

Relativity and Degrees of Relationality

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1. Introduction

Some things are relative. Left and right are relative to spatial orientation, for example, and legality is relative to jurisdiction. We also wonder about more controversial cases. Is morality relative to culture? Is color relative to type of perceiver? In this essay I am not concerned with any particular relativistic thesis. Rather, I am concerned with the prior question: What is it for one thing to be relative to another?

This question is interesting, I think, not only for its own sake, but also because it has considerable bearing on first-order disputes between absolutists and relativists. Some of the most formidable objections to relativism are metaphysical in nature. Relativism is true, these objections allege, only if the world is ontologically thus-and-so, and the world is not ontologically thus-and-so. There are a variety of metaphysical arguments run against relativism, but I want to focus on two sorts, which I label ‘arity arguments’ and ‘simplicity arguments’.

Let me begin with arity arguments. Many philosophers believe that there is some intimate connection between relativity and degrees of relationality. According to Robert Streiffer (2003, 4), for example, if moral relativism is true, then moral properties

... have an extra argument place, the value of which varies from context to context. So, although one might have thought that the property of being immoral was a one-place property, which a particular action either has or does not have, in fact there is no such one-place property. Rather, there is a two-place relation of being immoral relative to a morality, and any particular action bears this relation to some moralities, but not to others.

To a similar effect, Crispin Wright (2008, 158–159) says,¹

The ground-level relativistic idea is that the satisfaction-conditions of a certain property or family of properties, though superficially presenting as unary, are actually implicitly relational—or more generally, are of a *higher degree of relationality* than is apparent in the surface syntax. . . . [The] tacit relationality need not be to the effect that a certain apparently unary property is in fact binary. It may be to the effect that a certain apparently n -ary property is in fact $n+k$ -ary, $k > 0$.

Let **properties** include both properties and relations, and let the **arity** of a property be its degree of relationality. On the conception of relativity that Streiffer and Wright put forward, an apparently n -ary property is relative to a parameter only if the property is $n+k$ -ary, $k > 0$. It follows trivially, then, that **relativity and n -ary-ness are incompatible**: an apparently n -ary property can be relative, or n -ary, but not both.

The claim that relativity and n -ary-ness are incompatible in turn can be used as a weapon, for its truth makes relativism vulnerable to a particular line of attack. One can argue that though we might have good reasons for thinking that some apparently n -ary properties are relative, we have even better reasons for thinking that the properties are in fact n -ary, and hence that we should, all things considered, reject relativism. I call these **arity arguments**. As we will see, arity arguments feature prominently in debates between absolutists and relativists and across a wide variety of domains.²

I think that arity arguments are unconvincing. Arity arguments are only as good as their crucial claim, *viz.*, that relativity and n -ary-ness are incompatible, and I think that this claim is false. The main thesis of this essay is that there are at least three ontological schemes that can engender relativity. On two of these ontological schemes, I argue, relativity and n -ary-ness are compatible. Arity arguments, therefore, cannot establish the falsity of relativism; the most they can establish is that one of the ontological schemes that can engender relativity fails to obtain. In response to an arity argument, a relativist can always adopt one of the other ontological schemes.

Let me turn to simplicity arguments. The thesis that relativity and n -ary-ness are compatible, though once roundly rejected,³ has gained in popularity

¹ Emphasis is original.

² See the discussion of shape relativism and truth relativism in §2 and the discussion of color relativism in §6. Also see Paul Boghossian's (2006; 2011) argument against moral relativism.

³ A particularly clear example is Monroe Beardsley (1983, 265), who begins his essay with this passage: "One way of looking at relativism is this. If Smith holds that a certain predicate, P, is an n -place predicate, and Jones holds that P is an $(n + 1)$ -place predicate, then Jones is a P-relativist, relative to Smith."

of late.⁴ But even among philosophers who accept that relativity and n -aryness are compatible, many insist that relativists are nevertheless committed to positing extra arity. “Perhaps an apparently n -ary property can be both relative and n -ary,” these philosophers will say, “but only if we increase the arity of instantiation. After all, the extra arity must go somewhere.” If relativists are indeed committed to positing extra arity, then one could run an epicyclic version of the argument laid out above. One could argue that though we might have good reasons for thinking that the apparently n -ary properties are relative, we have even better reasons for accepting the conjunction—that the properties are n -ary *and* that instantiation is binary—and hence that we should, all things considered, reject relativism. I shall call these **simplicity arguments** because, as we will see, they involve the notion of ‘being *F simpliciter*’.

Simplicity arguments are thought to succeed where arity arguments fail.⁵ An absolutist runs an arity argument against relativism; the relativist responds by adopting a different relativity-engendering ontological scheme; the absolutist responds, in turn, by running a simplicity argument. The most surprising claim that I make in this essay is that relativists can respond to simplicity arguments by again adopting a different relativity-engendering ontological scheme. Relativists are not committed to positing extra arity: instantiation might be binary, the apparently n -ary properties might be n -ary, and still relativism might be true.

2. Shape Relativism

Let us look at the particular case of shape relativism, since it was in discussions of shapes (and other temporary intrinsic properties) that this dialectic concerning arity and relativity first arose.

In the 1980s a debate emerged between perdurantists and endurantists about the nature of persistence.⁶ Many people find endurantism more intuitive, at least initially. But certain arguments favor perdurantism. One of the main arguments for perdurantism is the problem of temporary intrinsics.⁷ As David Lewis (2002, 1) puts it:

⁴ See, e.g., Fine (2005), Forbes (1987), Haslanger (1989; 2003), Johnston (1987), and Lowe (1987; 1988). Although I think that they are after a slightly different point, also see Brogaard (2010) and Egan (2006b; 2010a).

⁵ See, e.g., Cappelen and Hawthorne (2009; 2011) and Lewis (2002).

⁶ See, e.g., Forbes (1987), Haslanger (1989), Johnston (1987), Lewis (1986), and Lowe (1987; 1988). For a discussion of how to distinguish perdurantism and endurantism, see Fine (2006b) and Sider (2003).

⁷ The problem of temporary intrinsics is a misnomer; it has nothing essentially to do with *intrinsic* properties. Cf., Johnston (1987, 113).

The problem about persistence is the problem of change, insofar as it pertains to intrinsic properties. Things somehow persist through time. When they do, they have some of their intrinsic properties temporarily. For instance shape: sometimes you sit, and then you are bent; sometimes you stand or lie, and then you are straight. How can one and the same thing have two contrary properties? How does it help that it has them at different times?

An adequate account of persistence must explain how something can be both bent at t_1 and straight at t_2 , despite the fact that nothing can be both bent and straight.⁸

Lewis sees three potential solutions to the problem of temporary intrinsics: namely, perdurantism, endurantism together with presentism, and endurantism together with shape relativism. Lewis then argues piecemeal; he argues that presentism is false, that shape relativism is false, and hence that endurantists have no satisfactory solution to the problem of temporary intrinsics. For the sake of argument I am going to grant Lewis his claim that presentism is false. I want to focus on his argument against shape relativism. (To anticipate, I think the argument fails: even if presentism is false, the problem of temporary intrinsics gives us no reason to reject endurantism.)

Lewis (1986) begins his argument against shape relativism with a substantive assumption about the nature of relativity. Lewis assumes that the only way for some properties to be relative to a parameter is to **increase the arity of the properties**, where we increase the arity of the properties by building into them an additional argument place that takes values of the parameter as relata.⁹ If we increase the arity of shape properties, then, as Lewis (1986, 204) puts it,

... contrary to what we might think, shapes are not genuine intrinsic properties. They are disguised relations, which an enduring thing may bear to times. One and the same enduring thing may bear the bent-shape relation to some times, and the straight-shape relation to others.

⁸ Cf. Johnston (1987, 115): “This then is the problem of persistence cast in the formal mode: explain the role of temporal qualification in our attributions of change, where explaining does not just mean opting for a style of appending ‘ t ’s and ‘ t^* ’s but defending the views about properties, the nature of time and the nature of persisting individuals which justify this style of appending.”

⁹ The phrase ‘increasing the arity of shape properties’ is perhaps somewhat misleading, as properties have their arities essentially. To increase the arity of shape properties is to claim (i) that the unary properties, which were thought to be the shape properties, either fail to exist or are anyway uninstantiated and (ii) that ‘shape properties’, in fact, name a collection of $1+k$ -ary properties, $k > 0$. See Boghossian (2006; 2011).

Of course, even if shapes are binary properties, there are unary properties in the vicinity. We should distinguish **plugged** and **unplugged** properties. Given any unplugged n -ary property $R_n \langle x_1, x_2, \dots, x_n \rangle$, we can replace one or more of the variables by objects, and the result is a plugged property. For instance, if we increase the arity of shapes, then we do away with the unplugged unary shape properties *being bent* and *being straight*, and in their place we put the unplugged binary properties *being bent at* and *being straight at*, which relate objects to times, and two large families of plugged unary properties *being bent at t_1* , *being bent at t_2* , \dots , and *being straight at t_1* , *being straight at t_2* , \dots . To say that shapes are binary is to say, in an abbreviated way, that the unplugged shape properties are binary.

For Lewis, the unarity of shape is a Moorean fact, more certain than any philosophical thesis to the contrary. “If we know what shape is,” says Lewis (1986, 204), “we know that it is a property, not a relation.” Lewis thus argues against shape relativism in the straightforward way: shape relativism implies that shapes are binary, but shapes are not binary, so shape relativism is false.

Endurantists were quick to respond.¹⁰ Shapes may be unary properties, they said, but the unarity of shape does not cut against shape relativism. For there is more than one way to be a shape relativist. We can increase the arity of shapes, or we can **increase the arity of instantiation**—do away with the unplugged binary instantiation relation and replace it with an unplugged ternary instantiation relation and a large family of plugged binary instantiation relations, one for each instant of time. Shape relativism engendered by increasing the arity of instantiation is perfectly compatible with shapes being unary.

Lewis, who revisits the problem of temporary intrinsics in 2002, concedes the point. He grants that shape relativism is compatible with the unarity of shape, and in so doing grants that there are at least two ontological schemes that can engender relativity. But Lewis thinks that the resultant ontology remains objectionable (2002, 5):

I protest that there is still nothing in the picture that has *bent* or *straight simpliciter*. Not you; not your nonexistent temporal parts. Instead of having *bent simpliciter*, you bear the *having-at* relation to it and *t1*. But it is one thing to have a property, it is something else to bear some relation to it. If a relation stands between you and your properties, you are alienated from them.

¹⁰ See, e.g., Forbes (1987), Haslanger (1989), Johnston (1987), and Lowe (1987; 1988). Some endurantists defended presentism; see, e.g., Hinchliff (1996). Others disputed the unarity of shape properties; see, e.g., Wasserman (2003).

We thus arrive at the problem of temporary intrinsics in its most mature form. It began as an arity argument: Lewis argued that although we might have good reason to believe that shape properties are relative to time, we have even better reason to believe that shapes are unary, and hence that we should, all things considered, reject shape relativism. But in response to endurantistic criticisms, the problem of temporary intrinsics became a simplicity argument with five premises:

- (P1) Persisting objects are simply shaped—where an object is simply shaped if and only if it stands in the unplugged binary instantiation relation to an unplugged unary shape property.
- (P2) Presentism is false.
- (P3) If presentism is false, then endurantism implies shape relativism.
- (P4) If shape relativism is true, then shapes are binary or instantiation is ternary.
- (P5) If shapes are binary or instantiation is ternary, then persisting objects are not simply shaped.
- (C) Therefore, endurantism is false.

The crucial claim in a simplicity argument is that **relativity and simplicity are incompatible**: that relativism about some property *F* is incompatible with objects being *F simpliciter*.¹¹ Assuming that presentism is false, Lewis thinks that we are forced to choose—either persisting objects are simply shaped, or shape is relative to time. Of the two options, Lewis chooses the former.

Lewis's theory of persistence is not without its own warts, it should be noted. There is an intuition that persisting objects are simply shaped, sure, but there is also an intuition that persisting objects are the bearers of shape properties. (I am bent. *Q*: What is bent? *A*: Me!) Since Lewis thinks that relativity and simplicity are incompatible, he thinks that the following three claims cannot all be true: (i) persisting objects change their shape over time, (ii) persisting objects are the bearers of shape properties, and (iii) persisting

¹¹ The notion of 'being *F simpliciter*' has different meanings as used by different philosophers. On some usages, an object is '*F simpliciter*' just if the object is *F* and relativism is not true of *F*. This is not the meaning intended by Lewis (2002) and Cappelen and Hawthorne (2009; 2011); they do not intend simplicity arguments to be flatly question-begging. For more on the notion of 'being *F simpliciter*' in the sense used by Lewis and Cappelen and Hawthorne, see Merricks (1994), Rea (1998), and Eddon (2010).

objects are simply shaped. Lewis thus rejects (ii), deeming it the least plausible of the three. On Lewis's brand of perdurantism, the bearers of shapes are the temporal parts of persisting objects; persisting objects, themselves, have shape properties only in some attenuated and derivative sense. By Lewis's own methodological lights, however, it would be better if we could accommodate all three intuitions. We should accommodate intuition where we can.

I think that (i), (ii), and (iii) can all be true, for I think that relativity and simplicity are compatible. In the argument from temporary intrinsics, (P4) is false.¹²

I am aware that my position is unpopular. Most philosophers share Lewis's belief that relativity and simplicity are incompatible. Michael Rea (1998, 245) says, "According to [shape relativism], there are no temporary properties which an object has *simpliciter*; there are only those it *has-at-t1* or *has tly*, for some time *t*."¹³ Speaking to the case of morality, David Velleman (2013, 45) says,

According to moral relativism, saying that an action is wrong is like saying someone is tall, a claim elliptical unless indexed to a reference class, since someone who is tall for an Mbuti may not be tall for a Kikuyu and it makes no sense to ask whether he is tall *simpliciter*. Similarly, says relativism, it makes no sense to ask whether an action or practice is wrong *simpliciter*. Claims of wrongness must be about wrongness-for-members-of-*x*, where *x* ranges over different cultures or societies . . .¹⁴

Moreover, Lewis is not the only philosopher running simplicity arguments against relativism. In their aptly titled recent book *Relativism and Monadic Truth* (2009),¹⁵ Herman Cappelen and John Hawthorne argue against truth relativism in exactly the way that Lewis argues against shape relativism. They argue that propositions are true or false *simpliciter*; that truth relativism is incompatible with propositions being true or false *simpliciter*, since truth relativism requires either that truth be binary or that instantiation be ternary; and hence that we should reject truth relativism.

There are various ways to respond to simplicity arguments, but I think that we can strike at the heart. Relativity and simplicity are compatible: at least one of the ontological schemes that is capable of engendering relativity

¹² Which is not to say that the other premises are true.

¹³ Rea is here paraphrasing Merricks (1994).

¹⁴ Velleman has told me in personal communication that he does not take this passage to be making a claim about metaphysics or about relativism in general. The passage is intended to be a claim about what moral relativists believe. As such, it's accurate: relativists—moral relativists included—often assume that relativity and simplicity are incompatible.

¹⁵ 'Unary' and 'monadic' are synonyms.

is compatible with simplicity. Hence, simplicity arguments, like arity arguments, cannot establish the falsity of relativism; the most they can establish is that some of the ontological schemes that can engender relativity fail to obtain.

Here is the plan for the rest of the essay. As I said above, my thesis is that there are at least three ontological schemes that are capable of engendering relativity. Already we have encountered two of them. In the terminology I will adopt hereafter, the first was **relationalism** about the properties; the second was **relationalism** about instantiation. In §3, I distinguish relationalism and **variabilism**. The distinction between relationalism and variabilism is then defended in §4, clarified in §5, and applied to the case of color relativism in §6. Finally, in §7, I argue that by applying the relationalism/variabilism distinction twice, we can reconcile relativity and simplicity.

3. Variabilism

The purpose of shape relativism is to allow the same object to have different shapes at different times. One way to achieve this purpose is to construe shapes as binary properties. Another way, however, is to construe shapes as unary properties with variable extensions. Let me introduce some terminology.

The **extension** of a property is the set of its instances. For example, the extension of *being prime* is the set of prime numbers, and the extension of *being taller than* is the set of ordered pairs $\langle x, y \rangle$, such that x is taller than y . An **index** on a parameter is a value that the parameter can take. For example, time is a parameter, and the various instants of time are the indices; type of perceiver is a parameter, and the various types of perceivers are the indices.

Given any parameter, we can distinguish the properties that are ‘fixed’ across parameter from the properties that ‘vary’ across the parameter. The extension of a property is **fixed across the parameter** if and only if the extension of the property is (and must be) the same relative to all of the indices on the parameter. The extension of a property **varies across the parameter** if and only if the extension of the property is (or could be) different relative to different indices on the parameter.¹⁶

To illustrate the distinction between fixed and variable extensions, consider the modal case. World is a parameter, and the various worlds are the indices. Compare two properties, *being prime* and *being spherical*. The extension of *being prime* is fixed across worlds. That is, if we think of

¹⁶ We can also draw a distinction among parameters: only some parameters have properties with extensions that vary across them.

properties as functions from worlds to sets, then *being prime* is a constant function, which takes every world to the set $\{2, 3, 5, 7, \dots\}$. By contrast, the extension of *being spherical* varies across worlds. If Mars is spherical in $w1$ and pyramidal in $w2$, then Mars is in the extension of *being spherical* relative to $w1$, but not relative to $w2$.

Once you understand the distinction between fixed and variable extensions as it applies to the modal case, you are in a position to understand the distinction as it applies to any parameter. A property has an extension that varies across time just if the extension of the property is (or could be) different relative to different instants of time. A property has an extension that varies across types of perceivers just if the extension of the property is (or could be) different relative to different types of perceivers.¹⁷

I can now state the most important structural difference between relationalism and variabilism. Relationalism is the way to reconcile relativism and **extensional fixity**. In the case of shape, for instance, relationalists do away with the unplugged unary shape properties and replace them with unplugged binary properties and families of plugged unary properties. Notice that all of the properties countenanced by shape relationalists are fixed across time. This is true in general: all of the properties countenanced by relationalists are fixed across the parameter in question. By contrast, variabilism is the way to reconcile relativism and *n*-ary-ness. Variabilists keep the unplugged unary properties and construe them as having variable extensions. There is no way to reconcile relativism with both extensional fixity and *n*-ary-ness.¹⁸

4. The Terminological Objection

I think that the distinction between relationalism and variabilism can do quite a lot of philosophically interesting work. But before applying the

¹⁷ There is another distinction to draw here. An individual can **belong** to a value on a parameter. There are many worlds, and I belong to the actual world. There are many times, and I belong to the present time. There are many types of perceivers, and I belong to the type of perceiver, whichever it is, that I am. Say that a value of a parameter is **occupied** just if there is an individual who belongs to it. We can then distinguish strong and weak extensional variation. There is **strong** extensional variation just if the extension of the property varies across occupied values of the parameter. **Weak** extensional variation is extensional variation that is not strong. For example, presentists and eternalists might agree that shape properties have extensions that vary across time. For presentists, non-present times are unoccupied, so the extensional variation is weak. For eternalists, non-present times are occupied, so the extensional variation is strong. Thanks to John Hawthorne for discussion on this point.

¹⁸ Distinctions akin to the relationalism/variabilism distinction are often drawn in the literature on time and tense; see, e.g., Bigelow (1991), Fine (2005; 2006a), and Schlesinger (1995). Perhaps the closest cousin of the relationalism/variabilism distinction is Fine's (2005) distinction between internal and external relativism. One important difference, however: the internal/external distinction gives rise to only two relativity-engendering ontological schemes, whereas the relationalism/variabilism distinction gives rise to three.

distinction, I want to defend it. The distinction between relationalism and variabilism rests on the distinction between an $n+1$ -ary property with a fixed extension and an n -ary property with a variable extension, a distinction which some philosophers reject.¹⁹ I call what follows the **terminological objection**, for it alleges that the difference between relationalism and variabilism is merely terminological.

Objection: We learn that an apparently n -ary property, F , is relative to a parameter. Relationalists say that F is an unplugged $n+1$ -ary property with a fixed extension; variabilists say that F is an unplugged n -ary property with a variable extension; *I* say that these are just two ways of talking. There is no difference between an unplugged $n+1$ -ary property with a fixed extension and an unplugged n -ary property with a variable extension. Relationalism and variabilism are terminological variants. Disputes between relationalists and variabilists are verbal disputes.

Reply: Imagine two disputes that you and I might have. First, we might have a ‘this versus that’ dispute. Both of us look into a box, and we agree that there is only one thing in the box. You say that the thing is G ; I say that the thing is H . Our dispute will prove merely verbal if the thing in the box is both G (as you use the term) and H (as I use the term). Second, we might have a ‘this versus this and that’ dispute. You say that the one (and only) thing in the box is G . I say that there are *two* things in the box: one thing is G , and the other thing is H . Our dispute will prove merely verbal only if it is a verbal matter as to whether there is a second thing in the box.

It is natural to construe the dispute between relationalists and variabilists as a ‘this versus that’ dispute—there is one thing in the world, and the dispute between relationalists and variabilists is about how to classify it. But this is a mistake. The dispute between relationalists and variabilists is a ‘this versus this and that’ dispute. Let me explain.

Suppose that an apparently n -ary property is relative to a parameter. We can divide relationalism into its positive claim and its negative claim. The positive claim is that there is both an unplugged $n+1$ -ary property with a fixed extension and a large family of plugged n -ary properties with fixed extensions. The negative claim is that there is no such thing as the unplugged n -ary property.

Variabilists, I think, should always accept the positive claim.²⁰ Thus, in the dispute between relationalists and variabilists, there is much common ground. They agree that there is an unplugged $n+1$ -ary property, they agree about its extension, and they agree that the extension is fixed across the

¹⁹ See, e.g., Lewis (1986, 52–53) and Hinchliff (1996, 122).

²⁰ Once we divide relationalism into its positive claim and its negative claim, we can distinguish **accommodating** variabilism and **unaccommodating** variabilism. Unaccommodating variabilists reject both claims; accommodating variabilists reject only the negative claim. I see little to recommend unaccommodating variabilism, so I set it aside in the body of the text.

parameter. They agree that there is a large family of plugged n -ary properties, they agree about their extensions, and they agree that the extensions are fixed across the parameter. Moreover, they agree about the conditional: *if* there is such a thing as the unplugged n -ary property, *then* it has a variable extension. What relationalists and variabilists disagree about is whether there is such a thing as the unplugged n -ary property. Relationalists think not; variabilists think so.²¹ Vis-à-vis relationalism, variabilism is a thesis of ontological super-addition: that the world contains everything relationalists believe in *and more besides*.

In my experience, pointing out that the dispute between relationalists and variabilists is a ‘this versus this and that’ dispute satisfies many of the skeptics. They come to the same two conclusions that I do: that the dispute between relationalists and variabilists is an ontological dispute about which objects instantiate which properties, and that the dispute is as genuine as other ontological disputes of the same sort. (Compare the dispute about whether external world objects are colored.)

Other skeptics, however, of a more dogged anti-metaphysical bent, press the terminological objection further. At this point, the question is second-order: Is it a substantive matter as to whether the unplugged n -ary property is instantiated? The more dogged skeptic thinks not. What can be said to the more dogged skeptic? Let me say two things.

First, a challenge. There are methods in first-order ontology for determining whether a putative property is instantiated. Employing these methods seems to reveal differences between cases of relativity, and the differences do not seem to be verbal; they seem to be worldly and genuine.

Start with the **switch-the-index test**. In cases of relative contrariety, if we switch the index on the underlying parameter, variabilism predicts a change in properties, while relationalism predicts no change in properties. As it turns out, the switch-the-index test cuts both ways.

In the case of shape, the test favors variabilism. If shape is relative to time, then an object, O , might be bent at $t1$ and straight at $t2$. Relationalists and variabilists agree that $\langle O, t1 \rangle$ instantiate the binary relation *being bent at*, that $\langle O, t2 \rangle$ instantiate the binary relation *being straight at*, and that O instantiates the plugged properties *being bent at $t1$* and *being bent at $t2$* . The question is whether the unplugged unary shape properties are instantiated. Employ the switch-the-index test. Suppose that time passes from $t1$ to $t2$. Has O undergone a change of shape properties?

²¹ The disagreement between relationalists and variabilists, as I have characterized it, belongs to ontology. There is a related disagreement that can arise between people who agree about the ontology, however. Take two variabilists. The first thinks that the unplugged $n+1$ -ary property is more fundamental than the unplugged n -ary property—she is a **priority relationalist**. The second thinks that the unplugged n -ary property is more fundamental than the unplugged $n+1$ -ary property—she is a **priority variabilist**.

Relationalists say, “No; the only shape properties that *O* has are the plugged properties, and objects do not gain or lose their plugged shape properties over time. At *t1*, *O* instantiates both *being bent at t1* and *being straight at t2*, and at *t2*, *O* instantiates both *being bent at t1* and *being straight at t2*.” Variabilists say, “Yes; at *t1*, *O* instantiates *being bent*. Then, from *t1* to *t2*, *O* undergoes a change of shape properties, loses the property *being bent* and gains the property *being straight*.” Since intuitively *O* does undergo a change of shape properties from *t1* to *t2*, the switch-the-index test favors variabilism.

In the case of size, however, the switch-the-index test favors relationalism. Big and small are relative to comparison class: Remy, a big mouse, is big relative to mice and small relative to animals. Are the unplugged unary properties *being big* and *being small* instantiated? Employ the switch-the-index test. Suppose that we change the salient comparison class. (It does not matter whether we change the comparison class synchronically or diachronically, but it is easier to imagine the change diachronically.) At first, Remy is surrounded by other, smaller mice, and then we gradually replace the mice with bigger animals. Has Remy undergone a change in size properties? Relationalists say, “No; the only size properties that Remy has are plugged properties, and changing the salient comparison class does not result in a change of plugged size properties.” Variabilists say, “Yes; when mice are the salient comparison class, Remy instantiates *being big*. Then, when the salient comparison class changes, Remy undergoes a change of size properties, loses the property *being big* and gains the property *being small*.” Since intuitively Remy does not undergo a change in size properties when the salient comparison class switches from mice to animals, the switch-the-index test favors relationalism.²²

Another test is the **real similarity test**. Suppose that *O1* and *O2* exist just for an instant of time. *O1* is bent at *t1*, and *O2* is bent at *t2*. Are *O1* and *O2* exactly similar in a shape respect? Intuitively yes. And since exact similarity in a respect is a matter of sharing properties, and since *O1* and *O2* do not share any plugged shape properties, this is evidence that the unplugged unary shape properties are instantiated. By contrast, Remy is big relative to mice, and Jupiter is big relative to planets. Are Remy and Jupiter exactly similar in a size respect? Intuitively not. And since exact similarity in a respect is a matter of sharing properties, this is evidence that the unplugged unary shape properties are not instantiated.

²² Like me, Judith Jarvis Thomson (2008, 9–11) defends relationalism about shape: “When people say “That is big” of a thing, they are not ascribing a property bigness to it: they are ascribing different properties to the things. One person may be ascribing the property ‘being a big mouse’. Another may be ascribing the property ‘being a big animal’... [T]here is no such property as bigness.”

The switch-the-index test and the real similarity test reveal differences between the relativity of shape to time, on the one hand, and the relativity of size to comparison class on the other. Moreover, the differences seem to be worldly and genuine, not merely verbal: the fact that Remy and Jupiter are not exactly similar in a size respect has nothing to do with how we talk. The challenge to the dogged skeptics, then, is to explain away the apparent worldliness of the differences between cases of relativity.

The second thing I want to say, however, is much more practical-minded. Ultimately, the proof is in the pudding. The best way to know whether a distinction is genuine is to put the distinction to work. If the work it does is genuine, the distinction is genuine; if the work it does is mere word chopping, the distinction is verbal. Like other endurantists, I think that shape variabilism is a significant improvement over shape relationalism. But I think the distinction between relationalism and variabilism most clearly does philosophical work in the case of colors, which is why I consider the case of color relativism in §6. Color variabilism enjoys genuine and philosophically important advantages over color relationalism, and this makes it very likely, I think, that the distinction between relationalism and variabilism is itself genuine and philosophically important.

5. Three Distinctions

The distinction between relationalism and variabilism is a distinction within relativism. The desire to draw a distinction within relativism is not, of course, new. In this section I compare the distinction between relationalism and variabilism to two others: namely, the distinction between contextualism and truth relativism and the distinction between properties and so-called ‘centering features’. As we get clearer about the notion of a property, we see that the three distinctions, though related in interesting ways, are separate and should be treated as such.

Nota Bene: Readers who want to cut to the chase and see what philosophical work can be done with the relationalism/variabilism distinction can skip ahead to §6 without loss of continuity.

5.1. Contextualism / Truth Relativism

Objection: The distinction between relationalism and variabilism is simply a repackaging of the distinction between **contextualism** and **truth relativism**. Relationalists and variabilists agree that the unplugged $n+1$ -ary properties and the plugged n -ary properties exist and have extensions that are fixed across the parameter. The question is whether there are the unplugged n -ary properties. We can understand the dispute between contextualists and truth relativists in an exactly parallel way. Both sides agree that there are the many **relativized** propositions (e.g. the proposition *that O is bent at t1*) and

that the relativized propositions have their truth-values absolutely. The question is whether there are the **unrelativized** propositions (e.g. the proposition *that O is bent*). Both sides agree that the unrelativized propositions, if they exist, have their truth-values relatively. Why think that there are two distinctions here, rather than just one?

Reply: The dispute between contextualism and truth relativism is a dispute in semantics and should be settled by semantical considerations. The dispute between relationalism and variabilism is a dispute in ontology and should be settled by ontological considerations. There are some interesting parallels, to be sure. But the two disputes are separate. In fact, they can come apart. There are a number of domains in which, in my opinion, the most plausible combination of views is truth relativism and relationalism.

One can ensure that the distinctions do *not* come apart by adopting a bridge principle that connects semantics and ontology. For example, if we adopt a Russellian conception of propositions, on which propositions are built out of worldly items (i.e. particulars and properties), then the two distinctions will necessarily coincide.

The cost of these bridge principles is decreased autonomy, and I think the cost is too high. The sorts of considerations that move us to truth relativism are internal to semantics: data about cross-context disagreements, indirect speech reports, third-party assessments, and so on. The considerations that move us to variabilism are internal to ontology.²³ The semantic data and the ontological data can point in opposite directions, however. There might be good reason to adopt truth relativism about epistemic modals,²⁴ for example, even though there is very little reason to believe in the unary property of might-ness. If you accept a bridge principle, then neither the semantics nor the ontology is autonomous. The dispute between contextualists and truth relativists cannot be settled wholly on semantic grounds, and the dispute between relationalists and variabilists cannot be settled wholly on ontological grounds. (I suppose that if you accept a bridge principle, the interesting upshot of this paper is that we can use arguments in ontology—arguments about change, real similarity, higher-order properties, etc.—to get further traction on the dispute between contextualists and truth relativists.) In my view, the reasons in favor of autonomy outweigh the reasons in favor of bridge principles. If the semantic data and the ontological data point in opposite directions, the distinctions should be allowed to come apart.

²³ Relevant ontological considerations include: change, real similarity, higher-order properties, and property exclusion.

²⁴ Notable defenses of truth relativism about concerns epistemic modals includes Egan (2011), MacFarlane (2011a; 2014), and Egan, Hawthorne, and Weatherson (2005).

My preferred way to ensure autonomy for both semantics and ontology is to distinguish **semantic values** and **properties**.²⁵

It is helpful to approach the distinction between semantic values and properties by way of an analogy. Consider the **stage view** of persistence.²⁶ On the stage view, nothing persists. There is Obama-at-*t1*, Obama-at-*t2*, Obama-at-*t3*, and so on, and while these objects are similar and connected in various ways, they are not identical. Of course, the English language contains the name ‘Obama’, and we use this name at various times. Stage theorists maintain that ‘Obama’ denotes different objects at different times. At *t1*, ‘Obama’ denotes Obama-at-*t1*. At *t2*, ‘Obama’ denotes Obama-at-*t2*.²⁷

With the stage view in mind, suppose that semanticists come to agree (a) that there is such a thing as the unrelativized proposition *that Obama is bent* and (b) that the truth-value of this proposition varies over time. *Q*: Does the existence of this proposition pose a threat to the stage view of persistence? *A*: Not a whit! Stage theorists should conclude that there is a sort of relativity in truthmaking, i.e., that different objects are alethically relevant to the same proposition at different times. At *t1*, the truth-value of the proposition *that Obama is bent* depends wholly on the shape of Obama-at-*t1*; the shape of Obama-at-*t2* is alethically irrelevant. At *t2*, the truth-value of the proposition *that Obama is bent* depends wholly on the shape of Obama-at-*t2*; the shape of Obama-at-*t1* is alethically irrelevant.

I note the stage theory of persistence to underscore the fact that we already distinguish semantic values and **particulars**. The fact that a name has a semantic value relative to each index on a parameter does not imply that the same particular is the semantic value relative to each index. I think that the same point applies on the predicate side of things, too. Just as we distinguish semantic values and particulars, so too we should distinguish

²⁵ The distinction between semantic values and properties is at issue in the dispute between Cappelen and Hawthorne (2009; 2011) and MacFarlane (2007; 2011a; 2011b; 2014). Cappelen and Hawthorne (2009) claim that truth relativism is incompatible with the unarity of truth. MacFarlane (2011b, 442) replies, “Old school relativists might have refused to call propositions ‘true’ or ‘false’ without adding a qualification, but the analytic [truth] relativists Cappelen and Hawthorne are discussing are happy to make room for a monadic truth predicate that behaves disquotationally. . . . Moreover, it is easy to make room for a monadic ‘true’ and ‘false’ that works in the analytic [truth] relativist framework and ratifies the disquotational inference. Roughly stated: ‘true’ expresses a property, *truth*, whose extension at a circumstance of evaluation is the set of propositions that are true-at that circumstance of evaluation.” In other words, contemporary truth relativists assign a semantic value to the predicate ‘is true’. In a rejoinder, Cappelen and Hawthorne (2011, 459) say, “MacFarlane’s discussion. . .confuses a monadic *property* with a monadic *predicate*.” Cappelen and Hawthorne object to MacFarlane’s move from semantics values to properties.

²⁶ See Hawley (2004) and Sider (1996; 2003).

²⁷ This is a slight oversimplification. In tensed sentences, e.g., ‘I saw Obama yesterday’, ‘Obama’ can name past or future objects.

semantic values and properties. The fact that a predicate has a semantic value relative to each index on a parameter does not imply that the same property is the semantic value relative to each index.

To keep things simple, stick with the same example. If endurantism is true (and presentism is false), then shape is relative to time. What form of shape relativism should we adopt, relationalism or variabilism?

Suppose that we are relationalists about shape, and suppose, as before, that semanticists come to agree (a) that there is such a thing as the unrelativized proposition *that Obama is bent* and (b) that the truth-value of this proposition varies across time. *Q*: Does the existence of this proposition pose a threat to relationalism about shape? *A*: Not a whit! Relationalists should believe that there is a sort of relativity in truthmaking, i.e., that different properties are alethically relevant to the same proposition at different times. At *t1*, the truth-value of the proposition *that Obama is bent* depends wholly on whether Obama (the enduring object) has the property *being bent at t1*; whether Obama has the property *being bent at t2* is alethically irrelevant. At *t2*, the truth-value of the proposition *that Obama is bent* depends wholly on whether Obama has the property *being bent at t2*; whether Obama has the property *being bent at t1* is alethically irrelevant.

Suppose, instead, that we are variabilists about shape. As variabilists, we do not explain truth-value relativity in terms of truthmaking relativity. The same property is alethically relevant to the proposition, irrespective of which index on the parameter we choose: both at *t1* and at *t2*, the truth-value of the proposition *that Obama is bent* depends wholly on whether Obama has the property *being bent*. But the extension of *being bent* does (or can) vary across time, and therefore the truth-value of the proposition *Obama is bent* does (or can) vary across time as well.

In fact, this points generalizes. If truth relativism is true of some predicate, then the predicate has a semantic value and the semantic value does (or can) vary across the parameter in question. As a result, propositions expressed by sentences containing the predicate do (or can) vary in truth-value across the parameter. But both relationalism and variabilism are compatible with truth relativism. Relationalists think that the semantic value of a predicate is *different* properties relative to different indices; variabilists think that the semantic value of the predicate is the *same* property relative to all of the indices.²⁸

Although I do not have the space to argue the point here, I think that we get examples of at least three of the four options. When it comes to colors,

²⁸ Wright (2008) gestures toward a similar distinction. He distinguishes the “ternary model” of truth relativism, which corresponds roughly to the relativism about truthmaking that I mention in the text, with relativism about “truth-conferrers,” which corresponds more closely to variabilism as I think of it.

I am inclined toward truth relativism and variabilism. When it comes to epistemic modals, I am inclined toward truth relativism and relationalism. When it comes to size, I am inclined toward contextualism and relationalism. I have even encountered philosophers who favor the fourth combination, contextualism together with variabilism.)

We are familiar with the debate between contextualists and truth relativists. Contextualism is the default view; we need some positive arguments to move us to truth relativism. We can think of arguments for truth relativism as semantic indispensability arguments. Truth relativists draw our attention to certain semantic phenomena (agreement and disagreement, patterns of assertion and retraction, various third-party assessments, etc.) and argue that we cannot properly account for the semantic phenomena without countenancing the unrelativized propositions and their relative truth-values.²⁹ All of this is as it should be: the questions what propositions there are and how the truth-values of these propositions vary across parameters are semantic questions to be settled by semantic considerations.

The dispute between relationalists and variabilists has a similar structure but a different subject matter. Relationalism is the default view; we need some positive arguments to move us to variabilism. Arguments for variabilism are essentially ontological indispensability arguments. Variabilists draw out attention to certain ontological phenomena (see fn. 23) and argue that we cannot properly explain the phenomena without countenancing the unplugged n -ary properties and their variable extensions. This, too, is as it should be: the questions what properties there are and how the extensions of these properties vary across parameters are ontological questions to be settled by ontological considerations.

That is not to say that there are no connections between semantics and ontology. I am sometimes inclined to think that variabilism implies truth relativism. But the reverse is certainly not the case. No argument from cross-context disagreements, or third-party assessments, or data about assertion and retraction should convince anyone to adopt variabilism.

5.2. *Properties / Centering Features*

Objection: Variabilists maintain that we should expand our ontology to include the unplugged n -ary and their variable extensions. What are these entities? I say that they are nothing new. Recall the distinction between a possible world and a centered possible world. We represent properties as functions from possible worlds to sets of objects. We represent **centering**

²⁹ See, among many others, Brogaard (2010), Egan (2010b), Egan, Hawthorne, and Weatherson (2009), Kölbel (2002; 2003; 2004), Lasersohn (2005), MacFarlane (2003; 2007; 2009; 2011a; 2011b; 2014), Richard (2004), and Weatherson (2009).

features as functions from centered possible worlds to sets of objects.³⁰ An unplugged n -ary property with a variable extension is just a centering feature called by a much less lovely name.

Reply: Centering features are represented as functions from centered worlds to sets because they do not contribute to the way the world is. One could know exactly which world is actual without knowing (e.g.) whether Shanghai is nearby. By contrast, the posits of variabilism do indeed contribute to the way the world is. To anticipate the next section, consider color variabilism, i.e., the thesis that the extensions of color properties vary across types of perceivers. By the lights of color variabilism, it is not true that one could know exactly which world is actual without knowing (e.g.) whether grass is green. As a result, unlike the thesis that colors are centering features,³¹ color variabilism induces a relativism about actuality. If color variabilism is true, then different worlds are actual relative to different types of perceivers.³²

Here, then, are two differences: unlike centering features, the posits of variabilism contribute to how the world is; and unlike centering features, the posits of variabilism should be represented as functions from possible worlds (not centered possible worlds) to sets. Here is a third difference. Centering features are not sensitive to the tests I mentioned above. When I am in Shandong, Shanghai is nearby. As I fly home, Shanghai ceases to be nearby. Has Shanghai, itself, changed? Intuitively not. Gaining and losing a centering feature does not engender genuine change. The same goes for similarity. When I am in Shandong, both Shanghai and Beijing are nearby. Does that make Shanghai and Beijing, themselves, exactly similar in a (locational?) respect? Intuitively not.³³ Sharing a centering feature does not engender real similarity.

There is a view—**centrism**—which, ontologically speaking, is relationalism plus centering features. Variabilism and centrism are different because properties and centering features are different. Variabilism is relationalism plus properties. The dispute between variabilism and centrism is really quite interesting, I think, but afield from the present discussion, so for the remainder of this essay I put centrism and centering features aside.

³⁰ The name ‘centering feature’ is due to Egan. See Egan (2006a; 2006b; 2010a).

³¹ The thesis that colors are centering features has been defended by Brogaard (2010) and Egan (2006a; 2006b; 2010a).

³² For other discussions of relativism about actuality, see Bigelow (1991), Fine (2005), Goodman (1978), and Rovane (2011).

³³ At most, the pair <Shandong, Shanghai> is exactly similar to the pair <Shandong, Beijing>. But it is binary properties that make pairs similar.

6. Color Relativism

The main motivation for color relativism is the phenomenon of color perception variation. The same object, in the same viewing environment, looks different colors to different types of perceivers, and singling out one type of perceiver (among the many that seem normal and non-defective) as *the* type that sees colors veridically seems arbitrary and metaphysically unmotivated.³⁴ I want to consider the case of color relativism for two reasons.

First, focusing too intently on shape relativism and the problem of temporary intrinsics can have a distorting effect. One can get the mistaken impression that the problem has something essentially to do with time or tense. (In fact, one of the leading responses to the problem of temporary intrinsics is called ‘taking tense seriously’.³⁵) The problem of temporary intrinsics is really just an instance of a much more general problem: namely, **the problem of relative contrariety**. Suppose that *F* and *G* are contrary properties, and suppose that *x1*, *x2*, . . . , are values on some parameter *X*. The problem of relative contrariety is the problem of how the selfsame object can be both *F* relative to *x1* and *G* relative to *x2*, despite the fact that nothing can be both *F* and *G*. Since some properties are relative to time, some instances of the problem involve the time parameter. But if properties are relative to other parameters (world, culture, type of perceiver, etc.), then the same problem arises without tense or time playing any role. The case of color relativism is interesting in part because it involves synchronic relativity. According to color relativism, color is relative to type of perceiver.³⁶

Second, color variabilism is plausible. In the literature, color relativism and color relationalism are often conflated together. This is unfortunate, because many of the arguments marshaled against color relativism, though they bite against color relationalism, are toothless against color variabilism. I cannot give a full defense of color variabilism here,³⁷ but I will argue that some of the metaphysical reasons to reject color relationalism are not likewise reasons to reject color variabilism. If my arguments succeed, then the distinction between relationalism and variabilism stands vindicated, since a reason to reject a theory is also a reason to reject any terminological variant of it.

Take a uniformly colored object, for example, color chip 527. According to color relativism, chip 527 is different colors relative to different types of perceivers. John sees chip 527 as plum (a particular shade of reddish-blue),

³⁴ The argument from perceptual variation to color relativism is defended in many places, but the most thorough defense is in Cohen (2009).

³⁵ See, e.g., Zimmerman (2005).

³⁶ Of course, if endurantism is true, then color is also relative to time. But the sort of color relativism that I am interested in here would arise even if perdurantism were true.

³⁷ For a defense of color *relativism*, see, among others, Cohen (2009), Johnston (1992), and McLaughlin (2003).

and Jane sees chip 527 as aqua (a particular shade of greenish-blue). According to color relativism, both John and Jane might see chip 527 veridically. For John and Jane are different types of perceivers—John is an *S1*, let us say, and Jane is an *S2*—and chip 527 might be plum for *S1*'s and aqua for *S2*'s.

Opponents of color relativism often allege that color relativists misidentify the color properties. Every theory of color must answer this question: Which properties are the colors? A color relationalist has only two options: (a) take the colors to be the binary relations, *being plum for*, *being aqua for*, . . . , or (b) take the colors to be the plugged properties, *being plum for S1's*, *being plum for S2's*, . . . , *being aqua for S1's*, But there are good reasons for thinking that the colors are neither the binary properties nor the plugged properties.

Why aren't the colors the binary properties? Because colors are not relations! Colors are unary, not poly-ary. Think of it in terms of bearers. There is a basketball in the room. *What is orange?* The correct answer: the basketball. The incorrect answer: a curious bit of ontological miscellany, *viz.*, the <object, type of perceiver> pair, whose first member is the basketball and whose second member is the type of perceiver *S1*.

Why aren't the colors the plugged properties? Let me offer three arguments in ascending order of strength.

First, color phenomenology.³⁸ Colors do not appear to be plugged properties; they appear to be simple, intrinsic, unary, unplugged, nonrelational properties of their bearers. Identifying the colors with the plugged properties thus makes color phenomenology misleading, and it is strange for phenomenology to be misleading about *colors*.

Second, color exclusion.³⁹ Some colors are determinates of others, and some colors are maximally determinate. Intuitively, maximally determinate color properties should exclude one another. It should be impossible for a uniformly colored object to instantiate more than one maximally determinate color property. But if colors are the plugged properties, then maximally determinate color properties do not exclude one another. Both *being plum for S1's* and *being aqua for S2's* are maximally determinate color properties, and chip 527 instantiates both, and many more besides.

Third, color individuation.⁴⁰ The plugged properties can be sorted in a variety of ways. One way is by their heads. Two plugged properties are

³⁸ Philosophers who have run the color phenomenology argument include Armstrong (1987), McGinn (1996), and Tye (2000). For a reply on behalf of color relationalism, see Cohen (2010).

³⁹ Philosophers who have run the color exclusion argument include Chalmers (2006), Kalderson (2007), Pautz (n.d.), and Tye (2006).

⁴⁰ So far as I know, this is a novel argument against color relationalism.

head-alike if and only if they are constituted by the same color relation. If we identify colors with the plugged properties, then there are head-alike color properties: e.g., *being plum for S1's* and *being plum for S2's*. But I think that the notion of head-alike color properties is absurd: color properties cannot be similar to one another in the way that head-alike color properties would have to be. A case helps to bring this out.

The Simultaneous Switch: Suppose that Wyatt and Brody are intrinsic duplicates—both are *S1's*. Wyatt, the control, sits before a uniformly colored screen that occupies his entire visual field. The screen looks to Brody a particular shade of forest green. In a duplicate room, we sit Brody before a duplicate screen. The duplicate screen looks to Brody exactly the way that Wyatt's screen looks to Wyatt. We then gradually transform Brody's visual system—change a neural connection, alter a rod or cone, change the shape of the eye—but always by non-invasive techniques that are totally undetectable from the inside. By the end of our tinkering, Brody is a different type of perceiver: Brody has transformed from being an *S1* to being an *S2*. If we were to leave the screen unaltered, the screen would look discernibly different to Brody-the-*S2* than it did to Brody-the-*S1*. But we are clever and meticulous scientists. For each alteration to Brody's visual system, we make a simultaneous and counterbalancing alteration to the screen's surface, thus inducing in Brody what seems to him an uninterrupted, phenomenologically unchanging visual experience as of forest green. In fact, the visual experience enjoyed by Brody during the course of the experiment is phenomenologically identical to the visual experience enjoyed by Wyatt in the other room. Afterwards, Wyatt and Brody report, with equal confidence, that the screen before them did not change in color.

Our task is to count color properties. Wyatt has seen only a single color property during the course of the experiment. How many color properties has Brody seen? If we identify the colors with the plugged properties, then Brody has seen at least two color properties—two head-alike color properties—namely, *being forest green for S1's* and *being forest green for S2's*. But that seems false to me. Much has changed both in and around Brody, but the color he was seeing remained the same. Head-alike color properties would have to be exactly similar to one another in the way they look;⁴¹ in other words, head-alike color properties would have to be phenomenologically identical. But I say that it belies the nature of colors for there to be distinct color properties that are exactly similar in how they look. In fact, I am inclined to individuate colors by how they look: if *C1* and *C2* are color

⁴¹ Head-alike color properties are not just indiscernible, in the way that red_{10} and red_{11} are. They are *identical* in the way they look.

properties, then *C1* and *C2* are identical if and only if they are exactly similar in how they look.⁴²

All three of these arguments are arity arguments whose conclusion is that colors are unplugged unary properties. Construed as arguments against color relationalism, these arguments seem to me nearly decisive. There are good reasons for thinking that color is relative to type of perceiver, sure, but there are even better reasons for thinking that colors are neither binary properties nor plugged properties. Color relativists who adopt color variabilism, however, have a ready reply to all three arguments. About phenomenology color variabilists say, “Color phenomenology is not misleading. Colors are simple, intrinsic,⁴³ unary, unplugged, nonrelational properties of their bearers, just as they appear to be.” About exclusion color variabilists say, “Maximally determinate color properties do indeed exclude one another. Chip 527 has exactly one maximally determinate color property,⁴⁴ although it is a variable matter as to which maximally determinate color property chip 527 has.” About individuation color variabilists say, “Colors are indeed individuated by the ways they look. Head-alike color properties are impossible and absurd.”

My thesis is not that color variabilism is true. Rather, my thesis is that color variabilism enjoys real and philosophically important advantages over color relationalism. There are good reasons for thinking that color is relative, and there are good reasons for thinking that colors are unplugged unary properties. Color variabilism is the way to consistently hold both theses.

7. Instantiation Relativism

We return, finally, to whether relativity and simplicity are compatible. Take the case of shape. An object is bent *simpliciter* if and only if the object

⁴² If one balks at talk of how a color property itself looks, then this claim could be modified slightly: if *C1* and *C2* are color properties, then *C1* and *C2* are identical if and only if the way that *C1* objects look (when they look *C1*) is exactly similar to the way that *C2* objects look (when they look *C2*). Thanks to Boris Kment for discussion on this point.

⁴³ The question whether variable colors are intrinsic is somewhat complicated. Relative to any type of perceiver, duplicates are necessarily color indiscernible. But the very object that is plum (relative to *S1*'s) is not plum but rather aqua (relative to *S2*'s).

⁴⁴ Color variabilists (at least accommodating color variabilists; see fn. 20) agree with color relationalists that chip 527 instantiates a plethora of plugged properties, among them both *being plum for S1*'s and *being aqua for S2*'s. This fact helps to clarify the color exclusion problem. The problem for color relationalism is not that it predicts that there are many plugged properties on the surfaces of things. Rather, the problem is that the properties which color relationalists identify as the colors are ill-fit to play the color role. Part what makes some properties fit to be the colors is (a) that they stand in relations of determinate-determinable and (b) that the maximally determinate properties exclude one another. The properties that color relationalists identify as the colors satisfy (a) but not (b). The properties that color variabilists identify as the colors satisfy both (a) and (b). Thanks to an anonymous referee for pressing me to say more about color exclusion.

stands in the unplugged binary instantiation relation to the unplugged unary property *being bent*. There are at least three ontological schemes that can engender the relativity of shape to time, and at least one of them reconciles relativity and simplicity.

As shape relativists, we face a choice: Should we be relationalists or variabilists about shape?

Start with relationalism. Suppose that an object, *O*, is bent at *t1* and straight at *t2*. If relationalism about shape is true, then *O*, at *t1*, is bent, but not bent *simpliciter*. *O* does not stand in the unplugged binary instantiation relation to the unplugged unary property *being bent*.

Turn to variabilism. If variabilism about shape is true, then the unplugged unary shape properties have extensions that vary across time. From the fact that there are properties whose extensions vary across a parameter, it follows that instantiation is relative to that parameter. Variabilism implies instantiation relativism. So, as variabilists, we must be relativists about instantiation, and thus we face another choice: Should we be relationalists or variabilists about instantiation?

Suppose that we are variabilists about shape and relationalists about instantiation. Call this **single variabilism**. If single variabilism is true, then *O*, at *t1*, is bent, but not bent *simpliciter*. *O* does not stand in the unplugged binary instantiation relation to the unplugged unary property *being bent*.

The option that has gone unnoticed is **double variabilism**. To reconcile relativity and simplicity, we need a form of relativism that is not founded ultimately on relationalism. And there is such a view: double variabilism. We can be variabilists both about shape and about instantiation, rejecting the claim that variabilism about instantiation must itself be founded on a relationalism about some second-order instantiation relation.⁴⁵ If double variabilism is true, then *O*, at *t1*, is bent, and bent *simpliciter*. *O* stands in

⁴⁵ Double variabilism, as I conceive of it, is a form of relativism that is not founded ultimately on relationalism. I do not believe in a second-order instantiation relation. A second-order instantiation relation would relate first-order instantiation relations, properties, and objects. (If we need a second-order instantiation relation, then presumably we need a third-order instantiation relation, and so on. But that way lies Bradley Regress; cf. Lewis (2002, 6).) If there is a second-order instantiation relation, then, in principle, we could be variabilists both about shapes and about (first-order) instantiation by being relationalists about second-order instantiation. This would be a variabilism about (first-order) instantiation that *is* founded ultimately on relationalism, not the sort of view that I find interesting. The important question, as I see it, is not whether we are variabilists about (first-order) instantiation but whether our relativism is founded ultimately on relationalism. Arity arguments that can be recast as simplicity arguments can be recast again as second-order simplicity arguments and make trouble for relationalism about second-order instantiation. The only way to avoid these arguments is to adopt a form of relativism that is not founded ultimately on relationalism, i.e., double variabilism as I conceive of it. Thanks to an anonymous referee for pressing me to say more about double variabilism and second-order instantiation.

the unplugged binary instantiation relation to the unplugged unary property *being bent*.

The same goes for other cases. Moral relativism is compatible with actions being right or wrong *simpliciter*. Truth relativism is compatible with propositions being true or false *simpliciter*. We reconcile relativity and *n*-ary-ness with one application of the relationalism/variabilism distinction, and we reconcile relativity and simplicity with two applications.

All three forms of relativism—relationalism, single variabilism, and double variabilism—have their occasion. When a thesis of relativity faces compelling arity arguments, and the objections encapsulated in the arity arguments can be recast as simplicity arguments, double variabilism is the best option. For example, suppose that what convinces us that shapes are not binary properties is the phenomenon of real change. We think that real change is not adequately captured by thinking of objects as (eternally) instantiating a variety of plugged shape properties. Relationalism is a bad option, then. But so too is single variabilism. After all, if we fail to capture real change by thinking of objects as (eternally) instantiating a variety of plugged shape properties, then we also fail to capture real change by thinking of objects as (eternally) standing in a variety of plugged instantiation relations to various unplugged unary shape properties.⁴⁶ Double variabilism does better. According to double variabilism, an object (temporarily) stands in the unplugged binary instantiation relation to different unplugged unary shape properties at different times.

Note, however, that arity arguments cannot always be recast as simplicity arguments. Consider the color individuation objection, which alleges that head-alike color properties are impossible and absurd. In response to the color individuation objection, a move from color relationalism to single variabilism is fine. There is no way to recast the color individuation objection as a simplicity argument. When a thesis of relativity faces compelling arity arguments, and the objections encapsulated in the arity arguments cannot be recast as simplicity arguments, single variabilism is the best option.

Finally, arity arguments are not always germane. There are no compelling arity argument against the claim that size is relative to comparison class, for example. When a thesis of relativity face no compelling arity arguments, relationalism is the best option.

Of the three forms of relativism, double variabilism is the most radical. We are accustomed to thinking that there must be some absolutist perch from which all of the facts can be seen together, but there is no such absolutist perch, if double variabilism is true. Relative to one index on a parameter, an object stands in the unplugged binary instantiation relation to a property, and relative to another index on the parameter, the selfsame object

⁴⁶ Cf. Merricks (1994, 169): “Once *fly bent*, always *fly bent*.”

does not stand in the unplugged binary instantiation relation to the selfsame property. If we think indices as having opinions about which properties are had by which objects, the indices disagree and contradict one another.

But there is an interesting point to be made here. Absolutists and double variabilists agree about the basic ontological ingredients. Absolutists and relationalists disagree about the first-order ontology; they disagree about whether objects have plugged or unplugged properties. Absolutists and single variabilists disagree about the first-order ontology; they disagree about whether objects and properties are glued together with a plugged or unplugged instantiation relation. But absolutists and double variabilists agree about the first-order ontology. The interesting point, then, is that we can remove the first-order ontological differences between absolutists and relativists without destroying the disagreement between them.⁴⁷ Absolutists and relativists can agree about the basic ontological ingredients and disagree about whether *those very ingredients* are absolute or relative.⁴⁸

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⁴⁷ There is an ontological difference between absolutism and double variabilism. The difference concerns the extensions of certain properties. For example, a double variabilist about shape will think that the same object might instantiate both *being bent at t1* and *being straight at t2*; absolutists will disagree.

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