

Nominalist Realism*

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Abstract

This paper explores the impact of quantification into predicate position on the metaphysics of properties, arguing that two familiar debates about properties are fundamentally altered by recasting them in a second-order setting. Two theories of properties are outlined, differing over whether the existence of properties is expressed using first-order or second-order quantifiers. It is argued that the second-order theory: (a) provides good reason to regard debate about the locations of properties as contentless; (b) resolves debate about whether properties are particulars or universals in favour of universals.

1 Introduction

Much contemporary metaphysics proceeds under the Quinean assumption—sometimes explicit, sometimes implicit—that non-substitutional quantification is always first-order quantification: non-substitutional quantifiers only bind variables that occupy singular term position. Yet many philosophers of logic and language are willing to countenance non-substitutional quantifiers binding variables in the positions of, e.g., plural terms, predicates, and sentences.¹ How, if at all, does this more liberal outlook affect traditional metaphysical debates? This paper explores the impact of quantification into predicate position on the metaphysics of properties, arguing that some familiar debates about properties are fundamentally altered by recasting them in a second-order setting.

Central to the metaphysics of properties is the question: what is it for properties to exist? I present one answer in §2 and another in §3. These answers differ over whether first- or second-order quantifiers are used to express the existence of properties. This difference turns out to be significant: the second-order approach undermines two familiar

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¹ On plurals: (Boolos, 1984), (Oliver and Smiley, 2013). On predicate quantification: (Prior, 1971, ch3), (Boolos, 1985), (Rayo and Yablo, 2001), (Williamson, 2003), (Wright, 2007). On sentential quantification: (Prior, 1971, ch3), (Künne, 2003, ch6.2), (Rumfitt, 2014).

debates about the nature of properties, though in somewhat different ways. §4 argues that the second-order conception provides good reason to reject debate about the locations of properties as contentless. And §5 argues that the second-order conception resolves debate about tropes and universals in favour of universals. §6 concludes.

Two caveats before I begin.

Firstly, the paper is intended in an exploratory spirit. Responses will be available to several of my arguments. I'll try to indicate where these lie and why I find them unattractive, but won't pretend that these considerations are utterly decisive. My primary goal is not so much to settle the issues as to show how a higher-order conception of properties reshapes the well-trodden landscape of metaphysical debate. Definitive mapping of the new terrain outstrips a single paper.

Secondly, I will not address every theoretical task to which properties have been put. The question of whether we should believe that properties exist is the question of what theoretical work they can do, of how else it can be done, and of the relative costs and benefits of the various options. The higher-order conception of properties outlined below may not be capable of doing everything that has been used to motivate the existence of properties. The question is: which such motivations can it accommodate, which are worth accommodating, and how else can they be accommodated? That must await another occasion (though §3.2 briefly discusses one such motivation). Even if the higher-order approach cannot ultimately be sustained, we will have learned something important about those debates it undermines by seeing why that is so: they arise because of such-and-such specific theoretical demands, rather than being forced upon us at the outset.

2 First-order realism

Realists believe that properties exist, whereas *nominalists* believe that they don't. What exactly does the existence of properties amount to? Much of the literature comprises disputes between competing views about the nature of properties: are they, e.g., tropes, universals, extensions, intensions, Fregean concepts, or predicates?² None of these theories answers our question; for we want to know what these competing theories are theories of. We want to abstract away from specific views about the nature of properties to uncover the core realist commitment, which different realisms embellish in different ways.

As I see it, the central plank of traditional forms of realism is an existentially loaded conception of (at least some) predication.³ These views take the truth of a predication '*Fa*' to require the existence of more than just the object denoted by the singular term '*a*': constituents of reality corresponding to predicates are also required. This section and the next present two precisifications of this core realist commitment. They diverge over the use of first- or second-order quantification to capture the existentially loaded nature of predicates.

First-order realism is the thesis that, for a certain range of substitutions of predicates

² (Armstrong, 1989) provides an overview.

³ That's what's at issue in, e.g., (Quine, 1948, pp29–38), (Armstrong, 1978), (Devitt, 1980), (Armstrong, 1980a), and (van Cleve, 1994).

for ‘ Φ ’, the instances of this schema are true:⁴

Exist 1: $\Box \forall x_1, \dots, x_n \left(\Phi(x_1, \dots, x_n) \rightarrow \right.$
 $\left. \exists y (I(x_1, \dots, x_n, y) \wedge \Box \forall z_1, \dots, z_n (I(z_1, \dots, z_n, y) \rightarrow \Phi(z_1, \dots, z_n))) \right)$.

‘ T ’ regiment the variably polyadic predicate ‘__instantiate(s)__', the key expression of first-order realist ideology.⁵ So one instance of the schema (for $n = 1$) says: necessarily, each red object instantiates something, and, necessarily, only red objects instantiate that thing. And another instance (for $n = 2$) says: necessarily, whenever one object’s above another, there’s something they instantiate; and, necessarily, a pair of objects instantiate that thing only if the first is above the second.

First-order realism is one way of precisely articulating the connection between predication and existence at the heart of all forms of realism. Different forms of realism are obtained by supplementing first-order realism in different ways. For example, theories of universals strengthen the second embedded material conditional ‘ \rightarrow ’ in instances of **Exist 1** to a biconditional. I’ve formulated **Exist 1** with a conditional in order to ensure consistency with trope theory. I discuss tropes and universals further in §5. In the meantime, three comments on first-order realism follow, by way of elaboration.

First comment. The quantifiers in **Exist 1** are *first-order*: they bind variables that occupy singular term position.⁶ Moreover, these quantifiers are unrestricted: they range over the entire supply of potential referents for singular terms, and no further. Unrestricted readings of the quantifiers in all displayed principles are intended throughout. I use ‘object’ for anything in the range of unrestricted first-order quantification; that is, for any potential referent of a singular term. A singular term could denote it iff an unrestricted first-order quantifier ranges over it iff it’s an object. Note that this is merely a terminological stipulation, designed to facilitate discussion and forestall confusion, not a substantive thesis about the nature of objecthood.⁷

Second comment. First-order realism’s properties are the witnesses for the existential quantifiers in instances of **Exist 1**. For example, a ’s property of *being F* is whatever witnesses the existential quantifier in:

$$\Box \left(Fa \rightarrow \exists y (I(a, y) \wedge \Box \forall z (I(z, y) \rightarrow Fz)) \right)$$

Similarly, a and b ’s relation of *being R* is whatever witnesses the existential quantifier in:

$$\Box \left(R(a, b) \rightarrow \exists y (I(a, b, y) \wedge \Box \forall z_1, z_2 (I(z_1, z_2, y) \rightarrow R(z_1, z_2))) \right)$$

⁴ To aid readability, I omit all but the first of a block of variable-binding operators. The official, unabridged, version of the schema thus begins: ‘ $\Box \forall x_1 \forall x_2 \forall x_3 \dots \forall x_n$ ’.

⁵ Different realists pronounce ‘ T ’ differently, or identify it with different pre-existing ideology, e.g.: ‘__has __’, ‘__exemplifies __’, ‘__possesses __’, ‘__falls under __’, ‘__is a member of __’, ‘__is a member of the actual extension of __’, ‘__is a way that __ is’.

⁶ For simplicity, I ignore: (a) quantifiers binding variables in singular term position but which aren’t definable in first-order logic, e.g., ‘there are exactly $\aleph_1 x$ such that’ and ‘most x such that...are such that’; (b) non-singular quantifiers binding variables in term position, e.g., ‘some x s are such that’.

⁷ See Hale (2013, ch1) for a similar conception of objecthood, though he takes it as a substantive matter with non-trivial metaphysical consequences.

The idea is as follows. We begin with a relatively uncontroversial body of observation and theory, which nominalists and realists both accept.⁸ First-order realists supplement this with **Exist 1**, thereby generating novel existential commitments. The properties are whatever entities to whose existence first-order realists are thereby committed. Nominalists reject **Exist 1**, and the existence of properties along with it.

Of course, matters are more complex than this. It may be possible to characterise, using only materials on which all parties agree, an interpretation for ‘ \mathcal{T} ’ that verifies the instances of **Exist 1**. That would yield a reductive analysis of properties, thereby refuting the letter of nominalism—at least, as I’m using the term—without nominalistically unacceptable existential commitment; that is, without existential commitments beyond those of the nominalist’s and realist’s shared stock of background beliefs. The lesson is that the existence of properties should be controversial only relative to (a) a specification of their theoretical role, which enriches **Exist 1** and constrains the interpretation of ‘ \mathcal{T} ’, and (b) a background view of reality. The more demanding the theoretical role and the less liberal the view of reality, the more controversial first-order realism will be. I’ll assume for simplicity that no reductive analysis of properties is available.

Third comment. Different versions of first-order realism will countenance different substitution instances of **Exist 1**. On abundant views, all or most predicates have corresponding properties. On sparser views, only some predicates have corresponding properties, typically those that play a privileged role in the natural sciences.⁹ We needn’t decide between these views here.

My presentation of first-order realism is now complete. First-order realists use quantification into singular term position and an instantiation predicate to achieve various theoretical goals. As I said in the Introduction, I won’t discuss those goals here. A glance at the literature suggests that realists are typically (best interpreted as) first-order realists; for they either explicitly use first-order quantification to formulate their view, or engage in debates—e.g. about instantiation (§3.1), or about property-location (§4), or about tropes and universals (§5)—that make little sense, or proceed quite differently, under the second-order view outlined in the next section.

3 Second-order realism

First-order quantifiers bind variables standing in singular term position. *Second-order* quantifiers bind variables standing in predicate position. This section presents a view that differs from first-order realism by using second-order quantification to articulate the existentially loaded nature of predication. §3.1 presents the view. §3.2 outlines the interpretation of second-order quantification on which it rests. And §3.3 argues that it warrants the label ‘realism’.

⁸ This is an idealisation. Particular nominalists and realists will often disagree about all sorts of things. Yet there remains much neutral territory within which their views about properties don’t require disagreement.

⁹ (Armstrong, 1980b) defends sparsity. (Lewis, 1983) discusses sparsity and abundance.

3.1 Second-order realism introduced

Second-order realism is the thesis that, for a certain range of substitutions of predicates for ‘ Φ ’, the instances of this schema are true:

Exist 2: $\Box \forall x_1, \dots, x_n \left(\Phi(x_1, \dots, x_n) \rightarrow \right.$
 $\left. \exists Y \left(Y(x_1, \dots, x_n) \wedge \Box \forall z_1, \dots, z_n \left(Y(z_1, \dots, z_n) \rightarrow \Phi(z_1, \dots, z_n) \right) \right) \right)$.

First- and second-order realism are different ways of precisely articulating an existentially loaded conception of predication. First-order realism uses first-order existential quantification and an instantiation predicate in the instances of **Exist 1** to capture the existential commitments of predicates. Second-order realism uses second-order existential quantification in the instances of **Exist 2** instead. Because second-order variables occupy predicate position, second-order realism needs no instantiation predicate to connect objects that satisfy ‘ F ’ with that predicate’s (second-order) existential commitments; ordinary predication, which is required by all forms of realism, will do instead.

As with first-order realism, second-order realism’s core commitment to the instances of **Exist 2** might be embellished in various ways. I discuss one in §4 and another in §5. The rest of this subsection makes an initial case in favour of second-order realism. It’s worth noting that first- and second-order realism aren’t incompatible, though for simplicity I’ll write as if second-order realists reject (non-reductive) first-order realism.

Second-order realism should be relatively uncontroversial. To see why, consider the second-order rule of existential generalisation:

EG2: From A , one may infer $\lceil \exists X A^{[X/\Phi]} \rceil$, where $A^{[X/\Phi]}$ results from A by replacing (zero or more) occurrences of the predicate Φ with ‘ X ’ (and (a) Φ is free for ‘ X ’ in A , and (b) Φ and ‘ X ’ are of the same degree).

EG2 is widely accepted amongst advocates of second-order quantification,¹⁰ and rightly so. Second-order existential generalisation must surely satisfy some such principle if it is to count as a genuine existential quantification. I shall therefore assume that **EG2** is valid, and leave it to those who would reject the below argument for second-order realism to state their preferred alternative.¹¹

Now, this is uncontroversially true:

$$\Box \forall x \left(Fx \rightarrow \left(Fx \wedge \Box \forall z (Fz \rightarrow Fz) \right) \right)$$

¹⁰ Two examples: (Shapiro, 1991, p66) and (Hale, 2013, p180) (though Shapiro employs the equivalent principle for universal quantification formulated in a non-modal language).

¹¹ One complication is that standard principles for quantification, identity, and modal operators allow one to prove, as a theorem, that, necessarily, everything necessarily exists. That might be taken to cast doubt on **EG2**’s validity in modal contexts. The issues are too complex to examine properly here. I note only that rejection of **EG2** is not the only potential response to this problem, and that even restricted versions will tend to validate the argument in the text. For if ‘ $Fx \wedge \Box \forall z (Fz \rightarrow Fz)$ ’ is true at a world w (relative to some assignment α), it’s true at w (relative to α) under the intended interpretation assigning the correct interpretation to ‘ F ’. That interpretation of ‘ F ’ then witnesses ‘ $\exists Y (Yx \wedge \Box \forall z (Yz \rightarrow Fz))$ ’ at w (relative to α); for if the correct interpretation of ‘ F ’ didn’t exist at w , ‘ $F(x)$ ’ wouldn’t be true at w (relative to α). (Wiggins, 2003) and (Williamson, 2013) discuss the interaction between classical quantification theory and contingent existence in more detail.

Orthodox reasoning with quantifiers, modal vocabulary, and **EG2**, licenses inference from that to:

$$\Box \forall x \left(Fx \rightarrow \exists Y (Yx \wedge \Box \forall z (Yz \rightarrow Fz)) \right)$$

That follows straightforwardly from an uncontroversial truth, given the validity of **EG2**. Since F was arbitrary, each monadic instance of **Exist 2** should be uncontroversial too, given **EG2**. Likewise for the polyadic case. Whereas first-order realists use the existential commitments of controversial metaphysical theses—i.e. the instances of **Exist 1**—to achieve various theoretical goals, second-order realists employ only principles that should be relatively uncontroversial. The only controversies should concern the intelligibility of second-order quantification and the principles governing it, not the existential commitments of second-order realism; for once the intelligibility of second-order quantification and validity of **EG2** are admitted, the characteristic existential claims of second-order realism follow from uncontroversial truths.

First-order realists shouldn't respond to this argument by rejecting second-order quantification as unintelligible; for first-order realists need second-order quantification to capture their view's intended content. As stated, **Exist 1** is schematic; its instances entail the existence only of properties corresponding to predicates of some particular language. First-order realists typically don't regard properties as restricted by expressibility in the language we presently speak, or even in any language that beings broadly like ourselves could possibly speak. The existence of properties is supposed to be an objective matter that may outrun our linguistic and epistemic capacities. Undiscoverable properties may thus correspond to predicational truths that beings like ourselves cannot possibly express. It is therefore not guaranteed that any possible collection of instances of **Exist 1** will capture first-order realism's intended content. The natural solution is to generalise over all predicational aspects of reality, as in this modification of (the monadic form of) **Exist 1**:¹²

$$\Box \forall X, x \left(Xx \rightarrow \exists y (I(x, y) \wedge \Box \forall z (I(z, y) \rightarrow Xz)) \right)$$

This, rather than any possible collection of instances of a schema such as **Exist 1**, is what the first-order realist intends, or at least should intend. First-order realists therefore cannot consistently deny the intelligibility of the alternative second-order position.

Because each instance of **Exist 2** should be uncontroversial, second-order realism most naturally delivers an abundant view on which each predicate determines a property.¹³ This contrasts with first-order realism. Each instance of **Exist 1** is independent of standard principles of first-order (and second-order) logic. So there is no parallel broadly logical motivation for abundant first-order realism, or even for first-order realism at all. A

¹² Sparse first-order realists will want: $\Box \forall X (\text{NATURAL}(X) \rightarrow \forall x (Xx \rightarrow \exists y (I(x, y) \wedge \Box \forall z (I(z, y) \rightarrow Xz))))$.

¹³ Note, however, that second-order realism alone cannot force a conception of properties so abundant that there's one for each set of objects. The reason is that each theory satisfiable when the second-order quantifiers have an infinite domain is satisfiable when they have a denumerably infinite domain; yet there are non-denumerably many sets. Nothing expressible in the language of second-order logic can rule out the Henkin semantics behind this result in favour of an alternative semantics that blocks it, e.g., the standard semantics on which second-order quantifiers always range over the full powerset of the first-order domain. See (Shapiro, 1991, chs3–4, esp. Theorem 4.18). Thanks to Salvatore Florio for assistance here.

sparse approach can, however, be simulated within second-order realism by adapting a technique from David Lewis.¹⁴ On Lewis's abundant view, every set is a property. He invokes a primitive predicate of sets to simulate a sparser theory: not all sets/properties are perfectly natural. The second-order realist can adopt a similar restriction, expressed by a second-level predicate ' \mathcal{N} ' that combines with first-level predicates of arbitrary degree to form sentences. *Sparse second-order realism* is the thesis that, for a certain range of substitutions of privileged predicates for ' Φ '—presumably the primitive predicates of some natural science—the instances of this schema are true:

$$\text{Sparse Exist 2: } \Box \forall x_1, \dots, x_n \left(\Phi(x_1, \dots, x_n) \rightarrow \right. \\ \left. \exists Y(\mathcal{N}(Y) \wedge Y(x_1, \dots, x_n) \wedge \Box \forall z_1, \dots, z_n (Y(z_1, \dots, z_n) \rightarrow \Phi(z_1, \dots, z_n))) \right).$$

Note that, absent independent account of ' \mathcal{N} '—independent of the proposed instances of **Sparse Exist 2**—the instances of **Sparse Exist 2** should be no more controversial than those of **Exist 2**.

3.2 A merely notational distinction?

Is the distinction between first- and second-order realism a substantive distinction? Or are these merely syntactically different ways of saying the same thing? Well, it depends what second-order quantifiers mean. There isn't space to investigate that properly here. Instead, I assume without argument a popular and attractive conception of second-order quantification. Central to this view is a fundamental semantic distinction between first- and second-order quantification. The best arguments for this distinction use variants of Russell's Paradox and Cantor's Powerclass Theorem to undermine the idea that the range of unrestricted first-order quantification includes that of second-order quantification. Rather than rehearse those arguments here, however, I simply take the view for granted.¹⁵ My primary concern is with second-order realism's impact on the metaphysics of properties, given this conception of second-order quantification. The view is as follows.

Second-order quantification is a perfectly legitimate and intelligible form of genuine (non-substitutional) quantification that cannot be understood or explicated in first-order terms. It is neither a disguised form of first-order quantification, nor quantification over a special kind of object in the range of unrestricted first-order quantification or to which singular terms may refer. Instead, second-order quantification is a *sui generis* form of quantification that must be understood in its own terms or not at all. Adequate accounts of what second-order quantifiers range over must be given directly in second-order terms, just as accounts of what first-order quantifiers range over are given in first-order terms. There is thus a fundamental semantical distinction between these two orders of quantification: first- and second-order quantified sentences express fundamentally different kinds of quantificational truth-conditions. The familiar classification of quantifiers into the substitutional

¹⁴ (Lewis, 1983)

¹⁵ On the Russellian and Cantorian arguments, see (Williamson, 2003, §9), (Rayo and Williamson, 2003, §1), (Linnebo, 2006), and (Linnebo and Rayo, 2012). For more general discussion of the view's philosophical underpinnings, see Prior (1971, ch3), Rayo and Yablo (2001), Wright (2007), MacBride (2008, §19.2.2), and Williamson (2013, pp254–261).

and the objectual is therefore not exhaustive; for second-order quantification is neither substitutional nor objectual (since the objects constitute the range of unrestricted first-order quantification). Second-order quantifiers are both genuinely (non-substitutionally) quantificational and yet irreducibly second-order.

This semantic distinction is essential to second-order realism's import. Suppose second-order quantifiers range over objects that first-order quantifiers can range over. Then the truth-conditions of second-order quantified sentences are expressible in first-order terms. This renders **Exist 2**'s instances semantically equivalent to instances of **Exist 1**, differing only over whether the instantiation predicate is made explicit.¹⁶ The distinction between these forms of realism becomes merely notational, undermining my arguments in §§4–5. For example, §4's argument requires that certain expressions have argument positions that meaningfully accept first- but not second-order variables. That restriction could be circumvented by replacing second-order quantifiers with first-order quantifiers with the same domain. Only the present semantic distinction can prevent that.

On this interpretation of second-order quantification, second-order realism cannot accommodate a prominent motivation for realism. Since first-order quantifiers can range over any potential referent of a singular term, second-order realism cannot supply referents for apparent natural language singular terms for properties like 'justice'. How problematic is that? As I said in the Introduction, I want to bracket such questions about what theoretical work a given conception of properties can do. I want to focus instead on exploring a novel and potentially fruitful view. I therefore leave it to the reader to decide how serious a cost this is. Personally, however, I am yet to be convinced either that (i) such expressions are really singular terms,¹⁷ or (ii) even if they are singular terms, they really do refer.

Relatedly, one might be concerned that second-order realism suffers from a version of Frege's notorious concept *horse* problem, on this interpretation of second-order quantification.¹⁸ How are we to specify the referents of predicates, if second-order quantifiers don't range over objects to which singular terms may in principle refer?

I cannot address this deep and difficult problem properly here.¹⁹ Note, however, that second-order realism alone does not generate the problem. The problem is about specifying the referents of predicates. But second-order realism does not say that predicates refer. Second-order realism is a thesis about the relationship between predication and existential generalisation, which uses second-order quantification to capture the existential import of predicates. A given predicate's existential import is expressed by an instantiation of the second-order existential quantifier in the appropriate instance of **Exist 2**. That instantiation replaces the bound second-order variable with a predicate. So the existential import of predicates can be expressed without using singular terms for properties or predicate referents. The concept *horse* problem therefore does not arise.

¹⁶ For example, the following instance (i) of **Exist 1** expresses the truth-condition of the corresponding instance (ii) of **Exist 2**: (i) $\Box\forall x(F(x) \rightarrow \exists y(I(x,y) \wedge \Box\forall z(I(z,y) \rightarrow F(z)))$; (ii) $\Box\forall x(F(x) \rightarrow \exists Y(Y(x) \wedge \Box\forall z(Y(z) \rightarrow F(z)))$.

¹⁷ A helpful discussion of the relevant issues here is (Butt, 2011, §§2.3–2.4).

¹⁸ Frege (1892). For discussion, see Dummett (1973, ch7) Wright (1998), MacBride (2008, §19.2), Hale and Wright (2012), and Hale (2013, ch1).

¹⁹ Dummett (1973, pp211–218), Jones (2016), and Trueman (2016) discuss the problem in the present kind of setting.

3.3 A form of realism?

With second-order realism and my preferred interpretation of second-order quantification now in place, two related doubts might arise. Is second-order realism really a form of realism? Does it really entail the existence of properties? This subsection argues for positive answers to both questions.

As I said in §2, the core of traditional forms of realism is an existentially loaded conception of predication, on which the truth of ‘ Fa ’ requires the existence of more than just the object denoted by ‘ a ’: predicates bring their own distinctive existential commitments. First- and second-order realism share this conception of predication. Under first-order realism, this instance of **Exist 1** captures ‘ F ’s existentially loaded nature:

$$\Box\forall x\left(Fx \rightarrow \exists y(I(x, y) \wedge \Box\forall z(I(y, z) \rightarrow Fz))\right)$$

Under second-order realism, this parallel instance of **Exist 2** captures ‘ F ’s existentially loaded nature:

$$\Box\forall x\left(Fx \rightarrow \exists Y(Yx \wedge \Box\forall z(Yz \rightarrow Fz))\right)$$

Both forms of realism thus see true predications as requiring the existence of more than just the objects denoted by their constituent singular terms. They differ only over the use of first- or second-order quantifiers to express these existential commitments of predicates (and the need for an instantiation predicate). So second-order realism is indeed a form of realism. **Exist 1** and **Exist 2** provide different ways of precisely articulating exactly what the existentially loaded nature of predication amounts to.

This argument presupposes that second-order formulae like

$$\exists Y(Ya \wedge \Box\forall z(Yz \rightarrow Fz))$$

express existence claims. One might respond by denying that they do. Perhaps only first-order quantification expresses existence,²⁰ and so second-order quantification doesn’t really bring “ontological commitment”, in Quine’s (in)famous phrase. This view severs the connection between second-order existential quantification and existence, and with it the route from second-order realism to an existentially loaded conception of predication. Second-order realism then becomes a misnamed form of nominalism. Hence this paper’s title.

Should we regard only first-order quantification as expressing existence? I know of no compelling reason to do so.²¹

The best reason I can find is that the English word ‘exists’ does not permit second-order usage. We can say that particular objects exist, e.g.: ‘ A exists’. We can also say that objects

²⁰ More carefully: perhaps non-first-order quantification expresses existence only if interpreted as first-order quantification over a special range of objects. So second-order quantifiers express existence only if second-order realism reduces to first-order realism because instances of **Exist 2** are notational variants on instances of **Exist 1**. Following §3.2, however, first- and second-order quantified sentences express irreducibly different quantificational truth-conditions.

²¹ For related discussion and defence of a similar view about higher-order ontological commitment, focussing on the plural rather than second-order case, see (Florio and Linnebo, 2015).

of particular kinds exist, e.g.: ‘cookies exist’. Both uses can be captured with first-order quantification, e.g.: ‘ $\exists x(x = \text{Al})$ ’, ‘ $\exists x(x \text{ is a cookie})$ ’. But we cannot, in English, attribute existence to the predicational aspects of reality generalised by second-order sentences like ‘ $\exists X(X(\text{Al}))$ ’. Strings like ‘is a cookie exists’ are not grammatical English. The point is not that second-order quantification isn’t expressible in English. The point is that even if second-order quantification is expressible in English, it doesn’t use the word ‘exists’. So we speakers of English should not regard the contents of second-order quantified sentences as concerning existence.

The problem with this argument is its linguistic focus. It shows, at most, that the English word ‘exists’ can’t be used to express second-order existential generalisation. It remains open that ‘exists’ expresses only the first-order restriction of the background fundamental notion: existential generalisation.²² If so, it would be more perspicuous to identify existence with the more general and fundamental notion of which ‘exists’ expresses a restriction. On this view, the fully general notion of existence goes with existential quantification regardless of order, and regardless of expressibility with the English ‘exists’.

This issue appears merely verbal. First- and second-order quantifiers both express kinds of generalisation. The question is whether they both express existence too. What turns on this issue? Why not regard both views as equally acceptable precisifications of our ordinary notion of existence? I see no reason not to do so. One precisification stays closer to ordinary usage, restricting ‘existence’ to the first-order. The other precisification expands ordinary usage to track the more general and fundamental underlying notion.²³ Both precisifications are equally legitimate. Dispute about which is correct is no more substantive than dispute about whether uses of ‘mass’ prior to the discovery of special relativity express relativistic mass or proper mass.²⁴ Prior usage didn’t distinguish between two interpretations which we now see come apart. As a result, a semantic decision must now be made, with neither choice ruled out by earlier usage as incorrect. There is thus a perfectly legitimate sense in which all orders of existential quantification express existence.²⁵ On this precisification of our ordinary notion of existence, second-order realism is indeed a form of realism because the second-order quantifiers in *Exist 2*’s instances enforce an existentially loaded conception of predication.

So, second-order realism does indeed involve distinctive commitment about the relationship between predication and existence. But is that commitment really to properties? It might appear not. Like ‘object’, ‘thing’, ‘entity’, and ‘individual’, the English word ‘property’ is a nominal expression. It’s most naturally regimented as a predicate whose argument

²² Although convenient, this probably isn’t quite the right way to put it. One can analyse English ‘exists’-sentences using first-order existential quantification without being committed to ‘exists’ expressing such quantification. It follows only that certain first-order quantified sentences express what English ‘exists’-sentences express. The point in the text is then that even if no second-order quantified sentence expresses what any English ‘exists’-sentence expresses, it remains open that English ‘exists’-sentences express only the first-order restriction of the fundamental background notion of what’s expressed by existentially generalised sentences regardless of order.

²³ Jones (2016, §5.3) discusses a problem with this notion, and some potential solutions.

²⁴ See Field (1973) for discussion.

²⁵ More strongly: we should reject the ordinary notion of existence as lacking distinctive theoretical import because: (i) our ordinary word ‘exists’ can be precisified in two equally good ways; and (ii) both precisifications mark distinctions already marked in other, less emotive and loaded, ways.

position is reserved for singular terms and first-order variables. So ‘ $\exists X(X \text{ is a property})$ ’ isn’t a well-formed bearer of truth-conditions. Since the second-order realist’s characteristic existential claims involve second-order quantifiers, she therefore cannot even say that there are properties. Two complementary responses are available.

First response: the nominal character of ‘property’ is a defect of (philosophical) English, which makes ‘property’ unsuited to express what it’s intended to express.²⁶ What’s needed is a higher-order analogue ‘PROPERTY²()’ of ‘property’ whose argument position accepts predicates and second-order variables. Second-order realists can use this expression to truthfully say that properties exist: $\exists X(\text{PROPERTY}^2(X))$.

Second response: similarities between first- and second-order realism’s characteristic existential claims warrant thinking of both as involving the existence of properties. Those characteristic claims are the instances of **Exist 1** and **Exist 2**. The only differences are: (a) **Exist 2** has a second-order quantifier where **Exist 1** has a first-order quantifier; (b) **Exist 1** but not **Exist 2** contains an instantiation predicate. Both views thus impose structurally similar constraints on the relationship between predication and existence. In light of these similarities, and absent an alternative account of what the existence of properties involves, first- and second-order realism should be seen as different precise articulations of the same informal idea at the heart of traditional realism, namely that predicates are a source of existential commitment. The existential consequences of second-order realism are rightly seen as involving the existence of properties.

4 Immanence and transcendence

Two versions of realism are now in place, differing over whether the existence of properties is expressed in first- or second-order terms. This section and the next examine two debates about properties from a second-order realist perspective. In the context of first-order realism, the prospects for resolution are dim. We’ll see, however, that second-order realism dissolves one and resolves the other.

Our first debate is between immanent and transcendent conceptions of properties:

Immanence: All properties are spatially located.

Transcendence: No properties are spatially located; despite being instantiated by located things, properties aren’t themselves located.

This section argues that second-order realism allows us to dissolve this debate.

4.1 Problems for Immanence and Transcendence

Immanence and **Transcendence** present realists with a dilemma. Neither thesis is attractive. Yet the only apparent alternative—some but not all properties are located—inherits the problems of each.²⁷ This section introduces these problems. I don’t claim that they’re

²⁶ This was Frege’s (1892, pp185, 192) view of his word ‘concept’ for the referents of predicates. Dummett (1973, pp211-218), Jones (2016), and Trueman (2016) develop this idea.

²⁷ Exception: the second problem for **Immanence** below.

irresolvable. I claim only that they render both **Immanence** and **Transcendence** *prima facie* unattractive. Sensible realists should try to avoid having to address them. The next subsection argues that second-order realism provides a well motivated way of doing so.

Defenders of **Immanence** must say where properties are located. The most plausible answer is: a property is exactly located—i.e. it fills and fits within—wherever its bearers are exactly located. Three problems now arise:

- According to theories of universals, the property of *being F* is instantiated by exactly the *Fs*. When many spatially separated things can simultaneously be *F*, as is typically the case, *being F* is multiply exactly located. Surely that's impossible. Surely nothing can fill and fit within many disjoint regions at a time.
- Granted that properties are located only where their bearers are located, **Immanence** implies: there are no uninstantiated properties. But such properties are arguably needed by the truth of statements of natural law. The existence of *being 10kg in mass* may be required by the truth of statements of the laws governing mass, and its relationship to other physical quantities, regardless of whether it's ever instantiated. Relatedly, the representation theorems that underwrite numerical measurement of a physical quantity impose structural constraints on the quantity's determinates.²⁸ Those constraints may fail if the instantiated determinates exhibit insufficient variety, and instantiation is necessary for existence, as **Immanence** implies.
- Where are relations located? Maybe they're co-located with each of their relata, and hence typically bi-located. Or with the fusion of their relata, and hence typically scattered. Or somewhere between their relata. Although none of these answers looks attractive, no more attractive alternative is forthcoming.²⁹

Maybe solutions to these problems are available. Yet they do provide *prima facie* powerful reasons to find **Immanence** unattractive.

Unfortunately for realists, **Transcendence** is also problematic:

- It is mysterious how the non-spatial could constrain, govern or explain the behaviour of the spatial, as transcendent realists often claim.
- Many regard the non-spatial as intrinsically objectionable or mysterious. Many others regard it as incompatible with a broadly naturalistic world-view.

²⁸ (Krantz et al., 1971) and (Suppes, 2002, ch3) discuss representation theorems and measurement.

²⁹ A referee offers this interesting suggestion: dyadic relations are located at the ordered pairs of their relata's locations. Using '*L*' to regiment the dyadic location predicate: if relation *r* holds from *a* to *b*, then $L(r, \langle l_a, l_b \rangle)$ (where l_x is the location of *x*). As standardly construed, however, ordered pairs and other mathematical objects lack location. So this suggestion appears to entail that relation-locations aren't in space or time. A related proposal modifies the logical form of attributions of location to relations by increasing the location predicate's argument positions. Just as the instantiation predicate's degree varies as the relation's degree varies, so does the location predicate's on this view. More precisely: if *n*-adic relation *r* holds amongst a_1, \dots, a_n (in that order), then $L(r, l_{a_1}, \dots, l_{a_n})$ (where '*L*' is *n* + 1-*adic* rather than dyadic as on the previous proposal). Two problems arise. (i) The resulting panoply of multigrade relation predicates is a significant ideological cost. (ii) It is unclear what it means to be located at, e.g., Oxford, London, and how that differs from simply being multi-located. Perhaps these problems can be overcome. But they are *prima facie* reasons to look elsewhere.

Again, solutions may be available. Yet these problems are *prima facie* powerful reasons to find **Transcendence** unattractive.

Debate about **Immanence** and **Transcendence** shows no sign of admitting stable resolution. The difficulties facing both theses combine into a powerful argument for nominalism. Yet it's hard to escape the feeling that realists needn't have been forced down this path. However strong arguments for the existence of properties may be, they surely shouldn't require realists to take a stand on **Immanence** and **Transcendence**. But it is not clear how to avoid them; for given that properties exist, each property is surely either located or not. Or are they? The next subsection argues that second-order realists can bypass this problem.

4.2 A second-order (dis)solution

In order to have a debate about **Immanence** and **Transcendence**, we need locative vocabulary with which to conduct it. In particular, we need locative vocabulary applicable to properties. Although first-order realism guarantees the availability of such vocabulary, second-order realism doesn't. Unlike first-order realism, second-order realism therefore does not guarantee that a debate over **Immanence** and **Transcendence** may be had. Or so I now argue.³⁰

I focus on 'is exactly located at' as a paradigm of locative vocabulary. My discussion carries over to other locative vocabulary *mutatis mutandis*. I regiment 'is exactly located at' with the binary predicate '*L*'. The question before us is: what is the logico-semantic form of '*L*', and does it permit formulation of **Immanence** and **Transcendence**? '*L*''s second argument-position takes singular terms, typically for regions and places. Our concern is with its first argument-position.

Let the *minimal core* be the relatively uncontroversial body of observation, doctrine, and theory on which realists and nominalists agree.³¹ The minimal core includes, *inter alia*, the apparent truths of ordinary discourse about location, as modified by our best empirical theory. It doesn't include attributions of location to properties; for properties are a controversial theoretical posit whose interaction with the rest of our world-view is what's under investigation. Insofar as concerns realists and nominalists, whatever constraints the minimal core places on '*L*' are uncontroversial. The issue is how those constraints interact with first- and second-order realism's extensions of the minimal core with **Exist 1** and **Exist 2** respectively.

The minimal core includes attributions of location to cats, dogs, humans, planets, galaxies, and electrons. They are all denotable by singular terms and first-order quantifiers range over them. The minimal core thus requires that '*L*''s first argument-position be open to singular terms and first-order variables. Filling '*L*''s first argument-position with such expressions is no obstacle to well-formedness. When doing so results in a sentence, the compositional semantic interaction between '*L*' and its other vocabulary delivers a truth-condition. In short, the minimal core requires that '*L*' be applicable to objects. Because first-order realism uses first-order quantification to express the existence of properties, its properties are a subclass of the objects. First-order realism thereby ensures that these are

³⁰ Thanks to Scott Sturgeon for a helpful discussion of the issues in this subsection.

³¹ See note 8 for a qualification.

well-formed:

- (1) $\forall x(x \text{ is a property} \rightarrow \exists yL(x, y))$
 (2) $\forall x(x \text{ is a property} \rightarrow \neg \exists yL(x, y))$

(1) expresses first-order **Immanence**. (2) expresses first-order **Transcendence**. The use of first-order quantification over properties in **Exist 1** suffices for these regimentations of **Immanence** and **Transcendence** to be well-formed. So standard compositional principles supply (1) and (2) with truth-conditions. Under first-order realism, the debate about **Immanence** and **Transcendence** is a debate about which of these truth-conditions is satisfied. First-order realism thus guarantees that debate's coherence. Not so for second-order realism.

The minimal core includes attributions of location to objects. It doesn't also include attributions of location to predicational phenomena. Although our ordinary world-view includes attributions of location to individual cookies, it doesn't include attributions of location to what's expressed by 'is a cookie': 'is a cookie is in the jar' isn't a grammatical or truth-evaluable string. Regimentation of our best empirical theories does not, as far as I know, require that '*L*''s first argument-position be open to predicates and second-order variables. The minimal core therefore doesn't require that filling '*L*''s first argument-position with a second-order variable be no obstacle to well-formedness. And even if such strings are counted well-formed, the minimal core doesn't require that '*L*' be capable of semantically interacting with predicates and second-order variables, via the compositional rules, to yield truth-conditions for them. In short, second-order realism and the minimal core do not ensure that these are well-formed, or that they possess truth-conditions:

- (3) $\forall X \exists y L(X, y)$ ³²
 (4) $\forall X \neg \exists y L(X, y)$

(3) is what's needed to express second-order **Immanence**. (4) is what's needed to express second-order **Transcendence**. Second-order realists are under no obligation to regard either string as a well-formed bearer of truth-conditions. They therefore needn't accept that a contentful debate about higher-order **Immanence** and **Transcendence** may be had.

Second-order realists face a choice. Second-order realism and the minimal core do not together ensure that (3) and (4) possess truth-conditions; so they do not guarantee that a contentful debate about higher-order **Immanence** and **Transcendence** may be had. But second-order realism and the minimal core do not together ensure that (3) and (4) *don't* possess truth-conditions; so they do not guarantee that a contentful debate about higher-order **Immanence** and **Transcendence** *cannot* be had. The minimal core may be extended in either way, to yield truth-evaluable (3) and (4) or not. One extension permits a contentful debate about higher-order **Immanence** and **Transcendence**, whereas the other doesn't. Second-order realists are free to choose which extension of the minimal core to endorse.³³

³² More cautiously: $\forall X(\exists y, z(L(y, z) \wedge Xy) \rightarrow \exists yL(X, y))$.

³³ This may be an exaggeration. In standard formulations of higher-order logic and type theory, no ar-

To be clear, second-order realists aren't free to choose whether higher-order **Immanence** and **Transcendence** exist to be expressed or not. That objective fact lies beyond their control. The point is that they are not rationally compelled to take either view, simply by the logico-semantical form of their theory of properties (i.e. the instances of **Exist 2**). Second-order realism and the minimal core are neutral about whether locative vocabulary can be meaningfully combined with predicates and second-order variables to express higher-order versions of **Immanence** and **Transcendence**. First-order realism and the minimal core are not. First-order quantification over properties in **Exist 1**'s instances combines with attributions of location to objects in the minimal core, to guarantee the coherence of first-order **Immanence** and **Transcendence**. First-order realism's logico-semantical form thus combines with the minimal core to settle a theoretical question that second-order realism leaves open: do higher-order theses of **Immanence** and **Transcendence** exist to be expressed or not?

Second-order realists are free to believe that higher-order **Immanence** and **Transcendence** cannot be formulated, and that there are no such truth-conditions available to express. From that perspective, the debate about **Immanence** and **Transcendence** collapses: there is no such debate to be had. Second-order realists may thereby dissolve the debate.

One might be suspicious of this dissolution: surely questions about reality's structure cannot be so easily undermined, and especially not by linguistic considerations. To alleviate the suspicion, consider a parallel case. Even those working on the locations of properties aren't usually concerned about the locations of negation, disjunction or possibility. That is entirely natural; for it is hard to see debate about disjunction's location as addressing a genuine question. Why?

One attractive answer begins with the observation that disjunction is expressed by a sentence operator. Discourse about disjunction is discourse about '∨' 's contribution towards truth-conditions. Theses about that contribution's location are formulable only if 'L' 's first argument position is open to sentence connectives. It isn't, and so they aren't. Sentences like 'L(∨, r)' are not well-formed. The semantic clauses for 'L' and '∨' do not interact with the compositional rules to deliver a truth-condition for 'L(∨, r)'. The logico-semantical forms of locative and disjunctive discourse thus explain why a contentful debate about disjunction's location cannot be had.³⁴

The second-order dissolution of **Immanence** and **Transcendence** exactly parallels this strategy for eliminating questions about disjunction's location. The only relevant difference is that debate about the locations of properties is more historically entrenched than debate about disjunction's location. The attractiveness of this approach to disjunction should alleviate suspicion in the second-order case. What the initial suspicion failed to

argument position accepts expressions of multiple type. This isn't supposed to be a merely grammatical phenomenon, but a syntactic manifestation of an underlying semantic limitation: no expression is meaningfully attributable to "entities" drawn from (the domain of potential semantic values for expressions of) different types. On this view, higher-order **Immanence** and **Transcendence** do not exist if location is meaningfully attributable to objects. The argument in the text aims to bypass this complex issue in the foundations of semantics. See Magidor (2009) and Linnebo and Rayo (2012) for discussion.

³⁴ Following (Hossack, 2007, pp68–72), we could postulate logical objects corresponding to the connectives, by analogy with first-order realism's properties. The possibility of contentful debate about disjunction's location would then follow. That is a powerful reason not to postulate such logical objects.

recognise is that worthwhile theorising, in metaphysics as elsewhere, must be communicable, hence linguistically expressible. Although linguistic analysis alone cannot reveal reality's structure, it can expose constraints on what there is to be said about it.

Second-order realists may regard higher-order **Immanence** and **Transcendence** as either coherent or not. Which view should they adopt? Should they regard (3) and (4) as well-formed expressions of truth-evaluable theses? Like any other theoretical questions, these should be addressed via the relative merits of each hypothesis. What theoretical work can higher-order location do? What puzzles can it resolve? What can it be used to explain? As far as I can see, higher-order location does no work, resolves no puzzles, and explains nothing. It serves only to generate intractable metaphysical debate. These are powerful reasons not to accept this extension of location beyond the minimal core's requirements. Accepting higher-order location's coherence also places one in an awkward theoretical position. One must either: (a) justify extending '*L*' to accept predicates despite rejecting its extension to sentence operators; or (b) be prepared to admit a parallel debate about the locations of disjunction, negation and possibility. Neither option is attractive. We thus have good reason to reject higher-order **Immanence** and **Transcendence** as incoherent: there are no such contents.

Note that higher-order location and quantification differ in this respect. Higher-order quantifiers have been used in the semantics of unrestricted generality, the foundations of mathematics, and the analyses of truth and possibility.³⁵ Higher-order quantification, unlike higher-order location, thus serves purposes other than the generation of metaphysical debate. That is a good reason to take its coherence seriously.

One might worry that second-order realism will inherit the problems with **Transcendence**, given this rejection of attribution of location to properties. The worry is misplaced. The view I've been describing isn't a version of **Transcendence**; for it rejects as contentless both attributions of location to properties, *and* the negations of such attributions. Both **Immanence** and **Transcendence** are rejected as contentless. It is not true, as the problems with **Transcendence** presuppose, that properties lack location; for properties lack location only if they are not located, and the present view rejects as contentless all attempts to say that properties are not located. There are no such contents attributing or denying locations to properties out there to express. Since the view doesn't admit non-located properties, the objections to non-located properties aren't objections to the view, any more than they're objections to, say, conjunction, negation, or necessity.³⁶ The initial problems for **Transcendence** therefore do not arise.

Relatedly, the view is consistent with the attractive thesis that to be is to be located.

³⁵ On unrestricted generality: (Williamson, 2003). On the foundations of mathematics: (Shapiro, 1991). On truth: (Künne, 2003, ch6.2), (Rumfitt, 2014). On possibility: (Dunaway, 2013).

³⁶ Following the preceding discussion, no contents attribute or deny locations to negation, conjunction, or necessity because they're all expressed by sentence operators, which play a fundamentally different semantic role from the singular terms that can meaningfully occupy the argument positions of '*L*'. That's clearly not a good reason to regard negation, conjunction, or necessity as naturalistically unacceptable or objectionably disconnected or separated from concrete reality. The same goes for properties, given second-order realism.

Using ‘ E ’ as an (first-order) existence predicate, that thesis amounts to:³⁷

$$\Box \forall x (E(x) \leftrightarrow \exists r L(x, r))$$

Necessarily, all and only located things exist. Of course, this is a first-order thesis. But if location cannot be meaningfully ascribed or denied to non-first-order aspects of reality, it follows that reality is completely devoid of unlocated aspects: whatever can be meaningfully said to be located or unlocated is located.

We’ve seen that second-order realists have good reason to reject debate about the locations of properties as contentless. Of course, this isn’t decisive. Perhaps there is theoretical work for higher-order location that I haven’t considered. Or perhaps it is required by an adequate regimentation of some aspect of the minimal core. What should be clear, however, is how second-order realism transforms this debate. The focus shifts from the relative merits of various theses about the locations of properties to a conceptually prior question that first-order realism settles out of hand: should we even accept that a contentful debate about the locations of properties can be had?

4.3 An objection

This subsection responds to an objection: first-order realists can also deny that a contentful debate about **Immanence** and **Transcendence** can be had; for they may deny that (1) and (2) possess truth-conditions, despite being well-formed combinations of non-defective vocabulary.³⁸ We can see this objection as the conjunction of:

- (A) Some grammatical combinations of non-defective singular terms and predicates into atomic predications lack truth-conditions.
- (B) Amongst the atomic predications that lack truth-conditions are all attributions of location ‘ $L(a, r)$ ’ where ‘ a ’ denotes a first-order property.

If (A) is true, then first-order realism alone doesn’t entail the coherence of first-order **Immanence** and **Transcendence**; it does so only in conjunction with additional semantic machinery. Unless (B) is also true, however, first-order realists seeking to avoid **Immanence** and **Transcendence** should take no succour in that.

Before considering this objection, note that, even if sound, it doesn’t undermine much of what I’ve said. Second-order realism continues to provide good reason to deny that **Immanence** and **Transcendence** exist. Perhaps some first-order realists can consistently do so too. That doesn’t undermine my claim about second-order realism. Moreover, theses (A) and (B) are optional additions to first-order realism, independent of its central claims. Conjoining them with first-order realism thus reduces the unity and systematicity of the overall theoretical package. By contrast, we’ve seen how second-order realism leads

³⁷ Assumption: ‘to be F is to be G ’ means that F is necessarily coextensive with G . If that assumption is false, the displayed formula should be modified accordingly. The discussion in the text should be unaffected.

³⁸ Could first-order realists deny that (1) and (2) are well-formed, perhaps by invoking the many-sorted languages I’ll discuss shortly? The arguments in (Magidor, 2013, §§4, 5, 7 of ch2) suggest not.

via a natural and well-motivated argumentative route to rejection as contentless of all attempted attributions of locations to properties. That said, the objection from (A) and (B) is unsound.

I now explain why (A) is unattractive.

Standard semantic analyses of predication treat all grammatical combinations of non-defective singular terms and predicates as truth-evaluable, hence as bearers of truth-conditions. Those theories do not impose distinctions within the semantic values of singular terms and predicates that restrict their interaction with the compositional rules to prevent those rules from supplying a truth-condition in all (well-formed) cases. The resulting truth-conditions needn't be satisfiable. But they're truth-conditions nonetheless. Thesis (A) thus requires semantic distinctions out of line with mainstream semantics. Moreover, this complication of semantic theory lacks logical or linguistic motivation: it's postulated solely for metaphysical reasons. To the extent that semantic theory should be shaped by logical and linguistic considerations alone, (A) should be resisted.

One might respond by appeal to many-sorted first-order languages. These languages associate terms, variables, and argument positions with sorts, which are used to restrict wellformedness and thereby semantic evaluability.³⁹ A variant could be developed in which the sorts were syntactically idle, but restricted the applicability of the compositional rules so that not all atomic predications were assigned truth-conditions. Such a variant many-sorted setting might in principle provide a semantical foundation on which to defend (A). However, two difficulties remain.⁴⁰ Firstly, the proposal still complicates semantic theory for metaphysical rather than linguistic reasons. We shouldn't allow metaphysical considerations to warp, say, mathematics, physics, or biology. The same should go for semantics and logic. Secondly, the semantic restrictions on standard many-sorted languages look unattractively *ad hoc*. There is no principled semantic obstacle to combining the sorts and eliminating artificial restrictions on the compositional rules. The resulting semantic framework will be inconsistent with (A). Many-sorted semantics thus provides an insecure foundation on which to base defence of (A).

Suppose we accept (A) nonetheless. First-order realists seeking to avoid **Immanence** and **Transcendence** must still argue for (B). What is it about singular terms for properties that places them in the special class? Why does ' $L(\text{redness}, r)$ ' lack truth-condition, rather than simply turn out false? Absent an independently motivated answer to these questions, (B) looks like little more than an *ad hoc* plea for special treatment; as such, it should be given no credence. Second-order realists, by contrast, can appeal to the fundamentally different semantic roles of singular terms and predicates to justify their corresponding claim that ' $L(\text{is red}, r)$ ' lacks truth-condition:⁴¹ although ' L ''s first argument position can se-

³⁹ (Turner, 2010, pp11–12) suggests using many-sorted languages to articulate the idea that each predicate is meaningfully applicable only to a given category of object.

⁴⁰ There is a third problem too. (Magidor, 2013, pp85–91) argues that this kind of view conflicts with the Tarskian biconditionals for propositional truth.

⁴¹ Although I haven't argued that singular terms and predicates play fundamentally different semantic roles, that's part and parcel of §3.2's conception of second-order quantification. The semantic role of a singular term is to refer to an object. So if predicates play the same kind of semantic role as singular terms, they refer to objects too. Those objects would then constitute a domain over which second-order quantifiers range. Second-order quantification would be equivalent to first-order quantification over this domain

mentally interact with singular terms, that provides no reason to expect that it can also semantically interact with predicates. I see no independent argument for a parallel semantic distinction between singular terms for properties and the rest.

In sum, this objection unwarrantedly complicates semantics for metaphysical reasons and rests on an unmotivated claim about the semantics of property-terms. It doesn't follow that (A) or (B) is false. Maybe firmer theoretical foundations for them can be supplied. Until then, however, the objection may justifiably be set aside.

4.4 Extending the lesson

Immanence and **Transcendence** present first-order realists with a dilemma: neither option is attractive, and yet the logical form of their theory of properties ensures that they are contentful. Second-order realists can avoid the dilemma because the logical form of their property-theory doesn't guarantee that **Immanence** and **Transcendence** are formulable. Second-order realism doesn't entail that they can't be formulated either. So a theoretical decision is required. Those who wish to treat higher-order location as coherent should provide positive motivation for this extension of location beyond the requirements of the relatively uncontroversial minimal core. I haven't shown that such motivation cannot be supplied, though it is not at all clear how to do so. In this sense, second-order realism undermines debate about **Immanence** and **Transcendence**.

The strategy is not peculiar to location. Second-order realism potentially undermines any debate that turns on applying objectual vocabulary to properties. The dialectical focus shifts from theses featuring that vocabulary, to the theoretical benefits of allowing it to take non-objectual arguments. Only when the benefits are significant, need the debate continue. Otherwise, it may be abandoned as a contentless inquiry into pseudo-questions arising from misuse of language. Different debates may go different ways. By way of illustration, I briefly mention two debates that might contrast with location.

Can the causal relation hold between properties? From a second-order perspective, the issue is whether we should admit causal vocabulary with argument positions open to predicates. Without taking a stand on the issue here, the possibility arises of using arguments for type-level causation to motivate admitting such vocabulary. If that strategy is successful, it differentiates this question about the relation of causation from the one discussed above about location: only the former retains coherence under second-order realism.

The second debate concerns the nature of ordinary material objects. Bundle theorists regard them as derivative entities, composed out of properties. In order to bind disparate properties into unified objects, they require relations of parthood and composition capable of holding from (a) properties to properties, and (b) properties to objects. From a second-order realist perspective, a central question is whether to admit parthood and composition predicates with argument positions open to both terms and predicates. The putative theoretical benefits of bundle-theoretic analyses of material objects might perhaps motivate doing so.

of objects, and its truth-conditions would admit explication in first-order terms. That conflicts with §3.2.

5 Universals and tropes

One prominent conception of properties takes them to be tropes. Another takes them to be universals.⁴² This section argues that second-order realism resolves the issue in favour of universals.

5.1 First-order tropes and universals

Trope theorists maintain that properties are unrepeatable particulars. Universal theorists maintain that properties are repeatable universals. It is not always clear exactly what repeatability and particularity amount to.⁴³ One natural precisification appeals to instantiation. Tropes are unrepeatable in the sense of not being instantiable by distinct objects. So one object's trope of *being F* is distinct from any other object's trope of *being F*. The universal of *being F* is repeatable in the sense of being instantiated by every *F*. We can now see first-order trope theory and universal theory as embellishments of first-order realism that supplement the instances of **Exist 1** with additional theses. Some notation will help with stating those principles:

- $x_1, \dots, x_n \neq z_1, \dots, z_n \text{ =df: } (x_1 \neq z_1 \wedge \dots \wedge x_1 \neq z_n) \vee \dots \vee (x_n \neq z_1 \wedge \dots \wedge x_n \neq z_n) \vee (z_1 \neq x_1 \wedge \dots \wedge z_1 \neq x_n) \vee \dots \vee (z_n \neq x_1 \wedge \dots \wedge z_n \neq x_n)$.

(Roughly, in English: some x_i is distinct from each z_j or some z_j is distinct from each x_i . Or: the x s are not coextensive with the z s.)⁴⁴

First-order trope theory and universal theory are the results of combining first-order realism with:

Trope 1: $\Box \forall x_1, \dots, x_n, y (I(x_1, \dots, x_n, y) \rightarrow \Box \forall z_1, \dots, z_n (x_1, \dots, x_n \neq z_1, \dots, z_n \rightarrow \neg I(z_1, \dots, z_n, y)))$.

Universal 1: $\exists x \Box \forall y_1, \dots, y_n (I(y_1, \dots, y_n, x) \leftrightarrow \Phi(y_1, \dots, y_n))$.

Universal 1 is a schema whose substitution instances are obtained by replacing ' Φ ' with a predicate that is also substitutable for ' Φ ' in **Exist 1**. Different versions of first-order universals theory admit different instances. Some instances must be inadmissible, on pain

⁴² Trope theorists include: (Williams, 1953), (Campbell, 1981). Universal theorists include: (Russell, 1967, chs9–10), (Armstrong, 1978).

⁴³ (MacBride, 2005) criticises the particular/universal distinction.

⁴⁴ A simpler definition is: $x_1, \dots, x_n \neq z_1, \dots, z_n$ iff $\langle x_1, \dots, x_n \rangle \neq \langle z_1, \dots, z_n \rangle$; i.e., iff $x_1 \neq z_1 \vee x_2 \neq z_2 \vee \dots \vee x_n \neq z_n$. Using this definition in **Trope 1**, $R(a, b)$ and $R(b, a)$ generate distinct R -tropes whenever $a \neq b$. Even for symmetric R . Plausibly, however, there should be only one such R -trope when R is symmetric; for then only one way for things to be can result from combining R , a , and b . See Fine (2000) and MacBride (2007) for discussion. The more demanding definition of distinctness in the text avoids this commitment. That definition is strictly stronger than the present suggestion. So the official definition yields a strictly weaker version of **Trope 1**. I use that weaker thesis because (a) problems with the weaker thesis are automatically problems for the stronger thesis that entails it, but not conversely, and (b) some of the problems for trope theory considered below involve symmetric predicates for which the stronger thesis is less plausible.

of Russell's paradox. A more cautious version of **Universal 1** would also be restricted to satisfied substitutions for ' Φ '.

Note that **Trope 1** is compatible with some instances of **Universal 1**. If only one possible object can be F , **Trope 1** is compatible with the corresponding instance of **Universal 1**. Incompatibility arises when more than one possible object can be F . In typical cases, many possible objects can be F ; the universal of *being F* encodes this commonality amongst them. So typical instances of **Universal 1** are incompatible with **Trope 1**. For simplicity, I proceed as if the first-order theories of tropes and universals cannot both be true.

Unlike **Immanence** and **Transcendence**, neither **Trope 1** nor **Universal 1** is obviously problematic. Yet this debate has also stalled. Although each view has its defenders, it's unclear how neutral bystanders could rationally decide between them. Maybe we have to learn to live with this situation. It would be better not to have to. I'll now argue that second-order realism resolves the issue in favour of universals.

5.2 Second-order tropes and universals

The second-order analogues of **Trope 1** and **Universal 1** are:

Trope 2: $\Box \forall x_1, \dots, x_n, Y(Y(x_1, \dots, x_n) \rightarrow \Box \forall z_1, \dots, z_n (x_1, \dots, x_n \neq z_1, \dots, z_n \rightarrow \neg Y(z_1, \dots, z_n)))$.

Universal 2: $\exists X \Box \forall y_1, \dots, y_n (X(y_1, \dots, y_n) \leftrightarrow \Phi(y_1, \dots, y_n))$.

This issue is readily resolved in favour of second-order universals.

Whereas the admissible substitution instances of **Universal 1** must be restricted to avoid contradiction, every instance whatsoever of **Universal 2** should be uncontroversial. Sentences of this form are uncontroversially true:

$$\Box \forall y_1, \dots, y_n (R(y_1, \dots, y_n) \leftrightarrow R(y_1, \dots, y_n))$$

Each instance of **Universal 2** follows from such a sentence by a single application of **EG2**. So the second-order theory of universals should be uncontroversial, given the validity of **EG2**. As noted in §3.1, acceptance of **EG2** is widespread amongst advocates of second-order logic.

Whereas each instance of **Universal 2** is easily seen to be true, **Trope 2** is inconsistent with one of the most basic aspects of our ordinary and scientific world-views: many distinct objects can be of the same type. For example: you and I are different humans beings; the universe contains many electrons; there are uncountably many real numbers. Many sentences of this form are therefore true:

$$Fa \wedge Fb \wedge a \neq b$$

This says that objects a and b are different F s. Yet **Trope 2** implies that distinct objects aren't both F s:⁴⁵

$$(Fa \wedge a \neq b) \rightarrow \neg Fb$$

⁴⁵ Assumption: second-order universal generalisations can be instantiated for arbitrary constant predicates.

These jointly entail a contradiction. Since F was arbitrary, **Trope 2** implies that distinct objects cannot be of the same type: there is at most one human being, or electron, or real number. Generalising to the relational case: only one pair of objects are of the same height, or spatially separated, or causally related, or such that one succeeds the other. And even worse: **Trope 2** implies that distinct objects aren't both self-identical, and hence that there's only one object. Such radical departure from our ordinary and scientific world-views should be rejected, and **Trope 2** along with it.

Notice that **Trope 1** lacks these consequences. If a and b are different F s, **Trope 1** entails only that they instantiate none of the same first-order objects. Given **Exist 1**, it follows that they instantiate distinct first-order F -properties, i.e. objects instantiation of which strictly suffices for being F . That's consistent with a and b both being F . First-order trope theory is thus not so easily refuted.

One might worry that this argument targets a straw man. As far as I'm aware, extant trope theorists are all best interpreted as first-order trope theorists. So the argument is powerless against them. However, my goal was not to refute extant trope theorists. My goal was to show that second-order realism resolves debate about tropes and universals in favour of second-order universals. Whereas the first-order debate about tropes and universals is intractable and contentious, the parallel second-order debate is readily resolved because: (a) the second-order theory of universals follows from uncontroversial truths by relatively uncontroversial principles of second-order logic; (b) the second-order theory of tropes is inconsistent with some of the most central components of our world-view.

Given the argument of §4, a stronger conclusion may be available.⁴⁶ The difficulties facing first-order **Immanence** and **Transcendence** constitute a powerful case against first-order realism, which second-order realism resolves. That is a good reason for realists to be second-order realists. This section argued that second-order realists should reject second-order tropes in favour of second-order universals. So we also have an argument against all orders of trope theory, including first-order: realists should be second-order realists, hence not trope theorists.

5.3 A trope-theoretic reply

This section considers three responses on behalf of the trope theorist.⁴⁷ Although unsuccessful, they cannot be dismissed out of hand.

The problem arose from the apparent truth of sentences like:

$$(5) \quad Fa \wedge Fb \wedge a \neq b$$

This says that distinct objects a and b are of the same specified type, F . Where ' f ' denotes the universal of *being F*, the first-order universalist realist can capture this as:

$$(6) \quad I(a,f) \wedge I(b,f) \wedge a \neq b$$

Since first-order trope theorists deny that distinct objects can instantiate the same property, they cannot capture sameness of specified type in this way. If their trope theory is to capture such facts, a different approach is required.

⁴⁶ Thanks to a referee for pointing this out.

⁴⁷ Thanks to Ben Curtis for suggesting this kind of response.

Rather than saying that a and b instantiate identical tropes, a weaker relationship, compatible with distinctness, must be used. Since the analysis is supposed to capture sameness of specified type, different types will require different relationships.⁴⁸ Regimenting this with the binary predicate ' R_F ', first-order trope theorists can use this sentence in place of the universal theorist's (6):

$$\exists x, y (I(a, x) \wedge I(b, y) \wedge a \neq b \wedge R_F(x, y))$$

This says that distinct objects a and b instantiate tropes that R_F one another. Since ' $R_F(x, y)$ ' doesn't entail ' $x = y$ ', first-order trope theorists can regard this as true, unlike (6).

I now consider three ways in which second-order trope theorists might try to adapt this strategy to respond to the previous subsection's argument. Each strategy re-conceptualises the phenomenon we would ordinarily use (5) to report, and does so in a way consistent with **Trope 2**. As we will see, each only postpones the problem.

First strategy: where we would ordinarily use the same predicate twice to say that a and b are both F s, by writing ' $Fa \wedge Fb$ ', use a single new relational predicate ' $a \stackrel{F}{\equiv} b$ ' by analogy with ' R_F '.⁴⁹ The phenomenon reported by (5) is then re-described as:

$$a \stackrel{F}{\equiv} b \wedge a \neq b$$

Unlike (5), this is consistent with **Trope 2**. Under this re-conceptualisation of the phenomenon we'd ordinarily use (5) to report, it is consistent with second-order trope theory.

The strategy cannot accommodate more than two F s. Suppose a, b, c are three distinct F s. Then, according to the present proposal, this is true:

$$a \stackrel{F}{\equiv} b \wedge b \stackrel{F}{\equiv} c \wedge a, b \neq b, c$$

Trope 2 implies:

$$(a \stackrel{F}{\equiv} b \wedge a, b \neq b, c) \rightarrow b \not\stackrel{F}{\equiv} c$$

Those jointly entail a contradiction. So **Trope 2** is incompatible with the existence of three F s, even under the revised account of sameness of specified type. Despite rendering second-order trope theory consistent with the phenomenon we would ordinarily report using (5), radical conflict with the rest of our world-view remains.

Second strategy: replace the first strategy's relational predicate ' $\stackrel{F}{\equiv}$ ', with a plural predicate ' F_{pl} '.⁵⁰ The claim that each of some objects xx is F is then reformulated as the claim that they F_{pl} : $F_{\text{pl}}(xx)$. Because pluralities can be of any cardinality, the previous problem dissipates. But a variant problem remains: incompatibility with the existence of four F s. Second-order trope theorists should also be trope theorists about plural predication/plural second-order properties. The most natural extension of **Trope 2** to monadic plural predication says that second-order plural properties can't be properties of distinct pluralities:

⁴⁸ This means that exact similarity of tropes won't suffice as an account of ' R_F '. Alternative options include: ' $_$ is similar-in- F -respects to $_$ ' provided ' F ' is semantically inert; ' $_$ is an F -trope \wedge $_$ is an F -trope'.

⁴⁹ The analogy is not perfect. Whereas ' R_F ' is a predicate of tropes, ' $a \stackrel{F}{\equiv} b$ ' is a predicate of the objects that possess them. The third strategy improves the analogy.

⁵⁰ Thanks to a referee for this suggestion.

Plural Trope 2: $\Box \forall xx, Y(Y(xx) \rightarrow \Box \forall zz(zz \neq xx \rightarrow \neg Y(zz)))$.

That entails:⁵¹

$$(F_{\text{pl}}(a \cdot b) \wedge a \cdot b \neq c \cdot d) \rightarrow \neg F_{\text{pl}}(c \cdot d)$$

Those principles both involve a plural non-identity predicate. So, when do pluralities count as distinct? Failure to include any of the same objects should suffice. So suppose a, b, c, d are four distinct F s. Then plurality $a \cdot b$ counts as distinct from $c \cdot d$. Since each of these objects is F , each of a, b is F , and each of c, d is F too. So on the present proposal, this should be true:⁵²

$$F_{\text{pl}}(a \cdot b) \wedge F_{\text{pl}}(c \cdot d) \wedge a \cdot b \neq c \cdot d$$

Those last two principles cannot both be true. So on the proposed plural reformulation of sameness of specified type, **Plural Trope 2** entails that no four objects are of the same type. Second-order trope theorists should also be second-order plural trope theorists. So radical conflict between second-order trope theory and the rest of our world view remains.

Third strategy: replace the single monadic predicate ' F ' with a range of new monadic predicates, one for each F object. To capture the fact that satisfiers of these new predicates are all of the same type, the strategy uses a new expression with two argument positions, each reserved for ordinary predicates. Ordinary predicates of objects are *first-level* predicates. Expressions taking first-level predicates in their argument positions are *second-level* predicates. In general, *i-level predicates* are expressions whose argument positions are reserved for $(i - 1)$ -level predicates. I'll use superscripts to encode level. In this terminology, the strategy: (a) replaces the original first-level predicate ' F^1 ' with many first-level predicates ' F_a^1, F_b^1, F_c^1 ' etc., one for each object a, b, c etc. that's (as we would ordinarily say) F ; and (b) uses a new second-level predicate ' R_F^2 ' to capture the idea that satisfaction of each of these new predicates corresponds to being of the original type F . The phenomenon we would ordinarily use (5) to report is then re-described as:

$$F_a^1(a) \wedge F_b^1(b) \wedge R_F^2(F_a^1, F_b^1) \wedge a \neq b$$

Unlike (5), this is consistent with **Trope 2**. Of our three strategies, this one is perhaps closest to the first-order strategy with which this subsection began.

Problems arise from *third-order* trope theory, which involves generalisation into *second-level* predicate position. The third-order analogue of **Trope 2** is:

Trope 3: $\Box \forall X_1^1, \dots, X_n^1, Y^2(Y^2(X_1^1, \dots, X_n^1) \rightarrow \Box \forall Z_1^1, \dots, Z_n^1(X_1^1, \dots, X_n^1 \neq Z_1^1, \dots, Z_n^1 \rightarrow \neg Y^2(Z_1^1, \dots, Z_n^1)))$.

(' $Y_1^1, \dots, Y_n^1 \neq Z_1^1, \dots, Z_n^1$ ' is defined by extending the definition of ' $y_1, \dots, y_n \neq z_1, \dots, z_n$ ' in the obvious way. I discuss higher-order non-identity shortly.)

⁵¹ I use ' \cdot ' as a plural term-forming operator. For any singular or plural terms t_1, t_2 , ' $t_1 \cdot t_2$ ' is a plural term denoting the plurality comprising exactly the denotations of t_1 and t_2 .

⁵² Second-order trope theorists could deny this. Only cases of sameness of specified type involving every object whatsoever of the relevant type could then be captured. So the view would be expressively inadequate.

It is hard to see what could motivate second-order trope theory without also motivating third-order trope theory. Why take different stances towards repeatability at these different orders? Absent an answer to this question, we may safely assume that second-order trope theorists should also be third-order trope theorists.

This strategy cannot accommodate four F s. Suppose a, b, c, d are four distinct F s. Applying the present strategy, the following should both be true:

$$\begin{aligned} F_a^1(a) \wedge F_b^1(b) \wedge R_F^2(F_a^1, F_b^2) \\ F_c^1(c) \wedge F_d^1(d) \wedge R_F^2(F_c^1, F_d^2) \end{aligned}$$

So this should be true too:

$$(7) \quad R_F^2(F_a^1, F_b^1) \wedge R_F^2(F_c^1, F_d^1) \wedge F_a^1, F_b^1 \neq F_c^1, F_d^1$$

Those theses and **Trope 3** employ a higher-order non-identity predicate. So, when do higher-order aspects of reality count as distinct? Higher-order identity should entail indistinguishability. So distinguishability should entail distinctness. Since a, b, c, d are all distinct, **Trope 2** entails that what each ' F_i^1 '-predicate expresses is distinguishable from each other. For example, this is true:

$$F_a^1(a) \wedge \neg F_b^1(a)$$

So ' $F_a^1 \neq F_b^1$ ' is true too. Likewise for each other pair of ' F_i^1 '-predicates. So ' $F_a^1, F_b^1 \neq F_c^1, F_d^1$ ' is true. Now, **Trope 3** entails:

$$(R_F^2(F_a^1, F_b^1) \wedge F_a^1, F_b^1 \neq F_c^1, F_d^1) \rightarrow \neg R_F^2(F_c^1, F_d^2)$$

That and (7) cannot both be true. So on the present approach, the conjunction of **Trope 2** and **Trope 3** is inconsistent with the existence of four F s. Since second-order trope theorists should also be third-order trope theorists, radical conflict between second-order trope theory and the rest of our world view remains. Second-order trope theory should still be rejected.

This last strategy can iterate up through the hierarchy of levels. Consistency with four distinct F s might be preserved by employing a non-standard analysis of sameness of specified type at the second level: replace the second-level ' R_F^2 ' with an array of new predicates, one for each pair of first-level ' F_i^1 '-predicates; capture the commonality amongst these new second-level predicates with a new third-level predicate ' R_F^3 '. This provides a way to render second- and third-order trope theory consistent with the existence of four F s. But a parallel argument shows that introducing fourth-order trope theory yields inconsistency with the existence of six F s. More generally: on the present strategy, the conjunction of orders of trope theory below any given order is inconsistent with an appropriately large cardinality of first-order objects that are F . Given the following plausible assumptions, it follows that all orders of trope theory are false: (a), for some F , there is no upper limit on how many F s there could be; (b) each order of trope theory is necessarily true if true. All (higher) orders of trope theory should therefore be rejected.

6 Conclusion

Given second-order quantification's coherence, two ways of formulating a theory of properties are available, differing over whether their central existence claims are cast in first- or second-order terms. As we saw in §4 and §5, the second-order theory fundamentally reshapes two familiar and otherwise intractable metaphysical debates. Once higher-order quantification is admitted, this is only the first step. Maybe other forms of higher-order quantification can be used to reshape and resolve other debates. One prominent option is to use quantification into sentence position to express the existence of propositions, thereby potentially reshaping, e.g., debates about their constituents and natures. Escape from Quinean strictures about quantification promises to transform the landscape of metaphysical debate, just as did the escape from Quinean hostility towards non-extensional contexts in the late twentieth century.

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