

A Puzzle About Parsimony*

Peter Finocchiaro

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Abstract

In this paper, I argue for the instability of an increasingly popular position about how metaphysicians ought to regard parsimony. This instability is rooted in an unrecognized tension between two claims. First, we as metaphysicians ought to avoid positing unnecessary ontological kinds. Second, it is not the case that we ought to avoid employing multiple expressions of the same ideological kind (e.g. the truth-functional operators ‘ \wedge ’ and ‘ \vee ’). I argue that the two claims are inconsistent because minimizing ontological kinds just is a way to minimize the number of expressions employed in stating a theory. I end by discussing three different responses to this puzzle.

Keywords: Ideology, Metametaphysics, Ontology, Parsimony, Simplicity, Theoretical Virtue, Theory Choice

Introduction

Parsimony is among the most prominent methodological considerations in metaphysics. Yet beneath the surface there lurks a puzzle. I will bring this puzzle about parsimony to light. As I will show, the puzzle highlights a conceptual tension between several prominent positions in metaphysics. I will then offer three responses to the puzzle. Each response faces unique challenges.

First, I will make some starting assumptions. These assumptions are not unassailable. But each is independently plausible and each has broad support amongst metaphysicians.

Parsimony has traditionally been restricted to ontology: do not multiply entities beyond necessity. Lately, however, metaphysicians have turned their attention toward *ideological parsimony*.

***This is a draft.** Try not to needlessly cite or criticize unless your goal is to professionally embarrass me. (If you goal is to professionally embarrass me, then let me know and I’ll give you some more effective strategies.) For their help in the development of this paper, I thank Andrew Brenner, Rebecca Chan, Alessandro Torza, Jeffrey J. Watson, Qiong Wu and the audience at my 2020 Central APA conference session.

Ideological parsimony, as I understand it, concerns the primitive (i.e. undefined) terminology used to state a theory. I will assume that both ontological and ideological parsimony make a theory more worthy of our endorsement (as do, *inter alia*, Brenner (2017); Cowling (2013); Finocchiaro (2019a); Schaffer (2014); Sider (2011); Turner (2015)).

I will also assume what is sometimes called a *realist* or *externalist* interpretation of ideology. Like an analogous interpretation of ontology, ideological externalism states that the quality of a theory's ideology is ultimately judged by the extent to which it corresponds to objective reality, i.e. the structure of the world.¹ (Ideological externalism can be contrasted with ideological internalism, which states that the quality of a theory's ideology is judged by details internal to the theoretic process – e.g. the intelligibility of the terminology employed.)

I will also adopt the orthodox approach to meta-ontology, *neo-Quineanism*. According to neo-Quineanism, a theory's ontological commitments are determined by what the theory quantifies over when regimented with a suitably perspicuous language.² Finally, for simplicity's sake I will focus on theories about the fundamental nature of the world. While there might be versions of this puzzle that extend to non-fundamental theories, I do not have much to say about them. That is in large part because I do not have much to say in general about the relationship between fundamental and non-fundamental theories.

These assumptions help generate a puzzle, one that highlights a conceptual tension in how some metaphysicians understand the role of parsimony in theory choice. This tension has, until now, gone unrecognized. To bring out the tension, I identify in section 1 four approaches to parsimony that differ along two axes: ontology/ideology and quantitative/qualitative. We seem to have an intuitive grasp on these approaches and understand the differences between them, in particular the differences between ontological and ideological parsimony. But the closer we look the more tenuous our grasp becomes. In section 2, I argue that qualitative ontological parsimony is just a species of quantitative ideological parsimony. This is a surprising and worrisome result. It is surprising because it goes against our intuitive grasp of parsimony. It is worrisome because it seems inconsistent with a popular position amongst metaphysicians – i.e. that we ought to prefer the theory with greater qualitative ontological parsimony but it is not the case that we ought to

¹For more on ideological externalism, see (Cowling, 2013, 3983), (Sider, 2011, 13), (Finocchiaro, 2019b, 7–13).

²See, *inter alia*, Quine (1948); van Inwagen (1998); Lewis and Lewis (1970).

prefer the theory with greater quantitative ideological parsimony.

In section 3, I discuss three available responses to this puzzle. First, we could resist the puzzle by rejecting neo-Quineanism. Second, we could downplay the significance of the puzzle by offering a more nuanced approach to parsimony. Finally, we could reevaluate the value of quantitative ideological parsimony as a theoretical virtue. Ultimately, I favor the third response.

1 Four Different Approaches to Parsimony

Many metaphysicians think that parsimony ought to play a role in theory choice. They have cited parsimony in support of theories as wide-ranging as mereological nihilism (Horgan and Potrč (2008)), bundle theory (Paul (2017)), materialism (Churchland (1984)), and nominalism (Melia (2008)).

But such metaphysicians often differ in how they use parsimony. Even when restricted to the ontology of a fundamental theory, there are two importantly different approaches they take. Some (e.g. Nolan (1997)) tend to prefer the theory that minimizes the number of entities posited. Others (e.g. Lewis (1973)) tend to prefer the theory that minimizes the number of *kinds* of entities. Following a convenient shorthand from Cowling (2013), I will name these two different approaches (NO-Parsimony) and (KO-Parsimony), respectively.

I won't take a stand on which approach is best.³ I simply note that even those inclined toward (NO-Parsimony) also tend to be inclined toward (KO-Parsimony). More generally, most metaphysicians who care about parsimony at all have accepted some form of (KO-Parsimony).

We can also consider the parsimony of a fundamental theory's ideology. David Lewis, for example, claims that modal realism enables us “to reduce the diversity of notions we must accept as primitive” (Lewis, 1986, 4). Theodore Sider argues that mereological nihilism “allows us to eliminate the extra-logical (or perhaps quasi-logical) notion of ‘part’ from our ideology” (Sider, 2013, 239). Both modal realism and mereological nihilism are ideologically parsimonious. For Lewis and Sider, the ideological parsimony of their theories provides a reason to endorse them.

Just as with ontology, there are two importantly different approaches to ideological parsimony. Metaphysicians might prefer the theory that minimizes the total number of undefined terms em-

³For two defenses of different uses, see Lewis (1973) and Tallant (2013).

ployed in stating the theory. Or they might prefer the theory that minimizes the number of ideological kinds so employed. Adopting another shorthand from Cowling (2013), I will name these approaches (NI-Parsimony) and (KI-Parsimony), respectively.⁴

I should note that it's not obvious how to individuate ideological kinds. (The same could be said about ontological kinds.) Metaphysicians often rely on the imprecise but intuitive method of individuation by topic. For instance, there is an ideological kind corresponding to color. All color predicates like 'blue', 'periwinkle', and 'Pantone 19-4052' are of this kind, as are relational predicates like 'is more saturated than'. There is also an ideological kind corresponding to modality. Primitive modal operators, predicates like 'possibly true' and 'consistency', as well as primitive dispositional predicates like 'fragile' are of this kind. There is much more worth saying about the individuation of ideological kinds.⁵ Yet I do not think that my main argument is affected by this issue. In what follows I will stick to the intuitive understanding just sketched.

Some metaphysicians might deny that our use of ideological parsimony can be neatly divided into (NI-Parsimony) and (KI-Parsimony). Yet the distinction seems intuitive enough and many think there is something to it (for example: Cameron (2012, 18) and Cowling (2013, 3897)). In addition, there are intuitive reasons to favor (KI-Parsimony) and reject (NI-Parsimony). For one, (NI-Parsimony) seems to force us to make objectionably arbitrary decisions. (NI-Parsimony) recommends that, all else being equal, we minimize the number of truth-functional operators in our ideology. What this recommendation precisely amounts to will depend on the resolution of issues that are too large to address here. To see the worry, though, suppose that there are no other relevant considerations regarding our choice of logical ideology. (NI-Parsimony) then recommends that we employ a minimal expressively adequate set of operators, preferably a one-element set. We are therefore faced with an unsettling question: should we employ NAND (\uparrow), or should we instead employ NOR (\downarrow)?⁶ Both options are unsavory because they seem to commit us to an unreasonable view about the fundamental logical structure of the world. Both options also seem impossible to motivate – what could justify choosing Quine's dagger over the Sheffer stroke? These worries about arbitrariness disappear if we reject (NI-Parsimony) in favor of (KI-Parsimony). Truth-functional

⁴Some characterize ideology as concerning the *concepts* employed in stating a theory. For reasons of space I cannot address this identity issue here.

⁵See, especially, Cowling (2013); Finocchiaro (2019a); Lewis (1986).

⁶There are many more candidate operators once we permit operators of arity greater than 2.

operators are (plausibly) of the same ideological kind. So there is no methodological pressure to choose between the dagger and the stroke.⁷

Thus far, I have presented four approaches to parsimony. I have suggested that the overall most attractive package for determining the overall parsimony of a theory is one that (i) can include (NO-Parsimony), (ii) definitely includes (KO-Parsimony) and (KI-Parsimony), but (iii) does not include (NI-Parsimony). Not coincidentally, this is a package that has recently gained prominence amongst metaphysicians who care about the parsimony of their theories. Even the most ardent supporters of parsimony have shied away from including (NI-Parsimony). Sider (2011) admits that “[t]here *is* a real question about which of propositional logic’s connectives carve at the joints, and similarly for \forall and \exists ,” and yet nevertheless “egalitarian answers can be given. . . [o]ne might hold that both \exists and \forall carve at the joints, or that all the truth-functional connectives do, and thus avoid drawing invidious metaphysical distinctions” (258–259).

But, as I will now show, there is a puzzle that undermines this package’s credibility.

2 The Puzzle

In this section, I will argue that (KO-Parsimony) just is a restricted form of (NI-Parsimony). To do so, I will walk through a paradigm example of the neo-Quinean methodology at work, Peter van Inwagen (2008)’s nominalist paraphrase of species.

The following English claim is indispensable for any serious theorizing:

Some species are cross-fertile.

The most straightforward regimentation of this English claim using first-order logic is:

$$\exists x \exists y (Sx \wedge Sy \wedge (x \neq y) \wedge Cxy)$$

which informally reads “There is an x and there is a y such that x is a species, y is a species, x is not identical with y , and x and y are cross-fertile.” According to orthodox neo-Quineanism, if we endorse this regimentation we thereby incur an ontological commitment to species.

⁷Cf. Cowling (2013); Sider (2011)

We want to avoid an ontological commitment to species. This is in part because (KO-Parsimony) recommends reducing the number of ontological kinds when feasible. Species form an ontological kind. So we ought to avoid positing them.

How do we accomplish that goal? It is not enough to merely reduce the number of species posited by our theory or to relegate species to a theoretically insignificant role. We need to avoid the mention of species altogether. As van Inwagen’s nominalist puts it, “I would symbolize the sentence [i.e. “Some species are cross-fertile.”] using other predicates than those two [i.e. ‘species’ and ‘cross-fertile’], predicates whose extensions comprise only nominalistically acceptable entities” (van Inwagen, 2008, 131). In other words, we posit an ontological kind when, in stating our theory, we employ a predicate that ranges over entities found within that kind. The predicates that are employed in stating the theory will determine which ontological kinds are posited by the theory and anyone who endorses that theory. In order to avoid an ontological commitment to species, we must not use any predicates that range over species.

Van Inwagen’s nominalist does not want to posit the existence of species. To satisfy this desire, she employs the dyadic predicate ‘conspecific’. This uncommon term is truly predicated of two animals just in case they are both *Homo sapiens*, or both *Felis cati*, and so on. Using ‘conspecific’, the nominalist can regiment “Some species are cross-fertile” as:

$$\exists x \exists y (Ax \wedge Ay \wedge \neg Cxy \wedge \forall z \forall w (Czx \wedge Cwy \wedge Dzw \rightarrow Izw))$$

which informally reads:

There are two living animals x and y that are not conspecific and which satisfy the following condition: For any two fertile animals of different sexes one of which is conspecific with x and the other of which is conspecific with y , one of those two animals can impregnate the other.

When the nominalist adopts this regimentation, she only employs predicates that range over animals. She thereby avoids an ontological commitment to species. But she consequently leaves ‘conspecific’ undefined. In contrast, the platonist can define ‘conspecific’ as:

$$x \text{ and } y \text{ are conspecific} =^{df} \exists z (z \text{ is a species and } x \text{ and } y \text{ are both members of } z).$$

Because the nominalist takes ‘conspecific’ as a primitive and the platonist defines it, the two differ with respect to their ideological commitments.

All this talk about predicates suggests that qualitative ontological parsimony is a species of quantitative ideological parsimony. Assuming neo-Quineanism, (KO-Parsimony) amounts to the view that we ought to prefer theories that employ fewer predicates.⁸ But a theory that employs fewer predicates is, everything else being equal, more quantitatively ideologically parsimonious.

(Of course, everything else is often not equal. Even in the case discussed above, it's unclear who has the more ideologically parsimonious theory; the nominalist is stuck with the dyadic predicate 'conspecific' whereas the platonist is stuck with the monadic predicate 'species'.⁹)

It's unexpected that the means through which we acquire qualitative ontological parsimony just is a means through which we acquire quantitative ideological parsimony. Our intuitive grasp of the relevant concepts suggests that ontology and ideology are quite distinct. Nevertheless, ideological externalists ought to embrace this result. If we use a theory's ideology to pick out features of the world, then it's entirely plausible that in so doing we occasionally pick out ontological kinds.

Think of it this way. The elimination of a single object from a metaphysician's ontology improves its quantitative ontological parsimony. So, too, does the elimination of every object of a given kind. But the elimination of an ontological kind does not necessarily result in the elimination of any objects. It's perfectly ordinary for a reductive project to "relocate" the objects of one kind into the province of another.¹⁰ So (KO-Parsimony) should not be understood as an efficient means of reducing the overall number of objects posited. Similarly, (KO-Parsimony) should not be understood merely as a preference for "empty kinds" over "occupied kinds". In many cases, whether or not an ontological kind is populated should depend on contingent facts of the world rather than metaphysical necessities. (KO-Parsimony) should be understood as a preference for the *elimination* of ontological kinds. As the example of paraphrasing above suggests, the elimination of an ontological kind is achieved by the abandonment of its corresponding predicate. When a theory commits to an ontological kind, it is not committing to some object that it quantifies over. Rather, when a theory commits to an ontological kind, it is committing to a structural feature of the world that corresponds to a predicate employed by the theory's ideology. Similarly, when a theory eliminates an ontological kind, it eliminates a structural feature of the world. Ontological

⁸It might be more accurate to say that (KO-Parsimony) is the view that we ought to prefer theories that employ fewer elements of a special class of predicates – the "kind-introducing" predicates. But here I simplify and restrict the discussion to predicates that correspond to ontological kinds.

⁹Cf. Pickel and Mantegani (2012): Section IV.

¹⁰See, for example, the various reductive accounts of possible worlds discussed in Lewis (1986).

kinds are features of the world's structure.

Compare this theoretical identification to the theoretical identification of water and H_2O . Our concept of water is quite different from our concept of H_2O : our concept of water predates our concept of H_2O ; our concept of water is rooted in its geographic, biological, and sociological functions whereas our concept of H_2O is rooted in the scientific discipline of chemistry; and so on. As a matter of fact, though, the two concepts pick out the same substance. Of course, in some sense our concept of water “could have” picked out a different substance. Perhaps, even, our concept of water “could have” picked out a metaphysically gruesome disjunction of substances. But that's not how things turned out. Consequently, to be concerned with water is to be concerned with H_2O . Imagine someone who stressed the importance of bringing water on a camping trip. If they stressed the importance of bringing *water* but denied the importance of bringing *H_2O* , we would be confused – and rightly so.

So, too, for ontological kinds and the structure of the world. While our concept of an ontological kind may predate our concept of the world's metaphysical structure, the two concepts ultimately pick out the same feature. Of course, there may be some differences between the two theoretical identifications. Those who maintain a firm distinction between the *a priori* and the *a posteriori* would likely consider “Water is H_2O ” to be an *a posteriori* identification and “Ontological kinds are metaphysical structure” to be an *a priori* identification. But, assuming the identities hold, many of the comparisons are apt. If a metaphysician stresses the importance of minimizing the ontological kinds posited by a theory, we should expect them to stress the importance of minimizing the structural complexity posited by a theory – it's the same thing that is being minimized! At a minimum, the metaphysician owes us an explanation for the difference in attitude.

All that I have shown here is that those committed to (KO-Parsimony) should be committed to a version of (NI-Parsimony). It does not follow that qualitative ontological parsimony *just is* quantitative ideological parsimony. There will still be instances of the latter that aren't instances of the former. Consider, for instance, a choice between two competing modal theories. Some forms of actualism (like those in Prior and Fine (1977)) eschew quantifying over possible worlds and take the sentential modal operators as primitive. Suppose that actualist theory T_1 takes both ‘ \Box ’ and ‘ \Diamond ’ as primitive and actualist theory T_2 takes only ‘ \Box ’ as primitive, defining ‘ \Diamond ’ in the standard way. (NI-Parsimony) would recommend T_1 over T_2 because it employs one less bit of ideology.

But by hypothesis neither theory posits more or fewer kinds of entities. Thus, some disputes about ideology are not reducible to disputes that involve ontology.¹¹

3 What to Do?

I will end by briefly discussing three ways to respond to the puzzle about parsimony.

First, we could try to resist the puzzle. I generated the puzzle by assuming orthodox neo-Quineanism. One way of resisting, then, is to reject the claim that a theory’s ontology is that over which the theory quantifies. There are several alternatives to the Quinean criterion of ontological commitment, but one promising option is the truthmaker view. On the truthmaker view, a theory’s ontology is that which makes the theory’s sentences true.¹² Importantly, the view explicitly permits two theories to differ with respect to their ideologies without also differing with respect to their ontological commitments. On the truthmaker view, a theory might truly state “Some species are cross-fertile,” without incurring an ontological commitment to species. What matters is not what the sentence quantifies over but rather what makes the sentence true – and what makes the sentence true need not be cross-fertile species. More importantly, the view entails that the two regimentations offered above – ‘ $\exists x\exists y(Sx \wedge Sy \wedge (x \neq y) \wedge Cxy)$ ’ and ‘ $\exists x\exists y(Ax \wedge Ay \wedge \neg Cxy \wedge \forall z\forall w(Czx \wedge Cwy \wedge Dzw \rightarrow Izw))$ ’ – have the same ontological commitments. The change in ideology does not impact the ontology. Thus, on the truthmaker view of ontological commitment, (KO-Parsimony) does not collapse into (NI-Parsimony). In a way, then, the puzzle about parsimony could motivate us to reject orthodox neo-Quineanism.

Those of us not yet ready to abandon orthodoxy have to either embrace the puzzle or downplay its significance. I suspect many would prefer the second option. Some metaphysicians (e.g. Bennett (2009)) have characterized many metaphysical disputes as being, at bottom, trade-offs between ontological and ideological parsimony. This characterization is hard to maintain if qualitative ontological parsimony is just a species of quantitative ideological parsimony. It seems, then, that my puzzle puts such metaphysicians in a hard place. But perhaps the essence of their characterization

¹¹This point is made in much greater detail by Finocchiaro (2019c).

¹²See Rettler (2016). Rettler even appears to gesture toward a version of my puzzle when he says, “[I]t’s true, just looking at the sentences will no longer tell you which theory wins the day with respect to parsimony of ontological commitments. But it never should have” (21). In what follows I will simplify my discussion by ignore Rettler’s distinction between the general truthmaker view and the specific truthmaker view.

can be maintained. One strategy is to redescribe the trade-offs involved in metaphysical disputes. Those who pursue this strategy could maintain that there are two categories of ideology such that (i) we ought to minimize the number of ideological bits from the first category, and (ii) it is not the case that we ought to minimize the number of ideological bits from the second category. Intuitively, the predicates corresponding to ontological kinds would be contained within the first category and the truth-functional operators would be contained within the second category. Perhaps this categorical division can be motivated by an appeal to differences in ideological correspondence. In other words, perhaps some ideological kinds correspond to comparatively coarse-grained features of the world's structure whereas other ideological kinds correspond to comparatively fine-grained features. In the first case, differences between the bits of those kinds outstrip genuine differences in the world. We could thus endorse a *restricted* version of (NI-Parsimony) while we simultaneously avoid the arbitrariness worries developed above.

That leaves the third response: embrace the puzzle. If we embrace the puzzle, we ought to claim that (NI-Parsimony) is no less justified a principle than (KO-Parsimony). This claim is quite shocking (well, as shocking as an esoteric claim about the proper methodological application of parsimony can be, anyway). (KO-Parsimony) has a rich history and is likely the most broadly endorsed approach to parsimony. In contrast, almost no one explicitly endorses (NI-Parsimony). Nevertheless, by embracing the puzzle we can save neo-Quineanism as well as the standard characterization of metaphysical disputes as disputes that involve trade-offs between ontology and ideology. As a consequence, we would have to reevaluate the apparent arbitrariness of choosing between functionally equivalent terminology. For instance, we would have to consider why and to what extent we should reduce the number of truth-functional operators we employ in stating our theories. This might generate an epistemic deadlock with regard to competing “equivalent” theories. To illustrate: (NI-Parsimony) suggests that a theory that employs only Quine’s dagger represents the logical structure of the world better than a theory that employs both Quine’s dagger and the Sheffer stroke. *Mutatis mutandis* for a theory that employs only the Sheffer stroke. But at this point our methodology fails us and we cannot know which of the two operators we ought to employ.¹³

Personally, I think we ought to embrace the puzzle. It’s not a perfect response, but it is the best

¹³Cf. (McSweeney, 2019, 127–128)

available. Neo-Quineanism is battle-tested orthodoxy. (More modestly, neo-Quineanism is much closer to the center of my web of belief than the other elements of the puzzle.) For that reason I reject the first response. The second response requires a distinction between parsimony-relevant and parsimony-irrelevant bits of ideology. I am skeptical that such a distinction can be made in a principled, non-*ad hoc* way that doesn't lead to absurdity. So I also reject the second response. Finally, I do not think that the third response is that bad. I don't know how to choose between Quine's dagger and the Sheffer stroke. I don't even know how to think about that choice. But a hard choice is not *ipso facto* a bad choice.

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