

2018-12-07

# Logical realism and the metaphysics of logic

---

Michaela Markham McSweeney. 2018. "Logical Realism and the Metaphysics of Logic."  
Philosophy Compass, Volume 14, Issue 1, pp. e12563 - e12563. <https://doi.org/10.1111/phc3.12563>  
<https://hdl.handle.net/2144/34288>

*Downloaded from DSpace Repository, DSpace Institution's institutional repository*

## Logical Realism and the Metaphysics of Logic

*Abstract:* ‘Logical Realism’ is taken to mean many different things. I argue that if reality has a privileged structure, then a view I call *metaphysical logical realism* is true. The view says that, first, there is ‘One True Logic’; second, that the One True Logic is made true by the mind-and-language-independent world; and third, that the mind-and-language-independent world makes it the case that the One True Logic is better than any other logic at capturing the structure of reality. Along the way, I discuss a few alternatives, clarify two distinct kinds of metaphysical logical realism, and finally, address the question of whether we use logic for a unified goal.

Many philosophers think that there is ‘One True Logic’: that there is a single logic (or, perhaps, a small plurality of logics) that is objectively correct.<sup>1</sup> But what this means is slippery. Beyond the claim that certain general logical principles (e.g., many think, the Law of Non-Contradiction) are true, it is unclear what it means for there to be OTL, and in particular, what *makes* the OTL true.

The first aim of this paper is to make explicit one view about what makes the OTL true: *metaphysical logical realism*. This view takes the OTL to either correspond to the structure of mind-and-language-independent reality or to be located in mind-and-language-independent reality. In section one, I’ll distinguish this view from other views about what make the OTL true. The second aim is to argue (in section two) that if reality has a privileged structure, then metaphysical logical realism is true. Section three addresses the issue of whether logic is a unified subject.

Why should we care whether metaphysical logical realism is true? One reason is that it conflicts with various assumptions that are often made about logic; e.g. that logic is topic neutral; that it is ontologically neutral; that inquiry into logic is special and distinct from other kind of theoretical inquiry; that logic is not *revisable*; and that logic is wholly *a priori*, whereas other kinds of inquiry are not. (All of these assumptions might be motivated by thinking that logic has nothing to do with the world.) Many neo-Quinean “anti-exceptionalist” philosophers of logic (e.g. Hjortland (2017), Maddy (2002, 2007, 2014), (Priest (2006a, 2014), Russell (2014), Williamson (2013, 2017)) reject some or all of these assumptions, but often seem to do so for distinct reasons from those I present here. More importantly, my sense is that many metaphysicians—even neo-Quineans-- take some subset of these assumptions for granted. Hence my second aim: if the views of many metaphysicians *entail* metaphysical logical realism, then they must cease treating logic as a neutral background to their arguments; they must cease appealing to logical principles uncritically in arguing for metaphysical conclusions; and generally speaking, they should be more interested in the logical commitments of their views.

---

<sup>1</sup> E.g. Read (2006), Priest (2006a), Williamson (2013, 2017); my sense is that many metaphysicians implicitly endorse something in the ballpark.

## 1. What it means for there to be One True Logic

‘Logical realism’ is sometimes used to just refer to the claim that there *is* OTL: that certain logical principles (which together are enough to constitute a logic) are *true*, and others are false. But metaphysical logical realism is clearly a distinct species of this kind of logical realism. We can see this by thinking in terms of truthmakers. What kinds of things make the OTL true? Different answers generate very different theoretical commitments about what it really is to be committed to there being OTL.<sup>2</sup>

Let *metaphysical logical realism* be the conjunction of the following claims:

- (a) There is OTL.
- (b) What makes the OTL true is the mind-and-language-independent world.
- (c) The mind-and-language-independent world makes the OTL *metaphysically privileged*: better than any other logic at capturing the nature of reality.

Some have distinguished something like metaphysical logical realism from other forms of logical realism by appealing to the question of whether logic is in the world or is representational. (E.g. Rush (2014) Tahko (2014).) I don’t put things this way in order to accommodate the view that (i) it is a category mistake to think that logic is *in the* mind-and-language independent world (if one thinks that logic has to do with linguistic entities and the relations between them), but (ii) the *reason* that it is correct to use a certain logic to describe the world is that the logic conforms to the structure of the world.

Others have discussed the merits of a principle of *independence*: that the logical truths are true *independent* of our minds/language. (E.g. Resnik (1999), La Pointe (2014)). This is closer to the way I have defined metaphysical logical realism; but in section two I will tie one kind of metaphysical logical realism to appearance in descriptions of reality, which complicates treating realism as requiring language-independence.

Without (c), my definition is weak and uninteresting: it allows for views on which the OTL is relative to something (a language, a frame of reference, a mathematical structure (e.g. Shapiro 2014), a particular notion of validity (e.g. Beall and Restall (2006); it would also allow for Carnap’s *principle of tolerance*, (1937, section 17), which metaphysical logical realism should rule out). The problem is that the truthmaking relation invoked in (b) is not fine-grained enough. (c) ensures that the OTL is not relative to the language that we happen to speaking, or to the particular mathematical structure we happen to be focusing on.

Many take truthmakers for the true logical principles to lie somewhere in *our psychology, our concepts, our minds, or our language*. On this view—call it *broad psychologism*--the OTL is true in virtue of correctly describing something about us or the way we represent things: the way we actually reason, the way our concepts are actually divided up, or the way our languages are actually structured. What distinguishes the OTL from false logics is that false logics do not correctly describe any of these things. Broad psychologism might count as realism; its proponents think that there is a single logic (or a small plurality) that correctly captures

---

<sup>2</sup> I use the machinery of truthmakers throughout the paper; it would be easy enough to reconstruct the discussion, and my argument, without them.

something objective about reality; and that the logical principles of that one logic are actually true, whereas the logical principles of other logics are (perhaps) false. But broad psychologism does not count as a metaphysical logical realist view, because it locates the truthmakers for true logical principles in us, or our language, and makes no further attempt to connect us up to mind-and-language-independent reality.

There is a version of broad psychologism—call it ‘logical rationalism’—which might count as metaphysical logical realism, but it involves controversial assumptions. Logical rationalism says that it is indeed the structure of our minds, concepts, or language that make the OTL true; but that, in turn, our minds, concepts, and language *correspond accurately* to mind-and-language-independent reality; and so ultimately, the OTL is made true by mind-and-language-independent reality, while somehow being *mediated* by facts about us. But that is just for simplicity’s sake; we should treat logical rationalism as a metaphysical realist view.<sup>3</sup>

Another view about the OTL is that its truthmakers are the correct norms of reasoning. This could count as metaphysical logical realism, depending on how it is cashed out. Those who believe that the OTL captures the correct norms of reasoning, and are perfectly objective, but don’t think that those norms come directly from mind-and-language-independent reality (e.g. neo-Kantians like Leech (2015)) do *not* count as metaphysical logical realists, because they don’t think that those norms are connected up with mind-and-language-independent reality in a straightforward fashion. But someone who thinks that logic is about norms of rationality, and those norms of rationality immediately *come from* mind-and-language-independent reality, might count as a metaphysical logical realist.

There are many other ways to maintain that there is OTL, and many issues I have not discussed; one important one is the relationship between *analyticity* and logical truths; another is that many philosophers of logic talk as though logic’s goal is to capture a particular consequence relation; so the OTL might be better cast as the logic with the *right* consequence relation (it is easy to restate the views above in terms of a consequence relation, but there are differences between the approaches). My goal here is not to examine all of the possible answers to what makes the OTL the OTL, but to zero in on metaphysical logical realism and one argument for it.

## 2. Metaphysical Logical Realism

In the remainder of the paper, I focus on views on which the OTL is true in virtue of correctly capturing the structure of reality. In my (\*\*), I distinguish between two forms of metaphysical logical realism: *ontological logical realism* and *ideological logical realism*.

Ontological (metaphysical) logical realists—hereafter ‘ontological realists’—think that the OTL is true in virtue of directly reflecting something about items in our ontology. For example, one might think that ‘&’ refers to some kind of conjunctive function that is an important part of reality. One view on which this might be true says that reality is made up of something like *Armstrongian facts*, and that among those facts are *conjunctive facts* which have constituents that

---

<sup>3</sup> I am not sure whether anyone holds this view, exactly. The closest views I know of are Evnine’s (ms) interpretation of Frege, Jenkins (2014), and Maddy (2002, 2014). It has also been suggested to me that this is Kant’s view, but I hesitate to attribute it to him.

are something like functions that “hold” two conjuncts of a fact together. Another says that some kind of abstract logical entities (functions, law-like things, truth values, propositions, etc.) live in a “third realm” and make the logical truths true (e.g. on some readings (e.g. Burge (1992)), Frege’s (1918) view belongs here, as perhaps does Husserl’s (1900).).

Ideological (metaphysical) logical realists—hereafter ‘ideological realists’—think that the OTL is the OTL in virtue of being a part of the language (ideology) that best captures the structure of reality. The most obvious example of a contemporary ideological realist is Sider (2011), who argues that logical notions are in the most fundamental language—the language that perfectly captures reality’s structure—but that there are not bits of fundamental ontology to which logical terms refer. I’m inclined to think that Maddy, who argues that “logical truths are true because the world is made up of objects enjoying various interrelations with dependencies between them” (2002, p. 501), counts as an ideological realist, though given Maddy’s story about epistemology, our cognition of logic, and idealization in theories, it’s possible she wouldn’t like the way I’ve stated the view.

Not all ways of being a metaphysical logical realist neatly divide into ontological or ideological realism. For example, Tahko (2009) addresses the issue of whether the Law of Non-Contradiction might be a metaphysical, rather than merely logical, law or principle. Whether this view counts as ontological or ideological realism will depend on the status of these metaphysical laws: if the laws are roughly Humean--are merely descriptive *of* reality’s structure, and are not additional items in our ontology, then it may be a version of ideological realism. If the laws are roughly anti-Humean—if they are primitive items in our ontology, or if they are “oomphy” and *constrain* or *determine* reality--then it may be a version of ontological realism. But in what follows, I will focus on more straightforward versions of ideological realism.

In the remainder of this section, I will argue that anyone who thinks that reality has a privileged metaphysical structure should be an ideological realist.

Metaphysicians often focus on the question of what fundamental reality is like. Those who give a positive answer to this question typically attribute a *structure* to reality. What is it to think that reality has a privileged structure? Rather than define the notion, I will just say that all of the following sorts of views are committed to reality having a privileged structure:

- Fundamentally, the world consists only in objects.
- Fundamentally, the world consists only in properties (e.g. Paul (2002), Cover and O’Leary-Hawthorne (1998)).
- Fundamentally, the world consists only in a single, purely general fact (e.g. Dasgupta (2009).)
- Fundamentally, the world consists in only states of affairs (e.g. Armstrong (1997)).
- Fundamentally, the world consists in a single structured object (e.g. Schaffer (2010)).
- I’m not sure what the world fundamentally consists in, but it does have some structure and science is probably going to eventually help me figure out what that is.
- And so on.

The only kinds of views that *don't* count as views on which reality has a privileged structure are those like the following:

- The world consists in a single unstructured (or completely indeterminately structured) object.
  - Insofar as there is an “external” question about what reality is *really* like, it can only be answered pragmatically; all we can do is give true descriptions of it in whatever language we happen to be speaking. (e.g. Carnap 1950, Thomasson 2015.)
  - There is no *metaphysical* fact of the matter about which empirically adequate theory is true.
  - All of these descriptions of reality are equivalent, and there is nothing more to say (e.g. about some issues, Rayo (2013) and Hirsch (2009), (2010)).
- And so on.

In order to argue that all of the views of the first type are committed to metaphysical logical realism, I first want to introduce some useful distinctions, adapted from Rayo (2013).

*Metaphysicalism*, according to Rayo, is the combination of two claims:

- (a) Reality has a metaphysical structure--there is a single “metaphysically privileged way of carving up reality into its constituent parts”. (6),
- (b) “In order for an atomic sentence to be true, there needs to be a certain kind of correspondence between the logical form of a sentence... and the metaphysical structure of reality”. (6).

*Moderate metaphysicalism* is the combination of (a) and:

- (c) Fundamentally speaking, or when we are explicitly trying to capture the correct metaphysics of reality, (b) holds; but it doesn't hold generally—we can say all sorts of true things about reality that don't perfectly capture the metaphysical structure of reality. (9).

With these views on the table, the argument goes as follows.

**P1:** Anyone who thinks that reality has a privileged structure must be either a metaphysicalist or a moderate metaphysicalist.

**P2:** Metaphysicalists and moderate metaphysicalists are committed to metaphysical logical realism (typically ideological, rather than ontological).

**Conclusion:** Anyone who thinks that reality has a privileged structure is committed to metaphysical logical realism.

Something like this conclusion seems to be assumed by many philosophers. For example, Priest (2006b, p. 302) says that “metaphysical dialetheism is simply a consequence of semantic dialetheism plus the appropriate form of metaphysical realism”. (Semantic dialetheism is the view that dialetheism lives at the level of semantics, any true contradiction could be re-described in another possible language in a consistent way; metaphysical dialetheism, translated into my

framework, is something like the view that there are “contradictionmakers” in the world, and the only (or perhaps best) way to capture them linguistically is via true contradictions.) Wyatt (2004) gives a related argument for the incompatibility of Beall-and-Restall-style logical pluralism and monism about metaphysical modality. Sider (2009) argues (in different terms) for moderate metaphysicalism, and also that logical expressions will appear in the most fundamental description of reality. (Sider argues that *particular* logical expressions will appear in most fundamental theory; so, he doesn’t make the general argument I make here, but it does seem to follow from his views in (2011, ch. 10), and it also follows from his arguments about quantifier variance in his back-and-forth with Hirsch (Hirsch (2009), (2010), Sider (2009), (2011)).) Something like the argument is in the background of Putnam’s work on quantum logic ((1975), (1994)). And, as we’ll see, Dasgupta (2009) makes a similar assumption.

Since moderate metaphysicalism is weaker, in the respects relevant to P1 and P2, than metaphysicalism, I will only argue for the claims about moderate metaphysicalism in what follows.

One option is to stipulate that P1 is true, by saying: what I mean by (c) is that, in the ontology room, the following holds:

In order for an atomic sentence to be true\*, there needs to be a certain kind of correspondence between the logical form of a sentence... and the metaphysical structure of reality.

Where ‘true\*’ means the following: a sentence is true\* if and only if its logical form directly corresponds to the structure of metaphysical reality.

If this is what (c) means, then P1 is true by definition. If one thinks that reality has a privileged metaphysical structure, then I am simply stipulating that there is a property, truth\*, which sentences have just in case they have a logical form that corresponds to the metaphysical structure of reality. The only real assumption needed to get us the premise is that there is a context in which it is worth trying to say only things that are true\*. (I’ll say something to motivate this below.)

But there is also an argument for P1. If I think that reality has a particular privileged structure, then presumably there are at least some contexts in which I want to communicate what it is like to others. I should want to communicate the facts about various regions of reality in a way that best captures what I actually think that those regions of reality are like. For example, if I am a strict generalist—I think that there are not really individuals, not even non-fundamental ones, but rather that there are is just one big fact--I will think that there are no such thing as tables or coffee cups. I might maintain that in the day-to-day, it is okay for us to say, in English, that the coffee cup is on the table. But sometimes, I need to say that I don’t really believe there are tables or coffee cups.

You might object by claiming that reality has a particular privileged structure, but that it is simply unimportant what reality is *really* like, because (e.g.) you think that there are political or practical matters that we must instead attend to. But note that successfully *forming the belief* that

within reality's privileged structure, there are no tables or coffee cups requires that we need to think in a context in which we can distinguish this view from the view that there are tables and coffee cups. So even if we think our views don't matter, in order to hold them in the first place, we need a context in which we can distinguish them.

Suppose again that I am a generalist, and you are an individualist. We need to find ways to state how we think about comparable chunks of reality which showcase the *differences* between what we are committed to. You need to be able to say that there is a brown table; I need to be able to state my claim about that chunk of reality, which is hard in English, but is something like "brownness and tableness (here)". We don't agree about what reality is like in the table-y region of reality in front of us; and we need a way to state our views such that (a) it is clear what each of us thinks is going on in the table-y region in front of us and (b) it is clear exactly how we disagree. You might say  $(\exists x)(Bx \& Tx)$ . As Dasgupta (2009, p. 50) points out, I might say something superficially similar, using what looks like predicate logic with identity but without individual constants:  $(\exists x)(Bx \& Tx)$ . But we mean different things by our existential quantifier and bound variables. This is non-ideal: it transforms our disagreement about the metaphysical question of what reality is really like to one about what our logical terms *mean*; and, at best, results in us having to do something like subscript our expressions to distinguish them from one another.

What is important here is that our two sentences make wildly different *logical commitments*, even if they have superficially similar logical forms. We might both be able to use something that looks like this:  $(\exists x)(Bx \& Tx)$  to express our views in the ontology room, but this is not because there is some logically neutral way that we can communicate our views. It is because the logical commitments of our respective sentences correspond to the metaphysical structure we posit. To see this, note the following: if I decide to use '&' to express conjunction, and you use it to express neither/nor, then when I write down 'A&B' and you write down 'A&B', these are distinct sentences which have distinct logical commitments.

The same is true with respect to what the generalist and the individualist use ' $\exists$ ' and ' $x$ ' to symbolize. While I don't have the space to explain how the generalist re-interprets these symbols, what matters is that the generalist's quantifier will clearly have (a) a distinct semantics, (b) a distinct inferential role, and (c) *if* it refers to anything, its referent will be distinct. (a)-(c) exhaust the standard accounts of logical constants. So the sentences contain distinct logical constants. So, if logical form is individuated by what logical constants actually appear in a sentence, these sentences have distinct logical forms. (If it isn't, no matter: we can define a notion of logical form\*, and replace "logical form" with "logical form\*").

The best reason for the generalist to use an alternative logic (in Dasgupta's case, predicate functorese) is that the sentence  $(\exists x)(Bx \& Tx)$ , even re-interpreted so as not to quantify over individuals, *obscures* the metaphysical commitments of generalism; it would be better to communicate using a sentence the grammar of which corresponds to the structure of reality, so we can easily see the commitments of the sentence (hence, predicate functorese, which is not even superficially committed to individuals). (Dasgupta says something somewhat similar.) But either way of going demonstrates that the generalist has distinct logical commitments from the individualist; what matters is that the generalist and the individualist are using distinct logical



*concepts* to state their views, and that they each understand that they are using distinct logical concepts. What does not matter as much (here I part ways with Sider (2011)) is *how* they represent those concepts.

More simply: if one thinks that the world has a privileged metaphysical structure, then one needs a way to express that structure that distinguishes it from other possible structures the world could have. If we grant that all of the descriptions are *true*, regardless of which one we think is privileged, then we need some other way to express the differences between what we are committed to. The best way to do this is to state things with distinct logical forms that wear their grammar on their face—logical forms that correspond to the structure of what it is that we are actually committed to, metaphysically speaking. So long as it is clear that we have different logical *commitments*—that we require different logical concepts to state our views in a way that differentiate them from one another—that is enough to recover what is important about moderate metaphysicalism here.

Once one is clear on what ideological realism is really committed to, one should automatically accept P2. Ideological realism says that the OTL is true in virtue of being a part of the language that best captures the structure of reality. Moderate metaphysicalists think that there is a language that best captures the structure of reality. The only real question is whether that language *has* a logic. But I take it that it is obvious that, in every case, it will.

I will quickly address two worries. First: is it really right that *everyone* who is committed to a privileged worldly structure need a logic to best describe that structure? I think so, but one case troubles me. First case you might be concerned by: suppose that you think the world only consists in unstructured atomistic facts, as defended by Turner (2016). You still need an ideology—a theory—that is going to explain how those atomistic facts relate to one another (hence, Turner’s quasi-geometric logical space, and the “relations” that hold between facts in that space).

Second: even if we grant that if reality is structured, it has some kind of logical structure (e.g. object-predicate structure if one thinks that fundamentally, there are objects instantiating properties), why think it has anything *more* than that? Why think we need any logical connectives, quantifiers, etc.? I haven’t shown that we do; but it is hard to give the best description of reality without *some* logical constants or other. Here, I’ve just argued that commitment to metaphysical structure entails *some minimal* commitments to logical structure.

A different worry is whether ideological realism should really count as metaphysical logical realism. It is importantly different from ontological realism; but it is committed to important metaphysical claims about the relationship between logic and the world: even if there are no ontological correlates of logical constants that are strictly speaking, a *part* of the world, the case the world is still the truthmaker for the OTL, and the world still makes the OTL *metaphysically better* than any other logic.

I conclude that anyone who thinks that reality has a privileged metaphysical structure is committed to metaphysical logical realism. (If one thinks that there are logical *items*—e.g. laws,

functions, abstract objects--in fundamental reality, then one is already committed to ontological realism—I don't discuss this issue here.)

I should clarify something about fundamentality. I've assumed that there is a difference between *fundamental* reality and reality. But one needn't believe this in order to accept that reality having a specific structure entails that metaphysical logical realism is true. One simply needs the claim that reality *is* structured a certain way. Those who think that there is a single structure to reality, and that there is no sense to be made of reality having "levels", may want to be metaphysicalists rather than moderate metaphysicalists (they should go this way if they have a very permissive ontology); or they may want to be moderate metaphysicalists, and provide a story of why we can say true things about non-existent entities (they should go this way if they think all there is is, e.g., what other metaphysicians might posit as existing at the fundamental level).

What about the claim that reality has multiple privileged structures? So long as some structures are *not* privileged, the spirit of metaphysical logical realism persists, but we might need to replace (a) with something like:

(a\*): There are Some True Logics.

This means that there are multiple logics that best capture the structure of reality; the structure of reality makes Some True Logics true; but not just anything goes. There are at least two other ways we might go here: first, perhaps, there *is* an OTL: perhaps the right way to understand reality having multiple privileged structures is that we need to construct a "super logic" that allows for all of the distinct structures there are. One way of understanding this claim is the following: suppose that reality has both generalist structure and individualist structure. Perhaps the OTL is one that treats whether *the table is brown* or *tableness, brownness (here)* as ontically vague; in which case it might be that there is still a single OTL, it is just a logic that allows for vagueness between two different descriptions of reality. (See Barnes (2010) and Barnes and Williams (2011) for related discussion.). Even those who think that reality has multiple privileged structures count as (perhaps modified) metaphysical logical realists.

### 3. Logical Unity?

I will end by discussing whether logic is a *unified* subject—whether, in the words of Eklund (forthcoming) it has a "single canonical purpose". Obviously we use logic for different purposes. We use fuzzy logic for programming rice cookers. Programming a rice cooker has a distinct end—cooking rice well—than the kind of metaphysical theorizing I have been discussing here does (which has as its end something like *most accurately describing reality*). How can the question of whether there is OTL make sense if different uses of logics have different ends? Maybe logic is not unified; there is "OTL" for programming rice cookers, another "OTL" for describing fundamental reality, another for purely descriptively capturing natural language reasoning, and so on.

I will make one conciliatory comment about this, and one far less conciliatory one.

The conciliatory comment is this: if logic is not unified, then those philosophers who think that the truthmakers for the OTL claim are *not* in the mind-and-language-independent world needn't rule out that there is also a OTL that best describes the structure of reality (if ideological realism is true). Metaphysical logical realism would have to be reformulated, since I defined it by appealing to there being a OTL. But the general argument for realism could easily be recovered. Anyone who thinks that the world has a privileged metaphysical structure should think that there is *a* goal of logic which is to capture that structure. We are also free to think that there are other goals for logic.

The less conciliatory comment is this: I think that logic is unified, and that at least many claims about logic ultimately lead to the claim that the OTL reflects the privileged structure of reality. For example, if one thinks that the OTL is the logic that captures the correct norms of reasoning or thought, one must have some kind of epistemic goals in mind; one of these goals is probably making inferences that preserve truth. But insofar as what is true has something to do with what the world is like, then there should be some relationship between the world and these truth-preserving inferences. If one thinks that reality has a privileged structure, then one should think that our inferences should also preserve that structure. Alternatively, one might think that the norms of thought are *in* mind-and-language-independent reality already, in which case it is obvious that the answer to the "which norms of thought" question bottoms out in the privileged structure of reality.

What about the rice cooker? We need a metaphysical story about *why* the rice cooker is best programmed with fuzzy logic; if we think that everything bottoms out in the privileged structure of reality, then such a story will explain how the privileged structure of reality gives rise both to rice cookers, and to the fact that rice cookers are best programmed using fuzzy logic. It doesn't follow that the OTL is fuzzy logic; but it might follow that the OTL needs to be a part of a story about why fuzzy logic works so well in parts of non-fundamental reality.

## References

- Armstrong, D.M. (1997). *A World of States of Affairs*. Cambridge: Cambridge University Press.
- Barnes, E. (2010). Ontic Vagueness: A Guide for the Perplexed. *Noûs* 44(4):601-627.
- Barnes, E. and Williams, J.R.G. (2011). A Theory of Metaphysical Indeterminacy. In K. Bennett and D. Zimmerman (eds.), *Oxford Studies in Metaphysics* 6 (103-148). Oxford: Oxford University Press.
- Beall, J.C. and Restall, G. (2006). *Logical Pluralism*. Oxford: Oxford University Press.
- Burge, T. (1992). Frege on Knowing the Third Realm. *Mind* 101:404, 633-650.

- Carnap, R. (1937). *The Logical Syntax of Language*. Translated by A. Smeaton. London: Kegan Paul, Trench, Trubner & Co.
- Carnap, R. (1950). Empiricism, Semantics, and Ontology. *Revue Internationale de Philosophie* 4, 20-40.
- Cover, J. and O'Leary-Hawthorne, J. (1998). A World of Universals. *Philosophical Studies* 91, 205-219.
- Eklund, M. (Forthcoming). Making Sense of Logical Pluralism. *Inquiry: An Interdisciplinary Journal of Philosophy*.
- Evnine, S. (ms). Frege on the Relations between Logic and Thought.
- Frege, G. (1918). Thought. Reprinted in (1997) M. Beaney (ed.), *The Frege Reader* (325-345). Oxford: Blackwell.
- Hirsch, E. (2009). Ontology and Alternative Languages. In D. Chalmers, D. Manley, and R. Wasserman (eds.), *Metametaphysics: New Essays on the Foundations of Ontology* (383-423). Oxford: Oxford University Press.
- Hirsch (2010) *Quantifier Variance and Realism: Essays in Metaontology*. Oxford: Oxford University Press.
- Hjortland, O.T. (2017). Anti-Exceptionalism About Logic. *Philosophical Studies* 174, 631-658.
- Husserl, E. (1900). Logical Investigations, Volume 1. Reprinted in (2000) D. Moran (ed.), J.N. Findlay (tr.). London: Routledge
- Jenkins, C. (2014). Naturalism and Norms of Inference. In O. Flanagan and A. Fairweather (ed.s), *Naturalizing Epistemic Virtue* (53-69). Cambridge: Cambridge University Press.
- LaPointe, S. (2014). Bolzano's Logical Realism. In P. Rush (ed.), *The Metaphysics of Logic* (189-208). Cambridge: Cambridge University Press.
- Leech, J. (2015). Logic and the Laws of Thought. *Philosophers' Imprint* 15.
- Maddy, P. (2002). The Philosophy of Logic. *The Bulletin of Symbolic Logic* 18:4, 481-504.
- Maddy, P. (2007). *The Second Philosophy: A Naturalistic Method*. Oxford: Oxford University Press.
- Maddy, P. (2014). A Second Philosophy of Logic. In P. Rush (ed.), *The Metaphysics of Logic* (93-108). Cambridge: Cambridge University Press.
- Paul, L.A. (2002). Logical Parts. *Noûs* 36, 578-596.

- Priest, G. (2006a). *Doubt Truth to Be a Liar*. Oxford: Clarendon Press.
- Priest, G. (2006b). *In Contradiction: A Study of the Transconsistent*. 2<sup>nd</sup> Expanded edition. Oxford: Clarendon Press.
- Priest, G. (2014). Revising Logic. In P. Rush (ed.), *The Metaphysics of Logic* (211-223). Cambridge: Cambridge University Press.
- Putnam, H. (1975). The Logic of Quantum Mechanics. In H. Putnam, *Philosophical Papers, vol. 1, Mathematics, Matter, and Method* (130-58). Cambridge: Cambridge University Press.
- Putnam, H. (1994). Michael Redhead on Quantum Logic. In P. Clark and B. Hale (eds.), *Reading Putnam* (265-80). Oxford: Blackwell.
- Rayo, A. (2013). *The Construction of Logical Space*. Oxford: Oxford University Press.
- Read, S. (2006). Monism: The One True Logic. In: D. de Vidi & T. Kenyon (eds.), *A Logical Approach to Philosophy: Essays in Memory of Graham Solomon*. Springer.
- Resnik, M. (1999). Against Logical Realism. *History and Philosophy of Logic* 20, 181-194.
- Rush, P. (2014). Logical Realism. In P. Rush (ed.), *The Metaphysics of Logic* (13-31). Cambridge: Cambridge University Press.
- Russell, G.K. (2014). Metaphysical Analyticity and the Epistemology of Logic. *Philosophical Studies* 171, 161-175.
- Schaffer, J. (2010). Monism: The Priority of the Whole. *Philosophical Review* 119(1), 31-76.
- Sider (2009). Ontological Realism. In D. Chalmers, D. Manley, and R. Wasserman (eds.), *Metametaphysics: New Essays on the Foundations of Ontology* (383-423). Oxford: Oxford University Press.
- Sider, T. (2011). *Writing the Book of the World*. Oxford: Oxford University Press.
- Tahko, T. (2009). The Law of Non-Contradiction as a Metaphysical Principle. *Australasian Journal of Logic* 7, 32-47.
- Tahko, T. (2014). The Metaphysical Interpretation of Logical Truth. In P. Rush (ed.), *The Metaphysics of Logic* (233-248). Cambridge: Cambridge University Press.
- Thomasson, A. (2015). *Ontology Made Easy*. New York: Oxford University Press.
- Turner, J. (2016). *The Facts in Logical Space*. Oxford: Oxford University Press.

Williamson, T. (2013). *Modal Logic as Metaphysics*. Oxford: Oxford University Press.

Williamson, T. (2017). Semantic Paradoxes and Abductive Methodology. In B. Armour-Garb (ed.), *Reflections on the Liar* (325-346). Oxford: Oxford University Press.

Wyatt, N. (2004). What are Beall and Restall Pluralists About? *Australasian Journal of Philosophy*, 82, 409-20.