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Ontological commitment and ontological commitment*s*

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Abstract The standard account of ontological commitment is quantificational. There are many old and well-chewed-over challenges to the account, but recently Kit Fine added a new challenge. Fine claimed that the "quantificational account gets the basic logic of ontological commitment wrong" and offered an alternative account that used an existence predicate. While Fine's argument does point to a real lacuna in the standard approach, I show that his own account also gets "the basic logic of ontological commitment wrong". In response, I offer a full quantificational account, using the resources of plural logic, and argue that it leads to a complete theory of natural language ontological commitment.

Keywords Ontological commitment · Plural quantification · Existence predicate · Quine · Kit Fine

The standard story about ontological commitment is quantificational: to be is to be the value of a variable. The story derives from Quine and though often challenged, is still very widely accepted by philosophers.[1] Many challenges to the quantificational approach are venerable and well-chewed over.[2] Recently Kit Fine added a

[1] See Quine (1948).

[2] For book-length challenges see Parsons (1980) and Routley (1982).

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new challenge, in the form of an argument that the "quantificational account gets the basic logic of ontological commitment wrong".[3]

The argument runs as follows. Fine claims that, in English, "integers exist" plausibly entails "natural numbers exist" but not vice-versa. At first this can sound odd to philosophers who unconsciously translate these claims into first-order logic to assess entailments. But Fine's point is that there is a natural English reading of these claims that the standard first-order translation misses. This is difficult to deny. There is an English reading of "Fs exist" that is *universal*—it commits us to the existence of *all* Fs. On this reading, "integers exist" entails "natural numbers exist", but the converse entailment doesn't hold. Perhaps other readings are available too (this will be discussed a bit below), but in any case, Fine's reading is familiar from natural language. Given this, any adequate account of natural language ontological commitment must be able to vindicate these basic entailment claims. But then the standard quantificational account is not adequate. It renders "integers exist" as "$\exists x\text{Integer}(x)$" and "natural numbers exist" as "$\exists x\text{Natural}(x)$", and these only manage to claim that *at least one integer exists* and *at least one natural exists*, respectively. This reverses the direction of entailment noted by Fine.

This is a bit sloppy. Let's be more careful. Assume:

$$\forall x(\text{Natural}(x) \rightarrow \text{Integer}(x)) \tag{1}$$

Then we have that (1), $\exists x\text{Natural}(x) \models \exists x\text{Integer}(x)$ but (1), $\exists x\text{Integer}(x) \not\models \exists x\text{Natural}(x)$. Without something like (1), neither of these sentences *logically* entails the other. Of course, there are various special definitions and bits of background theory that could be used in conjunction with "$\exists x\text{Integer}(x)$" that would entail "$\exists x\text{Natural}(x)$"—for one example, simply imagine defining integers using equivalence classes in $\mathbb{N}^2$, as is sometimes done in textbooks on the foundations of mathematics.[4] Fine notes that specific accounts like this are "completely ad hoc".[5] What is required is a general account of ontological commitment, applying to tables and chairs as readily as to integers and naturals. Given this, we can't rely on case-specific background facts in order to get "the basic logic of ontological commitment" to come out right.

Fine's replacement proposal uses both an existence predicate and universal quantification to paraphrase "integers exist" and "natural numbers exist" as follows:

$$\forall x(\text{Integer}(x) \rightarrow \text{Exist}(x)) \tag{2}$$

$$\forall x(\text{Natural}(x) \rightarrow \text{Exist}(x)) \tag{3}$$

He later refines this approach by replacing the existence predicate with an "in reality" operator, connecting his account of ontological commitment to his work on

[3] Quoted from Fine (2009), p. 166.

[4] For example, see Truss (1997), pp. 45–47.

[5] Fine (2009), p. 166—there Fine is considering the general strategy of appealing to our theory of the integers, not this particular example.

grounding and fundamentality.[6] But this wrinkle doesn't change any of the logical points, so I'll stick with (2) and (3). Fine claims that his alternative approach, unlike the standard Quinean quantificational approach, gets the logic of ontological commitment exactly right.

This too is a bit sloppy. (2) does not logically entail (3). And while (1) and (2) together entail (3), it is not clear that this result is desirable, for the result still holds when *there are no naturals*. To rule this out, we could add the premise:

$$\exists x \text{Natural}(x) \tag{4}$$

This keeps the previous entailment, but rules out the case where (3) is only true because (4) is not. The basic problem here is that $\neg(4) \models (3)$, which rendered back into English via Fine's translations, tells us that "there are no naturals" entails "naturals exist". It's fair to say that this is *extremely* counterintuitive. This is worth stressing. Recall that the goal was to respect intuitive entailment relations between natural language ontological claims, but given the just-noted point, Fine's own account fails badly at this. In terms of respecting natural language intuitions, at worst the Quinean is in a stand off with the Finean.

Fine does add one further wrinkle to his account. Rather than taking "Natural(x)" as a primitive notion, he defines it as follows:

$$\forall x(\text{Natural}(x) \leftrightarrow (\text{Integer}(x) \wedge \neg\text{Negative}(x))) \tag{5}$$

On Fine's approach, defining naturals as non-negative integers in this manner is supposed to show why "integers exist" entails "naturals exist". This is because, on one reading, "Fs exist" entails "Fs and Gs exist".[7] But taken too literally this means that, according to Fine's approach, "squares exist" entails "round squares exist". So once again, the logic of ontological commitment in natural language hasn't been respected. It seems that it is only (4) and (3) *together* that manage to capture anything like the intuitive content of "naturals exist", and even still problems arise. Likewise for other existence claims as well.

These points show that Fine's approach, like Quine's, has difficulty respecting natural language entailments. Fine's approach also uses features that make some of us uncomfortable. The Finean, but not the Quinean, uses an existence predicate and freely quantifies over nonexistent objects. There are things to be said in favor of such quantification, most of which were said long ago.[8] And Fine's argument provides another point in favor of these devices. But philosophers who, like myself, want to resist existence predicates and quantification over the nonexistent must find a way to answer Fine's challenge without appealing to these devices. Unfortunately, it is not immediately obvious how to go about doing this. As Fine says, "it is not even clear how to give proper expression to a commitment to F′s on anything like the standard quantificational account…".[9]

[6] Stemming from Fine (2001).

[7] There seems to be a typo in Fine's (2009) discussion of this, on p. 166.

[8] See, for example, part III of Anscombe (2015), McGinn (2000), Parsons (1980) and Routley (1982).

[9] Fine (2009), p. 166.

To find the way forward, let us first step back. Fine's argument is based on the fact that natural language sentences like "integers exist" can be read in at least two different ways. On the first, it claims that *at least one* integer exists. On the second, it claims that *the* integers exist. Perhaps there are other readings too, distinct from either of these. Perhaps "integers exist" can be read in a *generic* fashion, like "Tigers are fierce". Perhaps, but if so, let's leave these readings aside to focus on the two that have been highlighted. Read in the first way, the standard account is right on the money, but—as Fine stressed—it fails badly when confronted with the second reading.

One option is simply to limit the scope of the quantificational account. When asked about the second way, the Quinean can claim that they are not concerned with *that* reading. This is fine as far as it goes, but it doesn't leave the quantification theorist with a complete account of ontological claims in natural language. Some proponents of the standard approach seem untroubled by this. Phillip Bricker has claimed that Quineans can simply note that natural language is ambiguous about ontological commitment and be done.[10] I agree that Quineans *can* do this, but I don't think they should. The Quinean approach is incomplete as an account of ontological commitment in natural language, and as far as Quine himself goes, there is not much more to be said. The data that Fine uses for his argument shows this much. But as philosophers we want a complete theory of ontological commitment, if there is one to be had.

Fine has offered one attempt at a complete account. Some may be happy with his approach, but like the standard account and as I showed, it leads to some counterintuitive consequences. And it also requires controversial ideological commitments—an existence or reality predicate, quantification over objects that either don't exist or aren't real. Some won't see these features as serious problems, but many others—myself included—will worry. Here I won't be arguing that these resources are problematic. Personally I would prefer a purely quantificational approach, if possible. Of course, a merely quantificational approach can easily be had simply by quantifying over sets or classes of integers and natural numbers. But that isn't theoretically satisfying. I'm no nominalist, but claiming that integers or naturals or lions, tigers, and bears exist shouldn't *require* quantification over sets or classes.[11]

A much more natural approach for the quantificationalist is to go plural. There are independent reasons for thinking that a claim like "integers exist", when read as saying that *the* integers exist, is a plural description. In fact, plural descriptions like this are all over the place in natural language: the Clintons, the fans of Quine, the Aristotelians, the Neo-Meinongians, the papers written by David Lewis, and so on. And the obvious way to regiment natural language plural descriptions is with plural

[10] See Bricker (2014). Bricker also briefly notes that commitment to "the" mammals can be analyzed as involving singular commitment to each particular mammal.

[11] In saying this, I'm endorsing a version of Boolos's (1984) widely accepted Cheerios argument.

quantification, in a manner directly analogous to Russell's famous theory of descriptions.[12]

English and other natural languages seem to contain both singular and plural quantification. I think that this is right, and that we use and understand these locutions, in our mother tongue. I also think that plural quantification is a *sui generis* form of quantification, not a disguised form of quantification over classes or sets or properties or the like. When I talk about the papers by David Lewis (as I often do) I am not talking about the *set* whose members are papers by David Lewis, nor am I talking about the *property* of being a paper by David Lewis. Instead I am talking about *the papers by David Lewis*, and nothing else. What I sometimes talk about singly, I am here talking about plurally. At least since George Boolos's aforementioned treatment in the mid-1980s, this has been a popular view of plural quantification.[13] But it certainly isn't unanimous.[14]

Some critics of plural quantification may regard the cure I offer as being worse than the disease being treated. To engage this issue further would be a distraction here. I will only aim to show that *given* the ontological innocence and conceptual good-standing of plural quantification, a full quantificational account of natural language ontological commitment can be given, with nary an existence predicate in sight.

To see this, let's first fix our notation. I will write the plural quantifier "there are" as "$\exists xx$", so that "there are $\mathsf{F}'s$" is written as "$\exists xx \mathsf{F} xx$" where "F" is a plural predicate; plural universal quantification is written similarly. Plural logic also includes a binary "is among relation", written "$\preceq$" that takes either singular or plural terms on the left and plural terms on the right. As is standard, pluralities cannot be empty—they must contain at least one object.[15] Given this apparatus, plural descriptions like "the integers" can be analyzed in two steps. First, define the plural "identity" predicate "$\equiv$" as follows:

$$xx \equiv yy \leftrightarrow_{def} \forall z(z \preceq xx \leftrightarrow z \preceq yy) \tag{6}$$

Next, define a plural uniqueness quantifier "$\exists!$" in a manner analogous to the singular uniqueness quantifier:

$$\exists! xx\phi(xx) \leftrightarrow_{def} \exists xx(\phi(xx) \wedge \forall yy(\phi(yy) \rightarrow xx \equiv yy)) \tag{7}$$

Together (6) and (7) provide a Russell-style treatment of plural descriptions. The general topic of plural descriptions is somewhat vexed.[16] But the difficulties can be sidestepped here, since we need only the uncontroversial fact that *some* plural descriptions are justly accounted for in this fashion. In any case, the uniqueness

[12] Russell (1905).

[13] See Boolos (1984, 1985); see also Lewis (1991). Boolos was originally interested in using plural quantification to interpret monadic second-order quantification, but this isn't what I am endorsing here.

[14] See Resnik (1988), as well as the discussions in Parsons (1990), Hazen (1993) and Linnebo (2003).

[15] This assumption was made by Boolos and is formalized in Linnebo's (2003) PLO system, for example.

[16] See the discussion in Oliver and Smiley (2016).

added by "the" is mainly just a distraction, so I'll ignore it below, showing how plural quantification provides the needed generality for a quantificational theory of natural language ontological commitment.

We can now paraphrase the general reading of "integers exist" as:

$$\exists xx \forall y(y \preceq xx \leftrightarrow \text{Integer}(y)) \tag{8}$$

Similarly, "natural numbers exist" is rendered:

$$\exists xx \forall y(y \preceq xx \leftrightarrow \text{Natural}(y)) \tag{9}$$

Analogously to Fine's approach, (8) $\nvDash$ (9). Adding (1) isn't enough, you also need to add (4). In this way the plural approach does slightly better than Fine's approach, since $\neg$(4) $\nvDash$ (9) (and (9) $\models$ (4)).

But assuming (4) is problematic in this context, for it ends up doing all of the work. Consider the following instance of the comprehension principle for standard plural logic, which holds that there are pluralities of single objects:

$$\exists x \text{Natural}(x) \rightarrow \exists xx \forall y(y \preceq xx \leftrightarrow \text{Natural}(x)) \tag{10}$$

This is a logical truth in standard plural logic, so (4) $\models$ (9), and so (8)—the paraphrase of "integers exist"—wasn't doing any real work in the entailment.[17] By contrast, on Fine's account, since quantification comes apart from existence, the paraphrase of "integers exist" wasn't otiose in the analogous entailment.

A better idea is to use Fine's definition of "natural number", given by (5), and to claim that if the integers exist, then a non-negative integer exists:

$$\exists xx \forall y(y \preceq xx \leftrightarrow \text{Integer}(y)) \rightarrow \exists z(\text{Integer}(z) \wedge \neg\text{Negative}(z)) \tag{11}$$

This premise is less controversial, and doesn't eliminate the need for (8) in the entailment from "integers exist" to "naturals exist". Against the backdrop of a relevant instance of plural comprehension, we have that (5), (8), (11) $\models$ (9). But (5) is merely definitional, so the only substantive premise is (11), and using (11) is not much different from using both (1) and (4) as was required on Fine's approach. In the ways it is different, it is better. (5) entails (1), but while (4) states outright a commitment to there being at least one natural, (11) instead expresses only a conditional commitment—*if* the integers exist, *then* there is a non-negative integer. In effect, (11) isn't an additional substantive commitment at all. It is more akin to a conceptual truth. It merely makes fully explicit something that is implicit in accepting the integers.

One complication is worth noting. With a standard plural comprehension axiom, "$\exists x\text{Integer}(x)$" is *equivalent* to (8). The left-to-right direction follows from comprehension, and the right-to-left direction follows because we're making the

[17] Comprehension tells us, in effect, that we can plurally quantify over all sets, ordinals, and cardinals, despite singular quantification over these entities being notoriously problematic. For more on the interaction of plural logic and set theory, and some of the options faced, see Linnebo (2010) and Rayo and Uzquiano (1999).

standard assumption that pluralities consist of at least one thing. Given this, whatever is logically entailed by "the integers exist" is also entailed by "at least one integer exists", and so it might seem that there is no need for the Quinean to go plural to capture natural language ontological commitments. But this is too simplistic. What is true is that *in plural logic*, "$\exists x\text{Integer}(x)$" is equivalent to (8). So the Quinean would still need to appeal to plural resources to mount the argument that no plural rendition is required.

To have a plausible overall view, we must take care to distinguish between entailment claims in different contexts. When we are dealing with only singular claims, like "$\exists x\text{Integer}(x)$" and "$\exists x\text{Natural}(x)$", it is usually first-order consequence that is relevant. When dealing with plural claims, it is usually plural consequence that is relevant. In natural language "the integers exist" plurally entails "the natural numbers exist", but not vice-versa. And "at least one natural number exists" singularly entails "at least one integer exists", but not vice-versa. This is all as it should be, and it is little matter whether the *singular* claim "at least one integer exists" *plurally* entails the *plural* claim "the natural numbers exist", since that kind of mixed entailment claim wasn't what we set out to evaluate. And the mixed entailment isn't problematic or counterintuitive, at least to any great degree. In this respect, it contrasts strongly with the entailment from "there are no natural numbers" to "the natural numbers exist" which "mixed" quantification and existence and was vindicated by Fine's account.

Do we really have the natural language entailments right? Since "$\exists x\text{Integer}(x)$" is plurally equivalent to (8), by an instance of plural comprehension and (1), (9) $\models$ (8), contrary to what we expect and want. But care must be taken here. Someone who rejects the existence of non-natural number integers will still accept that there are some integers and so there is a plurality of all integers. What they reject is only the existence of *negative integers*. That is, they accept:

$$\neg\exists x(\text{Integer}(x) \wedge \text{Negative}(x)) \tag{12}$$

So for them, the plurality of integers is simply the plurality of naturals. This means that if they accept (1), they will reject the following claim, related to (11):

$$\exists xx\forall y(y \preceq xx \leftrightarrow \text{Integer}(y)) \rightarrow \exists z(\text{Integer}(z) \wedge \text{Negative}(z)) \tag{13}$$

The key point is that (9) does not entail (8) in any sense that requires (13). If, like (11), (13) is taken as a conceptual truth governing the concept of an integer, then those who believe in naturals but not integers will instead reject (1) and use (12) and (13) to reject (8), by *modus tollens* . Various other options are possible too. In general though, the plural approach to me seems to do at least as well as Fine's approach at respecting our beliefs about natural language ontological commitment. In fact, I think it does a bit better.

One final challenge to this claim comes when we look beyond simple mathematical examples. I have followed Fine in focusing on the example of the integers and the naturals, but our account of ontological commitment should be completely general. This is a point on which both Fine and I agree. I have used the definition (5) to generate the right entailments, and while this definition is not problematic, and is in fact a definition given by Fine, it might be worried that some such definition is needed for my account but not Fine's. How else could I handle the entailment from "mammals exist" to "tigers exist", for example? By contrast, Fine needs only the two added premises:

$$\forall x(\text{Tiger}(x) \rightarrow \text{Mammal}(x)) \tag{14}$$

$$\exists x \text{Tiger}(x) \tag{15}$$

Together these are more than enough to generate an entailment from his rendition of "mammals exist" to his rendition of "tigers exist". Without a definition of "tiger" in terms of "mammal" and something else, it seems that the plural account no longer does better than Fine's.

But recall that the import of the definition (5) was only to provide a bridge between the integers and the naturals. A non-definitional bridge can be provided by a simple conditional claim, linking singular existence claims:

$$\exists x \text{Mammal}(x) \rightarrow \exists x \text{Tiger}(x) \tag{16}$$

Obviously, (16) is not a necessary truth, but no matter. A conditional of this form will be true whenever, as a matter of contingent fact, the Fs are all Gs, and there is at least one F. In other words, Fine's premises (14) and (15) entail (16), so Fineans can hardly object to my using (16) when they use (14) and (15)! In fact, my assumptions are again weaker than Fine's, for while (14), (15) $\models$ (16), (16) $\not\models$ (14) & (15). The background assumptions needed by the Finean are stronger than those needed by the plural Quinean.

Another option for the plural approach is to use plural terms, "*tt*" for the tigers and "*mm*" for the mammals, and to say that the tigers are among the mammals—$tt \preceq mm$. Read standardly and assuming that plural terms can't be empty, this claim will entail both (14) and (15). We could then use a plural separation principle to see that "the mammals exist" entails "the tigers exist". In dealing with the converse entailment the subtlties noted above must be kept in mind. Tinkering with the background plural logic and our assumptions about terms may yield further improvements. Again and in general, the plural quantificational approach seems to do at least as well as Fine's approach.

These points concern the general case. Of course, in specific contexts, various different bits of background theory will be relevant. But I agree with Fine that appealing to substantive and case specific bits of theory is *ad hoc* and should be no part of our philosophical theory of ontological commitment. No matter what, on either the standard quantificational approach with the plural extension, or on Fine's approach, the transition between "integers exist" and "naturals exist" will be mediated by the theoretical and logical resources we allow ourselves.

None of the points I have made conclusively show that the plural version of the Quinean approach is definitively better than the Finean approach. Those with a prior distaste for plural quantification will still have grounds to object. But if we take the innocence of plural quantification as a given, there is a general account of ontological commitment open to those who reject existence predicates and quantification over nonexistent objects.

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