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Ideological parsimony

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Abstract The theoretical virtue of parsimony values the minimizing of theoretical commitments, but theoretical commitments come in two kinds: ontological and ideological. While the ontological commitments of a theory are the entities it posits, a theory's ideological commitments are the primitive concepts it employs. Here, I show how we can extend the distinction between quantitative and qualitative parsimony, commonly drawn regarding ontological commitments, to the domain of ideological commitments. I then argue that qualitative ideological parsimony is a theoretical virtue. My defense proceeds by demonstrating the merits of qualitative ideological parsimony and by showing how the qualitative conception of ideological parsimony undermines two notable arguments from ideological parsimony: David Lewis' defense of modal realism and Ted Sider's defense of mereological nihilism.

Keywords Theoretical virtues · Ontology · Ideology · Parsimony · Simplicity

1 Introduction

Like fertility, elegance, and conservativeness, parsimony—very roughly, the minimizing of theoretical commitments—is a virtue of theories.[1] For some of us, parsimony is not merely a *pragmatic virtue* of theories—a feature that makes the use of a theory practically preferable to otherwise equally good rivals—it is also an *epistemic virtue*:

[1] On theoretical virtues in general, see Kuhn (1977). On fertility, see Nolan (1999). On conservativeness, see (Lewis 1986, p. 235). On theoretical virtues as sources of epistemic reasons, see (Harman 1997).

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a feature that makes belief in a theory better justified than belief in otherwise equally good rivals. So, while almost all parties accept

(1) Parsimony is a theoretical virtue.

and its pragmatic sharpening,

(2) Parsimony is a pragmatic virtue.

the epistemic sharpening of (1) is controversial:

(3) (Parsimony): Parsimony is an epistemic virtue.

Why accept (Parsimony)? Perhaps because you are a methodological naturalist and believe that the norms of scientific inquiry codify a presumption in favor of parsimony.[2] Or perhaps because you are especially worried about external world skepticism and take a presumption in favor of parsimony to be a condition for knowledge of the external world.[3] Perhaps, instead, you believe in a divine being and hold that a presumption in favor of parsimony follows from the fact that such a being created the world.[4] Perhaps you have some entirely different reason, or simply take (Parsimony) to be self-evident.[5]

Despite the apparent diversity of arguments for (Parsimony), it remains a controversial thesis. For example, Parsons (1976) presents a dissenting opinion against (Parsimony) as follows:

> [U]nadorned appeals to Occam's razor have (or should have) absolutely no force at all. There is no prima facie reason to suppose that the universe contains a small number of things, or a small number of kinds of things. There is no prima facie reason to believe that a theory that endorses a smaller number of things, or kinds of things, or employs a smaller number of primitives, is simpler or likelier to be true or likely to yield more insight than another. Theories should not be compared by counting entities, kinds of entities, or primitives.[6]

In what follows, I defend a specific version of (Parsimony). This defense requires that we draw two distinctions between various conceptions of parsimony. The first distinction concerns the constituents of theories. It divides *ideological parsimony,* which concerns primitive concepts, from *ontological parsimony,* which concerns existential commitments. A second distinction concerns the general nature of parsimony. It divides *quantitative parsimony,* which concerns only the number of commitments, from *qualitative parsimony,* which concerns the number of kinds of commitments.

[2] On the connection between theoretical virtues and rationality, see McMullin (1976). See also Psillos (1999) on the role of parsimony in abductive arguments for scientific realism.

[3] On the abductive response to skepticism, see Vogel (1990).

[4] It is not obvious that the existence of a divine being would support (Parsimony). One might, for example, draw a contrary, broadly Leibnizian conclusion that reality is maximally rather than minimally populated.

[5] For an overview of efforts to defend (Parsimony), see Foley (1993), Sober (1975), and Smart (1984).

[6] Parsons (1976, p. 660).

The version of (Parsimony) I defend here is *qualitative ideological parsimony,* according to which minimizing the number of kinds of ideological primitives within a theory improves that theory's epistemic credentials.

Any defense of (Parsimony) faces a serious obstacle. As alluded to above, there is no consensus about what makes parsimony an epistemic virtue. For this reason, there is no straightforward strategy for demonstrating that qualitative ideological parsimony is an epistemic virtue. To avoid this obstacle, I proceed in reverse order. After presenting the qualitative conception of ideological parsimony, I discuss its consequences for several debates in metaphysics. Perhaps most notably, I indicate how a commitment to qualitative ideological parsimony provides a powerful response to arguments for highly counterintuitive metaphysical theories—modal realism and mereological nihilism—on the basis of ideological parsimony. Since a commitment to qualitative ideological parsimony furnishes us with a compelling response to these arguments and thereby allows us to resist theses most judge to be plainly incredible, I take this to be evidence that qualitative ideological parsimony is a theoretical virtue.

In broad outline, the subsequent discussion runs as follows. I begin in Sect. 2 by introducing the distinction between ontology and ideology. In Sect. 3, I defend (Parsimony) as it applies to both ideology and ontology. In Sect. 4, I examine the distinction between qualitative and quantitative parsimony. In Sect. 5, I defend qualitative ideological parsimony on the basis of general considerations regarding arbitrariness. In Sects. 6–8, I examine several metaphysical views—the growing block view of time, mereological nihilism, and modal realism—and argue that the implications of qualitative ideological parsimony for the evaluation of these views provides evidence that qualitative ideological parsimony is a genuine epistemic virtue. I then conclude in Sect. 9.

2 Ontology and ideology

A naïve interpretation of (Parsimony) holds that, in comparing otherwise equal theories, we are justified in believing whichever theory posits the fewest objects. But this naïve interpretation omits a crucial component of theories and their proper evaluation. This is because parsimony comes in two different forms, which correspond to the two kinds of theoretical commitments: ontological commitments and ideological commitments.

On Quine's knee, we learned what ontology is: the inquiry into what exists.[7] We also learned how to undertake this inquiry: regiment your best scientific theory, determine the ontological commitments of the theory (i.e., determine which entities are the values of bound variables in the canonical regimentation), and accept the existence of precisely those entities.[8] Here, I will understand ontological commitment along decidedly Quinean lines, taking the language of quantification to properly capture

[7] See Quine (1953a).

[8] See Quine (1953a). On the implementation of the Quinean approach to ontology, see Colyvan (2001).

the meaning of "exists."[9] In doing so, ontology and ontological commitment is, most fundamentally, a matter of commitment to particular objects.

In some ways, this understanding of ontological commitment might seem to come apart from the kind of commitment of central concern to scientific theories.[10] One might argue, for example, that physical and biological theories are rarely concerned with commitment to a particular number of electrons or finches, and that minimizing the number of electrons or finches does little to improve the credentials of theories. As I will argue, there is something correct about this assessment, but, for present purposes, I take it that we should not revise our understanding of ontological commitment, but, rather, our conception of parsimony. In proceeding with the familiar Quinean view of ontological commitment, we can therefore leave open the genuine possibility of scientific or other theories drawing inferences on the basis of the number of particulars rather than kinds. We might, for example, have reason to prefer theories that explain orbital perturbations through a lone undiscovered planet rather than many planets or biological explanations that posit a small rather than large number of chromosal anomalies. For this reason, I hold that we should take the ontology of a theory to comprise whatever objects serve as the bound variables of the quantifiers in the canonical formulation of the theory.[11]

As Quine took pains to point out, theories are not ontology alone. They have their accomplice in ideology. Quine says,

> Given a theory, one philosophically interesting aspect of it into which we can inquire is its ontology: what entities are the variables of quantification to range over if the theory is to hold true? Another no less important aspect into which we can inquire is its ideology (this seems the inevitable word, despite unwanted connotations): what ideas can be expressed in it? ... It is clearer, I think, to recognize in ontology and ideology two distinct domains of inquiry.[12]

Ideology concerns the representational power of a theory.[13] In the broadest sense, any concepts expressible within a theory are part of its ideology. In the narrower sense, ideology concerns only ideological primitives, which are concepts that resist definition in terms of other concepts.[14] This narrow sense, which will be the one relevant for

[9] On Quinean meta-ontology and ontological commitment, see Van Inwagen (1998).

[10] My thanks here to an anonymous referee for noting this concern about scientific commitments.

[11] I omit complications about the restrictions of a Quinean regimentation in first-order logic. As will be clear, some of theories of interest here invoke modal operators and are therefore anathema to the Quinean, but the core Quinean notion of ontological commitment is all that will be required for what follows.

[12] Quine (1951, p. 14).

[13] Not all accounts of the representational power of theories admit something like the distinction between ideology and ontology. For example, algorithmic information-theoretic approaches to model selection suggest at least one understanding of "representational power" where representational power, given a compressible body of data and fixed language, is determined by the minimal description length that outputs the data in question. On algorithmic complexity, see Li and Vitanyi (1997). Notably, this construal of representational power provides a prima facie rationale for parsimony within the context of model selection. Here, I assume the Quinean conception of theories and the corresponding understanding of representational power.

[14] As Quine (1951, p. 14) puts it, "As a subdivision of ideology there is the question of what ideas are fundamental or primitive for a theory, and what ones derivative."

what follows, is of greater interest than the broader sense of ideology. This is because only primitive ideology represents a potential cost to theories. After all, non-primitive ideology admits of definition in terms of primitive ideology and therefore "comes for free" once granted the *analysans*. So understood, the only substantial questions about ideological commitments are questions about which *primitive* concepts occur within a theory.

If ideology concerns primitive concepts, what is the metaphysical status of primitive ideology? For Quine, ideology is a matter of psychology, since the ideology of a theory concerns the particular mental items possessed by individuals who deploy a theory. In contrast, Sider (2011), following Lewis (1986), has argued that ideology is not a subjective matter but, rather, an objective matter that is indispensable for theorizing about the metaphysical structure of reality. On this objective conception, ideology is no less a part of the world's metaphysical structure than ontology. Metaphysical and scientific inquiry therefore aim at a concordance between the ontology and ideology of our best theories and the ontological and ideological structure of reality.

The objectivity of ideology is clearest when considering the kind of dispute between modal eliminativists—those who deny there are modal facts—and modalists—those who hold that irreducible modal operators are needed to state all of the truths about reality.[15] Although eliminativists and modalists might agree about all matters ontological, they invariably disagree at the level of ideology, because the eliminativist, unlike the modalist, denies there are modal truths. So, while the modalist accepts that primitive modal ideology is a part of the world's metaphysical structure, the eliminativist denies that the metaphysical structure of world has any modal component. Crucially, this difference between modalism and eliminativism does not depend upon any facts about the psychology of particular individuals. Moreover, this substantive disagreement persists even in the face of ontological agreement and illustrates how ideological commitments are no more or less objective than ontological ones.

In proceeding, I assume the objectivity of ideology.[16] I will therefore use "ideology" in a restricted sense that applies only to the primitives (e.g., predicates or operators) of a theory, which I take to be objective components of the world's metaphysical structure.

3 Ontological parsimony and ideological parsimony

Having distinguished ontological commitments from ideological commitments, two versions of (Parsimony) can now be evaluated:

[15] Quine (1953b) defends eliminativism. On modalism, see Melia (1992). Note that a defender of possible worlds is not a modalist in the relevant sense. The modalist eschews quantification over possible worlds of any kind, using only primitive modal operators to express modal claims. For present purposes, I set aside concerns about the ontological status of facts.

[16] Is there an analogue of fundamental rather than derivative ideological commitments in terms of ontological commitments? Perhaps. Some philosophers have argued that ontological commitments only contribute to the cost of a theory if they are fundamental rather than merely derivative ontological commitments. See Schaffer (2010) for discussion. Here, I assume a "flat" Quinean conception of ontology: no objects are more or less fundamental than other objects even while objects instantiate more or less fundamental properties.

(O-Parsimony) Ontological parsimony, which concerns the minimizing of ontological commitments, is an epistemic virtue.

(I-Parsimony) Ideological parsimony, which concerns the minimizing of ideological commitments, is an epistemic virtue.[17]

In isolation, (O-Parsimony) holds that, given otherwise equal theories, one has reason to prefer the theory committed to the smallest ontology. In isolation, (I-Parsimony) holds that, given otherwise equal theories, one has reason to prefer the theory committed to the fewest primitive concepts. Taken together, these principles require us to prefer the unique theory (if there is one) with the fewest ideological and ontological commitments. Unfortunately, these principles provide no guidance in weighing the values of ideological and ontological parsimony against one another in the evaluation of competing theories. A commitment to each of (O-Parsimony) and (I-Parsimony) therefore leaves open a range of difficult questions. Most notably, why should we accept (I-Parsimony) in the first place?

The strongest argument for (I-Parsimony) turns on the interaction between ontology and ideology within theories. Specifically, a commitment to (I-Parsimony) is needed to prevent a slide towards untenable theories that dispense with ontology in favor of a bloated ideology.[18] This threat arises because ontological commitments can often be exchanged in wholesale for ideological commitments. For example, a metaphysics that dispenses with ontological commitment in favor of a plurality of ideologically primitive adverbial modifiers (e.g., by translating the existential thesis that chairs exist as the non-existential thesis that it is chair-ing) might suffice for providing an account of the world.[19] Similarly, those who flout ideological parsimony might dispense with singular terms and quantification altogether and opt for a language of only predicate functors, which, on the Quinean view of ontology, carries no ontological commitments.[20] Given the apparent coherence of these theories, the defender of (O-Parsimony) has good reason to accept (I-Parsimony) upon pain of being rationally required to deny the existence of any objects whatsoever or, at the very least, doing without the best explanation of why such theories fail, viz., by virtue of taking on implausibly large ideological commitments.

Granted (I-Parsimony), we still face another difficult question: does one form of parsimony count for more than the other? Here, consideration of the possible exchange of ontology and ideology provides evidence that (O-Parsimony) and (I-Parsimony) are of equal weight. Suppose, for example, that (O-Parsimony) has greater weight than (I-Parsimony), such that the considerations of parsimony only adjudicate between theories with equal ontological commitments. On this view, any dispute between theories that posit ontology rather than ideology has a predetermined outcome, given that an ideological resolution will always be cheaper

[17] Here, the 'O' in O-Parsimony and 'I' in I-Parsimony stand for 'ontological' and 'ideological', respectively.

[18] See Sider (2011, p. 14) for discussion of ideological parsimony. See also Melia (2008) for a discussion of parsimony and its implications for nominalism.

[19] See Cortens and O'Leary-Hawthorne (1995) for discussion.

[20] See Quine (1976), Turner (2011), and Dasgupta (2010) on the implications of "functorese" for ontology.

than an ontological one. So, for example, faced with either a commitment to a primitive concept of instantiation or ontological commitment to a plenitude of instantiation relations, an unequal weighting of (O-Parsimony) and (I-Parsimony) mandates dispensing with the existence of an instantiation relation.[21] Similarly, when considering whether the familiar Lewisian distinction between natural and non-natural properties should be taken as an ideological primitive or analyzed in terms of an ontology of universals, the greater weight of (O-Parsimony) immediately requires us to reject universals in favor of a primitive concept of naturalness.[22]

In general, then, if any given ontological commitment can be replaced by a slightly cheaper ideological substitute, a case-by-case examination of one's metaphysical commitments will yield a rival theory that dispenses with ontology in favor of cheaper ideology. For this reason, an unequal treatment of (I-Parsimony) and (O-Parsimony) threatens to drive us towards an ideologically bloated metaphysics according to which all of our ontological assets have been traded away in favor of cheaper ideological commitments. To avoid this consequence and the preemptive conclusion of all debates about ontological and ideological options, we are better served to hold that, in principle, (O-Parsimony) and (I-Parsimony) enjoy equal weight.[23]

The case against accepting only one of (O-Parsimony) and (I-Parsimony) as an epistemic virtue can be bolstered by consideration of information-theoretic approaches to simplicity and complexity within theory choice. Among these approaches, algorithmic information theoretic accounts drawn on the absolute complexity or Kolmogorov complexity of a body of data and identify a unique measure of the complexity or simplicity of descriptions and subsequent theories.[24] (Roughly, the objective complexity of a theory, understood as a body of data, is the shortest program that outputs a finite binary encoding of the data in question, and irreducible or incompressible complexity results from data for which there is no program shorter than the very string that encodes the data.) Another related approach appeals to a Minimum Description Length Principle, which holds, roughly, that the best theory to explain a set of data minimizes the sum of the length in bits of the description of the theory and the length in bits of data when encoded with the help of the theory. Notably, these approaches draw no distinction between ontology and ideology but nevertheless identify criteria for objective measures of complexity and subsequently representational power. For those sympathetic to accounts of parsimony that proceed along information-theoretic lines, there is reason to question whether our best account of parsimony can be

[21] See Sider (2006) for discussion of the ideological and ontological solutions to the puzzle of how bare particulars are unified with their properties.

[22] See Lewis (1983) for discussion of the analytic options regarding the concept of natural properties.

[23] This does not require that there is some fixed value we can assign to commitments—it would, after all, be surprising to learn that, any primitive concept is equal in value to any collection of thirteen objects—but, rather, that both ontology and ideology figure equally into the evaluation of theories.

[24] On algorithmic information theory and Kolmogorov complexity, see Li and Vitanyi (1997) and Grunwald and Paul (2008). On the role of algorithmic information theory and minimum description length theory in model selection, see McAllister (2007).

articulated in terms of ontology and ideology. And, although I am content to follow Lewis and others in assuming this Quinean conception of theories here, I do take it that our best account of parsimony ought not ride roughshod over alternative proposals for articulating implementable accounts of simplicity or complexity. We therefore have another reason to deny an inegalitarian view of parsimony, which finds no support from other approaches to understanding simplicity and complexity.

4 Quantitative parsimony and qualitative parsimony

I have briefly defended a commitment to (I-Parsimony). I have also argued that (I-Parsimony) and (O-Parsimony) enjoy equal weight in the evaluation of theories. Given these preliminary conclusions, we can now focus our attention on the following thesis:

(IO-Parsimony) Ontological and ideological parsimony are epistemic virtues.

Although (IO-Parsimony) is intuitive, its application is a complicated matter. An especially thorny testing ground for (IO-Parsimony) is found in the evaluation of set theory, given the extreme ontological commitments it requires. On the epistemic merits of (IO-Parsimony) as it concerns set theory, Lewis (1986, p. 2)—a staunch defender of (IO-Parsimony)—says:

> Set theory offers the mathematician great economy of primitives and premises, in return for accepting rather a lot of entities unknown to *Homo javenesis.* It offers an improvement in what Quine calls ideology, paid for in the coin of ontology. It's an offer you can't refuse. The price is right; the benefits in theoretical unity and economy are well worth the entities...

Lewis' remarks here are striking, since, taken at face value, a commitment to the lavish ontology of set theory squares very badly with (IO-Parsimony).[25] Specifically, a commitment to the enormous ontology of set theory seems to be an obvious way to flout (O-Parsimony) and thereby treat (O-Parsimony) and (I-Parsimony) unequally.

To ease the tension between (O-Parsimony) and (I-Parsimony), Lewis draws a distinction between different versions of (O-Parsimony). As Lewis (1973, p. 87) says, "I subscribe to the general view that qualitative parsimony is good in a philosophical or empirical hypothesis; but I recognize no presumption whatever in favour of quantitative parsimony." We can express Lewis' distinction between general forms of (Parsimony) as follows:

(Quantitative Parsimony) Parsimony concerns the number of commitments.

[25] Benacerraf et al. (1966, p. 35) express the opposing skeptical view rather succinctly: "It is hard enough to believe that the natural world is so nicely arranged that what is simplest, etc., by *our* lights is always the same as what is *true* (or, at least, *generally* the same as what is true); why should one believe that the universe of sets... is so nicely arranged that there is a pre-established harmony between *our* feelings of simplicity, etc., and *truth?"* (Italics from original.)

(Qualitative Parsimony) Parsimony concerns the number of kinds of commitments.

With respect to (O-Parsimony), the application of Lewis' distinction delivers two different interpretations.[26] Lewis rejects the first,

(NO-Parsimony) Quantitative ontological parsimony, which concerns the number of ontological commitments, is an epistemic virtue.[27]

but accepts the second,

(KO-Parsimony) Qualitative ontological parsimony, which concerns the number of kinds of ontological commitments, is an epistemic virtue.

By endorsing (KO-Parsimony) and rejecting (NO-Parsimony), Lewis resolves the tension generated by set theory. Provided that all sets are of the same kind, a commitment to a vast plurality of sets does not offend against (KO-Parsimony) even while it is in conflict with (NO-Parsimony). In this way, Lewis sustains (IO-Parsimony) and a commitment to set theory by interpreting (O-Parsimony) as a principle that concerns only the number of *kinds* of entities rather than the mere number of entities.

(KO-Parsimony) reconciles a commitment to (IO-Parsimony) with the enormous ontology of set theory, but it also raises a question about (I-Parismony): if one accepts (KO-Parsimony), should one endorse the ideological analogue? Specifically, should one endorse,

(KI-Parsimony) Quantitative ideological parsimony, which concerns the number of kinds of ideological commitments, is a theoretical virtue.

rather than (or in addition to),

(NI-Parsimony) Quantitative ideological parsimony, which concerns the number of ideological commitments, is a theoretical virtue.

According to (NI-Parsimony), the ideological cost of a theory is determined by tallying the number of its theoretical primitives. So, if a theory has a smaller number of primitives than an otherwise equally good rival theory, we have reason to prefer the former theory. (KI-Parsimony) holds that the mere number of primitives has no bearing on the ideological cost of a theory. Instead, a theory is ideologically parsimonious to the extent that it posits fewer kinds of ideological primitives.

A proper understanding of (KI-Parsimony) requires a suitable grasp of the concept of an *ideological kind.* And, while some examples of kindred primitives are straightforward (e.g., necessity and possibility in modality, parthood and overlap in mereology), it is unlikely that any reductive account of this notion is forthcoming. To be sure, certain diagnostics are useful for discerning ideological kinds—e.g., whether the

[26] Here, 'N' in NO-Parsimony and 'K' in KO-Parsimony stand for 'quantitative and 'qualitative', respectively. Since 'Q' won't do the trick, I've opted for 'N' and 'K' with 'number' and 'kind' in mind.

[27] Nolan (1997) presents some evidence of the reasonable employment of (NO-Parsimony) within physical theory. See Baker (2003) for an examination of those cases where quantitative parsimony is a source of justification on the grounds of improved explanatory power.

concepts in question are interdefinable—but fixing upon the particular ideological kinds is (and should be) a matter of careful, case-by-case metaphysical examination.

One might now object that without a comprehensive analysis of ideological kindhood, (KI-Parsimony) is too vague or unintelligible to be useful. Notice, however, that its analogue, (KO-Parsimony), does not come with a comprehensive analysis of ontological kindhood, but has not been dismissed on these grounds. And, while one might propose that ontological kinds are simply natural kinds like *tiger* and *electron,* such a proposal precludes a suitably general application of ontological parsimony to contexts where theoretical virtues are crucial but natural kinds are not relevant (e.g., murder mysteries and set theory).[28] There is, then, no settled account of ontological kindhood. And, since this does not license us to reject (KO-Parsimony), we have no compelling reason to reject or dismiss (KI-Parsimony). In proceeding that we have an intuitive grasp on the concept of an ideological kind.

5 Qualitative Ideological parsimony

Having defended (I-Parsimony) and introduced (KI-Parsimony), I will now offer a defense of (KI-Parsimony). As noted earlier, there is no uncontroversial strategy for defending the thesis that a theoretical feature is an epistemic virtue. Indeed, Lewis says nothing explicit about why he accepts a presumption in favour of qualitative but not quantitative ontological parsimony. Implicitly, I take it that the best way to reconstruct Lewis' defense of (KO-Parsimony) is to view it as a consequence of his efforts to reconcile (O-Parsimony) with set theory. So understood, the implicit Lewisian strategy proceeds by fixing upon our best theories and holding whatever features support these theories to be reasonably viewed as theoretical virtues. In subsequent sections, I follow Lewis' lead.

After demonstrating how (KI-Parsimony) allows for the proper evaluation of competing views in the metaphysics of time, I show how it furnishes us with a powerful response to two arguments from ideology that purport to establish controversial and counter-intuitive theses. Before addressing these arguments, I begin by discussing the general role that (KI-Parsimony) plays in avoiding arbitrary theoretical decisions and resolving insubstantial metaphysical debates.

5.1 Avoiding arbitrariness

Like the box and diamond of modal logic or the existential and universal quantifier, the concepts of intrinsicality and duplication are interdefinable.[29] If intrinsicality is taken

[28] I assume here that neither *murderer* nor *set* is a natural kind. While controversial, I take it that a necessary condition for kindhood is figuring into the qualitative features of the world that are tracked by the natural sciences.

[29] Here, I omit a range of complications for the proposed analyses of both intrinsicality and duplication. While important, my primary aim here is illustrative in nature. I therefore assume that these proposals are unproblematic. On an alternative strategy for analyzing intrinsicality, see Trogdon (2009).

as a primitive, we can analyze duplication: x is a duplicate of y if and only if x and y share all the same intrinsic properties. In the opposite direction, we can use duplication to analyze intrinsicality: F is an intrinsic property if and only if F never differs between duplicates. Now, if we suppose (perhaps falsely) that no other concept can deliver an analysis of intrinsicality or duplication, a commitment to ideological parsimony, understood in quantitative terms, requires an objectionably arbitrary decision: we must take either intrinsicality or duplication as a primitive.[30]

Fortunately, ideological parsimony need not be understood in this way. If (KI-Parsimony) is taken to replace (NI-Parsimony), there is no pressure to make an arbitrary decision of this nature. Since these concepts are interdefinable, there is strong evidence that they are of a common ideological kind. And, since these concepts are of a common ideological kind, we can take each as a primitive without incurring any ideological cost over and above accepting only one of them as a primitive. (KI-Parsimony) therefore accommodates the theoretical significance of interdefinability—in particular, by keeping costs down in the face of distinct primitives—but does not drive us to make arbitrary decisions about particular primitives.[31] Put differently, it undermines any motivation for believing that there is an answer to questions like whether *duplicate* or *intrinsic* is the *correct* primitive.

Consider, for example, the interdefinability of the box and diamond in modal logic and the resulting question: which operator should be the one chosen primitive?[32] Intuitively, neither is more privileged than the other, so the choice, if forced upon us, is arbitrary and therefore *prima facie* objectionable. It is a choice better avoided than made.[33] Furthermore, given a theory that resists this arbitrary choice and one that defines the box in terms of the diamond, the latter theory will be counted as more parsimonious than the former theory. But, intuitively, these theories should not be ranked differently on the basis of the arbitrary choice just considered. (KI-Parsimony) is attractive precisely because it obviates any pressure to settle these issues by holding these theories to be equal with respect to ideological parsimony. Naturally, in some cases, we might reasonably believe that, given a pair of interdefinable concepts, one is a more suitable primitive, but (KI-Parsimony) has the desirable consequence of ensuring that there is no standing presumption in favour of arbitrary theoretical decisions.

[30] As Lewis (1983) and others have suggested, a primitive concept of naturalness might serve as an additional primitive that allows for the analysis of duplication and therefore intrinsicality. Again, for the sake of illustration, I set aside this complication.

[31] Sider (2011) cites the question of whether our mereological theory ought to take overlap or parthood as primitive. I take the present considerations to apply equally well to that case.

[32] As Sider (2011, p.13) says, "Should our fundamental logical theory take conjunction and negation, or instead, disjunction and negation as primitive? In such cases it's hard to see how to choose, and indeed, hard to believe there could be a single correct choice." See also Sider's discussion of the universal and existential quantifiers.

[33] See Sider (2011, p.13).

5.2 Conflict resolution

Just as (KI-Parsimony) allows us to resist arbitrariness, it also allows for a straightforward method for settling certain apparently insubstantial debates. Here, I offer one example of this general consequence of (KI-Parsimony).[34]

Lewis (1983) distinguishes two conceptions of properties. On the abundant conception, any set of individuals is a property. On the sparse conception, not all properties are created equal: only certain *natural* properties carve nature at its joints, figure into our fundamental physical theories, and guarantee qualitative resemblance. According to Lewis, this distinction between *natural* and *non-natural* properties is indispensable and properly taken as a theoretical primitive. But, if we suppose that Lewis is correct, what exactly is the primitive concept of naturalness that we should accept?

One candidate is a primitive second-order monadic concept: *being perfectly natural.* Unfortunately, if we hope to accommodate a ranking of more or less natural properties, and allow that some properties are only somewhat natural, this concept is insufficiently fine-grained.[35] Alternatively, we might accept a comparative concept *more natural than,* which provides us with an ordering of naturalness in the world. Unfortunately, if there are worlds of infinitely descending levels of properties, there would be no way to determine the cut-off between the natural and the non-natural, so the comparative notion also proves unsatisfactory.[36]

Fortunately, (KI-Parsimony) can be used to show that the worries that arise in trying to decide between these primitives are idle: the monadic concept and the comparative concept are of a common ideological kind, so, once either concept is taken as primitive, the remaining concept comes without any theoretical cost. We can therefore accept both concepts as primitives without flouting parsimony and therefore set aside efforts to adjudicate this issue. Through this general role, (KI-Parsimony) allows for the possibility of a swift resolution to debates concerning primitives of a common ideological kind but with limited structural differences.[37]

I claim that, by virtue of playing the roles noted above, (KI-Parsimony) enjoys certain general theoretical merits. Namely, it resists arbitrariness and resolves putatively shallow issues in theory choice. I will now examine the applications of (KI-Parsimony) for the evaluation of theories regarding the metaphysics of time, and then turn to the implications of (KI-Parsimony) for issues in modality and mereology.

[34] Unsurprisingly, some will believe this example to be genuinely substantial, if so, I encourage them to consider whether any of the debates they hold to be insubstantial can be resolved in the manner I suggest.

[35] This ranking should capture not only an ordering of properties, but also the metric structure of these properties (e.g., how far apart certain more or less natural properties are from one another). Here, I set aside the requirement of supplying a metric structure to naturalness and focus on the categorical and comparative naturalness primitives only. See Eddon (forthcoming) for discussion.

[36] See Sider (forthcoming) for discussion.

[37] See Sider (2011) for discussion of absolutist and comparativist views of structure.

6 Ideological parsimony and the growing block

Presentism, according to which only presently existing entities exist, and eternalism, according to which non-present entities (e.g., past and future objects) exist, are the leading views about the ontology of time.[38] The appeal of presentism owes to its accommodation of the apparently dynamic nature of the world. Moreover, presentism is ontologically parsimonious: it avoids ontological commitment to the vast range of past and future entities. But, as eternalists have taken pains to point out, presentism requires rich ideological commitments. Most notably, presentism requires primitive WILL and WAS operators that allow us to express truths about the past and future.

The presentism/eternalism debate is a paradigm example of theories with a common subject matter but very different ontological and ideological commitments. Within this debate, a central concern is whether the presentist can match the expressive power the eternalist gains by virtue of her ontological commitments, and whether this can be accomplished without commitment to mysterious or excessive ideology.

My present interest is not in ajudicating the debate between presentists and eternalists, but, rather, to clarify the status of an outlying view: the growing block theory, according to which only past and present entities exist. Specifically, I am interested in explaining why exactly the growing block view seems—and is often claimed to be—obviously inferior to presentism and eternalism. [39]

One account of the failure of the growing block view is that it succumbs to charges of arbitrariness. Specifically, it treats the past and future in very different ways without adequate motivation for this differential treatment. Put differently, if a presentist or eternalist account of the past or future is adequate, there is a reasonable presumption in favour of simply generalizing that account to make sense of the future or the past, but, since the growing block view resists this straightforward generalization, it is undesirable.

This diagnosis of the inadequacy of the growing block view seems mistaken. Although the appeal of a perfectly general account of the past and future is significant, there is nothing arbitrary about the growing block view. There is, after all, a genuine asymmetry in the nature of temporal experience. Notice, for example, that while the growing block view enjoys some support, the shrinking block view, according to which only present and future entities exist, seems plainly absurd. This differential assessment is evidence that there is a principled but not compelling reason to treat the past and future differently. As such, arbitrariness cannot be the proper explanation of why the growing block view is untenable.

I believe the proper explanation of the inadequacy of the growing block view is available only given (KI-Parsimony). To begin, let us suppose that presentism and eternalism are equivalent with respect to (IO-Parsimony) yet differ markedly with respect to (I-Parsimony) and (O-Parsimony). While eternalism requires ontological

[38] The proper formulation of presentism and eternalism is a matter of some disagreement. See, for example, Crisp (2004) and Caplan and Sanson (2010).

[39] I omit discussion of the "moving gap" view, according to which only past and future entities exist, and the present is distinguished from other times by virtue of its nonexistence. I am sincerely hopeful no one will be troubled by this omission.

commitment to both past and future entities, presentism takes on the ideological cost of primitive WAS and WILL operators. Given a quantitative conception of ideological parsimony, the growing block view is therefore equivalent in cost to either presentism or eternalism, since it accepts what we might think of as half the cost of each of presentism and eternalism. So understood, the case against the growing block view must turn on relatively small concerns about the cost of foregoing a purely general account of the past and future. But, if these concerns are indeed this small, the standard assessment of the growing block view is puzzling. Better, then, if a decisive negative assessment of the view is available.

In contrast to the quantitative conception of ideological parsimony, the qualitative conception of parsimony guarantees that the growing block view is more costly than either presentism or eternalism. On the one hand, since the WAS and WILL operators of the presentist are of the same ideological kind, the growing block theorist's commitment to a primitive WILL operator is at least equal to the total ideological cost of presentism. On the other hand, the growing block theorist also takes on the ontological cost of quantifying over past entities and is thereby guaranteed to bear a greater theoretical cost than either presentism. And, while the precise ontological cost of quantifying over past entities depends on one's preferred view of ontological parsimony, once coupled with the ideological expense, the growing block view is also assured to be more costly than eternalism. For this reason, (KI-Parsimony) provides a plausible and intuitive diagnosis of why the growing block view is reasonably dismissed as an alternative to presentism and eternalism. Since (NI-Parsimony) fails to provide a suitable diagnosis of the failure of the growing block theory and (KI-Parsimony) succeeds in this regard, we have reason to prefer the latter to the former.

I turn now to two ideological arguments for prima facie objectionable theses. In considering these arguments, I will show how a quantitative conception of ideological parsimony is an assumption crucial to each.

7 Ideological parsimony and modal realism

Modal realism is, roughly, the thesis that there are plurality of concrete possible worlds, and that modal notions admit of analysis in terms of quantification over these worlds. Lewis (1986) defends modal realism primarily by appeal to ideological parsimony. He holds that the ideological value of reducing modality outweighs the ontological cost of positing a plurality of concrete possible worlds.[40] As Lewis (1986) puts it:

> As the realm of sets is for mathematicians, so logical space is paradise for philosophers. We have only to believe in the vast realm of possibilia, and there we find what we need to advance our endeavours. We find the werewithal to reduce the diversity of notions we must accept as primitive, and thereby to improve the unity and economy of the theory that is our professional concern—total theory, the whole of what we take to be true... Modal realism is fruitful; that gives us good reason to believe that it is true.

[40] On the methodological assumptions crucial to this argument, see Cameron (2007a) and Daly (2008).

Lewis' argument presupposes (I-Parsimony), but, if (I-Parsimony) is interpreted as (KI-Parsimony), the ideological argument for modal realism can be undermined.[41]

Notice, first, that, if (KI-Parsimony) is true, modal realism must provide an analysis of any and all concepts of the same ideological kind as modality.[42] Without a reductive analysis of all concepts of the same ideological kind as modality, at least one such concept must be accepted as a primitive. But, if a commitment to a distinct primitive of the same kind as modality is required, Lewis' intended analysis—the rationale for concrete possible worlds—secures no ideological gain since a single primitive is just as costly as a plurality of primitives. Consequently, (KI-Parsimony) commits Lewis to what we can call the Ambitious Thesis: modal realism must deliver a successful analysis of all concepts of the same ideological kind as modality.

There is strong evidence against the Ambitious Thesis. In particular, there are at least two concepts of the same ideological kind as modality—essence and actuality—that resist reductive analysis within the modal realist framework. I will consider each concept in turn.

According to Fine (1994), neither modal logic nor possible worlds suffice for analyzing the concept of essence. Roughly, Fine presents several counterexamples to the modal view of essence, according to which an individual's essential properties are those properties it has in all worlds in which it exists, admits of counterexamples. Perhaps most notably, Fine claims that, while Socrates bears *being a member of singleton Socrates* in all worlds in which he exists, this property is not plausibly held to be part of Socrates' essence. Fine concludes that essence therefore resists analysis via possible worlds and is properly accepted as a theoretical primitive.[43]

The general consensus is that Fine's case against the modal view is decisive.[44] Let us suppose this assessment is correct. Notice also that essence and modality are plausibly held to be of the same general ideological kind. After all, essence has modal entailments and serves to analyze a broad range of modal notions (e.g., accidental properties and *de re* contingency). So, given (KI-Parsimony) and Fine's argument, we require a primitive concept of essence, which, in turn, ensures that primitive modality is no ideological cost over and above a commitment to primitivism about essence. For this reason, modal realism's reductive analysis of modality delivers no ideological advantage, since we are already required to accept essence as a primitive. In this way, the ideological argument for modal realism collapses, given the inadequacy of the modal view of essence, and the ontological costs of modal realism once again proves prohibitively expensive.

Like essence, actuality is naturally viewed as belonging to the same ideological kind as modality, and, like essence, the modal realist framework fails to provide a

[41] See Bricker (2006) for a defense of modal realism without appeal to theoretical virtues as a source of epistemic reasons.

[42] Here, I take the relevant concept of modality to include at least the operators of modal logic, but I leave open what precisely this concept of modality subsumes.

[43] Fine cites a range of other properties that the modal view errantly deems essential to Socrates: *being distinct from the Eiffel Tower, being such that* $1 + 2 = 3$, and *being such that Plato is essentially human.*

[44] Sider (2011) remarks that "Fine convincingly argues against the standard modal definition of essence." See Correia (2006) for a similar assessment.

satisfactory analysis of its nature. According to Lewis, actuality is an indexical rather than absolute matter, so worlds and their occupants are actual or non-actual only relative to other worlds or individuals. And, while this account handily resolves an epistemic worry regarding how we might know ourselves to be actual rather than merely possible, it precludes a satisfactory view about the plenitude of possible worlds. In particular, there is ample reason to believe that there could have been a world of island universes (i.e., wholly disconnected spacetimes); however, given Lewisian modal realism, worlds are isolated or unified by their spatiotemporal relations.[45] Island universes, which are not spatiotemporally unified, are therefore ruled to be impossible.[46] Assuming, for present purposes, that island universes are indeed possible, the Lewisian view of actuality must therefore be rejected. In its place, the leading alternative is absolutism about actuality, which takes actuality to be an irreducible property, which could be instantiated by a plurality of disconnected spacetimes. (In addition, the standard analysis of modality that proceeds using singular quantifiers must be amended to appeal to irreducibly plural quantifiers over co-actual worlds.) Absolute actuality is therefore required to accommodate the possibility of island universes within the modal realist framework.[47]

Since a serviceable version of modal realism must view actuality as an irreducible, unanalyzable property, it also comes at an ideological cost. Furthermore, it directly undermines the Ambitious Thesis, since modal realism offers no advantage in ideological parsimony over any view that already accepts primitive actuality. As with essence, modal realism's failure to analyze actuality threatens to undermine commitment to a plurality of concrete worlds, given (KI-Parsimony).

Presented with these objections, the most attractive option for Lewis is to deny that modality is of the same ideological kind as essence and actuality. But this line of response is not persuasive and puts pressure on the distinction between quantitative and qualitative ontological parsimony. Furthermore, this distinction is crucial for Lewis's case for modal realism, given that Lewis endorses the parallel thesis, (KO-Parsimony), which is the analogue of (KI-Parsimony). Notice, for example, that one can directly challenge the compatibility of modal realism with (KO-Parsimony) by noting that a plurality of concrete possible worlds will have wildly diverse inhabitants bearing wildly different fundamental properties than the properties of the actual world. Presumably, at least some of these properties will be of a different ideological kind than the properties instantiated by any actual entities. Why, then, does modal realism's commitment to a plurality of worlds not immediately conflict with Lewis' commitment to (KO-Parsimony)? I can think of no suitable response on Lewis' behalf, and therefore it seems that the Ambitious Thesis is false.

(KI-Parsimony) leads to a serious challenge for proponents of the ideological argument for modal realism. Fortunately, almost none of us want to be modal realists, so,

[45] In defense of island universes, see Bricker (1996).

[46] Lewis (1986) holds that the isolation and unification of worlds is determined by either spatiotemporal or what he calls "analogically spatiotemporal relations." See Bricker (1996) for a defense of an extended conception of isolation and unification that appeals to external relations (i.e., relations that fail to supervene upon the intrinsic natures of their relata).

[47] On absolute actuality, see Bricker (2006).

to the extent that (KI-Parsimony) provides us with a powerful and intuitive response to the ideological argument, we have reason to believe (KI-Parsimony) is an epistemic virtue.[48]

8 Ideological parsimony and mereological nihilism

In this section, I argue that (KI-Parsimony) provides a natural response to yet another argument from ideology: Ted Sider's recent defense of mereological nihilism, which holds that there are no mereologically complex objects.[49] Unlike competing views about the nature of mereological composition, nihilism requires a radically revisionary metaphysics of the material world on which there are no macrophysical objects like tables, chairs, or persons.[50] For rather obvious reasons, most are strongly inclined to reject mereological nihilism, despite the apparent force of the ideological considerations adduced in Sider (forthcoming). Sider summarizes his argument from ideology as follows:

> In addition to eliminating composite objects from our ontology, nihilism also allows us to eliminate the extra-logical (or perhaps quasi-logical) notion of 'part' from our ideology, and this kind of ideological simplification is an epistemic improvement. Nihilism is an ideologically simpler theory, and so is more likely to be true... Simplicity is not the only epistemic virtue. Choiceworthy theories must also be compatible with our evidence and predict as much of it as possible. It is only when multiple theories fit the evidence that we turn to simplicity and other epistemic virtues. But this is exactly the situation with nihilism and its competitors, since our best theories of fundamental matters—physics and, I say, mathematics and fundamental metaphysics—have no need for composite objects.[51]

[48] (KI-Parsimony) also has consequences for another modal metaphysical thesis: modalism, according to which there are no possible worlds and modal operators are irreducible primitives required to express modal facts. A powerful objection to modalism holds that the theory is untenable because, in order to match the expressive power of views that quantify over possible worlds, the modalist requires a plurality of distinct, individually indexed actuality operators. For ersatzist actualists, this commitment is taken to either undermine the theory or show it to be a mere notational variant of views that accept abstract possible worlds. But, if (KI-Parsimony) is true, there is good reason to believe that all these actuality operators are of a common kind, so modalism is on equal footing with (and perhaps superior to) standard forms of ersatz actualism, which help themselves to primitive modality as well as abstract entities that play the role of possible worlds.

[49] Strictly speaking, the view Sider defends cannot be stated using mereological vocabulary since Sider rejects commitment to the ideology of mereology. Here, I omit these particular complications. On nihilism, see Dorr and Rosen (2001) and Liggins (2008). Here, I focus my attention on those forms of nihilism, which identify mereological atoms with microphysical objects. See Schaffer (2007) for discussion of monistic mereological nihilism.

[50] Competitors to nihilism include universalism, according to which any objects compose a further object, as well as organicism, according to which only organic objects have proper parts, and brutalism, according to which there is no reductive account of the conditions under which composition occurs. See Rea (1998) for a defense of universalism. See Van Inwagen (1990) for a defense of organicism. See Markosian (1998) for a defense of brutalism.

[51] Sider (forthcoming).

While controversial, Sider's conditional seems plausible enough: if nihilism can be reconciled with our evidence, the standard conception of ideological parsimony supports a commitment to nihilism. And, while most will be inclined to challenge Sider's argument by demonstrating that nihilism is somehow inconsistent with our evidence, I will now show how (KI-Parsimony) provides a powerful response to the ideological argument for nihilism. And, since (KI-Parsimony) undermines the ideological argument for a conclusion most parties take to be implausible, I hold this feature of (KI-Parsimony) to be still further evidence for endorsing a qualitative conception of ideological parsimony.

The (KI-Parsimony)-based response to Sider's argument from ideology proceeds by defending the thesis that composition and identity are of a common ideological kind. Notice, first, that, on the nihilist conception of composition, improper parthood—the lone kind of composition—is just the relation of identity. More generally, composition has a strong claim to being viewed as a broadly logical relation. Like identity, it contributes nothing to the non-structural, qualitative character of the world, and, like identity, facts about its general nature seem to be a non-contingent matter.[52] Furthermore, regardless of whether one endorses nihilism, classical extensional mereology demands certain conceptual ties between these relations. Most notably, the uniqueness of composition precludes distinct entities being composed of the very same objects. In light of these connections, I take it that a plausible conception of ideological kindhood holds identity and composition to be of a common ideological kind.[53]

If identity and composition are of a common ontological kind, there is no ideological benefit to eliminating composition without also dispensing with an ideological commitment to identity (or, alternatively, distinctness). But, since any theory that does without a primitive commitment to identity will be manifestly implausible, we cannot improve the ideological credentials of a theory by eliminating only composition.[54] For this reason, (KI-Parsimony) affords opponents of nihilism a natural strategy for resisting Sider's ideological argument.

While it undermines Sider's ideological argument, (KI-Parsimony) also presents us with a novel interpretation of the familiar slogan that "composition is identity."[55] Understood in the present context, this slogan asserts that composition and identity are of the same ideological kind, and, as a consequence, composition is no theoretical cost over and above the cost of admitting identity into one's preferred theories. Although this is far from the sense in which composition is sometimes alleged to be identity, it is noteworthy that a qualitative conception of ideological parsimony allows us to illuminate the conceptual connections between these basic structural relations. And, while familiar interpretations of composition as identity focus on the relation between composites and their parts, the present interpretation focuses instead on the relation between the relations of composition and identity and, given careful atten-

[52] For a dissenting opinion, see Cameron (2007b).

[53] On the topic-neutral nature of mereology, see Lewis (1991, pp. 72–87).

[54] Defenders of the Principle of the Identity of Indiscernibles might lay claim to an analysis of identity, but, while individual identity may admit of analysis in terms of shared properties, this merely pushes the bump in the rug, since an analysis of property identity is still required.

[55] For discussion of various interpretations of "composition as identity," see Cotnoir (forthcoming).

tion to questions of ideological parsimony, indicates another direction in which the connections between these relations are metaphysically significant.

9 Conclusion

Parsimony takes many forms. I have argued that, given the distinction between ontology and ideology and the distinction between quantity and quality, we ought to endorse a particular version of ideological parsimony. In particular, I have defended the view that qualitative identical parsimony, which values minimizing the number of kinds of primitive ideology within a theory, is an epistemic virtue I have offered some considerations for preferring this qualitative conception of ideological parsimony in lieu of, or perhaps addition to, quantitative conception of ideological parsimony.

My defense of qualitative ideological parsimony turns on its consequences rather than any kind of putative a priori connection it might bear to the nature of truth. I have argued that it provides a general strategy for avoiding arbitrary theoretical decisions and dispensing with insubstantial metaphysical debates. I have also shown that a commitment to the qualitative conception of ideological parsimony explains the untenability of the moving block view, and, perhaps more significantly, provides a powerful response to arguments from ideology that, when (NI-Parsimony) is assumed, lead to implausible metaphysical conclusions. Since these conclusions are widely resisted, the fact that the qualitative conception of ideological parsimony buttresses our defense against these conclusions provides evidence that it is a genuine epistemic virtue and a licit interpretation of (Parsimony).

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