the existence of *something that makes them true*, but, rather, *whether they are true* (which may, for example, by a first-order normative matter). Third, it makes sense of why Parfit thinks that normative claims would be true even if there was an empty ontology as above. Fourth, it renders Parfit’s motivation for defending Non-Realist Cognitivism non-ad-hoc, since it appeals to a general rejection of (World-to-Truth). Fifth, this reading makes it perspicuous *how* to assess Parfit’s view: by asking whether his rejection of (World-to-Truth), and taking normative claims to be amongst those truths without truthmakers, is justified.

I turn, in §4, to consider whether Parfit can render his rejecting (World-to-Truth), and placing irreducibly normative claims amongst those claims lacking truthmakers, plausible. If successful, my objection fails. I consider a number of options available to Parfit to do so. I argue that in each case there is good reason to deny they succeed. I conclude, first, that Parfit faces a strong objection targeted at the clearest reading of his view yet presented, in the form of the ontological cheating objection. Second, that Parfit’s view helps highlight a question that meta-normative theorists *must* attend to: do normative truths require truthmakers?

Bahram Assadian (University of Amsterdam)

***Abstraction principles: presupposition and numerical existence***

Category: Objectivity in Mathematics and Logic

*Abstract:*

**1. A new puzzle for the neo-Fregeans**

Neo-Fregeanism is the thesis that the basic laws of the foundational theories of mathematics can be derived from suitable abstraction principles, with the aid of second-order logic. A well-known abstraction principle is Hume’s Principle (HP), telling us that the number of *F*s is identical to the number of *G*s if and only if there is a one-to-one correspondence between the *F*s and the *G*s. In this talk, I shall discuss a tension between neo-Fregeanism and the presuppositional view of expressions such as ‘The number of *F*s’. Since the presuppositional view has given rise to a considerable body of philosophical and linguistic explorations, it is somewhat curious to discover that the literature on neo-Fregeanism contains no discussion of this issue.

The neo-Fregeans Bob Hale and Crispin Wright (2001) have followed Frege who in his *Grundlagen* and *Grundgesetze*, takes ‘The number of *F*s’ as a genuine singular term, referring to a number as a particular object. Since the publication of P. F. Strawson’s ‘On Referring’ (1950), however, ample philosophical and linguistic evidence has been supplied in favour of the presuppositional understanding of definite descriptions. I will argue that the presuppositional view flies in the face of a crucial constraint that governs the stipulation of the truth of abstraction principles, known as *non-arrogance*. According to what Hale and Wright (2000) call the *traditional connection*, some important kinds of non-inferential *a priori* knowledge are found in abstraction principles construed as implicit definitions. If a stipulation is to respect the traditional connection, it has to avoid arrogance, where an arrogant stipulation “calls for” or “asserts” or “presupposes” the existence of the objects serving as the referents of the relevant terms. Thus, a modest abstraction principle must do no more than define the expression which it purports to define. It must not, in particular, tell us that the expression refers to existing objects.

First, I will discuss the philosophical significance of non-arrogance, and the misleadingly diverse formulations it has received. Second, I will shed a novel light on arrogance by showing the extent to which it is sensitive to the semantics of the expressions formed by abstraction principles, and in particular, by HP. And third, I will argue that the presuppositional reading of HP turns out to be incompatible with its cherished modesty.

**2. Hume’s Principle and numerical existence**

The neo-Fregeans hold that HP does not, by itself, entail the existence of numbers: it has no existential consequences, unlike some of the Dedekind-Peano axioms. That is what keeps HP on the modesty side, and the outright stipulation of the Dedekind-Peano axioms on the arrogance side. There is no denying that HP can be used to derive existential claims, but this can be done only provided that there are equinumerous concepts to serve as inputs on the right-hand side of HP.

This leads to an important role that modesty plays in the neo-Fregean enterprise. That HP, together with the conceptual resources of second-order logic, entail existential claims does not prevent HP from being an analytic, conceptual, or definitional truth, and thereby from being at the service of a logicist reconstruction of the basic laws of arithmetic. A classic objection to the logicist side of neo-Fregeanism is that HP cannot be an acceptable definition, for it has existential consequences, and no acceptable definition can carry such consequences. In this context, Field (1984) refers to Kant’s objection to Anselm’s Ontological Argument for the existence of God: no acceptable definition of ‘God’ can ensure that God exists, for existential claims cannot follow from analytic or conceptual truths. Similarly, Field argues that HP is unacceptable as a definition or explanation of the concept of number.

Hale and Wright’s rejoinder has always been along lines we sketched above: the crucial difference between HP and Anselm’s (arrogant) definition lies in the fact that admissible definitions should fix only truth-conditions for statements involving the *definiendum*, and not their truth-values. Anselm’s definition is objectionable for it illicitly presupposes that there exists a being a greater than which is not conceivable. But HP does not offend in this way, precisely because all it attempts to do is fix the truth-conditions of identity-statements involving numerical terms.

**3. Hume’s Principle and the presuppositional view of numerical terms**

I will argue that if we understand the semantics of ‘The number of *F*s’ along the presuppositional lines, the modesty of HP fails with it: numbers can be seen to be stipulated into existence, while there is no need to ensure whether the condition given on the right-hand side of HP is satisfied. This demonstrates a significant limitation on neo-Fregeanism, in its ability to accommodate the presuppositional view of the expressions formed by abstraction principles.

Following Strawson (1950 and 1952), when we say that a statement φ *presupposes* ψ, we mean that a particular logical relation obtains between φ and ψ. To specify the relation of presupposition in this semantic sense, we need to work in a logic which makes provision for statements that are undefined. Let us introduce the two-place connective as follows:

(i) φ ψ is true iff φ and ψ are both true.

(ii) φ ψ is false iff φ is false and ψ is true.

(iii) φ ψ is undefined otherwise.

We may, then, read ‘φ ψ’ as meaning ‘φ presupposes ψ’. The argument I am defending simply tells us that since HP presupposes that numbers exist, and since it is true, whatever it presupposes must also be true; and hence, numbers exist. There is thus no need to ensure whether the condition of one-one correspondence among concepts is satisfied. The argument can be formulated as follows:

(2)

(3)

(1) is the formulation of the claim that HP presupposes the statement that there are numbers; (2) is HP; and the step from (2) to (3) is based on an analogue of *modus ponens* in presuppositional environments. The crucial premise is, therefore, (1). How can we defend it? Let us start with the assumption that ‘The number of *F*s’ presupposes the existence of the number of *F*s. Now, to explore whether HP “inherits” this presupposition, we need to examine the behaviour of in conditional contexts. Following Karttunen’s classic paper, ‘Presuppositions of compound sentences’ (1973), I assume the following rule governing the projection of presuppositions in conditional contexts: a conditional presupposes what its antecedent does. That is, for any conditional statement of the form φ → ψ,

(iv) If , then

Now, let us rewrite HP as the following conjunction:

(4)

We have assumed that ‘’ presupposes the statement that there exists the number of *F*s. That is,

(5)

Now, assume the truth an instance of

(6)

Thus, by (iv), (5) and (6) entail that:

(7)

which states that one direction of HP presupposes the existence of a number. By the analogue of modus ponens in the presuppositional environments, (6) and (7) entail that there exists the number of the *F*s: ∃

However, this has not yet guaranteed that HP, taken as a whole, inherits the presupposition of numerical existence. We should then ensure that the second conjunct in (4) also presupposes the existence of numbers. Here, we need the following projection rule for conjunction, which has been formulated by Karttunen (1973, pp. 178–9) as follows:

(v) If then

By an application of (v) to (4), and given (7), we infer that (4) inherits the presupposition that numbers exist:

(8)

which means that HP, in both directions, presupposes the existence of numbers. Hence, (1) is validated and so the (1)-(3) argument is sound. The moral should be clear: HP is not merely the innocent truth of a biconditional purporting to explain what it is for an object to be the cardinal number of a given concept; it also says that the concept of the cardinal number is instantiated. This just means that HP is arrogant. In other words, the presuppositional rendering of HP shows that its mere stipulative truth entails the existence of numbers, and so there is no need to ensure whether the condition given on its right-hand side is satisfied.

Ralf M. Bader (University of Oxford)

***Meta-ethical robustness***

Category: Meta-ethical Robustness

*Abstract:*

This paper distinguishes and characterises two levels of good-making: the level of good-makers (the features of the value bearers in virtue of which they are valuable) and the level of makers of good-makers (the things that make it the case that certain features are good-makers). It then employs this distinction to develop an account of meta-ethical robustness, distinguishing robust (objective) from non-robust (subjective) normative phenomena.

Daniel Berntson (Princeton University)

***Relational Possibility***

Category: Objectivity in Mathematics and Logic

*Abstract:*

Relational possibilities are about how things compare or otherwise relate across worlds. We might say that Socrates could have been taller than he is or, perhaps, that the Athenians could have been happier than they are.

Relational possibilities, while ordinary and familiar, turn out to be surprisingly hard to express systematically. The usual solution is to express them by quantifying over things like heights or degrees of happiness. As it turns out though, this natural solution has certain unexpected implications. One of them being that it stands in the way of a certain promising strategy from Field (1984) for doing science without things like numbers, spacetime points, or platonic universals.

I think we can do better. My aim in this talk is to convince you that we can understand relational possibilities without quantifying over further things. Not only does this better reflect our ordinary thinking about modality, it also gives us a powerful philosophical tool, one that we can use to help advance the project of doing science with only particles.

**1. The Problem of Expression**

Suppose we have a language with a taller-than predicate, names for individuals, and a possibility operator. This lets us say that Aristotle is taller than Socrates by writing *Tas*. We can then say that Aristotle could have been taller than Socrates by writing 􏰾*Tas*. Now we want to express the relational possibility of Socrates having been taller than he actually is. How should we do that? We could try 􏰾*Tss*. But this says that Socrates could have been taller than himself, not that Socrates could have been taller than he is. Since there are no other good syntactic options, it would see that we have no good way to say that Socrates could have been taller than he actually is. Call this the **problem of expression**.

The usual solution to the problem is quantify over **degrees**. In the present case, this means quantifying over heights. We might, for example, try to express the idea that Socrates could have been taller than he is by writing:

There is a height *y* such that Socrates has *y* and 􏰾(there were a height *x* such that Socrates had *x* and *x* were greater than *y*).

This is what you might call the **degree solution**. But while there is much to be said in favor of the degree solution, that solution also comes with certain costs. One of them is that we must give up on a promising strategy for doing science with nothing more than particles. Why this is will be explained in the next section.

**2. Science with Only Particles**

Science as we know it tells us about various physical quantities like mass, charge, and distance. Those quantities are described using numbers. To fix on an example, suppose we perform a series of experiments and discover that the movement of particles is described by Newton’s laws of motion. These laws require distance ratios between particles to determine how they move. What are distance ratios? Suppose we use a meter stick to determine that *ab* are two meters apart and *bc* are one meter apart. We could then record the result using a distance ratio function from particles to numbers by writing δ(*abbc*) = 2. If you like, think of this as a certain definite description:

The distance ratio of *ab* to *bc* = 2.

Such measurements let us apply the laws and predict how things move.

How should we understand such distance ratios? One view is that we should take science at face value. Distance ratios ultimately involve a relation between particles and numbers and, so, numbers play an essential role in the physical world. Science is as much committed to numbers as it is to quarks and bosons. A competing view is that numbers are useful but not essential. They are part of science only because they speed along certain reasoning. With enough time and patience, we could fully describe the physical world without them. There may be physical facts involving numbers but, if so, they will have to be ultimately explained using physical facts not involving numbers.[[1]](#footnote-1)

Suppose we agree that numbers are not essential to the physical world. We then face the challenge of showing how there can be distance ratios without numbers. One strategy for doing that requires nothing more than particles and a pair of spatial relations. Those relations are betweenness and congruence. Intuitively speaking, betweenness is the relation of one thing being on a straight line between two others. Distance congruence is the relation of two things being exactly as far apart as two others. Now imagine a world with exactly four point particles that looks like this:

The betweenness and congruence relations of the world are as they appear. The particle *x* is between *ab*, the particles *ax* are congruent with *xb*, and so on. It also looks like the ratio of the distance between particles *ab* and *bc* is two, and in fact they are. What we want to do is explain this distance ratio in terms of the basic congruence and betweenness relations.

Just looking at the illustration, you can basically see how the explanation goes. Each adjacent pair of particles is congruent with every other adjacent pair, so we can treat those pairs as “units”. There are then two “units” between *ab*, but only one “unit” between *bc*. So *ab* are twice as far apart as *bc*. A bit more carefully, say that *x* is halfway between *ab* when *x* is between *ab* and *ax* and *xb* are congruent. We then claim that *ab* are twice as far apart as *bc* because:

There is an *x* halfway between *ab* such that *ax* and *bc* are congruent.

Other rational distance ratios can be defined similarly. Irrational distance ratios are defined using limits.

All of this would seem to work beautifully. The problem is that the proposed reduction works only if there happen to be enough particles and they happen to be in the right place. Suppose we have a world just like the last except that we delete the second particle.



This is a world in which *ab* is twice as far apart as *bc*. Our proposed definition of that distance ratio, though, requires there to be something halfway between *ab*. Since there is nothing there, the definition fails.

The problem can be fixed if we accept the existence of spacetime points. Spacetime points, like particles, stand in betweenness and congruence relations. Unlike particles, though, spacetime points are highly organized—you can always count on them to be where they need to be. In particular, there will be laws guaranteeing that whenever there are two things, there is a spacetime point halfway between them. Adding spacetime points to our three particles world, then, we have a world with a spacetime point *x* halfway between *ab*.



Because there is once again *something* halfway between *ab*, our proposed definition of the distance ratio works just fine.

We can explain distance ratios without numbers, then, if we quantify over spacetime points. You might wonder, though, whether these are the only options. Can we explain distance ratios using only particles? Or does science inevitably require further things?

A natural strategy at this point would be to give a modal theory of distance ratios.[[2]](#footnote-2) To see how that goes, consider the following diagram. The top row of black particles represents how things actually are. The bottom row of grey particles represents how things could have been.

What we want to explain is why the particles *ab* are twice as far apart as *bc* on the top row, since the top row represents how things actually are. The modal solution is to say that *ab* are twice as far apart as *bc*, not because there is actually a particle halfway between *bc*, but because there *could* have been. Particles could have been the way they are on the bottom row. There is thus no need for further ontology. Rather than accepting that there *are* numbers, spacetime points, or platonic universals, we only need to accept that there *could* have been more particles.

The problem is that we have now run headlong into the problem of expression. In order for the modal solution to work, we need to describe our diagram using modal operators. We need to say that:

It could have been that *a* were as far from *b* as *a* is from *b* and that *b* were as far from *c* as *b* is from *c* and that there were an *x* such that *x* were between *a* and *b* and *a* were as far from *x* as *x* were from *b* and *x* were as far from *b* as *b* were from *c*.

But the requisite possibility is a *relational* possibility. We need to be able to say that it could have been that the actual particles *were* as far apart as they *are*... The only way to say that in language of standard quantified modal logic is to use the degree solution. In this case, that means that we will have to quantify over things like distances. But quantification over things other than particles is precisely what we are trying to avoid! So it looks like we have reached the end of the line. Science would seem to require more than just particles after all.

**3. Modal Relationalism**

Now in fact, I think we have not reached the end of the line, and the rest of this talk will explain why. We will develop a view called **modal relationalism**, one on which modality is ultimately about how things could have *differed*, not just how things could have been. Making sense of this view requires a new quantified modal language that I call **relational modalese**. That language lets us express relational possibilities without quantifying over further things, so gives us an alternative to the standard degree solution. It also gives us a powerful tool for doing science with only particles.[[3]](#footnote-3) As a kind of proof of concept, we will briefly sketch a modal theory of distance ratios. That theory has modal operators, but only quantifies over actual particles. We will then close by considering and responding to various objections to modal relationalism.

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(National Taiwan University and Shanxi University, China)

***Physicalism about Mind and Realism about Hierarchical Structures***

Category: Structural Realism and Philosophy of Mind

*Abstract:*

Bourget and Chalmers’s (2014) questionnaires show that most philosophers (56.5%) accept or lean toward physicalism, and that only a small proportion of philosophers (27.1%) accept or lean toward non-physicalism. However, as far as we are concerned, it remains a highly controversial question as to whether there really are good arguments for physicalism, and if yes, what they are. Needless to say, philosophers are attracted to physicalism because of the successes of the modern scientific worldview and neuroscience, and that they are amazed by scientific discoveries like split brain phenomena and blindsight, but it can nevertheless be questioned: can these things really support physicalism? The intuitive support has to be spelled out and formalized.

Arguments for physicalism in standard philosophy of mind are by and large framed by metaphysicians like Smart, Lewis, and Kim. These arguments rely on certain metaphysical principles which attempt to capture certain spirits of the modern scientific worldview: e.g. (1) that positing non-physical entities always violates Occam’s razor (Smart 1963), (2) the identification of the mental and the physical via causal identity (Lewis 1972), and (3) the principle of the physical causal closure (Kim 1993). These arguments, however, all face serious difficulties. We believe that this is due to the fact that the relevant metaphysical principles are all based on very idealized assumptions which can be easily challenged.

We attempt to reframe the classical metaphysical debate between physicalism and non-physicalism by the more advanced toolboxes found in recent philosophy of science, in particular those of the study of causal mechanisms and structural realism. The aim is not to provide a novel argument for physicalism or against non-physicalism; rather, we attempt to formalize the intuitive support for physicalism in a new way different from those of the traditional metaphysicians of mind mentioned above. The key idea is that physicalism about mind can be understood as a realism about a certain ontological compositional hierarchy, and be based on reasons used to justify realisms of similar kinds.

Based on the idea of causal mechanisms, we argue that a typical supervenience relationship found in the nature can be understood as a property/function/phenomenon/behaviour supervening upon an underlying causal mechanism. Following the discussion in standard philosophy of science, a mechanism is composed of a set of components plus their activities/operations/interactions (Machamer, Darden, and Craver 2000; Craver 2007; Illari and Williamson 2012; Craver and Darden 2013; Glennan 2017). A component of a mechanism may also exhibit its own property/function/phenomenon/behaviour, which may in turn supervene upon its own underlying causal mechanism, which may be further decomposed into its own components. Provided that such a supervenience relationship is found in nature, an ontological compositional hierarchy of causal mechanisms/structures situating at different levels could ensue.

The supervenience relationship described above is typically indicated by (what we call) (1) co-timing (or co-existence), (2) co-variables, and (3) mutual-manipulability, which make empirical identifications of them particularly reliable. We spell out these technical concepts in detail. We believe that the relationship between the physical and the mental (the latter of which include qualia, which lead us to the hard problem of consciousness) exhibits all the above features, and can thereby be reliably identified as a supervenience relationship, rather than a diachronic lawful relationship or otherwise. We, however, acknowledge that the discovery of such a supervenience relationship cannot by itself *prove* the existence of an ontological compositional hierarchy. For the relationship is compatible with, say, certain versions of dualism. Furthermore, models of causal mechanisms are often replaced by newer ones and thereby fail to provide a strong support to a philosophical ideology which is supposed to be forward looking.

We argue that the above problems can be overcome by certain philosophical reflections on the general structure of science. The key is to make use of the idea of scientific structural realism and the method of meta-induction in philosophy of science. Firstly, the structures underwriting supervenience are almost categorically considered as ontological compositional hierarchies by our best scientific ontology. The consideration of such a powerful meta-induction supports the idea that the relationship between the physical and the mental is also an ontological compositional hierarchy. Secondly, as the scientific structural realists point out, while theories and models are most often replaced as science develops, their structures (rather than content) often remain in the newer theories and models (Worrall 1989). Of course, as the critics of structural realism remark, it is difficult, if not impossible, to distinguish between structures and content (Psillos 1995). However, for our argument to work, we do not need a way to identify all structures or a clear demarcation between structures and content; compositional hierarchical structures can be easily identified and are the only type of structures required for our argument. A meta-induction indeed shows that compositional hierarchical structures, indicated by the kind of robust causal mechanism mentioned above, most often remain unchallenged as science develops.

Finally, we argue that the above formalization of the intuitive support for physicalism is useful to current philosophy of science. For if we know why we want physicalism, then we have a better understanding of whether we want to reject some versions of non-physicalism, and can, in addition, distinguish good versions of physicalism from bad. But the results of these considerations will in fact vary if we formalize our reasons for accepting physicalism in different ways. We examine Russellian monism as a case study. Russellian monism is often conceived as sharing most remarkable virtues of physicalism by standard metaphysicians of mind (e.g. Chalmers 1996; Heil 2004; Stoljar 2014; Seager 2009); some metaphysicians of mind go even further and argue that Russellian monism and physicalism are compatible (e.g. Stoljar 2001a, 2001b; Strawson 2008; Montero 2010, 2015; Alter and Nagasawa 2012; Chalmers 2015). We argue that any version of Russellian monism can at most offer a hypothetical hierarchical structure which is parasitic on the standard mind/body hierarchical structure, but that parasitic structure cannot be framed in a causal mechanistic model of the kind mentioned above. Hence, if we take the demonstrability of the mind/body synchronic supervenience structure in a causal mechanistic model as one of the key virtues of physicalism, then no matter if Russellian monism can be developed into a version of physicalism or not, Russellian monism essentially lacks a key virtue of physicalism

Nate Charlow (University of Toronto)

***Degreed Belief, In General***

Category: Expressivism

*Abstract:*

Credences of a certain type may be understood as probabilities: subjective estimates of objective chance of the truth of a proposition about the world -- a worldly representation. Credences that are not of this type are not, however, to be understood as probabilities (when a subject’s credence cannot be understood as their estimate of objective chance of the truth of a worldly representation). How, then, are they to be understood? This talk attempts to describe an answer.

I-Sen Chen

(University of California, Davis)

***The Edenic Error Theory and Color Exclusion***

Category: Structural Realism and Philosophy of Mind

*Abstract:*

Edenism is a metaphysical theory of color, which says that colors are physical properties and are nomologically uninstantiable. It keeps the best of two traditional views of colors, without being committed to the unwanted consequences of them. However, in this essay, I argue that if Edenism is true, we do not have justification for certain intuitive beliefs about color, e.g., that nomologically necessarily, nothing is both green and red at the same time (called “GRIN”).

A *metaphysical* theory of color in this essay is taken to be any theory aiming at explaining the metaphysical nature of color and is not primarily about our ordinary concept of color. In this essay, my targets are metaphysical theories of color, which I divide into two kinds. The first kind of theory holds that colors *can be and are* instantiated by physical entities.

[[4]](#footnote-4) These are views I refer to as “physicalism”. The second kind of theory says that colors *merely seem* to be instantiated. These are what I call “error theory of color”.

I will first show the superiority of Edenism over physicalism and error theory. I then consider Edenists’ three possible justifications for GRIN: empirical methods, conceptual analysis, and introspection. I will argue that all these justifications are not available to Edenists given their commitment to the nomological uninstantiability of color. Given that we do have justification for GRIN, my argument provides a reason to reject Edenism.

To provide the context for discussion, I will start off by laying down the two core notions in our concepts of colors:

*Qualitativeness*: Colors are qualitative, non-dispositional, simple properties.

*Physicality*: Colors are surface properties of physical objects.

However, it seems that color science and visual science destroy our dream to keep both (Hardin 1997). Given this context, I will illustrate the strength and weakness of the traditional theories by considering some particular versions of those theories. For example, for physicalism, I will discuss reductive physicalism (Dretske 1995, Tye 2000, Byrne and Hilbert 2003), which holds that e.g., redness is *the physical reflectance property that normally produces the neural state realizing phenomenal red experience in a normal human*. For error theory, I will consider projectivism (Boghossian and Velleman 1989/1997), which says that redness by its nature is instantiated by regions of our visual field, not objects in the external world, and our color experience is thus in general in error. I will then show that the debate between physicalism and error theory can be taken as a trade-off between physicality and qualitativeness. Edenism tries to keep the best of both worlds. It says that *colors are surface properties of physical objects (in the sense that if they are instantiated, they are instantiated by physical objects), but are not instantiated in any nomologically possible world*. The main advocates are Chalmers (2006), Pautz (2006a, b, 2010), Mendelovici (2010, 2013, 2018), Mendelovici and Bourget (2014), Montague (2014), Bourget and Mendelovici (2016/2017). By rejecting projectivists’ counter-intuitive notion that colors are properties of regions of visual field, they endorse physicality; by claiming that colors are nomologically necessarily uninstantiated, they can keep qualitativeness without contradicting our physical laws or scientific data.

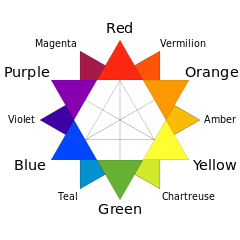
I then move on to introduce my case against Edenism:

*Green/Red Impossible Co-Instantiation, Nomological version (GRIN)*: Nomologically necessarily, no object is both green all over and red all over at the same time.

I will clarify the issue about GRIN in this essay by separating it from the traditional debate concerning the epistemology of color exclusion (BonJour 1998), and show why justifying GRIN is not a problem for physicalism and projectivism. After introducing GRIN, I proceed to argue that if Edenism is true, then we cannot justify GRIN.

I will start with *empirical methods*, which I divide into two: enumerative induction and inference to the best explanation (“IBE”). I will first quickly dismiss the justification by enumerative induction for the simple reason that GRIN is *modal*: we simply cannot *observe* what colors objects could have had. In this respect, justification by IBE seems to have more potential to justify modal knowledge: in science, we do have justification for some identity claims about properties, e.g., water is , which is a claim with modal content. We usually justify identity claims by IBE: when we observe that two properties are always co-instantiated, our best explanation of this is the claim that they are identical. But then I will point out that in order to apply IBE, we need to have observational data, which in our case should concern instantiations of one color (redness, say) occurring only in the absence of the another (greenness). But by Edenism, we cannot have any such data precisely because colors are not instantiated.

The second strategy I will discuss is *conceptual analysis*. Edenists may claim that GRIN is a conceptual truth, and we can justify them through analyzing our concept of color. For analogy, I will consider our arithmetic knowledge that 12. To justify it, mathematicians take the natural number line and Peano Axioms as our conceptual framework to organize the relation among naturals. Then as they say, according to Peano’s Axioms, successor function S(x)=x+1 is irreflexive, and S(1)=2, therefore 12. But do we have such a conceptual framework for organizing color concepts?

Edenists perhaps can invoke the hue circle as the conceptual framework for colors (see the figure on the right).[[5]](#footnote-5) Edenists might say that something like the hue circle is our conceptual framework. They may even justify our knowledge of GRIN by arguing that their “positions” on the hue circle are diametrically opposed, and any two colors whose positions on the hue circle are diametrically opposed are necessarily not co-instantiable, and therefore GRIN is true.

However, I will point out that the problem is that even if we agree that every two diametrically opposed colors are necessarily not co-instantiable, why do we think that red and green are diametrically opposed? Why, for instance, doesn’t the position of green span 180 degrees so that it overlaps the position of red? If they don’t answer this question, their justification is still defective. If their answer is that their positions *cannot* overlap, it is simply equivalent to GRIN, and is circular.

I will argue that no non-circular analysis of color concepts is available to Edenists for justifying GRIN. They argue color concepts are *simple* in the sense that they cannot be *analyzed by a description*.[[6]](#footnote-6) Edenists put weight on the commitment to the simplicity of color concept. E.g., Edenists take the simplicity of our color concepts as *facts* to argue against reductive physicalism, and to motivate Edenism (Pautz 2006b, Mendelovici 2018). As they argue, if reductive physicalism is true, then color concepts have descriptive contents. But since color concepts are simple, physicalism is false. Thus, as I will show, the simplicity of color concepts plays important dialectic roles in Edenists’ arguments, which makes it difficult for them to provide a non-circular conceptual analysis to justify GRIN.

Next, I consider a possible justification Edenists may resort to for the knowledge of GRIN: *empirical methods and conceptual analysis, combined*. Indeed, according to their analysis of the concepts of colors, colors are physical, qualitative properties but empirical sciences show that there are no such properties, and hence as Edenists conclude, no color is nomologically instantiable. These considerations support the view that nomologically no object instantiates both redness and greenness simply because nomologically no object instantiates any color. However, as I shall point out, although this justification of GRIN is logically valid, it cannot be the *right* justification since it trivializes our notion of the *mutual exclusiveness* between complementary colors, which is characterized by the following:

*Mutual Exclusiveness between Colors X and Y*: For any two colors XY, X and Y are mutually exclusive iff for any object, if it instantiates color X, then it does not instantiate a distinct color Y and if it instantiates Y, then it does not instantiate X.

Since according to Edenism, nomologically necessarily nothing instantiates any color, for any object, it vacuously satisfies the biconditional whatever colors X and Y are. This implies that according to Edenism, even scarletness and redness are mutually exclusive in all nomologically possible worlds, which is implausible.

What’s worse, as I will show, according to Kripke’s causal-historical theory of the extension of concept (1980), since by Edenism no color is instantiated, there is no causal connection between our color concepts and color tokens, the extensions of our color concepts are empty in all metaphysically possible worlds. Even if there is an object in a metaphysically possible world, which instantiates a surface property qualitatively indifferent from redness, it is not an instance of red. Therefore, by Kripke’s theory, if Edenism is true, no color is instantiated in any metaphysically possible world, which entails that all colors are mutually exclusive in all metaphysically possible worlds. That is indeed problematic for Edenists.

Finally, I discuss *introspection* as an Edenist justification for GRIN. To be sure, in the Edenist view, introspection is one of the most reliable cognitive mechanisms for knowledge of our internal states, including experiences. Through introspection, we can and do justify our belief that our color experiences never represent one object as instantiating both redness and greenness. By itself, this introspective belief says nothing about the mind-independent properties of redness or greenness. Edenists need a principle connecting our experiences of colors to colors themselves. In order to further justify our belief about redness and greenness, Edenists need a further assumption that

*Reliabilism of Experience*: Experiences are in general reliable.

Together with reliabilism of experience, our justified true belief that our experiences never represent an object as instantiating both redness and greenness plausibly supports our belief in GRIN. Unfortunately, reliabilism is not available to Edenists. For we should not forget about the most obvious fact that all our visual experiences represent everything as colored, but Edenists argue that nothing is in fact colored, which implies that our experience is extremely unreliable: *all* our visual experiences are misrepresenting. Since they already reject the reliability of experience for the non-instantiation of colors, it would be preposterous, as I will argue, for Edenists to here invoke the same principle to justify our knowledge of GRIN.

Ruey-Lin Chen and Jonathon Hricko   
(National Chung Cheng University, National Yang-Ming University)

***Pluralism About Criteria of Reality***

Category: Structural Realism and Philosophy of Mind

*Abstract:*

The scientific realism debate has developed into a large-scale war, and in this paper, we first distinguish three lines of battle in order to situate our own contribution to the debate. (1) Within the realist camp, deployment realists (e.g., Psillos 1999), structural realists (e.g., Ladyman and Ross 2007), and entity realists (e.g., Eronen 2019) debate with one another regarding which parts of theories (working posits, structures, or posited entities) successfully represent unobservables. This is the ontological aspect of the debate. (2) Wholesalists/globalists (e.g., Worrall 1989) and retailists/localists (e.g., Magnus and Callender 2004) argue about whether the realism debate ought to be settled by arguments regarding our best theories in general (wholesale arguments) or by arguments regarding particular theories, claims, and/or entities (retail arguments). This is the methodological aspect of the debate. (3) Realists (e.g., Psillos 1999) and anti-realists (e.g., Stanford 2006) disagree about whether or not there is a criterion of reality according to which we can demonstrate that some parts of theories (usually the ‘successful’ parts, according to some notion of success) actually represent an unobservable reality. Realists argue that there is such a criterion while anti-realists argue that there is not. This is the epistemological aspect of the debate.

Methodologically, we adopt a retailist approach to the debate. Ontologically, we see the disputes among those in the realist camp as tracing back to a shared commitment to monism about criteria of reality paired with disagreement regarding which proposed criterion ought to serve as the single criterion of reality. And epistemologically, we adopt a pluralist view regarding criteria of reality. Our defense of this view consists of developing a theoretical framework that combines retailism with pluralism about criteria of reality, and illustrating that framework by showing how it applies to cases from the history of science.

Regarding the framework, we argue that a commitment to retailism leads naturally to a pluralist view of criteria of reality. Methodologically, retailists restrict their arguments to particular theories, claims, and/or entities. Their refusal to generalize the conclusions of such arguments to similar cases makes sense only if, epistemologically, retailists are open to the possibility that a single criterion of reality is not applicable to all cases. After all, if one and the same criterion is applicable to all cases, retailists would have a direct route to generalizing their conclusions to similar cases, which would make it difficult for them to maintain that such generalization is unwarranted.

Regarding the application of the framework, we consider two historical cases that are often discussed in the context of the realism debate: Robert Millikan’s measurement of the charge of the electron (Millikan 1913, 1917), and Jean Perrin’s work on atoms and Brownian motion (Perrin 1910, 1916, 1965[1926]). We consider various criteria of reality (based on, for example, measuring essential properties, isolating entities, robustness reasoning, and counting individuals). We determine which criteria are applicable in each of the three cases. And we draw some conclusions regarding whether the work in question provides a sufficient reason for adopting a realist attitude towards the entities involved in these cases.

Duen-Ming, Deng and Hsuan-Chih, Lin

(National Taiwan University and Soochow University, Taiwan)

***Inside and Outside a Possible World***

Category: The Identity of Indiscernibles

*Abstract:*

Let us use ‘<*p*>’ as an abbreviation for ‘the proposition that *p*'. Now, consider the following argument:

(1) It is possible that Socrates does not exist.

(2) Necessarily, if Socrates does not exist, then <Socrates does not exist> is true.

(3) Necessarily, if <Socrates does not exist> is true, then <Socrates does not exist> exists.

(4) Necessarily, if <Socrates does not exist> exists, then Socrates exists.

(C) Therefore, it is possible that Socrates exists and does not exist.

Clearly, the conclusion is absurd. In the literature, there are two kinds of responses: the Straightforward and the Equivocation. The Straightforward response aims to reject one (or more) of the premises (e.g., Williamson (2002) would reject (1), Adams (1981) would reject (2), Fitch (1987) would reject (3), and Plantinga (1983) would reject (4)). However, it is somewhat surprising that the Straightforward response is not the most popular response. Many philosophers find it more attractive to attack the argument with the Equivocation response, i.e., by claiming that it involves some kind of equivocation. In this paper we argue that despite its popularity, the Equivocation response is deeply problematic.

Since virtually all advocates of the Equivocation response assume some form of actualism, we also assume actualism in our criticisms. The actualist denies that there are any non-actual concrete possible worlds, but uses some kind of abstract entities as the ersatz worlds. Following a useful terminology of van Inwagen (1986), we call the former ‘C-worlds' and the latter ‘A-worlds'.

For an actualist, there is only one C-world, namely, our actual world. But this only C-world might have been otherwise than it is, and the actualist can use A-worlds to *represent* the different ways our world might have been. For instance, suppose talking donkeys are indeed possible, and accordingly some A-worlds represent our world as containing talking donkeys. On this picture, to say that talking donkeys are possible is to say that there is an A-world *w* such that if our world had been exactly as *w* represents it to be, then there would be talking donkeys. This, we propose, is how an actualist should use A-worlds as surrogates for C-worlds.

Now, in response to the argument, Fine (1985) proposes that there are two notions of truth for propositions:

According to the outer notion, a proposition is true in a possible world regardless of whether it exists in that world; according to the inner notion, a proposition is true in a possible world only if it exists in that world. We may put the distinction in terms of perspective. According to the outer notion, we can stand outside a world and compare the proposition with what goes on in the world in order to ascertain whether it is true. But according to the inner notion, we must first enter with the proposition into the world before ascertaining its truth. (Fine, 1985, p.163)

Fine claims that on the inner notion, (3) holds but (2) fails, whereas on the outer notion, (2) holds but (3) fails. He therefore concludes: there is no single notion of truth which can make both premises true.

However, it is hard to see how such an Equivocation response makes sense. Three objectinos are raised. First of all, A-worlds are just abstract representations, and if it is absurd to say that we can stand outside any abstract representations, it is also obscure to say that we can stand outside an A-world and compare a proposition with what goes on in it. Second, it seems utterly *ad hoc* to posit the two notions of truth. For this is just to say that we can simply *define* the inner notion as that according to which (3) holds, and the outer notion as that according to which (3) fails. However, this is *not* an ambiguity in the notion of truth, but only two different positions concerning whether we should accept (3). Finally, perhaps one might think that Fine's distinction between the two notions of truth is independently motivated because it is just Adams's distinction between ‘*true in* a world’ and ‘*true at* a world’. However, if Fine's distinction really reflects Adams's, they ought to give the same verdict to the argument. Yet, we shall show that they would reject different premises, and thus their distinctions cannot be the same. To conclude, the Equivocation response is obscure, *ad hoc*, and unmotivated.

Daniel Dohrn

(Università degli Studi di Milano)

***Anti-Realism Enabled: the Problem of ‘Unlovely Counterfactuals’***

Category: Meta-ethical Robustness & Expressivism

*Abstract:*

**Anti-Realism Enabled: the Problem of ‘Unlovely Counterfactuals’**

I develop a new proposal for drawing the distinction of realism and anti-realism. Concentrating on a projectivist version of moral anti-realism as my prime example, I motivate the proposal by its potential to solve the challenge posed by certain counterfactuals to anti-realism.

Moral anti-realism is an attractive way of dealing with the elusiveness of presumed moral facts like ‘kicking dogs for fun is wrong’ without dismissing them as false or not truth-apt. I mention three aspects of elusiveness, which arise from the intuition that any fact somehow supervenes on the natural facts; the latter may as a first stab be identified with the facts of fundamental physics. First, it is puzzling how facts of fundamental physics could have normative force, i.e. could constitute an obligation to act in a certain way. Second, we do not seem to figure out moral truths by scientifically investigating the world. Rather we somehow regard ourselves as arbiters on these facts. For instance, we take the outrage and indignation caused by kicking dogs for fun as a criterion for the latter being wrong. Third, there are persistent disputes which seem to be decidable neither by investigating the physical facts nor by removing merely verbal disagreements.

One way of dealing with the elusiveness of moral facts is to acknowledge that they are partly due to *projecting* certain attitudes of ours onto the world. It is our response to the natural facts about kicking dogs that makes us feel obliged to avoid kicking dogs for fun. It is our feelings we look to in order to figure out whether kicking dogs is wrong. Moreover, the difference in our reactions to the same natural facts may lead to persistent disagreement. Thus, it is tempting to assume that our attitudes contribute to the making of moral truth. The way they do has to be carefully spelled out.

**Unlovely Counterfactuals**

A challenge for an anti-realism along these lines arises from certain counterfactuals. Notwithstanding the special role of our attitudes in explaining moral truths, many proponents of anti-realism deny that moral truth counterfactually depends on our attitudes. Simon Blackburn says:

…suppose a projective theory must involve us in believing things like [1] `If we had different attitudes it would not be wrong to kick dogs´… Then clearly it is refuted, because these things are absurd..(Blackburn 1981, 179)

According to Amie Thomasson,

The moral quasi-realist accepts, for example, that it would still be wrong to kick dogs for fun, even if it were the case that I (and others) approved of it.(Thomasson forthcoming)

It would indeed count against the projective theory if it had to countenance (1): as psychological results show, we intuitively reject (1) (Levy 2005).

Elaborating on his rejection of (1), Blackburn distinguishes two ways in which factors bear on moral truths. On the one hand, there is explanation, on the other hand, there is counterfactual dependence:

‘Values are the children of our sentiments in the sense that the full explanation of what we do when we moralize cites only the natural properties of things and natural reactions to them. But they are not the children of our sentiments in the sense that were our sentiments to vanish, moral truths would alter as well.’(Blackburn 1984, 218)

Our attitudes together with ‘natural properties of things’ viz. natural facts such as dogs feeling pain when kicked explain why it is a truth that kicking dogs is wrong. But whereas this truth counterfactually depends on the natural facts like kicking dogs causing them pain, it does not counterfactually depend on our attitudes.

The challenge to anti-realists is to on the one hand explain moral facts like the wrongness of kicking dogs for fun by our attitudes and on the other hand to make good on their claim that they do not counterfactually depend on these very attitudes. Using Blackburn’s account as an example, I shall criticize three proposals of Blackburn’s for meeting this challenge. The desideratum of providing a convincing account of ‘unlovely’ counterfactuals remains. I shall present my own alternative for doing so. The advantage of this alternative is that it reconciles the role of our attitudes in settling moral truth with rejecting unlovely counterfactuals. In contrast to Blackburn, I avoid *ad hoc* fiddling with the function of counterfactuals. I can make do but am not committed to the standard view. The key move is to interpret the projection of moral truths from our attitudes onto the world in a certain way. The view also leads to a distinctive hypothesis about the metaphysics of anti-realism more generally.

**Response-Enabled Truths**

I follow Yablo (2002) in distinguishing two ways for our responses to carve out truths about the world. The more familiar one yields *response-dependent* truths like ‘sugar is sweet’. The less familiar one is crucial to anti-realism about morals; it yields *response-enabled* truths. I shall concentrate on the latter and largely bypass the intense debate on the former (e.g. De Clerq 2002).

Yablo introduces response-enabled truths by the example of the predicate *oval*:

‘A thing in [any world] w is oval if it is of a shape that would strike me as eggshaped were I (with my sensibilities undisturbed) given a chance to look at it.’(Yablo 2002, 465)

‘Sensibilities undisturbed’ here means that sensibilities and conditions of their proper functioning are not changed compared to the actual world. Our actual reactions settle the extension of *oval* in any counterfactual situation.

Yablo’s example raises many issues, but I shall simplify my discussion. I shall for the moment only concentrate on identifying oval shapes in a two-dimensional Cartesian plane. Consider a sheet of paper used to draw a mathematical diagram. We may look at this sheet in two ways. First, we may identify a shape using our eyes. The sheet may show an oval shape. Second, we may think of the sheet of paper as embodying a diagram corresponding to a mathematical formula. The shape that strikes us as oval embodies a mathematical object.

When we look at oval shapes in this way, we realize two things: first, there is a certain overlap with mathematically eligible structures, i.e. structures mathematicians are interested in without looking at anything extra-mathematical. The diagrams corresponding to such structures come close to certain subcases of what we classify as oval. Yablo mentions so-called cassini ovals. Their Cartesian equation is “((x-a)2+y2) ((a+x)2+y2) = b4. Cassini ovals describe many of the shapes we would call oval, but also some shapes we would not call oval. So there is only a certain overlap. As an example of a truth relating cassini ovals and ovals, Yablo introduces ‘cassinis’, a subspecies of cassini ovals by the following formula: “(x² + y²)² - (x² - y²) = 5”(Yablo 2002, 468) If you draw a diagram according to this formula, you will find it oval. The following seems true : *cassinis are oval*.

Second, while there is a certain overlap, mathematicians would have a hard time to give a general mathematical description of any two-dimensional shape in a Cartesian plane that strikes us as oval. In sum, even if we consider only diagrams, *oval* is no mathematically eligible property. It can only be described in a highly gerrymandered way by a huge disjunction of mathematical formulas, among them many but not all cassini ovals. *Oval* seems ineligible from a mathematical standpoint. Were it not for the purposes of a reconstruction of our perception-based predicate, mathematicians would not be interested in *oval* as a predicate.

Response-enabled truths like ‘cassinis are oval’ resemble response-dependent truths like ‘sugar is sweet’ with regard to the constitutive role of our own reactions. Our normal reactions to oval forms and sugar explain why it is true that cassinis are oval and sugar is sweet. However, the two kinds of truth are distinguished by their modal profile. According to Yablo

(2) If we had different attitudes, sugar would not be sweet.

But

(3) If we had different attitudes, cassinis would still be oval.

The predicate *oval* is bound to what appears oval according to our actual sensitivities in their normal environment. If they were different, they would not any longer be guides to *oval*, but *oval* would still be the same property. *Oval* is modally tied to the gerrymandered mathematical diagrams which correspond to our actual sensitivities exercised in their normal surroundings. Thus, *oval* does not counterfactually covary with the sensitivities that make us judge forms to be egg-shaped. In contrast, if our tastebuds were wired differently such as to systematically taste sweet things as sour, things which are actually sweet would not be sweet.

Our practice of introducing response-enabled truths can be explained for the case of *oval*. When considering oval shapes, they seem highly eligible to us. This presumably has to do with their evolutionary function in our spotting eggs. They also promise to be mathematically interesting in roughly the way circles are. This is why our speech community invested them with counterfactual stability: They seem so simple and compelling - it is natural to think that there is more to them than meets the eye, however our visual capacities are wired. When we do the mathematics, we realize that they do not live up to this expectation. But their semantics is already settled. Thus, we continue to use our vague predicate *oval* in dealing with real-life forms and do not bother about questions of mathematical eligibility.

I shall now try to generalize the lesson. Response-enabled truths are a curious mixture of subjective and objective aspects. On the one hand, our responses explain why we find them relevant. Among the many ways of carving up the world, we choose these. At the same time we presuppose that this carving is eligible independently of our finding it salient. Yet closer scientific scrutiny reveals that its eligibility cannot be accounted for independently of our reactions. I shall argue that response-enabled truths provide a convincing way of interpreting moral anti-realism.

**Response-Enabled Anti-Realism**

Anti-realism may be local or global. I shall concentrate on the local version, although it will turn out to spread. According to local anti-realism, there are robustly realist fields of discourse and anti-realist ones. Candidates for the former are the natural facts, for instance those uncovered by ideal physics. I shall assume that there is an exhaustive inventory of the natural facts, which is the subject of robustly realist discourse. One may think of this inventory as a canonical description of the physical world as envisaged by philosophers like Chalmers (2002).

I shall try to be as neutral as possible about the description. However, I need the idea of it being more or less ideal in the sense in which we think of scientific theories as more or less ideal. Among the criteria that make a theory more or less ideal are virtues like simplicity, strength, and fit. In this vein, I shall assume that the exhaustive canonical description of the natual facts is ideal in terms of such virtues. One way of satisfying the intuition of robust realism is to claim that there is such a true description, which represents the way the world is independently of ours. One may use the metaphor of the ‘book of the world’ for it (Sider 2011). The book of the world is supposed to represent the world as it is independently of attitudes, conventions, conceptual schemes, and anything else that could involve a certain relativity to human observers.

I propose to formulate moral anti-realism with regard to the book of the world. Moral facts are not robustly real as they do not form part of the book. They are carved out by our reaction to the real facts. When talking of our reaction, I have in mind the whole pattern of emotions, motivational force, patterns of behaviour and speech. Though carved out by our reaction, moral truths are not merely subjective in the sense of counterfactually depending on our attitudes.They are response-enabled. They are modally tied to our normal responses to certain natural facts, holding fixed our actual sensitivities in their proper environment. When we accept that kicking dogs is wrong, we take our own reaction to certain natural facts as a guide to how the predicate *wrong* distributes over the world and other possible worlds. However, the resulting distribution does not counterfactually depend on our reaction. If the latter were to change, the distribution would remain the same. As a consequence, the conditions of applying ‘wrong’ can be reconstrued independently of our reactions by the natural facts to which we are actually disposed to react in this way. Just as we can give a mathematical formulation of *oval*, we can give a natural description of moral facts. But just as *oval* is mathematically ineligible, moral truths are naturally ineligible. Moral facts do not form part of the canonical description of the world. They become relevant only to beings which react in the way we react to the natural facts, although beings who does not react in this way may adopt our way of speaking by using a suitable reconstruction of our predicates. Someone who does not feel the way we feel about kicking dogs may acknowledge that kicking dogs is wrong, just as someone who lacks our perceptual apparatus may acknowledge that cassinis are oval. But in not sharing our reactions, both may be unable to appreciate the life significance of response-enabled truths.

I close with discussing in how far my version of anti-realism is contagious. In particular, one may doubt that the purportedly independent facts to which we react by moral assessments, facts like dogs feeling pain when kicked as mentioned by Blackburn, are robust in the sense introduced. It has to be discussed in how far they form part of a canonical description of the world. Ordinary predicates like *dog, kick, pain* may be as much response-enabled as *wrong*. The consequence may be a more pervasive anti-realism about ordinary objects.

Hartry Field (New York University)

***The objectivity of mathematics***

Category: Objectivity in Mathematics and Logic

*Abstract:*

There are two somewhat separable issues surrounding “platonism”: the existence of mathematical objects, and mathematical objectivity. After reviewing how a certain kind of no-mathematical-objects view leads to non-objectivity in math, and considering an argument that non-objectivity makes no sense if there are mathematical objects, I’ll consider one attempt to concede the objects while denying the objectivity: a kind of conventionalism. I’ll then consider arguments (1) that conventionalism makes no sense for arithmetic (because it needs to assume the consistency of conventions, which is essentially an arithmetic notion), and (2) that once one concedes objectivity in arithmetic there is little motivation not to extend it to much or all of set theory.

Simon Goldstein (Australian Catholic University, Melbourne)

***Credence for epistemic expressivists***

Category: Expressivism

*Abstract:*

Triviality results raise problems for plausible principles governing our credence in epistemic modal claims. This paper develops a new account of modal credence which avoids triviality. On the resulting theory, probabilities are assigned not to sets of worlds, but rather to sets of information state-world pairs. The theory avoids triviality by giving up the principle that rational credence is closed under conditionalization. A rational agent can become irrational by conditionalizing on new evidence. In place of conditionalization, the paper develops a new account of updating: conditionalization with normalization.

Adrian Kreutz (University of Amsterdam)

***Form as meaning: Towards a neo-structural mereology***

Category: Structural Realism and Philosophy of Mind

*Abstract:*

The debate between compositional realists and compositional anti-realists in material object metaphysics is an ongoing one. The realist has a slightly better pedigree. In this paper, I shall put forward a number of novel arguments against the conceived realist positions and introduce a new semantics for realist material object metaphysics which has its foundation in structural realism, as defended in the philosophy of science literature.

The first realist position, Neo-Aristotelian Mereology (Hylemorphism), as advanced by Kit Fine (1999), takes objects to be trans-categorical compounds of matter (*hyle*) and form (*morphe*). The other realist position I shall be concerned with, Classical Extensional Mereology (CEM), the theory associated with David Lewis (1986), sees objects as unstructured wholes composed of uni-categorical parts.

While CEM is the more elegant theory, Hylemorphism is closer to our ordinary understanding of what objects are and how they behave. Both come with their respective set of problems, both of technical concern as well as with regards to common sense.

The mereology proposed in paper seeks to build on the virtues of those theories, and also to avoid their vices. In detail, it generates a promiscuous ontology via CEM's principle universalism and determines ontological sub-sets via the hylomorphic notion of 'form'. The notion of 'form', however, is deprived of its Aristotelian content and endowed with a structural character and a Heideggerian distinction of objects into those which are ready-to-hand and those which are ready-at-hand.

In neo-structural mereology, we understand the notion of 'form' in terms of 'meaning'. Meaning itself is defined relational. The trick with a structualist picture is that 'form' understood as 'meaning' is no longer a structure-inducing entity -- such as the Neo-Aristotelian Form -- which compounds with matter to yield complex objects, it rather picks out those objects from the plenitude of objects generated by CEM which already have a meaningful structure, i.e. ordinary material and non-material objects.

As such, a neo-structural mereology is a realist position which defines the notion of 'ordinary object' as opposed to being defined by it, as it is the case with Hylomorphism. It is a universal and sortal-free account of the metaphysics of objects which has the potential to settle the long-standing debate on how liberal or conservative our ontology of material objects should be and makes for an intelligible solution to the puzzle-cases of material-object metaphysics. As the aim of this paper is expository, I shall limit the discussion to the problem of coincidence.

Keywords: Mereology, Neo-Aristotelianism, Hylemorphism, Heidegger Coincidence, Object Perception, Material Object Metaphysics.

Andrew J. Latham

(University of Sydney)

***Folk Compatibilism***

Category: Structural Realism and Philosophy of Mind

*Abstract:*

Is our concept of free will compatible with the thesis of determinism being true? That is, is our concept of free will a *compatibilist concept*? The thesis of determinism holds that the entirety of particular facts about the past, in conjunction with the laws of nature entails every truth about the future. Compatibilists answer ‘yes’; they think that having free will is compatible with determinism being true. According to them, if determinism is true then provided agents have some preferred set of abilities (which depend on the version of compatibilism at issue), then free actions are those produced by those abilities. Conversely, incompatibilists take it to be a necessary condition for our having free will that indeterminism is true. That is, they think that having free will is incompatible with determinism being true.

A major challenge to developing an account of free action in a compatibilist fashion is that if the folk as a matter of fact don’t accept that free actions can exist in a deterministic universe, then it’s difficult to argue that any account supposedly of free will of a compatibilist kind deserves to be called ‘free will’. One common objection to compatibilist accounts of free will is the ‘changing the subject objection’. According to this objection, whenever the compatibilist proposes some account of the abilities they take to be sufficient for free will, while they are giving an account of something, it isn’t an account of free will. That’s because our concept of free will is an incompatibilist concept, thus indeterminism is a necessary condition for there to be free will. This objection gains strength from the fact that current orthodoxy within the free will literature is that the folk concept of free will is an incompatibilist concept. The task I have set for myself in this talk will be to argue that this orthodox view of the folk concept of free will is wrong, and that the folk concept of free will is in fact a compatibilist concept.

Many compatibilist theorists have not especially concerned with the charge that they are changing the subject. That’s because the project they take to have set themselves is not to provide a descriptive account of the folk concept of free will, but rather, to prescribe what our concept of free will ought to be. They argue that the concept of free will we *ought* to possess is not an incompatibilist one, but instead a compatibilist one, irrespective of whatever concept we happen to possess already. I agree with them that the best account of free will is a compatibilist account. Further, if I took myself to be engaged in a conceptual engineering project, which I believe that most compatibilist theorists are engaged with, I too would try to show that a compatibilist account of free will best serves the functional role of a free will concept. But I don’t think such a project is necessary. That’s because I don’t think our concept of free will needs to be revised in order to be a compatibilist concept. I think that our concept of free will is already a compatibilist concept to begin with.

One area of research that we might turn to in order to figure out whether or not the folk concept of free will is a compatibilist or incompatibilist concept is experimental philosophy. Existing empirical evidence from experimental philosophy appears to be equivocal. There is some excellent evidence that the majority of the general population have a compatibilist concept of free will, provided by seminal work by Nahmias and colleagues. But there appears to be equally excellent evidence that the majority of the general population have an incompatibilist concept of free will from studies from Nicholls and colleagues amongst others. It is my goal in this talk to explain this apparent inconsistency in the experimental philosophy literature. I will argue that all existing studies in the literature are consistent with the underlying nature of our free will concept being a compatibilist concept. After I have done this I will then go on to present some new empirical data of my own that goes beyond merely showing that the folk concept of free will is consistent with being a compatibilist concept, but is strongly suggestive of the fact that the folk concept of free will is in fact a compatibilist concept.

Kok Yong Lee (Chung Cheng University)

***A New Twist to the No Miracle Argument***

Category:

Abstract:

The no miracle argument (NMA) has been widely regarded as a main argument for scientific realism, the view that scientific theories are true or approximately true. The general idea underlying NMA is that scientific realism provides the best explanation of the predictive success of scientific theories, or that predictive successes of scientific theories can only be regarded as miracles if they are not at least approximately true. For the past several decades, NMA has been hotly debated.

Two sets of counterexamples have been especially damaging to NMA. One set of counterexamples, initially proposed by Larry Laudan, consists of scientific theories that enjoy predictive success but are nonetheless far away from being approximately true, let alone true. The other set, initially proposed by Timothy Lyons, consists of scientific theories that, though are arguably approximately true, lack have any predictive success. In this paper, I suggest a novel way of constructing NMA, which can handle these two sets of counterexamples.

More precisely, I propose that the crux of NMA—namely, the idea that the (approximate) truth of a scientific theory T1 best explains why it has predictive success—can be interpreted in two different ways:

(a) The (approximate) truth of T1 best explains why it has predictive success rather than not.

(b) T1 is truer than T2 explains why T1 is predictively more successful than T2.

It is not hard to recognize that NMA is traditionally formulated along the line of (a). But I want to argue that (b) is a more fruitful way of formulating NMA. In particular, NMA along the line of (b) is immune to Laudan-style and Lyons-style counterexamples.

Mary Leng (University of York)

***The Prim and the Prime: Putnam, Thick Concepts, and the Collapse of the Mathematical/Physical Dichotomy'***

Category: Objectivity in Mathematics and Logic

*Abstract*

Just what is the ‘indispensability argument’ in the philosophy of mathematics an argument for? In contemporary philosophy of mathematics, it is widely assumed that this argument (usually presented as ‘the Quine-Putnam Indispensability Argument’) is an argument for mathematical Platonism, the view that our mathematical theories consist of bodies of truth about acausal mind- and language-independent abstract objects (such as numbers, functions, and sets). However, Hilary Putnam himself claimed that his indispensability argument was only ever intended to be an argument for “the objectivity of mathematics in a realist sense”, and not for the existence of mathematical objects. But just what is involved in the claim that mathematics is objective that distinguishes Putnam’s view from the nominalist positions that he claims to reject, which ground the objectivity of mathematical fictionality in the objectivity of logical consequence? To make sense of Putnam’s claim to be defending a genuinely realist, though not Platonist, picture of mathematics, I argue that we must look to Putnam’s metaethical views, and in particular to the emphasis placed there on the collapse of the fact/value dichotomy. Putnam’s indispensability considerations point to an analogous collapse of the mathematical/physical dichotomy, and to a logical space in the philosophy of mathematics for a realist understanding of the essential role of mathematical concepts modeled on realist positions in metaethics that point to the objectivity of evaluative concepts. A consequence of recognizing this Putnamian position is that it draws a new line between so-called ‘easy road’ and ‘hard road’ versions of fictionalism. While Field’s hard road fictionalism counts as anti-realist anti-Platonism, arguably easy road fictionalism offers just the combination of mathematical realism with anti-Platonism that Putnam claimed to be arguing for all along

Tien-Chun Lo (Oxford University)

***Grounding Identity in Existence***

Category: The Identity of Indiscernibles

*Abstract:*

The principle of identity of indiscernible (PII) is the thesis that there are no two distinct entities which share all their properties in common [[7]](#footnote-7) Although PII itself is merely a necessary and sufficient condition for when two entities are identical, some more ambitious proponents of PII, e.g. Della Rocca, suggest that we may even use it to ground identity facts like [a= b].[[8]](#footnote-8), [[9]](#footnote-9) That is, the identity of entities are grounded in their having all their properties in common.[[10]](#footnote-10) However, due to Black’s famous counterexample of two indiscernible spheres, many metaphysicians believe that particulars, or at least concrete particulars, cannot be individuated by or grounded in their properties.[[11]](#footnote-11) Shumener recently proposed a novel metaphysical explanation of identity facts (about concrete particulars) which is based on this consideration.[[12]](#footnote-12) She suggests that in order to distinguish concrete particulars one needs to look not only at which properties and relations particulars instantiate but also *how* they instantiate these properties and relations. The core idea of her proposal is that identity facts (involving concrete particulars) are grounded in how they stand in *quantitative* relations, e.g. being as massive as, to themselves.[[13]](#footnote-13) In this talk, I will defend another approach, i.e. the *existential* proposal which states that identity facts are grounded in things’ existence, which is rejected by Shumener. Specifically, I will firstly argue that Shumener’s own proposal faces a problem which the existential proposal is free from, and then reply to her objection to the existential proposal.

Before introducing Shumener’s quantitative proposal, we need to explain some terminologies. First, there is a distinction between fundamental and non-fundamental *facts*. Let us say that a fact is fundamental if and only if it is ungrounded, and all other facts are non-fundamental. Second, there is a distinction between fundamental and non-fundamental *properties/relations*. Let us say that a property or a relation is fundamental if and only if it appears in at least one ungrounded fact, and all other properties or relations are non-fundamental. Third, there is a distinction between fundamentally and non-fundamentally *possessing a property/relation*. Let us say that an object x instantiates a property P *fundamentally* if and only if [Px] is fundamental, and an object y instantiates a property Q *non-fundamentally* if and only if [Qy] is non-fundamental. For instance, consider the property of having -1 e electric charge. Arguably, it is a fundamental property (because it appears in some fundamental fact, e.g. the fact that a particular electron e1 has -1 e electric charge). Now suppose that my jumper also has -1 e electric charge. Then we can say that the electron e1 instantiates this property fundamentally as e1’s instantiating it is fundamental or ungrounded, while my jumper instantiates it non-fundamentally as my jumper’s instantiating it is supposedly grounded in facts about the charges of subatomic particles which constitute my jumper. Now given the distinction between fundamentally and non-fundamentally possessing a property/relation, Shumener suggests that things stand in quantitative relations to themselves and to things distinct from them in different ways. More precisely, she holds that things stand in quantitative relations to themselves *non-fundamentally* while things stand in quantitative relations to things distinct from them *fundamentally*.[[14]](#footnote-14) She writes:

“When a and b are distinct objects, they stand in certain [quantitative] relations to one another fundamentally. For distinct microphysical objects, quantitative facts of the form [a is five meters from b] or [a is as massive as b] are good candidates for fundamental facts extracted from our physical accounts. This differs from how objects stand in [quantitative] relations to themselves; Objects stand in physical [quantitative] relations to themselves non-fundamentally. For instance, the facts [a is the same mass as a], [a is co-located with a] are non-fundamental. This is because such facts are not scientifically informative. These types of facts do not belong in our ultimate physical accounts of the world as they hold ‘‘no matter what’’ or regardless of which specific features the object in question has. a will be the same mass as itself if a has one gram of mass, 1000 kg of mass, or (trivially) if a has no mass at all.”[[15]](#footnote-15)

Following this line of thought, Shumener suggests that identity facts about concrete particulars are grounded in their standing in quantitative relations to themselves non-fundamentally. Shumener notices that one may have a question about this proposal. If objects stand in quantitative relations to themselves non-fundamentally, then the facts about things standing in quantitative relations to themselves are non-fundamental. So what grounds the facts that they stand in such relations to themselves? Shumener’s answer is that these non-fundamental facts are grounded in things’ existence. Now given this, Shumener generalizes the quantitative proposal to absolutism with regard to quantities. She suggests that on absolutism, two distinct things’ standing in quantitative relations to each other is grounded in their instantiating their (monadic) quantitative properties (fundamentally) while things’ standing in quantitative relations to themselves is grounded in their own existence. Therefore, the generalized quantitative proposal says that identity facts are grounded in the facts that things stand in every quantitative relation to themselves in virtue of their existence.[[16]](#footnote-16)

I believe that the quantitative proposal faces a problem which the existential proposal, i.e. the proposal that for every object x, [x = x] is grounded in [Ex], is free from. To see why this is the case, let us notice that according to the quantitative proposal, the grounds of identity facts are themselves grounding facts, namely facts about what grounds what. Nowadays many philosophers believe that grounding facts, which link non-fundamental facts to fundamental facts, are non-fundamental because a fact can never be fundamental if it involves something non-fundamental.[[17]](#footnote-17) Let us, following Bennett’s term, call these philosophers ‘anti-primitivists’. If anti-primitivism is true, then the grounding facts about qualitative relations also need grounds. But what are their grounds? In the following discussion, I will focus on two main alternatives in the literature. One is Bennett’s view that grounding facts, say [[Fa] > [Ga]], are grounded in the grounds, say [Ga].[[18]](#footnote-18) The other is Dasgupta’s view that grounding facts are grounded in the so-called ‘autonomous’ essence facts about the groundeds, e.g. essence fact(s) about the property F.[[19]](#footnote-19) Let us start with the former. On Bennett’s view, the grounding fact [(R)([(Raa)] > [Ea])] is grounded in the ground itself, i.e. [Ea]. Furthermore, if as Shumener herself assumes, grounding relation is transitive, then the identity fact [a = a] is ultimately grounded in [Ea]. Thus, if Bennett’s view is true, the quantitative proposal will collapse into the existential proposal. On the other hand, suppose that Dasgupta’s view is true. On Dasgupta’s view, the grounding fact is grounded in the essence fact(s) about the grounded, i.e. the essence fact(s) about quantitative relations. Now let us leave the question of whether the essence facts about quantitative relations can really link facts that things stand in quantitative relations to themselves to their existence aside. There is a more serious problem with the quantitative proposal: why not go for a much simpler theory that the essence fact about identity relation can directly link identity facts to things’ existence? Recall that identity facts are also grounded. If the essence facts about groundeds link them to their grounds, then there should be some essence fact about identity relation which links identity facts to their grounds. Now there are two options. First, the essence fact links identity facts to the grounding facts like [(R)([(Raa)] > [Ea])]. Or, the essence fact directly links identity facts to the existential facts like [Ea]. It seems extremely plausible to me that the essence fact about identity relation is more likely to be the latter rather the former. Thus, if Dasgupta’s view is true, then the existential proposal will be explanatorily simpler than the quantitative proposal, though the latter will not necessarily collapse into the former. To be fair, these two views about what grounds grounding facts do not exhaust all options. However, as far as I can see, the problem about grounding facts, i.e. how to ground the alleged grounds of identity facts, does pose a challenge to the quantitative proposal unless one can find some still unknown way to solve this problem which, unlike Bennett’s and Dasgupta’s views, will not make the quantitative proposal less competitive than the existential proposal.

Now one might avoid the problem of grounding the grounding facts by insisting that the grounding facts about quantitative relations do not need any ground at all. They might hold that grounding facts are ungrounded because like Dasgupta’s autonomous essence facts, they are not apt for being grounded. Bader holds a view like this.[[20]](#footnote-20) Strictly speaking, Bader’s view is that grounding facts do not exist because there is no such thing as the grounding relation. Instead, he takes grounding to be an operation which generates grounded facts from their grounds. He writes: “The operation itself is neither fundamental nor derivative. It is not part of the fundamentality hierarchy but stands outside it…It does not occupy a position in the grounding order but instead gives rise to this order.” However, Bader’s view will undermine the quantitative proposal because the latter requires the existence of grounding facts about quantitative relations. Now for the sake of argument, let us still keep the spirit of Bader’s view but grant that grounding facts somehow exist. That is, grounding facts exist but are not apt for being grounded. As Bader suggests, the only things that are apt for being grounded are instantiations of monadic as well as polyadic properties. We may draw a distinction between facts in the world, namely instantiations of monadic and polyadic properties, and facts about the world, namely grounding facts (or perhaps Dasgupta’s essence facts as well). Therefore, the proponents of the quantitative proposal can say that it is a categorical mistake to ask what grounds facts about the world as only facts in the world are apt for being grounded. However, this does not save the quantitative proposal because if facts about the world cannot be the output, i.e. groundeds, of the operation, then for the same reason, they cannot be the input, i.e. grounds, either. As Bader has pointed out, they stand outside the fundamental hierarchy and do not occupy any position in the grounding order. Thus, if it is a categorical mistake to talk about the grounds of grounding facts, then it should also be a categorical mistake to talk about grounding facts as grounds. Again, the existential proposal does not suffer from this problem because existential facts are instantiations of the monadic property of existence, which are facts in the world rather than facts about the world.

I now turn to Shumener’s objection to the existential proposal. Her objection is that we are still left with the problem of explaining distinctness. If we say that [~a = b] is grounded in [Ea] and [Eb], then we need to firstly show that [Ea] and [Eb] are distinct rather than identical. However, facts are usually distinguished or identified on the basis of their constituents. That is, we should explain the distinctness of [Ea] and [Eb] by appealing to the distinctness of a and b, which is what we try to explain in the first place. To be honest, I do not quite understand what the problem really is here. Let us list all the relevant grounding facts in this picture. First, we have the grounding fact [[~a = b] > [Ea & Eb]]. Second, we have another grounding fact [[~[Ea] = [Eb]] > [~a = b]]. Third, given transitivity of grounding, we can derive from the foregoing two grounding facts another grounding fact [[~[Ea] = [Eb] > [Ea & Eb]]. That is, on the existential proposal, the distinctness of these two existential facts is also grounded in the existence of the objects involving in these facts. As Shumener herself notes, this does not generate grounding circularity. So what is the problem here? I suspect that there seems to be a problem only because one fails to distinguish between two sets of distinctions: distinctness/identity and discrimination/identification. The problem of explaining distinctness/identity is about the former one. To answer this problem is to provide a ground for the distinctness/identity fact. This is what the existential proposal does. On the other hand, how to distinguish or identify two facts is an epistemic question about the latter one. Sometimes, we can distinguish two things without knowing their grounds. For example, I can distinguish a red ball from a blue ball because they have different properties, though I do not know what the ground of one ball’s being red and the ground of another ball’s being blue, presumably some micro-physical facts, exactly are. Likewise, I may know the grounds of two things without being able to distinguish them. The most famous example is Mary the super-scientist. She knows the physical ground of the colour blue without being able to distinguish it from the colour red. Given the distinction between these two problems, we may see that the quantitative proposal is a good answer to the problem of distinguishing two distinct things. However, as we are concerned with how to ground identity/distinctness facts, Shumener’s objections just misses the point. Therefore, I conclude that the existential proposal is still better than the quantitative proposal in answering the problem of grounding identity facts.

Dan Marshall (Lingnan University)

***Nominalism and the Indispensability Argument***

Category: Objectivity in Mathematics and Logic

*Abstract:*

Let us understand ‘abstract object’ so that all numbers, sets and properties are abstract objects. An important issue in metaphysics, the philosophy of science and the philosophy of mathematics is whether there are any such abstract objects. Realism about abstracta holds that there are abstract objects, while nominalism holds that there are no abstract objects

In this talk, I will discuss what is widely taken to be the most powerful argument for realism about abstract objects, namely the indispensability argument. I will give reason to think that this argument is self-undermining, where an argument is self-undermining iff, given its conclusion is true, the premises of the argument are either not all true or do not support the argument’s conclusion.

The indispensability argument can be stated as follows, where a realist theory is a theory that entails that there are abstracta, while a nominalist theory is a theory that entails that there are no abstracta:

P) The best total theory relative to our evidence is a realist theory

--------------------------------------------------------------------------------------------------

C) There are abstracta

Realists claim that this argument is inductively strong (rather than being deductively valid).

The goodness of a theory is a matter of how theoretically virtuous it is, where theoretical virtues include, ideological parsimony, ontological parsimony, explanatory power, and consistency with our evidence.

Ideological parsimony of theory T can be at least roughly understood to be how few primitives T has, while the ontological parsimony of theory T is how few entities there are according to T. The explanatory power of T is (roughly) how much T putatively explains divided by how much it takes to be explanatorily brute.

Realists claim that best realist theories have fewer ideological primitives and contain simpler and stronger laws than best nominalist theories (and hence that realist theories are both ideologically more parsimonious and explanatorily more powerful than nominalist theories). Realists claim that, since these advantages outweigh any advantage nominalist theories have with respect to ontological parsimony, (P) is true.

Realists claim that good realist theories can (while good nominalist theories cannot) define `there are finitely many’, and hence good realist theories do not need to contain this quantifier expression as a primitive (while good nominalist theories do). An example of a theory that provides such a definition is T1, whose axioms are all the instances of (1).

(1) There are finitely many Fs =df For some natural number n, there is a 1-1 function from the set of Fs onto n={i|i is a natural number less than n}.

Since T1 can be conjoined with `There are abstracta’ to form a good realist theory, there are good realist theories that provide a definition of `there are finitely many’. In contrast, T1 cannot be conjoined with `There are no abstracta’ to form a good nominalist theory, since it would then be incompatible with the fact that there are finitely many people in this room.

Realists similarly claim that good realist theories can, while good nominalist theories cannot, define many other notions, such as modal comparatives, duplication and counterfactuals. For example, realists claim that there are good realist theories containing definitions (2) and (3).

(2) x is a duplicate of y =df for any qualitative intrinsic property p, x has p iff y has p

(3) Had it been the case that A it would have been the case that B =df ∃w[w obtains & ∀u[[(at u, A) & ∀v((at v, A) ⊃ (u is more similar to w than v is))] ⊃ (at u, B)]]

Realists claim that our best physical and semantic theories are realist theories (and they claim that there are no competing nominalist theories of the same phenomena that are as good as these theories). For example, realist theories can contain (4), which together with containing other natural law theorems and theorems ascribing certain properties to things allows those theories to be explanatorily powerful.

(4) For any x, for any mass m in kilograms had by x, for any acceleration in m/s2 had by x, for any net force F exerted on x in newtons, F=ma.

In this talk, I’m going to give reason to endorse (5).

(5) Given (credible) realism, the best total theory relative to our evidence is not a realist theory.

(The qualification to credible realist views is meant to rule out crazy realist views such as the view that there is the number 3, but no other numbers. Such crazy views are clearly not supported by the indispensability argument.)

If (5) is true, then (credible) realists are unable to appeal to the indispensability argument, since, given their views, its premise (P) is false! Hence, if (5) is true, the indispensability argument is self-undermining.

Giving a fully convincing argument for (5) would require: i) considering all the alleged advantages good realist theories are meant to have over good nominalist theories, and ii) arguing that, given realism, there are good nominalist theories that also have those advantages. Since I don’t have time to do this, I will consider only one advantage realist theories are meant to have over nominalist theories: that of providing a definition of ‘there are finitely many’. In particular, in this talk, I will aim to establish (6).

(6) Given (credible) realism, there is a good nominalist theory that provides a definition of `there are finitely many’.

The establishment of (6) will illustrate in a very simple case how one might try to go about giving a fully convincing argument for (5). It will also provide some direct inductive support for (5).

The argument for (6) is as follows. Assume (credible) realism and make the following two definitions.

Def: For any set of formulas, let be the disjunction of the members of .

Def: Let S be `There are finitely many Fs’ concatenated to the right with ‘=df’ concatenated to the right with {`there are exactly n Fs’|n is a natural number numeral}.

If we use single quotation marks as corner quotes, S is then the infinitary sentence: ‘There are finitely many Fs =df {`there are exactly n Fs’|n is a natural number numeral}’. Let T2 be the theory whose axioms are the instances of S. Then T2 defines `there are finitely many’. Moreover, the instances of S are nominalistically acceptable, in the sense that they do not (in conjunction with other plausible sentences) entail that there are abstract objects.

It is therefore plausible that there are good nominalist theories that define `there are finitely many’. An example might just be the result of adding ‘There are no abstracta’ to T2.

Therefore (6) is true.

I have argued that, assuming (credible) realism, there is a nominalistically acceptable definition of `there are finitely many Fs’. This suggests that we might similarly be able to show that, given (credible) realism, nominalist theories are at least as good as realist theories in all the other respects realists have claimed realist theories to be superior to nominalist theories. If we can do that, then, it is not be the case that, given (credible) realism, the best theory relative to our evidence is a realist theory. If this is the case, then the indispensability argument is self-undermining.

Gonzalo Rodriguez-Pereyra (University of Oxford)

***An argument for the Identity of Indiscernibles***

Category: The Identity of Indiscernibles

*Abstract:*

In this paper I will argue for what I take it to be an interesting, non-trivial version of the Identity of Indiscernibles, and I will present an argument for it.

Seungbae Park (UNIST)

***Critiques of Causal Platonism***

Category: Objectivity in Mathematics and Logic

*Abstract:*

Classic platonism holds that mathematical objects are nontemporal, nonspatial, immutable, and noncausal. By contrast, causal platonism (Callard, 2007, 2018) holds that mathematical objects are nontemporal, nonspatial, and immutable, but they causally affect human brains. I call this causation *the mathematical causation*. Causal platonism asserts that the mathematical causation not merely metaphysically possible but rather actual. Jody Azzouni (2008, 2016) and Seungbae Park (2018) raise objections to causal platonism. Benjamin Callard (2018) replies to them, and this paper counters his replies. Specifically, I summarize and respond to Callard’s (2018) four arguments as follows:

Callard’s Argument 1: Quantum entanglement shows that two objects, although spatially separated from each other, can be in a causal relationship. Hence, the mathematical causation is metaphysically possible.

Park’s Response: On close examination, quantum entanglement rather shows that a causal relationship between two objects requires that they be in temporal, spatial, and mutable. Mathematical objects, however, are nontemporal, nonspatial, and immutable.

Callard’s Argument 2: Establishing the metaphysical possibility of the mathematical causation is tantamount to establishing the actuality of it. In addition, causal platonism is an a priori claim. Consequently, it does not need empirical evidence.

Park’s Response: On close examination, Callard’s analogy does not show that establishing a possibility is tantamount to establishing an actuality. It rather shows that empirical evidence establishes an actuality. In addition, causal platonism is not an a priori claim but rather a posterior claim, so it needs empirical evidence. In addition, it is one thing that causal platonism is a priori; it is justified a priori.

Callard’s Argument 3: Just as cameras are receptive to physical objects, so human brains are receptive to mathematical objects.

Park’s Response: Just as cameras receive photons from physical objects, so human brains should receive some things from mathematical objects. To postulate the existence of those things, however, is to multiply a mystery beyond necessity.

Callard’s Argument 4: The mathematical causation is brute like all the other causations. Thus, to complain that the mathematical causation is unintelligible and inexplicable is to complain that causation, in general, is unintelligible and inexplicable.

Park’s Response: The contention that the mathematical causation is brute requires the prior belief that the mathematical causal is actual. The prior belief, however, is subject to dispute, as I argued above.

Conclusion: Causal platonism is a claim about both mathematical objects and human brains, and that claims that human brains are in certain neural states should be justified a posteriori, whatever might be the cause of the neural states. No empirical evidence, however, has been provided in support of causal platonism. In addition, a causality between two objects requires that they both should be spatial, temporal, and mutable. Mathematical objects, however, are nonspatial, nontemporal, and immutable. Therefore, it is metaphysically impossible for them to causally influence human brains. Let me end this paper with a slogan: *Math cannot move matter*.

Paolo Santorio (University of Maryland, College Park)

***Expressivism and Indeterminacy***

Category: Expressivism

*Abstract:*

The debate on expressivism about epistemic modality and the debate about indeterminacy have so far proceeded on separate tracks. In particular, the metasemantic picture that is usually associated to modal expressivism is very different from metasemantic and metaphysical views about the nature of indeterminacy. At the same time, there are striking formal connections between the two debates. Expressivist logics for epistemic "must" in the style of Veltman and Yalcin are analogous to standard logics for the determinacy operator. Moreover, analogous triviality results can be proven for epistemic modals and for languages involving a determinacy operator. In the talk, I will investigate whether these formal analogies may lead to reconsider some of the received views about the nature of modal content and of indeterminacy.

Elay Shech (Auburn University)

***Anti-realism (Selectionist) Explanation of the Success of Science, Material Induction, and Mathematical Platonism***

Category: Objectivity in Mathematics and Logic

*Abstract:*

In my paper (for which this is an extended abstract) I aim to achieve (or least gesture at) two goals. The first goal is to argue against anti-realism *a la* constructive empiricism through two method. I will long to John D. Norton’s material theory of induction as a framework for how we gain knowledge in science and show that whether evidence supports some hypothesis (say, about scientific realism) does not depend on whether possible object referred to are “observable or unobservsbles.” In addition, I note that there is no viable selectionist (i.e., anti-realist) explanation of the success of science. My second goal is to flesh out consequence for the debate about mathematical objectivity and realism. The main idea is that the type of objectivity that can be supported in mathematics, and the type of realism that may ensue, must be constrained by how we come to know about the world. Following the material theory of induction, it will be hard to see how we could ever gain evidence for the existence of mathematical entities. It should be noted that this type of nominalist position regarding mathematical objects differs from the one defende by Harty Field (1980) (so-called hard road nominalism) or Mary Leng (2012) (so-called easy road nominalism) since it about to debonking the Putnam-Quine indispensability argument (or its enhanced version in the spirit of Baker (2005). Still, a sense of objectivity in mathematics will remain.

What I will do in the rest of this extended abstract is start fleshing out the first goal by paying closer attention to a recent defense of anti-realism about science. Specifically, in his recent 2018 book, *Resisting Scientific Realism*, K. Brad Wray provides a detailed, full-fledged defense of scientific anti-realism in the spirit of Van Fraassen’s (1980) constructive empiricism. His positive and novel argument for his position consists of two main claims. First, he offers an anti-realist explanation of the success of science that, he holds, is both a genuine competitor and superior to the realist explanation, viz., that the best explanation of the success of science is that our theories are approximately true. Second, he argues that radical theory change is part and parcel of the development of science so that “our contemporary theories are apt to be replaced in the future by theories that make significantly different assumptions about” unobservable entities and their behaviors (Wray 2018, 143). In other words, Wray’s anti-realism and pessimism regarding the fate of our current theories is restricted to unobservables. As he explains, realists and anti-realists alike agree that scientific knowledge and precision progresses with respect to observable phenomena. The anti-realist’s skepticism then “is a skepticism about our alleged knowledge of unobservable entities that are posited to account for the phenomena” (Wray 2018, 204). In what follows, I will argue against Wray’s claims, placing an emphasis on his anti-realist “selectionist” explanation of the success of science. In particular, I maintain that there is no viable selectionist explanation of the success of science. Or, said different, that the anti-realist conflates a metaphysical-logical explanatory project, which is the proper issue at hand, with an epistemological explanatory project. I also suggest that his skepticism about unobservables is misguided and, at best, commits him to a stronger form of skepticism than he would wish to endorse. My goal is not wholly negative though. Instead, I aim to identify the type of work that anti-realists would need to undertake in order to further substantiate their position, and the type of realist and anti-realist views that seem viable.

Before starting in earnest, it is worthwhile to sketch John D. Norton’s material theory of induction since I will be drawing on insights from the material theory throughout this essay when discussion how induction and scientific confirmation work. Specifically, Norton (2003, Manuscript) has argued that formal theories of induction, which provide universal schemas that are meant to identify the inductions that are licit and those that are not, stand against an insurmountable difficulty when having to distinguish cogent from non-cogent inferences that are formally equivalent (an example of which I give below). Instead, he offers a material account of induction:

In a material theory, the admissibility of an induction is ultimately traced back to a matter of fact, not to a universal schema. We are licensed to infer from the melting point of some samples of an element to the melting point of all samples by a fact about elements: their samples are generally uniform in their physical properties. … *All inductions ultimately derive their licenses from facts pertinent to the matter of the induction*. (Norton 2003, 650; original emphasis)

Norton calls the local, background facts that power inductive inferences “material postulates.” Material postulates themselves are supported by other instances of induction that are licensed by different material postulates.

**2. The selectionist explanation and inductive inference**. The standard realist explanation of the predictive success of science is that our best theories are true or approximately true. However, it is well known that false theories (e.g., the caloric theory of heat or the phlogiston theory of combustion) afford successful predictions, and so it isn’t clear how truth is supposed to *generally* explain predictive success. Instead, Wray offers, develops, and defends a “selectionist” explanation of the success of science à la Van Fraassen:

[A]ny theory that does not enable scientists to make accurate predictions is not apt to be around very long. No scientist will waste her career working with such a theory. As a result, any theory that is still around, that is, any theory that is still being used by scientists, is apt to be successful. Consequently, when philosophers of science look at the world of science, they should not be surprised to find only successful theories. The others have been eliminated or are on their way to being eliminated. . . . Our theories enable us to make accurate predictions, because scientist do not work with theories that do not enable them to make such predictions. Consequently, inaccurate theories are not represented in the population of theories accepted by scientists. Scientists who work with unsuccessful theories are as rare as mice that do not rune from cats, and the fate of both is similar. (Wray 2018, 148-149)

Furthermore, Wray claims that, in contrast with realists’ explanation, the selectionist explanation enables us to explain why long-accepted theories come to be rejected. Specifically, newly observed phenomena and scientists’ changing research interests are akin to a new evolutionary environment, thereby creating novel standards of success that theories must contend with. Theories that do not meet the new challenges are thus discarded (Wray 2018, 152-153). Also, he contends that the selectionist can explain why two competing and contradictory theories are both predictively successful: “When two competing theories both enable scientist to make accurate predictions … we should expect each theory to be accepted by some scientists” (Wray 2018, 155).

Unfortunately, there seems to me to be no viable selectionist explanation of the success of science. Here is the reason why. A prediction based on a theory, law, model, etc., is an *inference*. When we are asking why science is predictively successful, we are asking why the inferences made in science are successful. Let us consider a simple case of a deductive inference to begin. Say that I predict successfully that “Socrates is mortal” and I do so based on my theory that “All Greeks are mortal and that Socrates is a Greek.” What explains the predictive success of my theory? What explains my successful inference? The selectionist explanation would hold that our inferential practices enable us to make accurate inferences, because (rational) people do not work with inferential practices that do not enable them to make such inferences. Let us concede this point for the sake of argument. Still, this explanation completely misses the point. We are not asking why people or scientists abide by certain inferential practices or work with certain theories. Rather, we want to know in virtue of what exactly is it the case that some *particular* successful inference, or predictively accurate theory, is indeed successful. Take the simple deductive example just discussed, it is (arguably) the fact that I used a correct rule of inference, along with the fact that the proposition “All Greeks are mortal and that Socrates is a Greek” is *true*, that explains why the inference is successful. Or, perhaps on a deeper level, it is the fact that the concept of “Socrates” contains within it the concepts of “Greek” and “mortal.” But what is certainly the case is that the selectionist explanations does offer us the type of explanatory insight that we were after.

Moving on then to the *inductive* case, which is more pertinent to science, we can inquire into what explains the following successful inference (based on Norton 2013, p. 649):

P1) Some samples of the element bismuth melt at 271 degrees C.

C1) Therefore, all samples of the element bismuth melt at 271 degrees C.

What explains this successful inductive inference (viz., C1)? The explanation concerns the presence of a background fact—a *true* proposition—to the effect that, *generally*, bismuth samples are uniform in exactly those properties that determine their melting point, viz., their elemental nature. It is the *truth* of this background fact (i.e., what Norton calls a “material postulate”) that warrants the inductive inference and makes it the case that if P1 is true, C1 is *likely* to be true. This can be seen by considering the formally equivalent inductive inference:

P2) Some samples of wax melt at 91 degrees C.

C2) Therefore, all samples of wax melt at 91 degrees C.

Since “wax” is a generic name for various mixtures of hydrocarbons, it is *false* that, generally, wax samples are uniform in exactly those properties that determine their melting point. Consequently, the inductive inference is not warranted because there is no background fact that licenses the inference.

But what explains successful inferences and predictions when a theory is false?! Somethings else. Presumably the false theory has captured counterfactual dependencies that are similar to that of the “true” theory, whatever it is. Perhaps also the true predictions can be explained by the list of factors that are identified in Wray (2018, Ch. 11), viz., standards of accuracy change over time, models and theories are intentionally designed to account for data, shortcomings of theories are often ignored, and so on. The important point is that inductive inferences and predictions are justified on a *case-by-case basis*—there is no general explanation for their success except to say that such inferences are warranted by background facts and, of course, that these facts are all *true* (or approximately true). Insofar as the selectionist explanation offers insight into other issues such as why long-accepted theories come to be rejected, the realist can adopt this explanatory strategy while still maintaining that there is a *deeper* story to tell about cases of predictive success based on true theories.

There has been some past criticism that resembles my own in some respects, although the emphasis has not been placed on inductive inference. For example, Lipton (2004, 194) has claimed that the selectionist explanation “does not explain why a particular theory, which was selected for observational success, has this feature” (194). Similarly, Leplin (1997) holds that “to explain why particular theories, those we happen to select, are successful, we must cite properties of the that have enabled them to satisfy our criteria” (1997, 9). In reply Wray (2018, 168-169) says: “I am prepared to acknowledge that the realist critics are correct on having more details about the mechanics responsible for the selection of our best theories in science. But indicating a need for further development is quite different from insisting that the explanation is bankrupt.” I agree with Wray that demanding more details those not amount to a wholesale rejection of an explanatory strategy, but I do believe that the selectionist explanation is bankrupt. Namely, it seems to me that the anti-realist is conflating the issue at hand, what we can perhaps call a metaphysical-logical explanatory project, with an epistemological explanatory project. In particular, there is something about the world such that if some things are true (or approximately true), other things either must be or are likely to be true (or approximately true). There is also something about rational agents like ourselves wherein we somehow know, recognize, and come to form beliefs to the effect that if some things are true (or approximately true), other things either must be or are likely to be true (or approximately true). Realists and anti-realist alike can endorse a selectionist explain regarding the epistemological issue: Our ability to recognize inferential structure is explained by the fact that those who did not develop such cognitive faculties did not survive. Generalizing then, scientific theories enable us to make accurate predictions because scientist do not work with theories that do not enable them to make such predictions. The epistemological issue, however, was not the focus of discussion. Instead, when realists claim that truth best explains the predictive success of science, they are targeting the metaphysical issue. What is it about the world such that if some things are true (or approximately true), other things are likely to be true (or approximately true)? Norton’s material theory, I submit, makes the first steps in shedding light on this issue. It holds that there will be no general, universal answer to this question. Instead, contingent facts pertinent to particular situation at hand allow us to make the inferential leap from some things being true to others being likely to be true. Truth, is part and parcel of the story. Insofar as the inductively obtained evidence that supports our best scientific theories is true (or approximately true)—and one would have to be an extreme sceptic to deny this—then the inductive inferences made based on this body of evidence is likely to be true. This, I take it, is what is meant by a reasonable realist when she claims that it would be miraculous if our theories were not approximately true, or, on the road to truth.

*3. The fate of theories and the observable/unobservable divide*

Taking the above into account, it remains to be addressed whether we ought to epistemically privilege scientific claims regarding observables over unobservables. Let us then consider Wray’s argument regarding the likely fate of our best theories:

Every theory is only ever a partial representation of the world, thus every theory leads scientists to disregarding some features of the world. Scientists’ interests determine which features they disregarding in their theories, and as they realize their research goals, their interest will change. Consequently, a theory that effectively served the interests of scientists at one time is apt to seem inadequate at some later time, when scientists have different research interest. At this later time, the theory is vulnerable to being discarded and replaced by a new theory that better serves current research interests. … My aim … has been to reexamine the history of science and reassess the significance of the pattern of theory change that seems to suggest that theories are apt to continue to be discarded indefinitely into the future. (Wray 2018, 187-188; 202)

Importantly, the type of pessimism and anti-realism that Wray thinks ought to be extracted from the above is one *solely* targeting *unobservable* entities and process. We can be fully optimistic and maintain our realist intuitions when dealing with observable phenomena.

There are two objections that I wish to raise to Wray’s argument, having to do with its logical structure and its emphasis on the observable-unobservable distinction. First, regarding the logical structure of the argument, consider an analogy with maps. Maps are partial representations. One could have a coarse-grained map of the entire, say, USA, or alternatively take a fine-grained interest and look at maps of particular cities. One may want to investigate an entirely different domain, say, the map of Canada. You could even look at different representational types: descriptions of terrane, paintings of the local flora, etc. None of this implies though, that when you try to put together a consistent story of the whole—concentrating on how the various partial representations, which are based on different research interests, come together—you will be forced to discard certain maps, or descriptions, or pictures. Thus, as it stands then, Wray’s argument doesn’t seem valid.

Still, for those moved by the above sentiments, it is worthwhile to identify why radical theory change is as much of a problem for an anti-realist like Wray, as it is for realists. Recall, if we could distinguish between theoretical and observational terms as the logical empiricists wished, we could perhaps be realists only about the referents of observational terms. However, we have come to realize that, on some (perhaps minimal) level, observation is theory-laden, and so a strict theoretical-observational distinction is untenable. It is of course possible to make a (vague) distinction between observable and unobservable entities (Van Fraasseen 1980), but if we are to take the type of radical theory change that Wray claims is indicative of science seriously, it follows that that the observable-unobservable distinction is not rigid (cf. Bacciagaluppi 2019). What is unobservable today, may become observable tomorrow, and, importantly, what is observable today, may become unobservable tomorrow. This means that if the likely fate of our best theories is that they will be discarded, it is hard to understand why Wray thinks he can continue to be a realist about observable phenomena and empirical laws; why he thinks that scientific knowledge about the observable is stable. Instead, it seems to me that Wray’s arguments, insofar as they work, commit him to a stronger form of skepticism than the one he would wish to endorse.

It is worth emphasizing this last point in relation to our previous discussion of induction. In particular, science is an inductive enterprise. The evidence that lends support to (or speaks against) various scientific claims concerns a relation of *inductive* support. But whether or not a particular inductive argument works, whether inductive inferences are warranted, does not depend on whether said claims are about observables or unobservables. For instance, considering our example with bismuth above, the inference would still be warranted even if there were “unobservable” samples of bismuth (in the sense that they reside in regions of space-time that lie outside the observable universe). In other words, if Wray (or any anti-realist) thinks that there is a fundamental distinction between observables and unobservables that cuts across inductive-evidential support, such that we ought not be ontologically committed to the latter, then this point needs to be argued for. I know of no theory of induction and confirmation that works in this manner. But I want to suggests that anti-realists can further substantiate their position by paying closer attention to induction and confirmation, and identifying why we ought to epistemically privilege claims regarding observable phenomena.

To my mind, a sophisticated anti-realist position that adapts itself to the changing nature of the observable/unobservable distinction and is reflective of how scientific evidence is accumulated and assessed, will come very close to a type of sophisticated realism, which is not susceptible to Wray’s (2018) critique. Such a realist position is *not* motivated by wholesale arguments like inference to the best explanation, which support a global thesis about all of science, viz., that we ought to commit to the existence of all theoretical postulates. Instead, a realism that seems viable is a selective, local realism in which our commitment to unobservables is assessed on a case-by-case basis, taking the scientific evidence into account.

Daniel Stoljar (Australian National University)

***A Non-Archimedean Defense of Field’s Nominalism***

Category: Structural Realism and Philosophy of Mind

*Abstract:*

Structuralist approaches to physical properties have played a big role in philosophical discussions of consciousness in recent years, mainly through the development of what has come to be called "Russellian monism"—an approach in philosophy of mind that is exciting because of its promise to move us beyond the dualist-physicalist standoff. In the first part of this talk, I will set out Russellian monism, explaining its differences and similarities to various nearby views. In the second part, I will raise some questions about what a structuralist approach to physical properties could amount to in the context of debates about consciousness.

Satoru Suzuki (Komazawa University)

***A Non-Archimedean Defense of Field’s Nominalism***

Category: Objectivity in Mathematics and Logic

*Abstract:*

(For keeping the logic symbols, the abstract is presented at the final page.)

Peter Shiu-Hwa Tsu (Chung Cheng University)

***Embeddedness and the Psychological Nature of Default Reason: On How Particularists Should Address the Flattening Objection***

Category: Meta-ethical Robustness

*Abstract:*

Particularism is widely conceived to endorse the view that moral relevance is context-dependent in the sense that it is to be determined in the particular context (Little 2000, p. 291); nothing can claim to have moral significance independently of the contexts. This being so, particularism is often accused of flattening the moral landscape---treating the feature of killing as having no more moral significance than the feature of wearing a yellow shoelace in advance of the considerations of the contexts (McKeever & Ridge 2006, pp. 47-48). Some particularists, feeling the force of the ‘flattening’ objection, appeal to the notion of ‘default reason’ to address it. Dancy (2004, pp. 112-113), for instance, maintains that his particularism allows some considerations such as killing or lying to have a negative reason status by default; it is just that their default negative reason status might get ‘switched off’ in some contexts. In this paper, I will argue that Dancy’s ontological understanding of default reason (2007) wouldn’t help him address the flattening objection, due to the ‘embedded thesis’ which I advocated elsewhere. However, once the nature of default reason is correctly understood as psychological, particularism will be enabled to deal with the flattening objection, or so I will argue. It is worth emphasizing that the central contribution of this paper is to reveal the psychological nature of default reason. Particularism and the flattening objection mainly serve as a foil to bring this out, although it will be argued how a psychological understanding of default reason might provide a reason for us to favor particularism over Rossian generalism. Finally, I address some potential objections to a psychological understanding of default reason.

Mark Warren (Daemen College)

***Objectivity Without Truthmakers: Morality, Modality, and Mathematics***

Category: Objectivity in Mathematics and Logic & Meta-ethical Robustness

*Abstract:*

This paper develops a meta-theoretical framework for a deflationary explanation of objectivity in three discourses: ethics, metaphysics, and mathematics. I focus on the efficacy of a simple norm, *discursive intolerance*, which tells us that for any genuine disagreement, at least one disputant must be in error. Discourses governed by this norm, I argue, are characterized by two hallmarks of objectivity: *mind-independence* and the *possibility of communal error*. The arguments I present for domain-specific objectivities in this paper are not meant to be dispositive; they are instead best seen as *proofs-of-concept* for a method of investigation. My hope is that we’ll have as a takeaway a kind of meta-theoretical approach to all sorts of discourses, one that might put us into a position to pursue a taxonomy of deflationary objectivities.

Inflationary accounts have a relatively easy time explaining discursive intolerance as a norm. In metaethics, for example, a traditional realist might argue that, because there are mind-independent normative facts out in the world, and because our moral discourse aims to successfully refer to them, it follows that any moral disagreement will involve a mistake on the part of one or both disputants—and indeed, that entire communities can get these facts wrong. For inflationists, then, the objectivity of a discourse can be read off of the nature of the truthmakers for the claims made within that discourse.

I argue that there is a way for deflationists to secure objectivity without relying on inflationary facts as *explanans*. Continuing in a metaethical key: Moral objectivity isn’t best explained in reference to some realm of moral facts waiting to be accurately described by a successful discourse. Instead, the objectivity of morality is a function of its purpose—the coordination of social behavior. Because moral questions are ultimately questions about what we are to do, we cannot simply agree to disagree about our answers; doing so would frustrate the purpose of moral talk itself.

It is the pragmatic significance of moral discourse that necessitates discursive intolerance as a discursive norm; it encourages speakers to incorporate one another’s cognitive resources, to marshal evidence and reasoning in favor of their positions, which leads speakers to more informed, stable positions. I argue that this view of moral objectivity makes sense of mind-independence and the possibility of communal error. If we took moral truths to depend on our beliefs, this would undermine our ability to resolve our differences of ethical opinion. Our conversational spades would constantly be turned, because once it was established that a disagreement arose out of disparate values, disputants would have no common pool of cognitive resources from which to draw. Such intolerance also makes sense as a norm governing disagreements that occur *between* groups. By remaining open to the reasoning of other communities, we give ourselves the opportunity to develop principles by which our communities can live together. This only works if inter-communal disputants recognize that there’s room to continue the moral conversation even once we’ve passed the point in the disagreement where both disputants have said, “This is just the way my group does things.”

This line of reasoning suggests a general thesis: a deflationary approach to a given discourse can make sense of objectivity by appealing to the role that discursive intolerance has in promoting the function of that discourse. In the second half of this paper, I offer suggestions for extending this approach to other domains. Modal deflationists like Amie Thomasson try to make sense of the way we talk and think about matters of matters of necessity and possibility, without relying on the notion of a realm of modal truthmakers being represented. According to my central thesis, such an approach can make sense of modal objectivity by adverting to the function of modal discourse: the coordination of common meanings for our terms. A precondition for meaningful communication is that people are using their terms in the same way (rather than using different terms homophonically). They need to keep track of what uses are allowed, forbidden, and required. Modal language functions to make this use explicit, and in doing so can facilitate this precondition. What makes sense of objectivity here isn’t some modal fact of the matter, but rather a practical commitment to using words in the same way. If we disagree, we must not simply let disputes remain unresolved, because inconsistent modal beliefs frustrate the shared attempt at communication.

This conception of modal discourse also gives us an insight into what’s going on in modal disagreements, and how those disagreements can be resolved. First, modal disagreements might be resolved in a straightforwardly empirical manner, when the rules of use for a term involve some empirical placeholder that can be filled in with a discovery about the world. Second, modal disagreements can be resolved with concessions about appropriate rules of use for a term. Sometimes this can be a simple matter of clarifying these rules, but can also proceed via a more sophisticated kind of analysis, where a general characterization of the rules of use and their entailments are determined via a sometimes-subtle conceptual analysis. Finally, some modal disputes reflect a pragmatic disagreement about how we *should* use the relevant terms: these are pragmatic debates about how we ought to revise the rules of use for our terms, not factual debates that can legitimately purport to yield discoveries about what the relevant detailed conditions of use really are. They are, in Timothy Sundell and David Plunkett’s words, *metalinguistic negotiations*: disagreements in which what is implicitly being disputed by interlocutors is not some fact of the matter, but instead is a normative matter about how they ought to be using the expressions in question. In such cases, the pragmatic dispute may yet yield results, inasmuch as there are compelling reasons to precisify a term or otherwise change the norms for its use.

But we might find that some modal disputes stall—that they cannot be fruitfully pursued by any of the three avenues discussed above. I consider a plausible example, and argue that in such cases, the disputants don’t have to be discursively intolerant, because in a real sense, they’re just talking past each other. Discursive intolerance can run out of gas, but this doesn’t really undermine the objectivity of modal discourse: inasmuch as the disputants aren’t using the same word, they’re not engaged in a genuine disagreement. Sometimes, in the modal case, we can just opt for an easy pluralism.

In the last part of my paper, I consider the implications of these arguments for a deflationary conception of mathematical objectivity, focusing on debates regarding the adequacy of the axioms of Zermelo-Frankel set theory with Choice (ZFC). These axioms are provably unable to decide the truth of many important mathematical propositions, such as Cantor’s Continuum Hypothesis (CH). This sets the stage for a debate between mathematical objectivists—who insist that that propositions like CH *must* have a determinate truth condition, and so the conception of sets elaborated in ZFC requires some sort of precisification—and pluralists—who argue there is not a single, unified concept of set, but many such concepts, each with their own consequent models.

The meta-theoretical framework I argue for in this paper gives us a way to think about a deflationary conception of this debate. For this, we need an account of the function of mathematical discourse. I briefly consider the work of the mathematical deflationist, Alejandro Perez Carballo, who argues that mathematics doesn’t primarily aim to report on a realm of facts, but instead draws out the logical entailments of axioms in a way that help us to conceptualize and articulate information about ways the world could be—it helps us to “structure logical space in an epistemically useful way.” It makes sense to pursue mathematical disagreements with an attitude of discursive intolerance; to fail to do so would undermine our ability to pool cognitive resources, and so would leave us incapable of consistently structuring logical space in any useful way.

The debate about ZFC can be reframed as a question of whether or not there is more than one fundamental way of fulfilling this function. Perhaps we shouldn't be surprised that mathematical discourse allows different, mutually incompatible ways of structuring logical space, because different ways of doing so might help us fulfill different pragmatic (or aesthetic) aims. Unlike the function of moral discourse, the function of mathematical discourse might not always be frustrated by the acceptance of unresolved inconsistencies.

I conclude the paper by advertising three advantages of the meta-theoretical framework I’ve argued for:

1. It fulfills the important deflationary project of *accommodation*, showing how the deflationist can make sense of objectivity without appealing to truthmakers.
2. It’s *general*. The framework I argue for gives us a way to think about objectivity in some very diverse domains: ethics, modality, and mathematics. This suggests that it might be an all-purpose tool for framing these issues. To illustrate, I briefly consider the import of my thesis for a deflationary analysis of knowledge claims.
3. It’s *informative*. As we saw in the cases of modality and mathematics, this analysis gives us a way to frame our first-order debates about the objectivity of a given discourse. We can cite the function of a discourse to justify our continued insistence on objectivity, but also use it to explain why pluralism might make more sense. Framing these issues in terms of discursive intolerance gives us a potential way to proceed with these debates.

The basic idea, to summarize, is that when wrestling with the question of whether and to what extent a particular discourse is objective, the deflationist must first ask: what role does this discourse play? And then: what function would discursive intolerance have in expediting such a role? Inasmuch as discursive intolerance is appropriate, disagreements are fruitful, and can be adjudicated by appeal to empirical facts, conceptual analysis, or metalinguistic negotiation, and the discourse is objective there. If discursive intolerance is inappropriate, though, the cogs of our cognition can slip free of one another, and there, objectivity gives out.

Mark Warren (Daemen College)

***Generic Validity***

Category: Objectivity in Mathematics and Logic

*Abstract:*

Given the increasingly vast literature on revising logic, logical pluralism, and logical nihilism, one would expect that there’s a shared common notion of logic under dispute. Yet one rarely finds discussion of what this common notion might be. The most common background thought seems to be that the relevant “core” notion of logic, if there is such a thing, is one that would be applicable in any circumstance whatsoever. This connects with the broad tradition of treating logic as “formal” and “universal”—that is, not being attached to or drawing from any particular subject matter. This seems, in fact, to be the very conception of logic that pluralists and nihilists are eager to deny.

But these days logical pluralism—the view that there are many equally correct logics—is on the rise, my sense of incoherence to the side. Some pluralists— or self-identified logical nihilists—have even made the stronger claim that no notion of logical consequence holds across all contexts. This increasingly pervasive view puts pressure on the idea that there’s a single most basic, foundational, and fundamental relation of logical consequence (a view sometimes called logical monism.) So it’s inclement on us logical monists to push back against pluralism.

Why think that there really is common, a generic, notion of validity? There are a number of sophisticated considerations and one pugnacious one. The sophisticated ones range from the idea that there’s a fixed domain of existing propositions which are logically related to each other, to the necessary use of logic in areas like abduction, the theory of credences, and belief revision, to the thought that no pluralist picture could do explain the uniformity of our judgments of what we’re committed to by means of the beliefs and theories we adopt. Put these to the side, though I think they’re individually compelling and jointly conclusive. The pugnacious reason is equally damning and far more fun. It’s best thought of in the form of an obnoxious question to the pluralist. Which logic is your book written in?

That’s facile, obviously. Here’s the serious version: books and papers defending logical pluralism contains arguments and those arguments are ostensibly meant to be taken seriously. That is, they’re taken to be at least valid. We can thus fairly ask which notion of validity is employed in arguing for logical pluralism. As well as asking which logic is used in evaluating which logic is best for which purpose, which logic outlines connections between results in one domain and another, and which logic is used for the metatheory in which pluralism is usually defined.

The most natural, non-recherch ́e, and unified answer to these questions is that there’s a single notion of validity that provides the standard of argument for pluralist claims. Moreover, the most charitable interpretation of the systematic lack of discussion of the pugnacious question by pluralists and nihilists is that they intend their interlocutors to use, when evaluating their arguments, a relation of logical consequence which is uniquely appropriate to the context of deciding about philosophical views like logical pluralism. But if that’s right, then why isn’t that relation suited to play the role of a most foundational notion of logical consequence?

Of course, this relation arises in the case of deciding which logic is to be used for which purpose, including the purpose of deciding between logical theories and metatheories. Perhaps there’s no logical notion that holds across all contexts. But the “consequence” relation that we use to check entailments and coherence in our claims about which logics are to be used for which purposes is the most natural candidate for a basic, foundational, and fundamental relation of logical consequence—which logic plays this role is something worth fighting about. As a consequence, we can take seriously arguments for pluralism, but not in their rhetorical guise of arguing that there’s no u ̈berlogic—since, as a matter of fact, they presuppose it.

I’ll start my argument for this by describing intuitively instrumental uses of logic. For example, way back in 1977, Nuel Belnap demonstrated that relevance logic, in particular paraconsistent relevant logic, is a useful tool for drawing consequences from inconsistent datasets. As he put it, some form of relevance logic is the way a computer should “think”. This is true. It’s nearly obviously true. Is this fact a consideration we should pay attention to when thinking about which logic is really correct? No, this use of relevance logic is merely instrumental.

We are not endorsing relevance logic as a general account of what follows from what. Rather, we’re endorsing it—or, rather, the related proof system—as a mechanical procedure for drawing consequences from a body of information. We do a similar thing when we use linear logic to track resource use in analyzing programs or use intuitionistic logic as the “internal” logic of a topos. None of these applications are inconsistent with a different logic playing the role of generic validity. In fact, as Eklund (2017) points out, if this is all the logical pluralist had in mind, then the thesis of logical pluralism looks trivial.

I’ll then look at what it is to argue about which logic is the right logic for a particular application. This involves there being two logics, one playing the instrumental role, the other explaining what the consequences are of the first logic in that particular context. Two ways of fleshing out the latter role suggest themselves. The first uses a situation-specific non-instrumental logic to evaluate the instrumental goodness of various candidate logics. The second takes there to be a single unified non-instrumental logic for evaluations.Both views are possible, but there are few weighty considerations of theoretical virtue which suggest that a single logic plays this latter role for all instrumental uses of logic.

I’ll then turn to explaining away particular pluralist approaches in terms of such instrumental applications. This involves showing that the data they’re making use of can be glossed in instrumental terms—for some purpose, some particular logical calculus is appropriate. Then I’ll argue that these views really do presume—in the sense of being best interpreted as presuming—that there’s some neutral canon of implication which is used evaluate claims like “this logic is best for this purpose”. That is, there’s a neutral playing field on which to decide which logic is right for which purpose. It then involves arguing that this neutral canon really does play the role of a most basic notion of logic, that it’s the best candidate for what a most basic notion of logic would be.

Granting this, we can then explain any serious putative example of pluralism in instrumental terms. So there’s significant reason to reject pluralist arguments as arguments for what the right core logic actually is, at least in the sense of generic validity I’ve outlines. So, there really is a single most basic, foundational, fundamental relation of logical consequence whose nature is playing the role of grounding instrumental uses of logic. That is, that there really is generic validity in a sense worth caring about.

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***Indispensability Argument and Full-blooded Platonism: Mathematics and Morality***

Category: Objectivity in Mathematics and Logic

*Abstract:*

The realism-antirealism debate has been a central topic in both philosophy of mathematics and morality. Despite that mathematical objects and moral objects are quite different in many senses, it turns out they are the two kinds of causal inert abstract objects that whose existence seems to be quite significant for many philosophers and lay people. However, as today’s philosophers are making more effort on observing the world, they find that the fact is there are much more disagreements and vagueness in both mathematics and morality than they thought. Therefore, it becomes more and more difficult for philosophers to have realism stance.

Despite that realists are minority in both mathematics and morality, comparing with realism in morality, realism in mathematics seems to be more attractive. It is natural to think that morality is more culture dependent and therefore not as rigid and general as mathematics, which is widely believed to be culture independent. However, philosophers like Clarke-Doane argue that it might be insightful to make analogy between mathematics and morality, in particular, with realism-antirealism debate considered. Clarke-Doane claims that by applying the epistemological challenge of mathematics (Benacerraf-Field challenge) to morality and applying the evolutionary challenge of morality to mathematics, it is not rational to be a moral antirealist and a mathematical realist at the same time.

Clarke-Doane is not the only philosopher who provide insightful mathematics-morality analogy. It is well known that Quine-Putnam indispensability argument is probably the strongest argument for today’s mathematical Platonism, which claims that as mathematics is indispensable to our best science theory and we ought to have ontological commitment to what is indispensable to best science theory, we should have ontological commitment to mathematical entities. In *Taking Morality Seriously*, Enoch strives to establish a generalized version of indispensability argument, so that it could be applied to morality. In Enoch’s generalized indispensability argument, “best science theory” is replace by intrinsically dispensability project, or in his explanation, “rational non-optional project”, which include both science project and deliberate project. Enoch apply this general argument to morality and indicate that as irreducible normative truth is indispensable to deliberative project, we ought to have ontological commitment to irreducible normative truth.

According to Leng (2011), Putnam believes that “put up” and “shut up” are the only two attitudes one should have towards best science theory, i.e. if one is intellectually honest, she must accept the best science theory. In contrast to science theory, as Leng put it, Enoch’s intrinsically indispensable project has normative premise. Therefore, it should not be regarded as project that intellectually honest people must not deny.

In this paper, I investigate Quine-Putnam indispensability argument as well Enoch’s generalized indispensability argument and its application on moral cases. Following Leng’s comments, which I think is probably the strongest objection on Enoch’s proposal, I argue that it is plausible for Enoch to give up the generalized argument and establish an independent indispensability argument solely for morality by substitute “deliberate project” with “empirically widely accepted social values” such as, “the happiness of all people”, “human right”, “equal rights” etc. I suggest that instead of philosophers’ decision, empirical work should be done in a diversity of cultures to decide what are the widely accepted values that should be regard as convincing as science theories by intellectually honest people.

Moreover, as the conclusion of his indispensability argument, Enoch said that we ought to have ontological commitment of irreducible normative truth. Unfortunately, he failed to provide satisfying clarification on this concept and in what sense irreducible normative truth and deliberative project is essentially different. However, I want to argue that another mathematical realism argument might be helpful to answer “to be a moral realist, what exactly we should have ontological commitment to?”. Balaguer (1988) suggests that full-blooded Platonism is a more defendable Platonism in mathematics. Full-blooded Platonism is a position that the existence of all logically possible mathematical objects should be accepted. In this sense, mathematical objects are not demanded to have causal relation with our experience, and all mathematical theories exists as long as they are consistent. Despite this stance seems a bit bold, it does succeed in answering the strongest epistemological challenge to platonism, i.e. the Benacerraf-Field challenge. Therefore, in this paper, I want to discuss whether we can develop a full-blooded moral realism, i.e. we can have ontological commitment to all “logically possible” moral principle as long as they are consistent. If it is possible, in a sense, Leng’s challenge on Enoch’s indispensability argument can be solved. I argue that in contrast with most people’s belief that there are some moral truth that all cultures share, the development of human society and technology in the past few decades shows that many of our fundamental moral belief might be challenged in the near future. Thus, if moral realists want to have ontological commitment to something, consistent moral principle might be better candidate than Enoch’s irreducible normative truth.

1. The first view is endorsed by Quine (1961). Field (1980) defends the second. [↑](#footnote-ref-1)
2. An early proponent of this strategy is Field (1984) [↑](#footnote-ref-2)
3. Relational modalese can be naturally interpreted on two-dimensional Kripke models. When it is, the class of logical truths is finitely axiomatizable. That result is proved in a separate technical paper. [↑](#footnote-ref-3)
4. By “physical property”, I mean any property that is a property of physical objects, and *whose instantiation does not supervene on the internal states of humans.* A person holding that colors are qualities of experience can still claim that color is physical in a sense since she can consistently hold physicalism of mind. But then color as a quality of experience is not physical in the sense employed in this essay since in that case the instantiation of color supervenes on the internal (neural) states of humans. [↑](#footnote-ref-4)
5. The source of the figure is Wikipedia, and the link to the license is: <https://commons.wikimedia.org/wiki/File:Color_star-en_(tertiary_names).svg> [↑](#footnote-ref-5)
6. Mendelovici (2010, 2018) takes analysis is only applicable to concepts in public discourse, or folk concepts. Pautz (2006b) seems to suggest that color concepts are Millian/Kripkean names. [↑](#footnote-ref-6)
7. In symbols: (x)(y)((F)(Fx≣Fy) → (x = y)). There are various versions of PII whose difference depends on how the term ‘properties’ is understood. In this talk, I assume for the sake of simplicity that ‘properties’ means qualitative properties. For various versions of PII, see Rodriguez-Pereyra (2006). [↑](#footnote-ref-7)
8. See Della Roca (2005). [↑](#footnote-ref-8)
9. In this talk, I use expressions like [φ] where φis a well-formed formula to refer to facts. [↑](#footnote-ref-9)
10. In symbols: (x)(y)([(x = y)] > [(F)(Fx≣Fy)]) where ‘>’ is read as ‘is grounded in’. [↑](#footnote-ref-10)
11. See Black (1952) and Adams (1979). [↑](#footnote-ref-11)
12. Shumener (Forthcoming). Shumener calls the foregoing suggestion that identity facts are grounded in their having all their properties in common ‘the qualitative proposal’. [↑](#footnote-ref-12)
13. She calls her own account ‘the quantitative proposal’. [↑](#footnote-ref-13)
14. Here Shumener assumes for the sake of exposition that some quantitative relations are fundamental. If absolutism with regard to quantities is true, then all facts about quantitative relations are grounded in facts about particulars’ quantitative (monadic) properties. It follows that no quantitative relations are fundamental. We will see below how Shumener can drop the relationist assumption and generalize her proposal to absolutism as well. [↑](#footnote-ref-14)
15. See Shumener (Forthcoming). The underlying assumption here is that scientific indispensability is a guide to fundamentality. I will grant this assumption in this talk. [↑](#footnote-ref-15)
16. In symbols: (x)(y)( [(x = y)] > [(R)([(Rxy)] > [Ex])] where (R) quantify overs all quantitative relations and ‘E’ stands for existence. I will work with this version of the quantitative proposal in the following discussion. Besides, it is noteworthy that Shumener takes existence to be a first order property so that facts like [Ea] can be fundamental facts which do not need any ground. (Existentially quantified facts like [x (x = a)] cannot be fundamental as they are putatively grounded in their instance, e.g. [a = a], which are identity facts that we attempt to ground in the first place.). [↑](#footnote-ref-16)
17. See Sider’s purity requirement in his (2012), ch.7. Bennett also argues that if grounding facts are fundamental, then the necessary connection between the existence of grounds and their groundeds and the existence of the corresponding grounding facts will be mysterious. See Bennett (2017), pp. 190-192. [↑](#footnote-ref-17)
18. See Bennett (2017), pp. 192-198. [↑](#footnote-ref-18)
19. See Dasgupta (2014). Although these essence facts about groundeds involve something non-fundamental, Dasgupta insists that they do not need any ground because they are autonomous—not apt for being grounded. [↑](#footnote-ref-19)
20. See Bader (Forthcoming). [↑](#footnote-ref-20)