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Counterfactual similarity, nomic indiscernibility, and the paradox of quidditism

Andrew D. Bassford [a] and C. Daniel Dolson[b]

[a]Department of Philosophy, University of Texas, Austin, TX, USA; [b]Department of Philosophy and Religion, Mississippi State University, Mississippi State, USA

ABSTRACT

Aristotle is essentially human; that is, for all possible worlds metaphysically consistent with our own, if Aristotle exists, then he is human. This is a claim about the essential property of an object. The claim that objects have essential properties has been hotly disputed, but for present purposes, we can bracket that issue. In this essay, we are interested, rather, in the question of whether *properties themselves* have essential properties (or features) for their existence. We call those who suppose they do 'property essentialists'; those who do not, 'property anti-essentialists,' or 'quidditists.' We offer two complementary arguments. Our total argument is under-girded by two assumptions: transworld identity theory and 'received view' counterfactual semantics, *a la* David Lewis. We then argue that, if one presumes that these are true, then one risks running headlong into paradox if one also accepts property anti-essentialism. That's the first argument. By contrast, if one accepts these same assumptions in conjunction with property essentialism, then the paradox is avoided. This is the second argument. We take it that our arguments work to show that, between property essentialism and quidditism, the property essentialist is on better footing. Plausibly, properties themselves do have essential properties for their existence.

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1. Introduction

Is it the case that for all possible worlds metaphysically consistent with our own, for certain properties and certain of their features, that, if that property exists at any world, then it has those features associated with it at that world too? That is, do properties have essential features of their existence?

This is the primary question of this essay. Here, we offer an argument to the effect that this question ought to be answered in the affirmative.

CONTACT Andrew D. Bassford a.d.bassford@utexas.edu Department of Philosophy, University of Texas at Austin, 2210 Speedway, Stop C3500, Austin, TX 78712-173, USA

Dialectically, this amounts to an argument against property anti-essentialism (or quidditism) and an argument in favor of property essentialism.

To support this thesis, we proceed as follows. In §2, we begin by defining the terms of the question: What is meant by 'property,' 'feature,' 'essence,' and 'metaphysical consistency,' for the practical purposes of the inquiry. With these terms defined, the question can be stated more exactly. In §3, we then detail the context of dispute surrounding the question. The question has gained considerable attention since Shoemaker (1980), and several prominent positions have emerged with respect to it. We condense the various positions into two – property essentialism and property anti-essentialism – and define each. In §4, we then explicitly state the assumptions under-girding our argument. Those assumptions are two in number and pertain to transworld identity and counterfactual semantics. The second is especially important, and so we spend some time detailing the 'received' or 'standard' view of counterfactuals, namely that most often accredited to David Lewis.

In §5, we then offer our argument. The argument takes the form of a *reductio* and so functions as a *paradox* for the anti-essentialist who shares our commitment to these assumptions. Our argument, in brief, is this: If one accepts our assumptions and one also accepts the property anti-essentialist thesis, then one loses the ability to properly evaluate certain kinds of counterfactual conditionals. However, if one accepts our assumptions alongside property essentialism, then no such paradoxical conclusion is reached. The paradox may be taken as a mark against property anti-essentialism and a mark in favor of property essentialism, and so provides a plausible reason to answer the primary question of this essay in the affirmative. This argument requires a fair amount of exposition; and so, we conclude, in §6, with a brief summary of all that has been said.

2. Definition of terms

Is it the case that for all possible worlds *metaphysically consistent* with our own, for certain *properties* and certain of their *features*, that, if that property exists at any world, then it has those features associated with it at that world too? That is, do properties have *essential* features of their existence?

In this section of the essay, we define each of these terms for present purposes. Each is open to multiple interpretation. Therefore, we offer some of these definitions as merely *stipulative*, conceding at the outset that they may not hold in the final analysis.

2.1. 'Property'

We'll first need to settle on some meaning of 'properties' – what properties or property-like qualities ought to be included within the scope of the inquiry. No general consensus has been reached on what ought to be so included. Nonetheless, for present purposes, we'll include all of the following: (i) so-called 'natural' or 'scientific' properties (such as *being negatively charged*) (Yates 2013), the kinds of properties we use to describe ordinary physical objects within our scientific disciplines; (ii) both primary and secondary qualities (*having a mass of 2.4 grams* vs. *being red*) (Locke 1706), the first of which are thought to belong intrinsically to objects, and the second, which are thought to belong relationally or merely dispositionally to them; and (iii) sortal or 'thick' properties (such as *being oxygen* or *being a mental disorder*) (Wiggins 1980; Zimmerman 2009), the kinds of attributes of objects we think place them within their natural categories.[1]

We'll treat them all as a unified class within the scope of this essay unless otherwise forced to carve them up and treat them separately. Importantly, for present purposes, we exclude merely logical, mathematical, and so called 'Cambridge' properties (Shoemaker 1980) (*being identical to oneself*; *being odd*, *being prime*, etc.; and *being the unique member of some singleton set*, respectively). We exclude these because it is likely that no one would seriously doubt that there is at least some feature essential to *being odd*, etc., whereas one may reasonably doubt whether, say, there is anything essential to *being red* or *being negatively charged*. Perhaps such properties might be or behave differently than they actually are or do.

2.2. 'Feature'

We'll also need to say something about 'features,' or those qualitative aspects examined in looking at properties to determine if they do or do not have essences. Features may be treated as second-order properties (of whatever adicity), which are or are not instantiated in properties themselves. Gibbs (2018, 2333–2334) distinguishes between three categories of features: (i) structural features, 'such as being a monadic property or a two-placed relation'; (ii) patterns of instantiation, such as, e.g. *being red*'s being exemplified by both this apple and that stopsign; and (iii)

[1]This list is not intended to be mutually exclusive.

causal or nomic roles, i.e. 'in terms of their causal and lawlike relation to other properties.'[2]

We'll consider all three as candidate essences in the inquiry, though, by and large, most attention has fallen on category (iii). More on this in §3.1. Importantly, for present purposes, we exclude trivial second-order features of properties, such as, again, *being self-identical*. We exclude non-qualitative features like these because even if such features might serve as necessary conditions for the existence of certain properties, the term 'essence' has qualitative implications (Fine 1994); only those qualitative features of properties (like (i–iii)) are suitable candidate essential features of properties.[3]

2.3. 'Essence'

We'll also need to stipulate some meaning of 'essence' for present purposes. We'll need to *stipulate* it because, like 'property,' no general consensus on the meaning of 'essence' has been reached in contemporary discussion. As we use the term throughout this essay, we mean only to designate *qualitative necessary-for-existence conditions*, or what is normally just referred to as the 'essential properties' of the phenomenon under investigation (Plantinga 1970, 474; Robertson and Atkins 2018; Bassford 2019). This kind of essence differs from what Roca-Royes (2011) refers to as 'sufficient for existence' essences. It also differs from what is sometimes called the 'individual essence' of the phenomenon (Losonsky 1987; Hawthorne 2001; Ujvári 2013).

(i) To hold that some property, *P*, has a feature, *F*, that functions as its necessary-for-existence essence (or '*N*-essence') is to hold that for all worlds, w, if *P* exists at *w*, then *P* has *F* at *w* too. (ii) To hold that *F* is the sufficient-for-existence essence (or '*S*-essence') of *P* is to hold that, if some property at *w* has *F*, then that property is identical to *P*. (iii) And to hold that *F* is the individual essence (or '*I*-essence') of *P* is to hold that *F* functions as *both* the *N*-essence and *S*-essence of *P*.

[2]A common thought is that, in virtue of possessing feature (iii), a property takes on a particular 'causal profile.' As Audi (2016, 833) puts it:

> A property's causal profile is roughly the sum of facts about what it disposes its bearers to do. In particular, this includes what a thing is disposed to cause by having a given property (*forward-looking powers*), and also what factors are disposed to cause things to have the property in question (*backward-looking powers*).

[3]See Cowling (2015) for more on the distinction between first-order qualitative and non-qualitative properties. Much of what Cowling says there about non-qualitative properties might be extended to make sense of non-qualitative features too.

Figure 1. Four grades of modality.

Note: We'll use a graph of this sort throughout the remainder of the paper. '@' designates actuality; 'P' designates physical possibility; 'M' designates metaphysical possibility; and 'L' designates mere logical possibility. The different shades indicate each respective modal grade.

In this essay, we are concerned only with qualitative features of properties that might be *N*-essential to them, as such; we leave the question of whether certain properties (of the sort described above) have *S*-essences and, more strongly, *I*-essences, to another time.

2.4. 'Metaphysical consistency'

Finally, the phrase 'metaphysically consistent with the actual world' needs to be clarified. As we use the phrase, 'all worlds metaphysically consistent with the actual world' is equivalent to 'all worlds governed by the same specific metaphysical laws as those governing the actual world.' This itself needs further explication.

Take as the domain of possible worlds within our model all ways that things *logically* might have been. Supposing there are no impossible worlds, this is the maximal domain of possible worlds. Our world, the actual world, $w_@$, is included within this set.

Now, among these worlds, all of them are governed by the same logical laws as $w_@$. These are the *L*-worlds. Some possess the same logical and metaphysical laws as $w_@$. These are the *M*-worlds. Some possess the same logical, metaphysical, and physical laws as $w_@$. These are the *P*-worlds. And finally, some possess all of these laws plus all of the same facts as obtain at $w_@$. This just is $w_@$. If we partition our domain of worlds in this way, we arrive at a 'nested sphere' or onion model of possible worlds (Lewis 1973b, 427–428), corresponding to four 'standard' grades of modality (Vaidya 2017): $w_@$ is a *P*-world; all *P*-worlds are *M*-worlds; all *M*-worlds are *L*-worlds; and all worlds whatsoever are *L*-worlds (Figure 1).[4]

[4]Distinguishing each order of law from one another is, of course, a difficult task. We won't undertake the task here. For present purposes, consider these laws. The Law of Non-Contradiction is clearly a mere

Relative to some proposition, *p*, and $w_@$, we can understand the claim that *p* is physically possible (*P*-possible) as the claim that there is a *P*-world at which *p* obtains. We can understand the claim that *p* is metaphysically possible (*M*-possible) as the claim that there is an *M*-world at which *p* obtains. And we can understand the claim that *p* is logically possible (*L*-possible) as the claim that there is an *L*-world at which *p* obtains.

Consistency can now be understood as follows. (i) A physically consistent world is a *P*-world, *P*-possible relative to $w_@$. (ii) A metaphysically consistent world is an *M*-world, *M*-possible relative to $w_@$. (iii) And a logically consistent world is an *L*-world, *L*-possible relative to $w_@$. We are interested here only in the *M*-worlds, what's *M*-possible, *M*-necessary, or *M*-impossible *for properties*, relative to $w_@$.

3. Context of dispute

Our question can now be stated more precisely: Across all *M*-worlds, w, is it the case that for certain properties, *P*, and certain of their qualitative features, *F*, that if *P* exists at w, then it is *F* at *w* too? Relative to $w_@$, are there any qualitative features of certain properties such that it is *M*-necessary that they possess them if they exist, which function as the *N*-essences for those properties, as such?

In this section, we'll detail the various answers that have been given to this question.

3.1. Property essentialism

Those who answer this question in the affirmative are *property essentialists*. According to property essentialism, certain properties do have features that function as the *N*-essence(s) for them across all *M*-worlds at which they exist; certain features of properties are *M*-necessary for them, as such.

Popular accounts of which features are essential to certain properties usually make reference to the third sort of features that properties may possess: e.g. (i) their nomological roles or structures (Ellis 2001; Mumford 2004); (ii) their causal profiles (Handfield 2009; Yates 2013); (iii) their particular powers or bundles of them, conditional or otherwise (Shoemaker 1980; Heil 2004; Roberts 2008); or (iv) their unique dispositions (Harré and Madden 1975; Swoyer 1982; Molnar 2003; Bird 2007;

logical law. The Law of Sufficient Causation is clearly a mere metaphysical law. And the Law of Gravity is clearly a mere physical law.

Eagle 2009). These positions go by various names, such as 'causal essentialism,' 'dispositional essentialism,' 'structuralism,' 'scientific essentialism,' *inter alia*, and have been diversely individuated in the literature (Schaffer 2005; Wang 2016). Some among this camp go further and subscribe not only *N*-essentialism, but to *I*-essentialism, as well (Shoemaker 1980).

In using the term 'property essentialism' throughout this essay, we do not mean to designate any of these particular views *per se*, but just the general thesis. Determining which of these theses is best is an in-house dispute among essentialists, and so ought only be considered a secondary question, dependent upon how the primary question of the essay is answered.

3.2. Property anti-essentialism (Quidditism)

By contrast, those who answer this question in the negative are *property anti-essentialists*. According to property anti-essentialism, it is not the case that any properties have features that function as their *N*-essence(s) across all *M*-worlds at which they exist; there are no features that are *M*-necessary for them, as such. In other words, for any property and any of its features, there are *M*-worlds at which it has the feature and there are *M*-worlds at which it does not (Stalnaker 1976, 344). Sometimes this view is called 'quidditism.'[5]

'Quidditism' is ambiguous in contemporary literature.[6] Its different senses have, likewise, been diversely individuated (Locke 2012; Hildebrand 2016; Smith 2016). The sense of 'quidditism' we mean to associate with anti-essentialism here is the thesis that there are *M*-worlds that differ merely quiddically from $w_@$. A world that differs merely quiddically from $w_@$ is a world *just like* $w_@$ with the exception that two properties have perfectly swapped their features (Gibbs 2018).[7] This is important for present purposes because it follows as a consequence of the anti-

[5]Black (2000, 92): 'Since the fashion is to mine the Scotist tradition for technical terms in this area, let us use the word 'quidditism' for the acceptance of primitive identity between fundamental qualities across possible worlds.'

[6]Quidditism's ambiguity is similar to Haecceitism's ambiguity in several respects (Cowling 2016). Sometimes it is taken as the position committed to the existence of *quiddities*, just as haecceitism is sometimes taken as the position committed to the existence of *haecceities*. (See Robinson 1993, who refers to quidditism as 'property haecceitism' 19). Since the existence of quiddities does not concern us here, this position will not be discussed throughout the remainder of this essay.

[7]Again, like haecceitism, quidditism is sometime described as the thesis that there are, or might be, two properties at a single world (perhaps our world) that share all and only the same qualitative features and differ only according to their respective *thisnesses*. This would not be a quiddically different world, but rather two merely quiddically different properties. Haecceitism, in this sense, is discussed in Black (1952) and Adams (1979); we remain neutral with respect to this corresponding version of quidditism. What concerns us here, rather, is a parallel to the kind of haecceitism discussed by Chisholm (1967) –

essentialist thesis. From this, it follows that for any two properties, P_1 and P_2, for P_1's actual features, F_1, and P_2's actual features, F_2, there are *M*-worlds at which P_1 does not have F_1 (but has F_2 instead) and *M*-worlds at which P_2 does not have F_2 (but has F_1 instead). And so, by taking the intersection of these two possibilities, we arrive at a world at which P_1 is F_2 and P_2 is F_1; a world just like our own but with a quidditic difference. In this sense, the anti-essentialist supposes that there is an *M*-world, *w*, at which, e.g. *quark flavor* and *quark spin* have all and only of each other's features at *w* as they possess respectively at $w_@$ (Lewis 2009).

This entails a commitment to a certain kind of nomically indiscernible world within the domain of *M*-worlds. Any plausible version of property essentialism denies this. And so, one focal point of the dispute is over whether or not there are *M*-worlds at which two properties have perfectly swapped their nomic roles whereas everything else is just like $w_@$.[8]

4. Assumptions

Our question can now be understood dialectically: Which position is more plausible – property essentialism or property-anti-essentialism? More pointedly: Are there merely quiddically different *M*-worlds in the maximal domain or are there not?

In the next section, we'll argue against property anti-essentialism and in favor of property essentialism. However, before we can detail our argument, we first need to explicitly state certain assumptions on which the argument depends. There are two primary assumptions under-girding our paradox. The first pertains to transworld identity and the domains of each individual world within our model. The second, pertaining to counterfactual semantics, is the most important and will therefore receive a more thorough examination.

4.1. Transworld identity

First, in presenting the argument, we presume *transworld identity*, for objects, properties, and features (Kaplan 1967; Mackie and Jago 2017). So, for example, if we are considering the (at least logical) possibility

the possibility of a world such that two objects have swapped all of their qualitative properties; in this case, the possibility of a world such that two properties have swapped all of their qualitative features.

[8]Note that this focal point of dispute is not over whether or not there might be quiddically different *P*-worlds in the domain. Plausibly, even if it is metaphysically possible that two properties might swap features, this is not a physical possibility, relative to $w_@$; no such world is physically consistent with our own. We presume both the property essentialism and anti-essentialism agree on this point.

that some known object at the actual world, *a*, has some known property, *P*, with some certain known feature, *F*, then we are conceiving of a world, w, at which *a exists* and (*a* at $w = a$ at $w_@$), at which *P* exists and (*P* at $w = P$ at $w_@$), and at which *F* exists and (*F* at $w = F$ at $w_@$). This is an assumption of overlapping world-domains, of constant elements across diverse possible worlds. It is in contrast with an assumption of *counterpart theory*, with respect to any of these elements.

Counterpart theory with respect to objects is alive and well (Lewis 1968; Heller 2005), and it is gaining in popularity with respect to properties, as well (Guigon 2016). Nonetheless, we resist it here for two reasons. First, because if one accepts counterpart theory with respect to properties, then one risks trivializing the primary question of the inquiry. If any given property can only exist at a single world, then, on the supposition that no property at any world ever changes across all times at that world, it would follow that all of its features are necessary for its existence. Property essentialism, so understood, would follow as trivially correct.

And second, we resist it because we have remained convinced with a certain standard objection to object counterpart theory, namely the infamous Humphrey objection posed by Kripke (1972). A parallel argument in response to property counterpart theory is equally plausible, if not more so. If one is daydreaming about the possibility of her becoming a great boxing champion, she might reasonably take pleasure in the daydream. But if *being a great boxing champion* is actually entirely world-bound, it would follow that she's really only conceiving of the possibility of being a *great schmoxing champion*. But, if that is the case, then it would not be reasonable for her to take pleasure in the daydream, for she's never encountered that property and never will.

4.2. Basic 'received view' counterfactual semantics

And second, in presenting the argument, we presume the 'received' or 'standard' view of counterfactual semantics (Kment 2006; Starr 2019). A counterfactual is a subjunctive conditional with a (presumed) false antecedent (von Fintel 2012). The received view evaluates counterfactuals in terms of *possible worlds* and *modal nearness relations* among them. The semantics of this account was developed chiefly by Stalnaker (1968), Nute (1975), and Lewis (1973a, 1973b, 1979, 1981, 1986a, 1986b), though there are minor differences between each. Lewis's semantics has become standard; on his account:

$v(p \,\Box\!\!\rightarrow q) = 1$, relative to $w_@$, iff (i) p is L-impossible at $w_@$; or (ii) there is some world at which both p and q are true that is more nearby to $w_@$ than any world at which p and $\sim q$ are true; $v = 0$ otherwise.

$v(p \,\Diamond\!\!\rightarrow q) = 1$, relative to $w_@$, iff there is some world at which both p and q are true that is at least as nearby to $w_@$ as any world at which p and $\sim q$ are true; $v = 0$ otherwise.

Imperfectly, the first is read as: If p were the case, q *would be* the case. The second is read as: If p were the case, q *might be* the case.

This assumption is in contrast to other kinds of counterfactual theories, which prefer to evaluate counterfactual conditionals in terms of *causal models* rather than possible worlds, and which therefore do not make use of modal nearness relations at all (Woodward 2003, 2016; Briggs 2012; Hitchcock 2019; Starr 2019). We adopt received view semantics primarily for two reasons: First, because it is, indeed, the standard account, and so (hopefully) less controversial as an assumption than any alternatives; and second, because the primary question of this essay is directly about possible worlds, and among those who will appreciate a discussion of possible worlds, one reason possible worlds are thought valuable is because of how serviceable they are in explaining various phenomena (such as counterfactual semantics) (Lewis 1986a).

4.3. Counterfactual similarity

The semantics of this account, as sketched, is skeletal so far. It provides adequate necessary and sufficient conditions for determining when '$p \,\Box\!\!\rightarrow q$' is vacuously true: We look at the maximal domain of possible worlds and determine if p holds at any of them; it is vacuously true iff it holds at none of them. For non-vacuously true counterfactuals, the remainder of the work is done by modal nearness relations, determining under what conditions one world is counterfactually more *nearby* to some world than some other world.

This topic is controversial, and there is a great deal of in-house dispute among those that accept this account. Nonetheless, most who presume received view semantics assume the following: (i) modal nearness ought to be understood on the basis of *global similarity*, such that $p \,\Box\!\!\rightarrow q$ is non-vacuously true at $w_@$ if p & q is true at some world that is holistically more similar to $w_@$ than any world at which at which p & $\sim q$ is (Arregui 2009). (ii) Similarity here ought to be understood as *qualitative similarity*, in terms of the total qualitative aspects, or *resemblance*, of

the worlds being compared (Gundersen 2004). And finally, (iii) certain qualitative aspects of worlds are more important for total similarity than others; in other words, we ought to use a metric of *weighted similarity* when determining modal nearness (Starr 2019).[9] Once again, Lewis's remarks on the latter have become standard. He suggests three respects in which worlds may be similar to one another, in descending order of importance: (a) in terms of their modal grades; (b) in terms of their nomic structures (i.e. their laws); and (c) in terms of their facts.[10]

On the subject of modal grade, Lewis (1973b) says the following:

> We may ignore antecedent worlds that are gratuitously removed from actuality … Given a far-fetched antecedent, we look perforce at antecedent worlds remote from actuality. There are no others to look at. But given a less far-fetched antecedent, we can afford to be more fastidious and ignore the very same worlds. In considering the supposition 'if I had just let go of my pen … ' I will go wrong if I consider bizarre worlds where the law of gravity is otherwise than it actually is; whereas in considering the supposition 'if the planets traveled in spirals … ' I will go just as wrong if I ignore such worlds (419–420).

In other words, Lewis tells us that, when evaluating a counterfactual of the form $p \mathrel{\square\!\!\rightarrow} q$, relative to $w_@$, we ought to only consider worlds that are *maximally consistent* with $w_@$, in the sense that *P*-worlds are more consistent with $w_@$ than are mere *M*-worlds, and *M*-worlds are more consistent with $w_@$ than are mere *L*-worlds. All things being equal, worlds most consistent with $w_@$ are among those most similar to it, and so among those most nearby to it too.

Among those worlds maximally consistent with $w_@$, we ought then consider their respective laws and facts. Lewis (1979, 472) has provided the standard weights for determining which among the remaining are most similar to $w_@$ in these respects:[11] He says, when ordering worlds in terms of their nomic and factual similarity to $w_@$:

[9]Lewis (1973a, 92): 'Our familiar, intuitive concept of comparative overall similarity, just applied to possible worlds, is employed in assessing counterfactuals.' (1973b, 420–421):

> Imprecise though comparative similarity may be, we *do* judge the comparative similarity of complicated things like cities or people or philosophies – we do it often without the benefit of any definite respect of comparison stated in advance. We balance off various similarities and dissimilarities according to the importance we attach to various respects of comparison and according to the degrees of similarity in various respects.

[10]The distinction between (a) and (b) might strike the reader as somewhat unusual. After all, we've defined modal grade in terms of law, and so how exactly are (a) and (b) distinct, and why is this distinction important? This will be explained more in §5.2, but for now we'll say this. When we're evaluating counterfactuals with *P*-possible antecedents, there is really no reason to distinguish between (a) and (b). But when we're evaluating counterfactuals with *P*-impossible (but at least *M*-possible) antecedents, the distinction, we think, makes a big difference.

[11]These weights were absent from Lewis's original (1973a, 1973b) account. He added them, in part, to account for what are known as 'Future Similarity Objections' to his semantics, as stated most poignantly by Fine (1975).

(1) It is of the first importance to avoid big, widespread, diverse violations of law. [Minimize 'Big Miracles']
(2) It is of the second importance to maximize the spatiotemporal region throughout which perfect match of particular fact prevails. [Minimize 'Backtracking']
(3) It is of the third importance to avoid even small, localized, simple violations of law. [Minimize 'Small Miracles']
(4) It is of little or no importance to secure approximate similarity of particular fact, even in matters that concern us greatly. [Minimize Total Fact Divergence]

So, for example, suppose we are considering a series of events at $w_@$. At t_1, Suzy goes into her backyard and picks up a rock. At t_2, she sets up an empty bottle on a tree stump some yards away. At t_3, she throws the rock. And at t_4, the rock hits the bottle and it shatters. Now consider this counterfactual inquiry: What if Suzy had not thrown the rock at t_3? Intuitively, the correct answer here is: If Suzy had not thrown the rock at t_3, then the bottle would not have shattered at t_4.[12] On Lewis's weights for determining comparative similarity, this comes out correct.

(1) tells us that we ought to avoid 'Big Miracles' when we're considering most nearby worlds. Practically, this means that, when we are examining the maximal domain of worlds equally maximally consistent with $w_@$, we ought to consider those worlds that have the same nomic structure as our world as most similar to it. So, for example, if we are considering two worlds, w' and w'', and w' possesses the Law of Gravity (or something very much like it) but w'' does not, then, all things being equal, w' is closer to $w_@$ than w'' is. (2) tells us to avoid backtracking counterfactual reasoning. Practically, this means that, when we are examining the domain, we ought to consider worlds that have the same (or very similar) history as $w_@$ as more similar to it than those that do not. So, for example, if we are considering two worlds, w' and w'', and at w', Suzy goes into the backyard at t_1 and picks up the rock at t_2, whereas at w'', Suzy either does not go into the backyard at t_1 or does not pick up the rock at t_2, all things being equal, w' is closer to $w_@$ than w''.[13] (3) tells us that 'Small Miracles' count against similarity too. Practically, then means that, if we are considering two worlds, w' and w'', at at w',

[12]This example is a modified version of Hall's (2004), and is discussed at length in, e.g., Menzies (2017) and Schaffer (2016). We use it here simply for elucidation.
[13]In this way, certain counterfactuals are generally said to come with 'auxiliary' premises, stipulating under what conditions a world in the domain counts as a backtracker, relative to $w_@$ (Lewis 1981).

Suzy does not throw the rock and so it remains on the grounds, whereas at w', Suzy does not throw the rock but it (miraculously) throws itself and so temporarily suspends the laws, then we say that w' is closer to $w_@$ than w'' is. Finally, (4) tells us that, (1–3) being equal, any other kind of factual similarity with $w_@$ counts for little (or perhaps nothing), and so, if possible, we ought to maximize factual agreement in the worlds we choose. So, for example, if we are considering two worlds, w' and w'', and at both $w_@$ and w', Suzy's friend Billy is riding his bicycle outside of her house at t_1, whereas at w'', Billy is not, all things being equal, w' is (/may be) closer to $w_@$ than w'' is.

And so, on this analysis, the closest world(s) will be such that, Suzy goes into her backyard at t_1, she sets up the bottle at t_2, she doesn't throw the rock at t_3, and the bottle does not shatter at t_4, for no miraculous events have occurred, and the bottle's shattering was causally (nomically) dependent on Suzy's throwing at $w_@$. In this way, Lewis's weights help guide our selection of the most nearby (most counterfactually similar) worlds. Others have modified these weights to account for both determinism and indeterminism (Lewis 1986b), chancy counterfactuals (Williams 2008), event causal dependence and independence (Schaffer 2004), and the explanatory power of counterfactual conditionals (Kment 2006). These nuances can be bracketed for now, since, moving forward, we'll be focused on a certain kind of counterfactual conditional whose truth-conditions remain unaffected by these modifications.[14]

4.4. Standard resolution

Most who accept the received view also note that (iv) counterfactual conditional evaluation is at least partly context-sensitive. Nonetheless, when one follows a weighted, global, qualitative criterion in determining modal nearness, one can arrive at a 'default interpretation' of the counterfactual; how the counterfactual should be evaluated, all things being equal.

In this way, leaving context-sensitivity aside, we can determine the default interpretation, or 'standard resolution' (Lewis 1979), of $p \mathrel{\square\!\!\rightarrow} q$ (at $w_@$) by following this process.

(A) We begin by examining the maximal domain of possible worlds, all of the ways things might have been.

[14]These modifications help fix certain problems related to evaluating *local*, as opposed to *global*, counterfactuals. We're concerned only with global ones. This distinction will be discussed more shortly.

(B) We then de-select and remove from our model all worlds at which p is false. If no worlds remain, the counterfactual is vacuously true and we can end our evaluation; if p-worlds do remain, however, then we continue on.

(C) We then de-select and remove from our model all worlds that are not *maximally consistent* with $w_@$, in the sense that P-worlds are more consistent with $w_@$ than mere M-worlds, and M-worlds are more consistent with $w_@$ than mere L-worlds. As Lewis (1973b, 419) says, 'We may ignore antecedent worlds that are gratuitously removed from actuality,' as being worlds at which the most fundamental laws governing our world have been arbitrarily violated.

(D) Among these worlds, we then follow our weighted criterion stated above, and we de-select and remove from our model all worlds that do not meet criteria (1–4) as well as others.

(E) Finally, we convert our non-extensional counterfactual into an extensional proposition of the form p & q. We evaluate this conjunction at all of the remaining worlds in the model. $p \mathbin{\Box\!\!\rightarrow} q$ is true, then, iff p & q is true at all of the remaining worlds; false otherwise. $p \mathbin{\Diamond\!\!\rightarrow} q$ is true iff p & q is true at at least one of the remaining worlds; false otherwise.

More could be said about this subject, but this suffices for the moment.

5. The arguments

Which position is more plausible – property essentialism or property-anti-essentialism? More pointedly: Are there quiddically different, nomically indiscernible M-worlds in the maximal domain or are there not?

We've spent some time detailing this context of dispute. Now, in this section, we take a stance in it. We offer two arguments; the two complement each other. We argue, first, that if one accepts our core assumptions along with property anti-essentialism, then one runs headlong into paradox. However, if one accepts them alongside property essentialism, then the paradox is avoided.

The paradox is generated by considering a special kind of counterfactual conditional. We call them 'P-impossible, M-possible, global, non-vacuously true object-quantified counterfactuals.' We'll begin by discussing counterfactuals of this variety and their peculiar semantics; then we'll present each argument, in turn. These arguments are controversial; nonetheless, we take them as a good reason to reject property anti-essentialism and accept, in its place, property essentialism.

5.1. P-impossible, M-possible, global, non-vacuously true object-quantified counterfactuals

Counterfactual conditionals come in several varieties. The kind that concern us here have five important attributes. Consider again the dummy counterfactual, $p \mathrel{\square\!\!\rightarrow} q$, evaluated relative to $w_@$. Important for our argument are counterfactuals such that:

(α) p is *physically impossible* relative to $w_@$. That is, there are no *P*-worlds in the domain at which p obtains.

(β) p is *metaphysically possible* relative to $w_@$. That is, there is at least one *M*-world in the domain at which p obtains.

(γ) p is *global* rather than *local*. Another way to put this is that p is ahistorical; it does not express some counterfact about what would or would not have happened at any particular moment in the history of $w_@$. It essentially references no particular event in the total sequence of events across all times at $w_@$.[15]

(δ) p is a *universally quantified* proposition, ranging over *objects*. Propositions of this form pick out no particular object, but rather a class of them, at whatever world at which they are operative.

(ε) p is *not vacuously* true. That is, p is a universally quantified proposition, ranging over objects, and that class is not empty of objects.

There are two important things worth noting about counterfactuals of this variety. First, we can reason soundly or unsoundly about them. We'll give an example of an obviously true counterfactual of this sort in just a moment.

And second, the way we evaluate counterfactuals of this sort differs in certain respects from the way we evaluate ordinary, local counterfactuals. The truth of any given *local* counterfactual depends heavily on criteria (2) and (3) from Lewis's weighted considerations. (2) tells us to avoid backtracking as much as possible; and (3) tells us that to avoid 'small miracles' in the resulting timeline we choose (Starr 2019). When we are considering global counterfactuals, however, we are not stipulating any necessary timeline. And so, there are no backtrackers with respect to the antecedent's truth; and there are, therefore, no small miracles we must avoid presuming in the resulting consequent timeline. Consequently,

[15]See Placek and Müller (2007) for more on the distinction between historical and non-historical counterfactuals. Note, however, that we carve out the distinction between the two slightly differently, and we suppose that ahistorical counterfactuals should be evaluated as more than mere instances of universal generalizations (176) (a proposal they accredit to Bennett 2003).

P-impossible, *M*-possible, global, non-vacuously true object-quantified counterfactuals are evaluated in terms of (1) and (4) alone.

Let's pause here and say a bit more about the relations among (1–4) and what it would mean to compute counterfactual similarity on the basis of (1) and (4) alone. This is not only an interesting subject in its own right, but important premises for our argument can be extracted from considering their dynamic relations.

5.2. Evaluating global counterfactuals

We have said that possible worlds might be compared according to several respects when determining counterfactual similarity: (a) in terms of their modal grades; (b) in terms of their nomic structures (i.e. their laws); and (c) in terms of their facts. Lewis's weighted criteria (1–4) addresses (b) and (c) directly, and gives us a sense of their complicated relation and their relative importance when calculating overall world-to-world qualitative similarity. (1) and (3) pertain explicitly to (b); (2) and (4), on the other hand, pertain explicitly to (c). So, when we are comparing two worlds, w' and w'', according to criteria (1) and (3), we look to their laws and nomic structures; and when we are comparing w' and w'' according to criteria (2) and (4), we look instead to their particular facts (as dispersed throughout their respective world-histories (2) or otherwise (4)).

There are at least two senses in which two worlds, w' and w'', may be said to possess the 'same' or 'similar' laws or nomic structures. First, w' and w'' may possess the same *specific* laws. For example, suppose at w', Newton's Second Law of Motion obtains, such that $F = m \cdot a$; the force acting on an object is equal to the object's mass multiplied by its acceleration. If that is so, then w'' may be said to have the same specific law as w' just in case, at w'', $F = m \cdot a$ too. In other words, at both worlds, there are three specific properties – force, mass, and acceleration – and those properties at both worlds have just the same nomic features. If w'' is missing one of those three properties or if those properties exist but do not have the same nomic features as they do at w', then the two worlds do not share the same specific laws. Two worlds that share all and only the same specific laws are *nomically identical* worlds.

The second sense of this phrase, by contrast, is more general. We can say that two worlds possess the same *general* laws just in case *there are* properties at both worlds that possess identical nomic features. So, for example, suppose at w', again, $F = m \cdot a$ obtains, such that this law governs all objects at that world. If that is so, then w'' may be said to

have the same general laws as w' just in case, at w'', $\exists X_1 \exists X_2 \exists X_3$ ($X_1 = X_2 \cdot X_3$), which, likewise, governs all objects at that world. In other words, following the literature, we can say that two worlds have the same general laws just in case they possess the same Ramsified Lawbook (Ramsey 1978); they are generally different iff they do not.[16] Two worlds that share all and only the same general laws, worlds at which the same Ramsified Lawbook holds, are *nomically indiscernible* worlds.

Moreover, there are at least two senses in which two worlds, w' and w'', may be said to possess the same facts, and so score well with respect to weights (2) and (4). Two worlds might possess the same *first-order* facts or they might possess the same *second-order* facts. So, suppose at w', there is an object, a, with some property or set of properties, P, at some time, t: $P(a)$ at t, at w'. w'' is first-orderly factually similar to w' (in this respect), then, just in case $P(a)$ at t, at w'' too; it is factually dissimilar otherwise. And, now, suppose that at w', property P itself has some property (some specific feature or set of features), F: $F(P)$ at w'. w'' is second-orderly factually similar to w' (in this respect), then, just in case $F(P)$ at w'' too; it is factually dissimilar otherwise.

Now, when Lewis (1979) says 'It is of the first importance to avoid big, widespread, diverse violations of law,' most read him as saying that we ought consider as more nearby to $w_@$ all worlds that are nomically *identical* to it. When we are considering local counterfactuals, this interpretation of (1) is fine; but when we are considering global counterfactuals, however, a little reflection should reveal that we would do better to interpret him as saying that we ought to consider as more nearby to $w_@$ all worlds that are nomically indiscernible to it.[17] This is so for two reasons: First, because Lewis makes no reference to second-order facts in (1) at all, but only to law. As we have said, (1) and (3) pertain to (b); (2) and (4) pertains to (c). And second, because Lewis says that we ought to understand 'comparative similarity' in our ordinary sense of

[16]Where A and B are properties, we can represent a nomic relation between the two, following the literature, as AnB. Suppose we are considering a world with only three laws, involving A, B, C, and D: An_1B & Bn_2C & Cn_3D. A Ramsified Lawbook is constructed 'by replacing each predicate with a predicate variable and placing the appropriate number of quantifiers in front of each' (Gibbs 2018, 2337). In this case, the Ramsified Lawbook at this world would be: $\exists X_1 \exists X_2 \exists X_3 \exists X_4$ ($X_1 n_1 X_2$ & $X_2 n_2 X_3$ & $X_3 n_3 X_4$).

[17]As indicated, many understand (1) as a kind of 'Minimize "Big Miracles"' criterion. But note that Lewis's (1979, 468–469) remarks on miracles are, likewise, ambiguous between nomic identity and nomic indiscernibility:

> When I say that a miracle takes place at w_1, I mean that there is a violation of the laws of nature. But note that the violated laws are not laws of the same world where they are violated … A miracle at w_1, relative to w_0, is a violation at w_1 of the laws of w_0, which are at best the *almost-laws* of w_1. The laws of w_1 itself, if such there be, do not enter into it. [italics added for emphasis]

the term (1973a, 92), in the same sense in which we compare 'cities or people or philosophies' (1973b, 420–421), and our ordinary comparisons of nomic similarity are decidedly general, not specific.

For example, consider how we would compare two cities, C_1 and C_2, and under what conditions we would ordinarily say that the two have the 'same laws,' or that they have the 'same government.' In such cases, we would say that C_1 and C_2 have the same government just in case: at each, there is *some* certain number of governing officials that carry out a certain *specific* set of directives and so impose a certain *specific* set of restraints and restrictions on *some* governed population. So, suppose C_1 has a certain sheriff, a, a certain mayor, b, and a certain judge, c, etc.; and it has three specific main governmental branches, the Executive, the Legislative, and the Judicial, within the confines of which the sheriff, mayor, and judge are constrained to interact and govern the people in some specific way. We would say ordinarily that C_2 has the same laws or government as C_1, then, just in case at C_2 there likewise exists some sheriff, x, some mayor, y, and some judge, z, etc.; and it likewise has three corresponding governmental branches, the Executive, the Legislative, and the Judicial, within the confines of which x, y, and z are constrained to interact and govern that city's people in some specific way. Importantly, we would not require that $a = x$, $b = y$, $c = z$, or that C_1 and C_2 have the same exact governed population, in order to judge that they are legally equivalent. Were we to find out that this holds also between C_1 and C_2, this would make no difference to our judgment of similarity of *law*, but rather we would say in such a case that, moreover, C_1 and C_2 are similar in *fact* also; namely, *in fact* about who specifically the sheriff is, who specifically the mayor is, who specifically the judge is, (who interact in some specific way), as well as who specifically the governed people are. This would increase the overall similarity between C_1 and C_2, but only in a way that is irrelevant to the *nomic* similarity between them.

By analogy, when looking at worlds, w' and w'', the roles of cities C_1 and C_2 – sheriff, mayor, judge (and how they relate to one another and govern the people) – correspond to the nomic features of properties at w' and w''; the specific properties at, e.g. w' correspond to the specific people playing those roles at C_1 – a, b, and c; and the governed population of C_1 corresponds to the objects at w', those things held at the mercy of the governing forces of the world. And so, when we are comparing two worlds strictly on the basis of laws (1), we would do better to consider Lewis as advising us to maximize nomic indiscernibility between the two, not necessarily nomic identity. We convert (1) to (1*) to read:

(1*) It is of first importance to maximize nomic indiscernibility.[18]

This will serve as a key premise in the paradox we present momentarily.

Moreover, given that (2) and (4) make essential reference to fact, and we have distinguished between two kinds of fact, we can modify (4) to (4*) to read:

(4*) It is of little or no importance to maximize particular first- and second-order fact, even in matters that concern us greatly.

This too will play a crucial role in the following arguments.

With these modifications to (1) and (4), we can now understand what it would mean to evaluate a counterfactual sans criteria (2) and (3). We begin by following standard resolution steps (A–C), de-selecting all impossible worlds and de-selecting worlds with inferior modal grades. Then, once we come to step (D), we compare the remaining worlds according to (1*) and (4*). That is, we take as our first priority to maximize nomic indiscernibility (not necessarily identity); and we take as our second importance (if at all) to maximize first – and second-order fact (which, in conjunction with (1*), may result in nomic identity, as well). We then perform step (E) at those remaining worlds and assign the counterfactual some definite truth-value.

5.3. Juster

We'll now introduce an example of a *P*-impossible, *M*-possible, global, non-vacuously true object-quantified counterfactual and use it throughout the remainder of this paper. The example comes from Norton Juster's (1961) children's book, *The Phantom Tollbooth*. In it, the main character, an apathetic boy named 'Milo,' comes home from school one day to find a small car in his living room. He steps into the car and travels to a whimsical world. Along the way, he travels to Dictionopolis, where he meets the Earl of Essence and the Duke of Definition, and he

[18]Earlier we claimed that the distinction between (a) and (b) – a world's modal grade and its nomic structure – is a useful one when evaluating certain kinds of counterfactuals. We're in a place now to see why that might be so. Suppose we are considering a counterfactual, $p \,\Box\!\!\rightarrow\, q$, relative to $w_{@}$, where p is *P*-impossible but *M*-possible. Suppose there are at least two *M*-worlds at which p obtains, w' and w''. Despite sharing their *M*-class grade, there are still various ways w', say, might be nomically more similar to $w_{@}$ than w''. For example, suppose that the laws at w' are just like $w_{@}$'s, except ever so slightly weaker, whereas the laws at w'' do not resemble $w_{@}$'s at all. Or suppose that at w', all but one of $w_{@}$'s specific *P*-laws hold, whereas at w'', almost all of them are broken. In either case, despite having the same modal grade, we would say that w' is decidedly closer to $w_{@}$ than w'', despite having little to no information about the facts that obtain there. That is, we appeal to nomic indiscernibility, or (1*).

literally eats his words; to Digitopolis, where he meets a Dodecahedron with twelve faces (one for every expression), and he climbs a staircase with infinite steps; and at one point he travels to the Forrest of Sight, where he learns something about perspective. There, Milo meets a strange boy, named 'Alec,' who floats perfectly several feet from the ground at all times. Alec informs Milo that his appearance is not nearly so strange as he thinks: Among Alec's people, the process of maturation for all children begins by levitating in the air at the height they will eventually occupy at the termination of their growth, and then throughout their lives growing down towards the ground. That is, among Alec's people, children's feet grow down rather than their heads growing up.

We suppose that this state of affairs is metaphysically possible; that is, that such a world, though not physically consistent with our own, is, at least, metaphysically consistent with our own. And so, with Juster, we wondered: What if *all children grew down rather than up*? This is a kind of counterfactual inquiry: We are looking for the counterfactual consequent of taking as an antecedent the proposition that *all children grow down*. Our predictions resembled Juster's. At such a world, children would rarely get in trouble for scuffing their shoes. We can call this counterfactual 'JUSTER' and symbolize it as so:[19]

$$((\exists x\,(C(x))) \,\&\, (\forall y(C(y) \rightarrow D(y)))) \,\Box\!\!\rightarrow\, (\forall z\,(C(z) \rightarrow\!\sim S(z))) \text{ at } w_{@}$$

Where 'C' is read as 'is a child,' 'D' is read as 'grows down' (in Juster's sense), and 'S' is read as 'often gets in trouble for scuffing her shoes.' We can read 'U' as 'grows up,' which is true of all *C*s at $w_{@}$. Incidentally, at $w_{@}$, children do frequently get in trouble for scuffing their shoes. This, we can suppose, is due to the features *U* has at $w_{@}$. And so, one consequent of JUSTER is that the world would be qualitatively different than it actually is.[20]

We take this to be an instance of sound reasoning with respect to *P*-impossible, *M*-possible, global, non-vacuously true object-quantified counterfactuals. JUSTER is obviously true. And so, if one accepts some thesis that would entail that JUSTER is false, this is a mark against the

[19]Note the logical structure of this proposition. Propositions of this form are both global and universally quantified, in the sense that concerns us here. This proposition contrasts with:

$$\forall x((C(x) \rightarrow D(x)) \,\Box\!\!\rightarrow\!\sim S(x)) \text{ at } w_{@}$$

which, more naturally, is read as at least partially (and incompletely) local in scope.

[20]One reason condition (ε) is important here is because, without it – $(\forall y\,(C(y) \rightarrow D(y))) \,\Box\!\!\rightarrow\, (\forall z\,(C(z) \rightarrow\!\sim S(z)))$ at $w_{@}$ – could be true as a result of a nearby world with no children at all. The existential quantification insures that we are considering a world at which children exist and they grow down rather than up.

thesis. This is more-so the case if by presuming the opposite of the thesis, JUSTER is saved.

5.4. The paradox of property anti-essentialism

We'll argue now that, if one accepts the core assumptions of this essay in conjunction with property anti-essentialism, then one must suppose that JUSTER is false. Moreover, if one accepts property anti-essentialism, it would follow that

$$((\exists x(C(x)) \,\&\, (\forall y(C(y) \rightarrow D(y)))) \,\Box\!\!\rightarrow\, (\forall z\,(C(z) \rightarrow S(z))) \text{ at } w_{@}$$

That is, that children would still scuff their shoes, just as they now do. In fact, it would follow that, if children *grew down rather than up*, the world would be qualitatively just as it currently is. But this is absurd.

Consider again the property anti-essentialist thesis. According to property anti-essentialism, it is not the case that any properties have features that function as their *N*-essence(s) across all *M*-worlds at which they exist; there are no features that are *M*-necessary for them, as such. In other words, for any property and any of its features, there are *M*-worlds at which it has the feature and there are *M*-worlds at which it does not (Stalnaker 1976, 344). We have said that one consequence of this thesis, if true, is that there are *M*-worlds in the domain that differ merely quiddically from $w_{@}$, worlds at which a pair of properties have perfectly swapped their features (Gibbs 2018).

Now, consider our property *D*, the property of *growing down*. We need not specify precisely what features *D* has at $w_{@}$. Suppose its features are F_1.[21] Consider now also *U*, the property of *growing up*. Again, we need not specify what features precisely *U* has a $w_{@}$. Let them be F_2, such that $F_1 \neq F_2$. Given the anti-essentialist thesis, then, there is an *M*-world at which *D* has F_2 and *U* has F_1. Let w_1 be such a world. Now consider another world at which *D* and *U* exist, but at which they have not swapped their features. Let w_2 be such a world. Suppose that at both worlds, the antecedent of JUSTER is true.

[21] It may be reasonably doubted whether *D* actually exists at $w_{@}$. For present purposes, bracket that concern. We need not be so fixated on JUSTER. The point we attempt to make in this argument, as indicated, applies to all *P*-impossible, *M*-possible, global, object-quantified counterfactuals. We use JUSTER for its charm, but a different example might be given that clearly and uncontroversially involves only known properties at $w_{@}$. Bracket also the concern of whether or not *D* and *U* count as genuine (i) 'natural' or scientific properties, (ii) primary or secondary qualities, or (iii) sortal or 'thick' properties. Again, JUSTER is just our dummy example; others involving only uncontroversial properties may be constructed *salve veritate*.

It can be shown that w_1 is counterfactually closer to $w_@$ than w_2 is. Consider how JUSTER should be evaluated, given our prior assumptions.

(A.1) We begin by examining the maximal domain of possible worlds, all of the ways things might have been. w_1 and w_2 are among these worlds (Figure 2).

(B.1) We then de-select and remove from our model all worlds at which p is false. Now, the antecedent of JUSTER is true at no P-world, for it is not P-possible

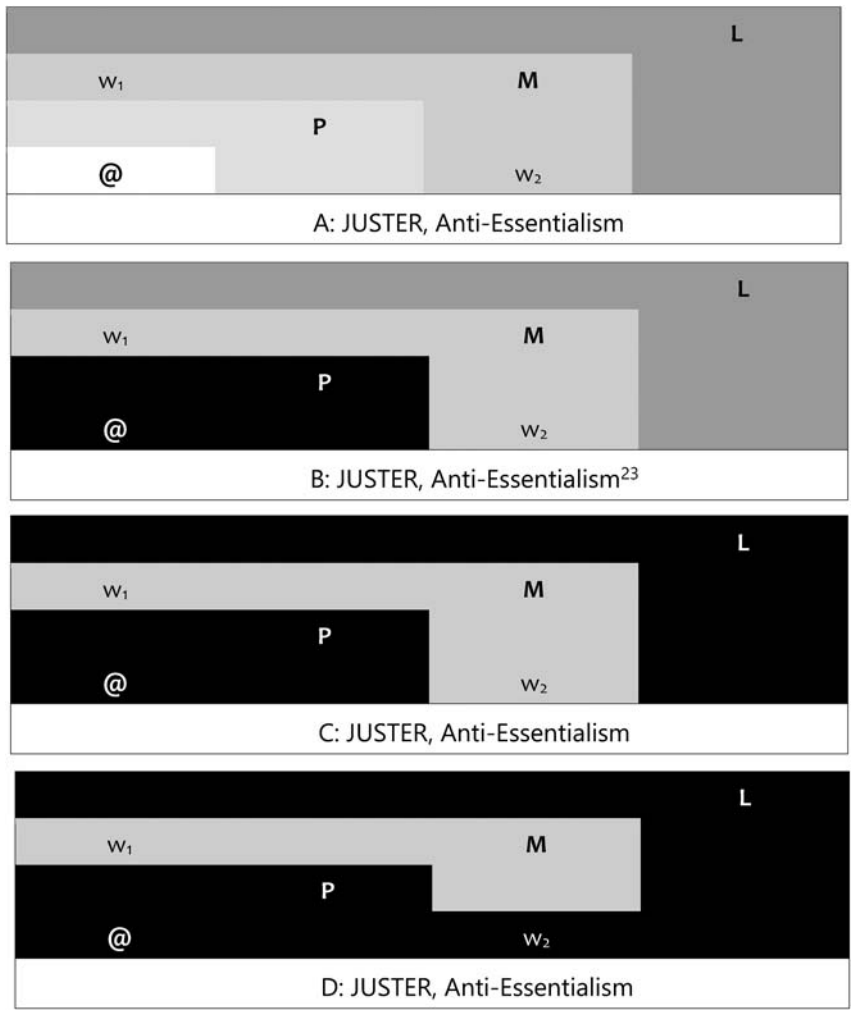

Figure 2. (A) JUSTER, Anti-Essentialism. (B) JUSTER, Anti-Essentialism. (C) JUSTER, Anti-Essentialism. (D) JUSTER, Anti-Essentialism.

Note: In the following several figures, contrast areas (black-fill, white-font) illustrates that a grade of modality (and all worlds included within it) have been de-selected, per application of our standard resolution.

or *P*-consistent with $w_@$ for children to grow down rather than up. However, it is metaphysically possible. So, all *P*-worlds are removed, and the *M*-worlds (including w_1 and w_2) and the *L*-worlds remain.

(C.1) We then de-select and remove from our model all worlds that are not *maximally consistent* with $w_@$. In this case, the antecedent of JUSTER is true at both w_1 and w_2, and w_1 and w_2, on the assumption of anti-essentialism, are both *M*-worlds. And so, all mere *L*-worlds are removed, and only the *M*-worlds (including w_1 and w_2) remain.

(D.1) Among these worlds, we then follow our weighted criterion stated above, and we de-select and remove from our model all worlds that do not meet criteria (1–4) as well as others.

This is the crucial step of the paradox. We claim that w_1 meets these criteria better than w_2, and so w_2 ought to be de-selected and removed from the model as not being closer to $w_@$ than w_1 is.

JUSTER is a *P*-impossible, *M*-possible, global, non-vacuously true object-quantified counterfactual, and counterfactuals of this sort cannot be evaluated on (2) and (3), but only on (1*) and (4*) alone. Now, with respect to (1*), it is worth noting that $w_@$ and w_1 are nomically indiscernible, whereas $w_@$ and w_2 are clearly nomically discernible. If we are comparing two worlds equally maximally consistent with $w_@$, and one of those worlds is nomically *just like* $w_@$, whereas the other is not, then, *ceteris paribus*, the first is more nearby to $w_@$ than the second, given criterion (1*).

It can be easily demonstrated that $w_@$ and w_1 are nomically indiscernible. This is because, at $w_@$, *D* and *U* have the places in the Ramsified Lawbook that they do in virtue of their features – F_1 and F_2, respectively. And so, if we are considering a world at which *U* has F_1 and D has F_2, and everything else remains the same, then we are considering a world at which the selfsame Ramsified Lawbook is true, but at which *U* takes *D*'s place in the lawbook and *D* takes *U*'s place in the lawbook. And so, merely quiddically different worlds are worlds that share the same Ramsified Lawbook; and worlds that share the same Ramsified Lawbook, we have said, are nomically indiscernible from one another.

By contrast, it is clearly not the case that w_2 and $w_@$ are nomically indiscernible from one another. If *D* and *U* have not swapped features (everything else remaining the same), then *U* at w_2 resembles what *U* at $w_@$ is like and *D* at w_2 resembles what *D* at $w_@$ is like – it is a world at which children *levitate* in the air, in the common sense of the phrase. Such a world

will certainly be nomically discernible from $w_@$. For starters, it would seem that $w_@$ has no comparable law of gravity; if gravity does exist at w_2, it's forces would seem to swerve anytime they go to interact with children at that world. The Ramsified Lawbook at w_2 would need to reflect this fact; consequently its Lawbook and $w_@$'s lawbooks are different. And so, with respect to weight (1*), w_1 is shown to be more nearby to $w_@$ than w_2 is. We take this to be a deciding fact of the matter.

However, we have said that JUSTER is a *P*-impossible, *M*-possible, global, non-vacuously true object-quantified counterfactual, and that when we are evaluating counterfactuals of this variety, we must consider not only weight (1*), but weight (4*) as well. Now, according to Lewis (1979): 'It is of little or no importance to secure approximate similarity of particular fact, even in matters that concern us greatly.' And so, given that w_1 qualitatively resembles $w_@$ so perfectly with respect to weight (1*), it is difficult to see what difference weight (4*) could make in our evaluation of counterfactual similarity. But, if we do consider weight (4*) in our comparison of w_1 and w_2, we can note the following.

It is true that w_1 does not factually match $w_@$ to a perfect degree. It differs in its second-order facts from $w_@$ (i.e. *D* and *U* nomically relate to certain properties at $w_@$; they relate to different properties at w_1). And it also differs in certain of its first-order facts from $w_@$ (namely, at w_1, it virtue of the features of *D* there, $\forall x$ (C(x) $\rightarrow \sim S(x)$) obtains, whereas $\forall x$ ($C(x) \rightarrow S(x)$) obtains at $w_@$). Nonetheless, in other respects, it very strongly factually resembles $w_@$, both second- and first-orderly. This is because, besides these modifications to $w_@$'s worldbook, any fact that does not directly involve *D* or *U* at w_1 is identical to $w_@$: at $w_@$. By comparison, the facts are also very different at w_2, but not in a neat and predictable way. If w_2 is the closest world, then many other counterfactuals besides ($\forall x$ ($C(x) \rightarrow D(x)$)) $\Box\!\!\rightarrow$ ($\forall y$ ($C(y) \rightarrow \sim S(y)$)) at $w_@$ will also follow. At such a world, for example, children would also not frequently fall out of trees; there would be no practical necessity for them to wear shoes; contact-sports would be much less dangerous for them; and adults would look much differently to them than they currently do (Juster 1961). Moreover, at w_2, second-order facts about how properties nomically relate to one another will also be very different. It is difficult to say whether any gravitational forces exists at such a world at all. And so, with respect to weight (4*), w_1 is comparable with w_2, if not better off than it. Weight (4*) might make some little difference, but not enough to make w_2 closer to $w_@$ than w_1 is to it.

And so, w_1 is decidedly more nearby to $w_@$ than w_2 is: per (D.1), w_2 is de-selected and removed from the model, and we are left with w_1 and those worlds like it.

> (E.1) Finally, we convert our non-extensional counterfactual into an extensional proposition of the form p & q. We evaluate this conjunction at all of the remaining worlds in the model. $p \,\Box\!\!\rightarrow q$ is true iff p & q is true at all of the remaining worlds; false otherwise. In this case, $((\exists x\ (C(x))) \ \&\ (\forall y\ (C(y) \rightarrow D(y)))) \ \&\ (\forall z\ (C(z) \ \&\ \sim S(z)))$ does not follow, for given that only w_1 (and worlds like it) remain and w_1 is just like $w_@$, and at $w_@$, $\forall z\ (Cz \rightarrow S(z))$, at w_1, $\forall z\ (Cz \rightarrow S(z))$ follows too (in virtue of D possessing all of features F_2). And so, at w_1, $((\exists x\ (C(x))) \ \&\ (\forall y\ (C(y) \rightarrow D(y)))) \ \&\ \sim(\forall z\ (C(z) \ \&\ \sim S(z)))$; JUSTER is false; rather, its contrary is true.

But, we have said, JUSTER is true, according to sound counterfactual reasoning. Therefore, we have reached a contradiction.

5.5. The non-paradox of property essentialism

In the previous sub-section, we offered a critical argument to the effect that accepting property anti-essentialism would lead us headlong into paradox. We argue now that, with these same core assumptions plus a commitment to property essentialism, the paradox just presented may be avoided. JUSTER still comes out true. And so, the paradox presented above is not the result of accepting our core assumptions, *per se*, but only with accepting them alongside a problematic assumption – an assumption of property anti-essentialism.

Consider again the property essentialist thesis. According to property essentialism, certain properties do have features that function as the *N*-essence(s) for them across all *M*-worlds at which they exist; certain features of properties are *M*-necessary for them, as such. We need not specify which among the set of features, F_2, is essential to *U*, as such, nor which among the set of features, F_1, is essential to *D*, as such. For present purposes, it is enough to note that on a reasonable version of property essentialism, whatever features they might have, *U* could not have all and only F_1, and *D* could not have all and only F_2. It may be *L-possible* for each to possess the other's features, but this is not a state of affairs that is *M-possible* for either, relative to $w_@$.

On an assumption of property essentialism, it can be shown that w_2 is closer to $w_@$ than w_1 is, and so no paradox is generated. Consider how JUSTER is evaluated given our prior assumptions:

> (A.2) We begin by examining the maximal domain of possible worlds, all of the ways things might have been. w_1 and w_2 are among these worlds (Figure 3).

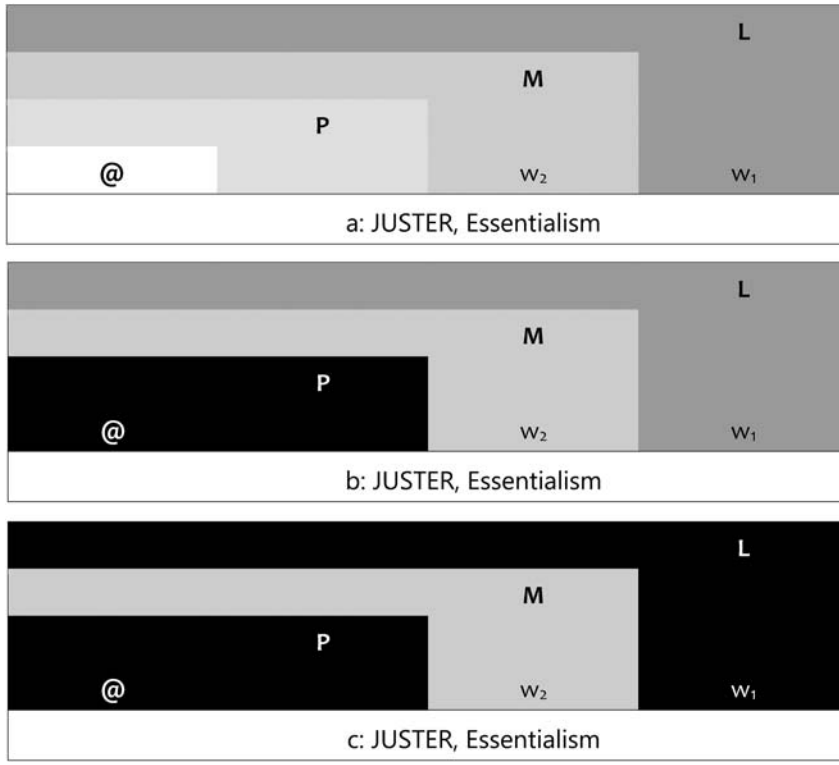

Figure 3. (A) JUSTER, Essentialism. (B) JUSTER, Essentialism. (c) JUSTER, Essentialism.

(B.2) We then de-select and remove from our model all worlds at which *p* is false. Now, the antecedent of JUSTER is true at no *P*-world, for it is not *P*-possible or *P*-consistent with $w_@$ for children to grow down rather than up. However, it is metaphysically possible. So, all *P*-worlds are removed, and the *M*-worlds (including w_2) and the *L*-worlds (including w_1) remain.

(C.2) We then de-select and remove from our model all worlds that are not *maximally consistent* with $w_@$, in the sense that *P*-worlds are more consistent with $w_@$ than mere *M*-worlds, and *M*-worlds are more consistent with $w_@$ than mere *L*-worlds. In this case, the antecedent of JUSTER is true at both w_1 and w_2. However, on the assumption of essentialism, whereas w_2 is an *M*-world, w_1 is merely an *L*-world. And so, w_1 is removed, and we are left only with the *M*-worlds (including w_2).

And at this point, we need not continue. For once w_1 (and all worlds like it) have been removed, only w_2 (and all worlds like it) will remain for the final stages of evaluation. At such worlds, *U* and *D* have their ordinary features, and the other laws of that world have had to accommodate them. By following (1*) and (4*) at the remaining worlds, JUSTER will come out true.

And so, if one accepts property essentialism alongside the core assumptions of this essay, the paradox is avoided. This goes to show, again, that it is not a problem with our core assumptions, *per se*, but only with our core assumptions in conjunction with property anti-essentialism. Property anti-essentialism, therefore, ought to be rejected, and property essentialism ought to be accepted.

6. Concluding remarks

Is it the case that for all possible worlds metaphysically consistent with our own, for certain properties and certain of their features, that, if that property exists at any world, then it has those features associated with it at that world too? That is, do properties have essential features of their existence? In §2, we spent some time defining the terms of this question and clarifying the inquiry. We have said that this question may be understood more precisely as the question: Across all *M*-worlds, w, is it the case that for certain properties, *P*, and certain of their qualitative features, *F*, that if *P* exists at w, then it is *F* at w too? Relative to $w_{@}$, are there any qualitative features of certain properties such that it is *M*-necessary that they possess them if they exist, which function as the *N*-essences for those properties, as such?

In §3, we then detailed two possible responses to this question. According to property essentialism, certain properties do have features that function as the *N*-essence(s) for them across all *M*-worlds at which they exist; certain features of properties are *M*-necessary for them, as such. According to property anti-essentialism, it is not the case that any properties have features that function as their *N*-essence(s) across all *M*-worlds at which they exist; there are no features that are *M*-necessary for them, as such. In other words, for any property and any of its features, there are *M*-worlds at which it has the feature and there are *M*-worlds at which it does not (Stalnaker 1976, 344). The latter is sometimes called 'quidditism' for it entails a commitment to merely quiddically different worlds. Between property essentialism and property anti-essentialism, whether or not we should allow for such nomically indiscernible worlds is a focal point of the dispute.

This is the point at which we entered the discussion. We sided with the property essentialist and presented our reasons for thinking that its thesis is more reasonable than its adversary's. Our argument made two primary assumptions; transworld identity, and 'received' view counterfactual semantics, *a la* Lewis (1973a, 1973b, 1979, 1981, 1986a, 1986b). The second was central to our arguments, so we spent some time, in §4,

discussing *modal nearness*, a crucial concept within this account. Then, once this was explicated, in §5, we moved on to present our arguments.

The first argument we presented took the form of a paradox of property anti-essentialism, and argued that, if one accepts our core assumption along with property anti-essentialism (and its commitment to quiddically different worlds), then one's ability to evaluate *P*-impossible, *M*-possible, global, non-vacuously true object-quantified counterfactuals is baffled. For example, the counterfactual – if there were children who grew down rather than up, they would rarely get in trouble for scuffing their shoes – is clearly true, but the anti-essentialist must deny it, for the most nearby world that nomically resembles our own is one at which growing down and growing up have swapped features, and so children do continue to frequently scuff their shoes and receive reprimance for it. By contrast, if one accepts property essentialism instead, then the paradox is avoided. Merely quiddically different worlds may be logically consistent with $w_@$, but they are not metaphysically consistent with it; and so, since '[w]e may ignore antecedent worlds that are gratuitously removed from actuality,' we can ignore such worlds when evaluating counterfactuals like JUSTER (Lewis 1973b, 419).[22] The most nearby worlds will be such as to make the counterfactual true.

In conclusion, we think that the primary question of this essay ought to be answered in the affirmative: For all possible worlds metaphysically consistent with our own, for certain properties and certain of their features, if that property exists at any world, then it has those features associated with it at that world too. That is, some properties plausibly do have essential features of their existence.

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[22]Gibbs (2018) has argued that, unless one supposes that there are *M*-worlds that are merely quiddically different from $w_@$, we risk permitting an unacceptable gap in modal space. On this way of understanding the distinction between property essentialism and property anti-essentialism, however, that is no problem. Neither supposes that there must be a gap; rather, they both accept that modal space is fully flushed out (perhaps by a principle of unrestricted combinatorialism – cf. Smith 2016). Rather, they are engaged in a debate over the boundaries of the mere *L*-worlds and the *M*-worlds. The anti-essentialist says they should be included among the *M*-worlds; the essentialist says they should be included only among the mere *L*-worlds.

ORCID

Andrew D. Bassford http://orcid.org/0000-0002-7118-4236

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