

WHAT KIND OF NON-REALISM IS FICTIONALISM?

NATHANIEL GAN

National University of Singapore

Fictionalists about a kind of disputed entity aim to give a face-value interpretation of our discourse about those entities without affirming their existence. The fictionalist's commitment to non-realism leaves open three options regarding their ontological position: they may deny the existence of the disputed entities (anti-realism), remain agnostic regarding their existence (agnosticism), or deny that there are ontological facts of the matter (ontological anti-realism). This paper outlines a method of adjudicating between these options and argues that fictionalists may be expected to hold preferences between them. The typical arguments and motivations for fictionalism lead naturally to a practice-based metaontological framework under which our practices regarding a kind of disputed entity might inform our ontological beliefs about those entities. When that framework is applied to fictionalism, it is found that the usual motivations for fictionalism lead naturally, though not decisively, to ontological anti-realism. And, where there are reasons against ontological anti-realism, fictionalism leans more toward anti-realism than agnosticism.

In ordinary contexts, we are intuitively inclined to understand sentences like

The sum of two and two is four.
Murdering innocent people is wrong.
Sherlock Holmes is a detective.

as sentences about numbers, moral properties, or fictional characters. But while we affirm such sentences, we might be hesitant to say that numbers, moral properties, or fictional characters exist, perhaps because a realist view of such entities runs into difficulties when it comes to accounting for some features of the corresponding domain (such as our knowledge of that domain, or the precise nature of the purported entities).

Contact: Nathaniel Gan <nat_gan@hotmail.com>

Fictionalism about a kind of disputed entity seeks to avoid the difficulties of realism while preserving the above intuition. According to fictionalism, our discourse in the relevant domain should be given a face-value interpretation: sentences that appear to be about the disputed entities should be read as purporting reference to them. But at the same time, fictionalists say that we should not affirm the existence of those entities. This implies the possibility that many sentences in the relevant discourse that we typically affirm might turn out to be false. Fictionalists accept this implication, holding that our affirmations in the relevant discourse are not (or should not be) intended to track truth. Instead, they say, we engage in the relevant discourse the way we engage with fictional stories, with the standards of acceptability given by what is true according to a possibly false theory.¹

An example of a fictionalist view is mathematical fictionalism, which has been defended by Mark Balaguer (1998), Otávio Bueno (2009), Hartry Field (1989; 2016), Mary Leng (2005; 2010), and Stephen Yablo (2005), among others. Mathematical fictionalists do not commit to the existence of numbers. Nevertheless, they interpret sentences like

The sum of two and two is four.

as purporting reference to numbers. On this interpretation, if numbers do not exist, such sentences, and many other mathematical sentences, would be false. Mathematical fictionalists take this possible implication to be unproblematic, because they hold that we can make sense of what we do with numbers without appealing to either the truth of mathematical sentences or the existence of mathematical entities. In particular, mathematical fictionalists say that our affirmations of sentences like ' $2 + 2 = 4$ ' are governed not by the literal truth of those sentences, but by what is true according to the accepted theory of mathematics. It is usually presented as a key attraction of mathematical fictionalism that the view can accommodate our mathematical practices and give a straightforward account of mathematical discourse without committing to an ontology of mathematical entities.² Fictionalism has also been suggested as an approach to moral properties (Joyce 2001; Kalderon 2005; Nolan, Restall, and West 2005), fictional characters (Brock 2002; 2015; Everett 2007; Kripke 1973; Sainsbury 2009;

1. For a more thorough characterisation of fictionalism, see Kroon, Brock, and McKeown-Green (2018). In this paper, the interest is in fictionalism about entities, rather than fictionalism about discourse domains. Both kinds of fictionalism do not affirm the truth of a discourse domain, but the former also does not affirm the existence of a kind of entity.

2. See, for instance, Balaguer (1998: 102), and Bueno (2009: 63).

Walton 2000), scientific entities (Rosen 1994),³ concrete possible worlds (Divers 1999; Rosen 1990; 1995), time (Baron, Miller, and Tallant 2021), mereological parts (Schaffer 2007), and composite entities (Rosen & Dorr 2002), among other things. These other forms of fictionalism have similar features and motivations.

Within the broad boundaries delineated above, there is room for variation among fictionalist views. This paper will consider how fictionalists might differ in their *ontological* positions. All fictionalists share their opposition to realism about a class of entities, but this negative characterisation alone leaves it open whether a fictionalist (a) is *agnostic* about the existence of the target entities, (b) *denies* their existence, or (c) takes there to be *no fact of the matter* regarding their existence. I will argue that the usual fictionalist motivations naturally (though not decisively) incline the view most toward (c), and more toward (b) than (a).

§1 describes the three kinds of fictionalism in more detail and surveys the reasons that have been advanced for each. §2 suggests how fictionalists can adjudicate between these options. It will be argued that the usual considerations motivating fictionalism align well with a practice-based metaontological framework under which the things we do involving apparent reference to a kind of entity might bear on our beliefs about the ontology of those entities. §3 applies this framework to fictionalism to determine the preferences that fictionalists should have between (a)-(c).

1. Fictionalist Options

One possible way of explicating fictionalism is as a form of *agnosticism* regarding the ontology of the target entities. According to this kind of fictionalism, there is a fact of the matter as to whether the entities in question exist, but we do not know (at least at this time) what that fact is.⁴ For, these fictionalists say, when we consider the things we do involving those entities,⁵ particularly our discourse in the relevant domain, we find that we can make adequate sense of these things without appealing to the existence of those entities. Therefore, they say, it seems that we do not have any clear indication regarding the relevant ontological

3. Bas van Fraassen's (1980; 1998) view on scientific entities is also often considered fictionalist (e.g., Rosen 1994), though this has been disputed on the grounds that van Fraassen's account of our discourse about science does not appeal to the notion of fiction—see, for instance, Kroon et al. (2018), and Armour-Garb & Woodbridge (2015).

4. Some agnostic fictionalists argue for the stronger claim that we *cannot* know whether the disputed entities exist. As defined here, agnosticism holds only the weaker claim that we presently do not know this.

5. The locution 'things we do with those entities' is only rough—in a context where the existence of the entities in question is under dispute, this phrase is intended as shorthand for 'things we do that involve apparent reference to those entities'.

facts, from which it is concluded that we should be agnostic about such facts. An example of a fictionalist who advanced such an argument for agnosticism is Otávio Bueno, who formulated an agnostic form of mathematical fictionalism and justified the view's agnosticism on the grounds that our mathematical practices are silent regarding mathematical ontology:

The resulting view turns out to be agnostic about the existence of the mathematical entities the platonist takes to exist...Perhaps these entities do exist after all; perhaps they don't. What matters for the fictionalist is that it's possible to make sense of significant features of mathematics without settling this issue. (Bueno 2009: 73)

Bas van Fraassen is similarly agnostic regarding unobservable entities. According to van Fraassen, we can take our scientific theories to purport reference to unobservable entities, and account for all our scientific practices, without appealing to either the truth of those theories or the existence of unobservable entities (van Fraassen 1980). Therefore, van Fraassen has 'no opinion at all about whether those entities exist' (1998: 214; also see 1989: 193). Likewise, Paul Dicken (2007) defends an extension to van Fraassen's view under which we should be agnostic regarding the existence of concrete possible worlds.

Alternatively, fictionalists may adopt a stronger *anti-realist* view that denies the existence of the entities in question. Anti-realist fictionalists agree with agnostic fictionalists that we can make sense of the things we do with the disputed entities without appealing to their existence. However, they take this to mean that we should deny the existence of those entities. Hartry Field, for instance, once defended an anti-realist form of mathematical fictionalism on such grounds. After arguing that his fictionalist view can account for the applications of mathematics to science, he says

Admittedly, we can't have direct evidence against mathematical entities...but it seems to me undue epistemological caution to maintain agnosticism rather than flat out disbelief...I think it natural to go beyond agnosticism and assert that mathematical entities do not exist. (1989: 45)⁶

Similarly, Mary Leng (2010: 258–260) argues that because our mathematical practices give us no reason to affirm the existence of mathematical entities, a principle of parsimony suggests that we should hold anti-realism rather than agnosticism about mathematical entities.

6. More recently, Field has expressed an inclination toward a different form of fictionalism—see below.

The two aforementioned forms of fictionalism, as well as realism, hold that there is a fact of the matter regarding the existence of the target entities. Fictionalists may deny this metaontological assumption. For some fictionalists, the fact that we can make sense of the things we do with the target entities without appealing to their existence is a reason to doubt that there is any fact of the matter at all regarding their ontology. Stephen Yablo, for instance, observed that our affirmations and denials of mathematical sentences are unaffected by the existence of numbers, and argued on those grounds that there is no fact of the matter as to whether numbers exist (Yablo 2009: 520; also see Balaguer 1998: 151–152). Similarly, Hartry Field, who argued that our use of mathematics in science does not commit us to the existence of mathematical entities, is ‘not entirely sure that the question of what exists has a univocal and non-conventional content’ (Field 2016: 3). Following Chalmers, Manley, and Wasserman (2009), call this metaontological view *ontological anti-realism*. Ontological anti-realists about a kind of entity hold that there are no facts of the matter regarding the existence of those entities.⁷

On the face of it, fictionalists are committed only to non-realism, rather than any particular ontological position, so agnosticism, anti-realism, and ontological anti-realism seem to present three viable options. Moreover, at least in the case of mathematics, all three forms of fictionalism have been defended in the literature. This plurality of options raises the question of whether fictionalists may be expected to lean more toward some ontological positions than others. The remainder of this paper will seek to answer this question.

2. A Practice-based Metaontology

To begin with, it may be observed that the usual arguments for agnostic, anti-realist, and ontological anti-realist fictionalism all depend on the same claim: the things we do with the entities in question do not commit us to their existence. The arguments for the three views differ only on what this claim is taken to imply. Agnostics infer from this claim that we do not know whether to affirm the existence of those entities, anti-realists say that parsimony principles should weigh in, and ontological anti-realists infer instead that we cannot make sense of the relevant existence claims. Since the arguments all begin in similar ways, it might be helpful for the purpose of assessing these arguments to have a general

7. But even as ontological anti-realists deny that there are facts of the matter regarding the existence of some entities, they might still hold that we should speak as though those entities exist (or do not exist). Thus, they might still affirm or deny sentences like ‘numbers exist,’ though such affirmations and denials might be guided by pragmatic considerations rather than ontological facts of the matter. See, for instance, Hirsch (2005; 2009).

account of how the things we do with a kind of entity can inform our ontological beliefs regarding those entities. Such a framework, when applied to fictionalism, might yield some indication about where the usual arguments for the view naturally lead. In this section, we will set aside fictionalism for the moment, and aim to develop such a framework. §3 will then apply the proposed framework to fictionalism.

To see how the things we do can inform our ontological beliefs, consider the following simplified scenario. When we observe electromagnetic phenomena, we typically assume, following our best scientific theories, that the explanations for these phenomena are to be given in terms of the electron. Now suppose that one of our goals in scientific explanation is to identify the relevant dependency relations in the world. Further suppose that a necessary condition for a scientific explanation to succeed in identifying dependency relations is that its explanantia exist. That is, if it turns out that electrons did not exist, explanations of electromagnetic phenomena in terms of electrons would fail. Under these suppositions, should we say that electrons exist? It seems that given these suppositions, our practice of explaining electromagnetic phenomena gives us reason to affirm the existence of electrons. For, if explanations require the existence of their explanantia, our current explanations of electromagnetic phenomena depend on the existence of electrons. It would then be irrational for us to use these explanations while holding that electrons do not exist. For as long as we maintain these explanations, then, rationality requires that we say electrons exist. In this scenario, the things we do with electrons inform our ontological beliefs regarding electrons.⁸

In fact, some arguments that have been advanced in ontological debates appear to relate our ontological beliefs to the things we do along similar lines. As an example, consider David Lewis' (1986) argument for modal realism, the view that possible worlds exist. The argument begins with the observation that we often talk about possibilities in ordinary discourse. This aspect of our discourse has several purposes, one of which is to track alethiological relations involving modal sentences. According to the argument, the best way to make sense of the way we talk about possibilities is to interpret such talk in terms of possible worlds. And under this interpretation, we would fail to make adequate sense of alethiological relations involving modal sentences if possible worlds did not exist—as Lewis argues, 'if we want the theoretical benefits that talk of *possibilia* brings, the most straightforward way to gain honest title to them is to accept such talk as the literal truth' (1986: 4). Lewis concludes from this that we should

8. It should be noted that this scenario does not describe a case of inference to the best explanation. In ordinary cases of laypeople observing electromagnetic phenomena, it is not that we consider various candidate explanations and decide to believe in the existence of electrons because we find that they offer the best explanation. Instead, we simply follow our best scientific theories in using electrons in explanations without thinking about whether electrons exist.

accept the existence of possible worlds. According to the argument, therefore, the way we talk about possibilities can guide our ontological beliefs regarding possible worlds.

Another example might be the Quine-Putnam indispensability argument for mathematical Platonism, according to which we should affirm the existence of mathematical entities because of the role that mathematics plays in our best scientific theories (Quine 1948; 1981). One possible way of explicating the argument is as follows.⁹ As part of our scientific practices, we employ scientific theories for some purposes, for instance, to increase our understanding of certain phenomena in the world. Some of these purposes depend on the existence of posits in our scientific theories, such that if nothing in the world bears sufficiently many of the properties attributed to the electron in our scientific theories, those theories would fail to increase our understanding of electron-related phenomena in a satisfactory way. In using our scientific theories as we presently do, therefore, we assume (at least tacitly) the existence of some of their posits. Now according to the argument, mathematics is *indispensable* to our best scientific theories, in the sense that if those theories were reformulated in such a way as to avoid the use of mathematics, they would fail to help us understand the relevant phenomena. Our use of scientific theories thus carries an ontological commitment to mathematical entities, and it is only rational to align our ontological affirmations accordingly. So according to this argument, our scientific theorising gives us reason to affirm the existence of mathematical entities.

In each of the above examples, something we do (scientific explanations, modal discourse, or scientific theorising) carries ontological baggage because we can attain the purpose for which we do those things only conditional on certain ontological facts. Slightly more precisely, we may say that some of our *practices* are such that they depend on the ontology of the world. Moreover, in the examples, some kind of entity (electrons, possible worlds, mathematical entities) is indispensable to those practices, in the sense that the purpose for which we perform those practices cannot be attained without the use of those entities. The examples above suggest that when (i) a practice depends on the ontology of the world, and (ii) a kind of entity is indispensable to that practice, the fact that we have that practice gives us reason to hold realism about those entities.

To see how our practices may incline us to ontological positions other than realism, we might consider cases in which either (i) or (ii) is absent. Suppose we have (i) but not (ii): we make apparent reference to a kind of disputed entity in some practices, and some of those practices even depend on the ontology of the world; but the entity in question is not indispensable to those practices.

9. See Azzouni (2009), Resnik (1995), and Panza & Sereni (2016) for this interpretation of the Quine-Putnam indispensability argument.

Phlogiston might be an example of this. Suppose that one of our goals in formulating phlogiston theory was to increase our understanding of combustion-related phenomena, and that scientific theories generally succeed in helping us understand phenomena only if the relevant posits exist. Then (i) would be the case: phlogiston theory depends on the existence of its posits. But (ii) would not hold here, because oxygen is at least as useful as phlogiston for helping us understand combustion-related phenomena, so phlogiston is not indispensable for this purpose. Now, does our theorising about combustion tell us what we should say about the existence of phlogiston?

On the one hand, our theorising about combustion gives us a reasonably clear grasp on what it would take for phlogiston to exist. Because phlogiston theory depends on the existence of its posits, for phlogiston to exist would mean that phlogiston theory can help us to understand combustion-related phenomena. Presumably, there is a fact of the matter as to whether phlogiston theory is helpful for understanding combustion-related phenomena, so we have reason to believe that there are also facts of the matter regarding the existence of phlogiston. But at the same time, our current scientific practices suggest that phlogiston theory does not help us understand combustion-related phenomena, because we employ oxygen theory instead for this purpose. So it seems that the facts about the existence of phlogiston are negative. Our theorising about combustion hence gives us reason to be anti-realists about phlogiston. Generalising: if an entity is involved in some practices that depend on the ontology of the world, but is not indispensable to any of those practices, then our practices give us reason to be anti-realists about the entities in question.

The discussion above also suggests how our practices might give us reason to hold agnosticism. If a kind of entity is involved in practices that depend on the ontology of the world, but we are agnostic (at least at this time) as to whether those entities are indispensable to any of those practices, then we should also be agnostic about the existence of those entities. Some hypothetical posits of modern science might fall into this category. We posit gravitons for the purpose of explaining gravitational phenomena in quantum terms, and this gives us some idea of what it would take for gravitons to exist. Namely, if gravitons exist, then the world is as quantum gravity says, and we can explain gravitational phenomena in terms of gravitons. It seems that there is some fact of the matter as to whether quantum gravity provides the right explanation of gravitational phenomena, but we do not know what that fact is. That is, we do not know whether gravitons are indispensable to the best explanations of gravitational phenomena, or whether they can be eliminated from those explanations in favour of other posits. So our practice of explaining gravitational phenomena at present gives us reason to be agnostic about the existence of gravitons: we have reason to think there are facts of the matter regarding their existence, but we do not yet know what those facts are.

Next, consider cases in which (i) is absent: an entity is not used in any of our practices that depend on the ontology of our world. In earlier cases, it was (i) that gave us some idea of what it would take for the entities in question to exist. Even in the case where there was reason to deny the existence of phlogiston, it was reasonably clear what it would take for phlogiston to exist, because the dependence of phlogiston theory on the world allowed us to understand the existence of phlogiston in terms of the way we use phlogiston theory. In this case, however, the existence of a kind of entity makes no difference at all to the things we do, so it is unclear how the conditions for the relevant existence claims can be explicated in terms of our practices. That is, not only do our practices give us no indication as to whether a kind of entity exists, they do not even give us any idea of what it would take for those entities to exist. Insofar as we take our practices to inform our ontological beliefs, then, it seems we have reason to hold that there is no fact of the matter regarding the existence of the entities in question.¹⁰

To give a straightforward (if slightly contrived) example, suppose that our concept of a geographical North Pole is intended to help us locate a point on Earth. Further suppose that we would be able to locate this point regardless of whether the North Pole exists. That is, even if nothing in the world bears sufficiently many of the properties associated with our concept of the North Pole, we would still be able to locate the point we presently call ‘the North Pole.’ In this case, how does our practice of navigation bear on what we should say regarding the existence of the North Pole? Given that the existence of the North Pole makes no difference whatsoever to our navigation, it seems unclear how we would even understand the existence of the North Pole in terms of our navigation practices, much less decide on those grounds whether to say that the North Pole exists. It might be more natural in this case to say that if our practices inform our ontological beliefs about the North Pole at all, they give us reason to say that there is no fact of the matter regarding the North Pole’s existence.

To sum up, we have the following practice-based metaontological framework. To see how our practices can inform our ontological beliefs regarding a kind of disputed entity, we consider all the ways those entities are used in our practices. If none of them depend on the ontology of our world, then this is a reason to hold ontological anti-realism about the entities in question. Other-

10. Indeed, some ontological anti-realists about a kind of entity argue for their view on the grounds that it is unclear what it would take for those entities to exist (Balaguer 1998; Carnap 1950; Chalmers 2009; Thomasson 2014). It might be thought that such inferences are problematic because they involve appeals to positivism, which as a general approach to metaphysics is known to be false. However, similar to what Balaguer (1998) noted, the inference here is weaker in several ways. It concerns not all metaphysical claims, but only claims regarding the existence of disputed entities in certain cases. And, the inference does not imply that the claims in question are meaningless, only that we cannot conceive of their truth conditions. Thanks to an anonymous reviewer for highlighting this possible concern.

wise, some of our practices involving those entities depend on the ontology of our world, and we can understand claims about their existence in terms of the relevant practices, which is a reason to think that there are facts of the matter regarding their ontology. Then, if the entities in question are indispensable to some of those practices, this is a reason to hold realism. If instead those entities are not indispensable to any of those practices, this is a reason for anti-realism. If it is unclear to us which of the latter two is the case, we have reasons to adopt agnosticism.

It should be noted that the framework proposed here is not intended to be a decisive means of settling ontological disputes, since it focuses entirely on our practices. There might be other considerations that factor into our ontological beliefs. For instance, if the existence of a universal set would entail a contradiction, this seems to be sufficient reason to deny the existence of a universal set, regardless of what we may do with it. Nevertheless, it was observed earlier that the arguments for the three kinds of fictionalism surveyed in §1 generally take our practices to inform our ontological beliefs. So the practice-based framework proposed here might be able to weigh in on the question of which ontological views fictionalists should, by their own lights, naturally prefer.

3. Application to Fictionalism

We now apply the framework proposed in the previous section to fictionalism. According to the proposed framework, if we say that numbers (for example) are indispensable to some of our practices, and at the same time hold that those practices depend on the ontology of our world, then we have reason to be realists about numbers. Since fictionalism is a non-realist view, we may expect fictionalists about numbers not to hold both of the above. In general, whenever we use a kind of entity in some of our practices, fictionalists about those entities may be expected to resist realism via one of the following strategies:

- (a) they may argue that we should not take the entities in question to be indispensable to those practices (call this the *dispensability strategy*);¹¹ or
- (b) they may argue that those practices do not depend on the ontology of our world (call this the *ontological independence strategy*).

Either strategy, if successful, would allow fictionalists to resist realism.

11. A common way of applying the dispensability strategy is to argue that those entities are not indispensable to the relevant practices, but this is not the only possible way, as will be observed below.

In some cases, both strategies seem to present viable options for fictionalists. For example, we use mathematics in our scientific theories, so mathematical fictionalists require an account of our scientific practices under which those practices do not commit us to realism about mathematical entities. Some fictionalists have attempted to give such an account by arguing that although our best scientific theories happen to use mathematics, we can reformulate those theories to avoid the use of mathematics without compromising their key virtues (Arntzenius 2012; Burgess 1984; Field 1980). These fictionalists adopt the dispensability strategy. Other fictionalists adopt the ontological independence strategy by arguing that although our scientific theories require the use of mathematics, they do not depend on mathematics in a way that requires the existence of mathematical entities (Leng 2010; Liggins 2012; Yablo 2012).

When it comes to our discursive practices, however, the dispensability strategy does not seem to be a natural option for fictionalists. As observed earlier, a key part of the attraction of fictionalist views is that they give a straightforward interpretation of the relevant discourse, interpreting sentences like ' $2 + 2 = 4$ ' at face value as purporting reference to numbers. But this attraction would be undermined by an interpretation under which sentences in the target discourse do not involve the use of the target entities. It would seem more natural, instead, for fictionalists to pursue the ontological dependence strategy. That is, they may be expected to account for our discursive practices in such a way that apparent reference to the target entities is preserved, while arguing that this discourse does not depend on the existence of the entities to which it apparently refers. Typically, fictionalists do this by giving an interpretation that withholds affirmation from most statements in that discourse.

Under the framework proposed in §2, the fact that fictionalists may sometimes be expected to prefer the ontological independence strategy suggests that fictionalism leans toward ontological anti-realism. According to the proposed framework, our practices give us reason to think that there are facts of the matter regarding a kind of entity only if those entities are involved in practices that depend on the ontology of the world. But fictionalists typically say that a significant part of our practices involving the target entities—our discursive practices—do not depend on the ontology of the world. Indeed, if those entities are not involved in anything we do apart from our discourse, fictionalists would be expected to hold that *none* of our practices involving those entities depend on the ontology of the world, which would be a reason for ontological anti-realism under the proposed framework.

In the latter case, there would be pressure on agnostic and anti-realist fictionalists, especially if they hold their views on the grounds that the things we do with the entities in question do not commit us to their existence. Agnostic fictionalists say that the silence of our practices on ontological matters is a rea-

son to believe that we are in the dark regarding the ontology of those entities, while anti-realists say that this is a reason to deny their existence on grounds of parsimony. But both implications assume that there are ontological facts in the first place of which we can be ignorant, or that we can deny. Doubt would be cast on this assumption if all our practices concerning the entities in question do not depend on the ontology of the world. For, we would then be unable to understand claims regarding the existence of those entities in terms of our practices. And insofar as we take our practices to inform our ontological beliefs, as agnostic and anti-realist fictionalists do, it might be difficult to explicate intelligibly what agnosticism about or denials of the relevant existence claims amount to. Instead, it might seem more natural to say that there are no facts of the matter regarding the ontology of the entities in question.

To be sure, these considerations are not decisive in favour of ontological anti-realism, since (as noted in the previous section) the proposed framework concerns only the bearings of our practices on our ontological beliefs. Agnostic or anti-realist fictionalists may look beyond our practices when explicating the relevant existence claims. For instance, we may suppose that our mathematical theories yield sufficient information about what numbers would be like if they exist, such that their existence comes down to a matter of whether anything in the world is sufficiently number-like. Instead of considering just what we do with numbers, then, we can also determine the existence of numbers by empirical investigation. And, anti-realism about numbers can be understood as the view that nothing in the world bears the required properties to be numbers (and similarly for agnosticism). While such an approach is certainly possible, it depends on an additional supposition about the ontology of numbers to which fictionalists are not necessarily committed. There does not seem to be anything within the fictionalist view suggesting that fictionalists should take the existence of numbers to be reducible to an empirical matter, even if nothing within fictionalism rules out such a possibility. In contrast, the proposed framework and its application above depend on considerations that align with the usual arguments and motivations for fictionalism. Hence, we might expect fictionalists to lean naturally, even if not decisively, to ontological anti-realism.¹²

But even if fictionalists take our practices to inform our ontological beliefs, they may not always be committed to ontological anti-realism. Under the proposed framework, fictionalists would have reason to hold ontological anti-realism only if they adopt the ontological independence strategy for all our practices involving the target entities. Fictionalists are not committed to doing this for non-discursive practices. As observed above, some mathematical fictionalists argue that our best scientific theories depend on the ontology of our world,

12. Thanks to an anonymous reviewer for raising this point.

but nevertheless do not commit us to the existence of mathematical entities because mathematics is not indispensable to those theories. In their view, then, we can understand the existence of mathematical entities in terms of the way we use scientific theories. Namely, for mathematical entities to exist would be for mathematical scientific theories to be better aligned with the world than non-mathematical ones, which would play out practically as an indispensability of mathematics to our best scientific theories. In such cases, fictionalists would be justified in holding positions other than ontological anti-realism.

When fictionalists have reasons not to hold ontological anti-realism, whether they incline toward anti-realism or agnosticism depends on what they say about the indispensability of the entities in question to the relevant practices. Following the example above, if they hold that mathematics is *not* indispensable to science, this is a reason for anti-realism about mathematical entities; if fictionalists hold instead that we *do not know* whether mathematics is indispensable to science, this is a reason for agnosticism. Here, again, there are reasons to think that one of these options is more natural. The fact that we do use numbers in science is some *prima facie* reason to think that numbers are indispensable to science. While these reasons are by no means decisive, they suggest that if we see no way of doing science without mathematics, then the only way we know of doing science is with mathematics, and this is a reason to think that mathematics is indispensable to science. To resist realism, therefore, what the fictionalist needs is some reason to think that there might be a way of doing science without mathematics. The most straightforward way to provide such reasons, it seems, is to provide a positive demonstration that science can be done without mathematics. But this would imply that mathematics is in fact not indispensable to science, and that our scientific practices incline us toward anti-realism. So insofar as fictionalists take our practices to inform our ontological commitments (as they typically do), they may be expected to prefer anti-realism over agnosticism if they do not hold ontological anti-realism.¹³

To conclude: fictionalism about a kind of disputed entity is committed to non-realism about those entities, but this commitment leaves fictionalists with a choice between agnosticism, anti-realism, or ontological anti-realism. The typical arguments for all three kinds of fictionalism take our practices to inform our ontological beliefs, and are thus suggestive of a practice-based metaontological framework. When such a framework is formulated and applied to fictionalism, it was found that fictionalism leads naturally, though not decisively, to ontologi-

13. The reasoning here differs slightly from the typical arguments for anti-realist fictionalism. Both lines of argument are similar in taking there to be reasons for anti-realism when there are no reasons for realism, but the argument here appeals to the practice-based framework rather than principles of parsimony. The applicability of the latter to some domains might be contentious, while the former is compatible with all fictionalist views regardless of their target domain.

cal anti-realism. And where fictionalists have reasons against ontological anti-realism, their view leans more toward anti-realism than agnosticism.

Acknowledgements

Thanks to Mark Colyvan and two anonymous reviewers for helpful comments on earlier versions of this paper.

Funding information

This work was supported by the National Research Foundation, Singapore, under its Medium Sized Centre Programme—Centre for Advanced Robotics Technology Innovation (CARTIN), Subaward A-0009428-08-00.

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