

Intrinsicality and counterpart theory*

Michael De

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Abstract

It is shown that counterpart theory and the duplication account of intrinsicality—two key pieces of the Lewisian package—are incompatible. In particular, the duplication account yields the result that certain intuitively extrinsic modal properties are intrinsic. Along the way I consider a potentially more general worry concerning certain existential closures of internal relations. One conclusion is that, unless the Lewisian provides an adequate alternative to the duplication account, the reductive nature of their total theory is in jeopardy.

1 The duplication account

Lewis attempts to reduce intrinsicality to (at least for him) more fundamental notions. The account he provides, which I shall call the *duplication account* (DA for short), states that

DA. A property is intrinsic iff it never differs among duplicates.

Lewis gives two separate accounts of duplication, thereby yielding two separate formulations of DA. According to the first [Lewis, 1986, pp. 61–62], two things are duplicates just in case they share their perfectly natural properties, and their parts can be put into one-one correspondence so that corresponding parts share the same perfectly natural properties and stand in the same perfectly natural relations (to the things and their parts only). Call this account *Perfect* (since it relies on the sharing of perfectly natural properties).

According to the second [Langton and Lewis, 1998], two things are duplicates just in case they share their basic intrinsic properties, where a property is *basic intrinsic* just in case it is neither disjunctive nor the negation of a disjunctive property, and it is independent of accompaniment, i.e. it can be: (i) had by a lonely thing; (ii) lacked by a lonely thing; (iii) had by an accompanied thing; (iv) lacked by an accompanied thing. A thing (i.e. possible individual, not transworld sum) is *lonely* just in case it exists without any contingent, wholly distinct worldmate and it is accompanied otherwise, and two things are *wholly distinct* just in case they share no common part. Finally, a property is *disjunctive* if it is not natural but is expressible by a disjunction (of conjunctions) of natural properties. One may prefer a characterization involving the less contentious notion of *comparative* naturalness, according to which a property is disjunctive if it is expressible by a disjunction (of conjunctions) of properties, each sufficiently more natural than the disjunction (where what counts as sufficient is left unclear). Call this second account *Disjunctive* (since it relies on disjunctiveness).

A number of objections to DA apply only to Disjunctive. For instance, Dan Marshall and Josh Parsons [Marshall and Parsons, 2001] argue that the intuitively extrinsic property *being such that there is a cube* is, according to Disjunctive, intrinsic. In response, Langton and Lewis say:

it seems to us (1) that being accompanied by a cube is less natural than being a cube, and (2) that being either a cube or accompanied by a cube is less natural still by a disjunction. The general rule is that disjoining unrelated properties always reduces naturalness; and we think that the relation between the disjuncts in this

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case—both involve being cubical, though in very different ways—is not a relevant sort of relatedness. [Langton and Lewis, 2001, p. 354]

According to Langton and Lewis, *being accompanied by a cube* is not basic intrinsic, so it doesn't get in on the first stage of the definition of Disjunctive. It doesn't get in on the second stage either since the property differs among duplicates. Notice, however, that *being such that there is a cube* is extrinsic according to Perfect since two non-cubes sharing their perfectly natural properties, one cube-accompanied and the other not, differ with respect to the property in question. Thus regardless of whether Langton and Lewis are correct in their dismissal of the Marshall and Parsons objection, that objection does not undermine DA *per se* since the Perfect formulation survives unscathed. Those happy to help themselves to an elite class of perfectly natural properties need not be worried by the Marshall and Parsons objection.

John Hawthorne [Hawthorne, 2001] poses a similar counterexample, arguing that the intuitively extrinsic property *attending to something* is deemed intrinsic according to Disjunctive. But again, regardless of whether the objection goes through, the alleged counterexample, as Hawthorne notes, poses no threat to Perfect since *attending to something* does not strike us as sufficiently natural to cause any worry: two individuals sharing their perfectly natural properties may differ with respect to the not-so-natural *attending to something*. As far as counterexamples have gone, Disjunctive is the more objectionable formulation of DA.¹ The problem to be raised in §2, however, applies equally to both formulations of the account, so it constitutes a more general objection to DA. As such, it will not matter to the following discussion which of the two formulations we have in mind.

Let us briefly consider one last objection to DA that has been raised by Robert Francescotti:

whatever else the duplicate relation amounts to, it would seem to be a transitive relation. . . Now suppose that Marla is a duplicate of Carla. Then, by transitivity, all of Marla's duplicates are duplicates of Carla. So defining intrinsicity in terms of duplicates yields the implausible result that being a duplicate of Carla is an intrinsic property of Marla. Since it is unclear how to construe the notion of a duplicate without making the relation transitive, we have reason to doubt whether any account in terms of duplicates could provide sufficient conditions for intrinsicity. [Francescotti, 1999, p. 593]

This doesn't constitute an objection for Langton and Lewis since *being a duplicate of Carla* is non-qualitative, making particular reference to Carla, and thus falls outside of the scope of DA. Langton and Lewis are explicit about this restriction: “[a] first qualification is that the proposed definition, and likewise all that follows, is to be understood as restricted to pure, or qualitative, properties” [Langton and Lewis, 1998, p. 334]. This will, of course, be taken by some as too much a restriction to make DA attractive, though we shall accept the restriction in any case.

The alleged counterexample is important, however, because it hints at a similar objection lurking in the vicinity. Suppose Marla is a duplicate of at least one distinct person. By transitivity, all of Marla's duplicates are duplicates of at least one distinct person. It follows that, at least according to Perfect and quite plausibly Disjunctive too, DA yields the implausible result that *being a duplicate of at least one distinct person* is an intrinsic property. Notice that this existential generalization of Francescotti's example makes the property qualitative, in contrast to *being a duplicate of Carla*.

While a problem for DA, I think it not as troubling as the worry I raise below for the following reason. The worry to be raised does not depend on examples of a highly theoretical sort, such as *being a duplicate of at least one distinct person*, which a defender of DA or counterpart theory might dismiss as not falling under the scope of an account of intrinsicity meant to apply *only* to properties of our ordinary vernacular. As the relevant notion of duplication is no notion of

¹This is not to say Perfect is the better formulation, for it relies on the contentious notion of perfect naturalness, whereas Disjunctive can get away with the less contentious notion of comparative naturalness.

our ordinary vernacular, one might be willing to deny that properties like *being a duplicate of at least one distinct person* cause any worry for the combination of DA and counterpart theory.²

Before turning to the next section, let me remark that an account of intrinsicity would be incomplete or inadequate if it could not account for the so-called global/local distinction. A property is global intrinsic (or intrinsic *simpliciter*) if, for any thing, it never differs among duplicates of that thing. A property is locally intrinsic to a thing if it never differs among duplicates of that thing. For example, *being a cube or accompanied by a cube* is globally extrinsic, locally intrinsic to cubes, and locally extrinsic to cube-accompanied non-cubes. A local account of intrinsicity is naturally lifted from the global one as follows:

A property is intrinsic to x iff it never differs among duplicates of x .

By ‘DA’ I mean to include both the local and global versions of the account.

2 Modal properties

Call a modal property of a thing x involving only counterpart relations C that supervene on the intrinsic character of x and its counterpart relata y (when C is restricted to x and the y s) an *internal modal property* of x (simply an *imp* of x for short). Call such a property an *imp simpliciter* if it is an imp for any x .³ An example of an imp for some objects on at least some determinations of the counterpart relation is *being possibly bent*: for some things x and y , to determine whether y is a bent counterpart of x , we need only look at their intrinsic properties.

Of course *being possibly bent* is not an imp on all determinations of the counterpart relation. When extrinsic features such as match of origins count toward determining when something has a counterpart, it will not be an imp of that thing. For instance, *being possibly bent* is not an imp of me (we suppose) since whether something counts as my counterpart is an extrinsic matter (do our origins sufficiently match?). We can, however, usually recover a corresponding imp from such a property by making the intrinsic features of the property salient, as with *being possibly bent-qua-merely-shaped-object*. It counts as an imp on any determination of the counterpart relation, since extrinsic features are ruled out by *fiat*. Since *being possibly bent* is an imp on at least some determinations of the counterpart relation, throughout I use it as an example of an imp.⁴

An important property of imps is that *they never differ among duplicates, so each is intrinsic according to DA*.

²Whether the example is of a highly theoretical sort depends on whether the notion of duplication is, and for the DA proponent (e.g. Lewis), it must be since she cannot define duplication as one ordinarily would in terms of the sharing of intrinsic properties (as that would be circular). I don’t know of any ordinary sense of duplication that does not appeal to intrinsicity, so the DA proponent can only be working with a theoretical notion. (Lewis’s proposal is obviously very theory-laden.)

³One axiom of Lewis’s counterpart theory of [Lewis, 1968] (viz. P5) is that nothing is a counterpart of a distinct worldmate. Though Lewis speaks of the counterpart relation as being internal, P5 rules it out. I don’t think this affects what I have to say since there are strong, independent reasons for doing away with P5. Lewis himself later rejects the axiom (see [Lewis, 1986, fn. 22]) to get a cheap alternative to haecceitism. From hereon I reject P5 from having axiom status, though I don’t deny that *some* contexts will determine a counterpart relation satisfying the axiom.

⁴To reemphasize, I see the problem I raise as involving properties picked out by our ordinary vernacular, unlike theoretical properties such as *being a duplicate of at least one non-overlapping individual* (on which, see footnote 2). It should be made clear, then, that the problem I’m about to raise does not rest on examples like *being possibly bent-qua-merely-shaped-object*. All that is needed is that there is a context and some x such that a property like *being possibly bent* involves only counterpart relations that are internal, when restricted to x and its counterparts. Under some contexts, e.g. those where we care only about the shapes of things, even *being possibly bent* will involve only internal counterpart relations. A nice feature of *being possibly bent-qua-merely-shaped-object* is that the relevant counterpart relations will always be internal, restricted or not, no matter the context. Thanks to an anonymous referee for getting me to clarify these matters.

Proof. Consider an arbitrary imp of the form $\diamond\phi$ had by an individual x . Then x has a counterpart y which has ϕ . Let z be a duplicate of x . Since the relevant counterpart relation (restricted to x and its counterparts) supervenes on the intrinsic properties of its relata, y is a counterpart of z too. Whence z has $\diamond\phi$. Thus if something has an imp of the form $\diamond\phi$, so do all of its duplicates.

In the other direction, suppose x lacks an imp $\diamond\phi$. Then none of x 's counterparts have ϕ . Let y be a duplicate of x , and z a counterpart of y . Then z is a counterpart of x , since the counterpart relation (restricted to x and its counterparts) supervenes on the intrinsic properties of its relata. Whence z lacks ϕ . As z was arbitrary, y lacks $\diamond\phi$. Thus if something lacks an imp, so do all of its duplicates.

Stringing these two implications together,imps of the form $\diamond\phi$ never differ among duplicates. Parallel reasoning establishes thatimps of the form $\square\phi$ also never differ among duplicates. \square

As a consequence, DA deemsimps intrinsic even when they involve relations between wholly distinct things. But properties that involve relations between wholly distinct things are intuitively extrinsic, at least by Lewis's lights (see §3 for an elaboration of this point). Thus, when modal properties are given a counterpart-theoretic analysis, DA wrongly deems intuitively extrinsic modal properties intrinsic.

Not all modal properties are intrinsic according to DA. Consider *possibly originating from different origins* which something has just in case (i) it originated from something, and (ii) it could have originated from something else. I have the property but none of my *lonely* duplicates do, since none of them has an origin in the relevant sense. As I and my duplicates differ with respect to possibly originating from different origins, the property is not intrinsic on DA. Notice that the involved counterpart relation is determined partly by *extrinsic* features, and is hence not an imp.

Call a *necessary property* one had by all and an *impossible property* one had by none. According to DA, all necessary and impossible properties are intrinsic since such properties can never differ among duplicates, and Langton and Lewis find this consequence acceptable. They say:

[a] property which necessarily belongs to everything never differs between any two things; *a fortiori* it never differs between duplicates. Therefore the necessary property [...] turns out to be intrinsic under our definition. Likewise, the (or any) impossible property turns out to be intrinsic.

Here is another way to make the point: necessary and impossible properties supervene on the basic intrinsic properties in the trivial way that non-contingent matters supervene on any basis whatever. There can be no difference in the supervenient without a difference in the basis, because there can be no difference in the supervenient at all.

Is this consequence acceptable?—We think so. True, the distinction between intrinsic and extrinsic is of interest mostly when applied to contingent properties: that is, properties that are neither necessary nor impossible. But it is harmless to apply it more widely. [Langton and Lewis, 1998, p. 340]⁵

I will assume to the benefit of Langton and Lewis, and since one could take it as following from what they say concerning necessary and impossible properties, that their discussion also covers *essential properties*, i.e. those had by a thing whenever that thing exists (according to a world).

⁵The necessary property of *being such that every number has two successors* is intuitively extrinsic but deemed intrinsic according to DA. Instead of saying that it is harmless to apply DA more *widely* to cover necessary properties, which it certainly is not, Langton and Lewis should have said that it is harmless to *restrict* the account by excluding necessary and impossible properties.

For if ϕ is an essential property had by x then, trivially and just like necessary and impossible properties, there can be no change in x 's having ϕ without a change in any property.

Ifimps were always necessary or impossible (or essential, we assume), Langton and Lewis would dismiss them as unproblematic. However, not allimps are necessary or impossible. For example, *possibly being a rock* is not, since some things are not possibly rocks (such as myself, suppose) and others are. The problem is thatimps need not be essential (hence neither necessary nor impossible) according to counterpart theory. This is one important difference between an **S5** analysis of modal properties and a counterpart-theoretic one: only on the former are all modal properties had or lacked essentially.

One example of a non-essential (hence non-necessary and non-impossible) imp is *possibly having fewer atoms (than one actually has)*. I have the property of possibly having fewer atoms. Thus one of my counterparts, call him s , is comprised of fewer atoms than me. Suppose I couldn't have had fewer than n atoms since that would be too few atoms to constitute a human, and suppose n is the largest number such that I couldn't have fewer than n atoms. Suppose that s has n atoms. Then since s is human (assuming I'm essentially human), s doesn't have the property of possibly having fewer atoms. It follows that I might have had fewer atoms but not of necessity.

Some may object: can we really say that for some n , it is the largest number such that a human couldn't have had fewer than n atoms? Isn't it vague or indeterminate which number n is? Perhaps, but that there are non-essentialimps is true for the counterpart theorist, whether *possibly having fewer atoms* counts as a genuine example or not. It is simply uncontentious for Lewis that the counterpart relation is intransitive (see [Lewis, 1986, p. 219]) and it is this feature that implies the existence of non-essentialimps.⁶

A final strategy of dismissingimps as unproblematic is by showing them all disjunctive or the negations of disjunctions. But this strategy is shown to easily fail. Consider *possibly having fewer atoms*. I have that property in virtue of standing in the counterpart relation to distinct individuals. Is it disjunctive or the negation of a disjunctive property, i.e. can it be expressed by a "bad" disjunction (or the negation of one)? I can't see how. True, *possibly having fewer atoms* is equivalent to *having fewer atoms or having a counterpart with fewer atoms*, but given that the first disjunct is impossible (one can't have fewer atoms than one actually has), the property is equivalent to the second disjunct alone which is no more natural than *possibly having fewer atoms*.

3 Rejoinders

I've been assuming that modal properties analyzed counterpart-theoretically are intuitively extrinsic since they involve relations between wholly distinct things. One might question this assumption in one of two ways. First, one might deny that 'intuitively extrinsic' is applicable to a theoretical analysis of modal properties: the expression is applicable only to properties *pretheoretically conceived*, hence not to modal properties counterpart-theoretically conceived. The idea is that it doesn't make sense to say of some theoretical notion that it is intuitively ϕ , perhaps because we simply don't have intuitions in the relevant sense about theoretical matters.

The problem with this rejoinder is that one of the main motivations of the Langton and Lewis account is that, compared to Jaegwon Kim's account (discussed by Lewis in [Lewis, 1983]), it

⁶Non-transitivity of the counterpart relation allows the possibility for there being x , y , and z such that (i) y is x 's counterpart while z is y 's but not x 's; (ii) y has ϕ and hence x has $\diamond\phi$; (iii) none of y 's counterparts has ϕ and hence x doesn't have $\Box\diamond\phi$. I take the example just given of possibly having fewer atoms to be a legitimate instance of ϕ , but here is another example perhaps more plausible for some. Consider the property had by a mere lump or sum x of many atoms. Plausibly x has a one-atom counterpart y —imagine a scenario in which the lump could've been reduced to a single atom. Then x could have had fewer atoms, but one of its counterparts, y , could not have had fewer atoms. So x has a modal property non-essentially. This example requires (plausibly I think) denying mereological essentialism.

deals better with properties like *being lonely*, which is highly theoretical. So if an account of intrinsicity is not intended to cover theoretical properties, it is not clear what the advantages Langton and Lewis's more complicated account has over Kim's. Second, it is not even clear that modal properties analyzed counterpart-theoretically ought to be counted as theoretical. For such properties *just are*, at least on some plausible senses, mundane non-theoretical properties like *being possibly bent*. Third, what Lewis says regarding an endurantist analysis of temporary intrinsics, viz. that on that analysis they become relational and hence extrinsic, can be transformed into a like argument for the extrinsicity of modal properties counterpart-theoretically conceived.

The problem of temporary intrinsics is roughly this. How can one and the same thing have an intrinsic property at one time and not another? Equivalently (given the closure of intrinsic properties under negation), how can something have incompatible intrinsics at different times?⁷ One may view the matter as follows. Endurantists give an account of intrinsic change (partly) as a solution to the problem of temporary intrinsics according to which those properties are relational. Lewis takes this as enough to conclude that such properties are extrinsic according to the endurantist. Similarly, counterpart theorists give an account of de re modality (partly) as a solution to the problem of accidental intrinsics according to which those properties are relational. This parallel between the modal and temporal allows us to conclude that temporal properties as conceived by the endurantist are relational iff modal properties as conceived by the counterpart-theorist are as well.

Someone, though I don't think Lewis, may deny the extrinsicity of properties involving relations between wholly distinct things. Here is but one such example. Consider an analysis of shape according to which a thing has a given shape just in case it occupies a region of spacetime having that shape. Are we forced to say that, according to this analysis, shape is extrinsic since it involves a relation between wholly distinct things, viz. occupants of spacetime regions and spacetime regions? I should think so, and I would think Lewis would as well, but I can see that it might be met by resistance from others. In the debate about persistence, endurantists hold that temporary properties are had relative to times. Does it follow that endurantists view intuitively intrinsic properties like *being bent* as extrinsic relations between things and times? Endurantists think not; Lewis think so. Endurantists think not because they think that one can have a property relative to a time without the property being relational—that's what it means to take tense "seriously". But to endorse counterpart theory in the spirit of Lewis is most certainly not to take modality seriously in that sense.

Couldn't one simply stick to their guns (viz. DA and counterpart theory) and maintain that having a "property" in virtue of standing in relation to distinct things does not guarantee the property is extrinsic? If DA deems such properties intrinsic, why not forget about our intuitions and side with a rigorously worked-out account?⁸ One reason is that DA does not strike me as such a compelling and independently motivated theory of intrinsicity as to allow us to ignore any intuitive counterexamples we come up with, especially very compelling ones. It seems to me analytic that any property had in virtue of standing in relation to distinct things is extrinsic. If we can't even agree to this, I start to lose grip on the intuitive notion we were meant to analyze. On what other grounds are we supposed to measure the success of DA?

Another reason for not overlooking (alleged) counterexamples we have already discussed above: given what Lewis says about intrinsic properties becoming extrinsic on the endurantist account—since they become relations to times—he should certainly think the same concerning modal properties counterpart-theoretically conceived. I am not much compelled to say that the endurantist's *relativization* of intrinsics makes those properties extrinsic, since the endurantist is not committed to times being objects that things stand in relation to. I am very much compelled, however, to say that the counterpart theorist's *relationalization* of modal properties makes those

⁷See [Lewis, 1986, pp. 202–206] for discussion.

⁸Thanks to an anonymous referee for pressing this point.

properties extrinsic. So if there is an argument for calling the endurantist's intrinsics extrinsic, there is an even stronger case to be made for calling the counterpart theorist's imps extrinsic.

A final reason is methodological. Consider Lewis on philosophical analysis.

One comes to philosophy already endowed with a stock of opinions. It is not the business of philosophy either to undermine or to justify these preexisting opinions to any great extent but only to try to think of ways of expanding them into an orderly system. A metaphysicians analysis of mind is an attempt at systematizing our opinions about mind. It succeeds to the extent that (1) it is systematic, and (2) *respects those of our prephilosophical opinions to which we are firmly attached*. [Lewis, 1973, p. 88, my emphasis]

If we are firmly attached to any pretheoretical opinions concerning intrinsicity, one of those is that relations had between distinct things are not intrinsic properties (of those things). DA when coupled with counterpart theory fails to respect this intuition, and so I—and presumably Lewis too—reject DA (assuming counterpart theory) for very general methodological reasons. Any systematization of the stock of opinions concerning intrinsicity had better respect the firm intuition that a relation had between distinct things cannot be an intrinsic property of either.

4 Internal relations

An internal relation, as Lewis defines it, is “one that supervenes on the intrinsic natures of its *relata*: if X_1 and Y_1 stand in the relation but X_2 and Y_2 do not, then there must be a difference in intrinsic nature either between the X s or else between the Y s” [Lewis, 1986, p. 62]. Note that if ϕ is an imp of x (relative to a context c) then the counterpart relation (determined by c) restricted to x and its counterparts is an internal relation.

Let $R(x, y)$ be an internal relation. Call $\exists y R(x, y)$ the *right- \exists closure* of R , or simply $r\text{-}\exists^R$. (Right- \exists closures are always closures of *internal* relations, as I’ve defined them.) Right- \exists raise a worry for one who wants to maintain both a counterpart-theoretic analysis of *de re* modality and the duplication account of intrinsicity since, like imps, they never differ among duplicates.

Proof. Suppose x has $r\text{-}\exists^R$. Then there is a y such that $R(x, y)$. Let z be a duplicate of x . Since R is internal, $R(z, y)$, hence z has $r\text{-}\exists^R$.

Similarly, suppose x lacks $r\text{-}\exists^R$. Then there’s no y such that $R(x, y)$. Let z be a duplicate of x . If z has $r\text{-}\exists^R$, then there is a y such that $R(z, y)$, whence $R(x, y)$ as R is internal, contradicting our earlier claim. Thus z lacks $r\text{-}\exists^R$.

Stringing these two implications together, right- \exists closures never differ among duplicates. \square

According to DA, it follows that right- \exists closures are intrinsic. It is clear, however, that the right- \exists closures of some relations are intuitively extrinsic. We have already seen an example of this in imps. A question, which we shall come to shortly, is whether there any *other* clear-cut cases of right- \exists closures that are problematic for the conjunction of counterpart theory with DA.

Some counterexamples that have been put to DA resemble right- \exists closures but are not right- \exists closures. The example *tending to something* of [Hawthorne, 2001] is not the right- \exists closure of an internal relation since the relation x *tends to* y is not internal. This is at least one reason it is not *guaranteed* to cause trouble for DA. Note, moreover, that while *tending to something* may be an objection to the disjunctive formulation of DA (i.e. Disjunctive), it is certainly no objection to the formulation of DA given in terms of perfectly natural properties (i.e. Perfect).

Are there any other problematic examples of right- \exists closures? I cannot think of any that are non-modal or non-theoretical or non-reflexive in nature, and hence none that are as clearly problematic as imps are for the conjunction of DA with counterpart theory. If $r\text{-}\exists^R$ is non-modal, it won’t be independent of accompaniment (hence intrinsic) unless it holds of x in virtue of x

standing in the relation R to itself. But then it is questionable whether x has $r\text{-}\exists^R$ intrinsically or not: for one might hold that the relation is intrinsic to x in virtue of Rxx holding. We could also consider theoretical properties involving e.g. explicit unrestricted quantification over possibilities, but there may be good reasons to exclude such properties from the scope of DA or counterpart theory since it is unlikely, e.g., that ordinary language has any mechanism for explicit quantification over possibilities and counterpart theory is intended to provide truth conditions only for sentences of ordinary language.

It is interesting that, as far as I can see, *imps* constitute the only *clearly* problematic case for the conjunction of DA with counterpart theory.

5 Final remarks

Why should the Lewisian not just accept an alternative account of intrinsicity instead of e.g. revising their account of de re modality in an effort to retain DA? One reason is that there doesn't appear to be any alternative to DA to which a Lewisian could help herself. And she cannot take intrinsicity as primitive, for that would threaten the Lewisian project of reducing the modal and related notions to purely extensional ones. Who is to say, taken primitively, that intrinsicity is an extensionally acceptable notion?

By way of example, three accounts of intrinsicity that are incompatible with counterpart theory are that of (i) Robert Francescotti [Francescotti, 1999], (ii) D. Gene Witmer et al. [Witmer et al., 2005], and (iii) Brian Weatherson [Weatherson, 2001]. Weatherson's is technically not an alternative to DA, but since it is an improvement on it (in particular, Disjunctive), I thought it worthy of inclusion. While consideration of just these two accounts is not exhaustive, it does leave the burden of finding an adequate replacement to DA in the hands of the counterpart theorist. I see this as a serious challenge for the Lewisian if their total theory is claimed to be both adequate (e.g. extensionally) and reductive.

Of these two alternative accounts of intrinsicity (and of any I've seen, more generally), Francescotti's looks most plausibly compatible with counterpart theory, so I shall elucidate this case first. Francescotti gives the following relational account of local intrinsicity. First, he defines being a *d*-relational property of a thing x . Intuitively these are properties had by x which "consist in"⁹ x 's standing in a relation to "distinct"¹⁰ things. He then defines a property's being intrinsic to x as a property had by x that is not *d*-relational of x . Since the having of modal properties counterpart-theoretically construed consists in the standing of a relation to distinct things, it is *prima facie* plausible that the *d*-relational account would give the correct verdict concerning modal properties counterpart-theoretically conceived.

In detail, the account is as follows:

d-relationality. A property ϕ is *d*-relational of x iff one of the following is satisfied:

- (a*) there is a relation R , and an item y , such that (i) x 's having ϕ consists in x 's bearing R to y , and (ii) y is not part of x ;
- (b*) there is a relation R , and a class of items C , such that (i) x 's having ϕ consists in there being some member of C to which x bears R , and (ii) at least one member of C to which x bears R is not part of x ;
- (c*) there is a relation R , and a class of items C , such that (i) x 's having ϕ consists in x 's bearing R to every member of C , and (ii) there is a member of C which is possibly not part of x ;

⁹Regarding the 'consists in' relation, he says: "I propose that we view the consists-in relation as being nothing less than identity; the event or state, x 's having F , consists in the event or state, x 's having G , just in case x 's having F is the very same event or state as x 's having G " [Francescotti, 1999, p. 599].

¹⁰Francescotti uses ' x is distinct from y ' to mean ' x is not a (possibly improper) part of y '. I've chosen to use the latter so as to make this clear without introducing another definition.

Intrinsicity. property ϕ is intrinsic to x iff x has ϕ and ϕ is not a d-relational property of x .

Let us suppose that under the present determination of the counterpart relation, a thing x (e.g. a lump of atoms) has at most one counterpart in each world and that in determining whether something is a counterpart of x we need only look at their intrinsic natures. Then given C and R , isn't it true that there is a member of C , viz. a bent counterpart of me, that is possibly not part of me? If so, clause (c*) deems *being possibly bent* d-relational. The surprising answer is "No", because given a counterpart-theoretic interpretation of 'x is possibly not part of y', there is no bent counterpart of me that is possibly not a part of me. For it is possible that x is not a part of y iff there is a world w inhabited by counterparts u and v of x and y respectively, and u is not a part of v . Under the supposition that I have at most one counterpart in each world, if x and y are both counterparts of me that inhabit world w , they are identical, in which case x is an improper part of y . Since there is simply no reason for the counterpart theorist to interpret 'x is possibly not part of y' other than counterpart-theoretically, it is thus impossible that a bent counterpart of me not be part of me. (The notion of parthood employed in clauses (a*) through (c*) needs to be improper for Francescotti, for he wants properties such as *being self-identical* or *being identical to Jill* to come out intrinsic to Jill on his account. See [Francescotti, 1999, p. 598].) So being possibly bent is not, according to (c*), d-relational of me, and hence not intrinsic on that account.

Witmer et al. [Witmer et al., 2005] give an account of intrinsicity in which independence of accompaniment centrally figures, but duplication does not. Their account is given as follows:

Intrinsic fashion. x has ϕ in an intrinsic fashion just in case (i) ϕ is independent of accompaniment; and (ii) for any property ψ , if x has ϕ in virtue of having ψ , ψ is also independent of accompaniment;

Intrinsicity. property ϕ is intrinsic just in case, for any possible individual x , if x has ϕ , x has ϕ in an intrinsic fashion.

The in-virtue-of relation is here taken as primitive. Aside from other merits and demerits of this account, it too does not work in conjunction with counterpart theory.

Consider the property *possibly being comprised of more atoms*. Something x is possibly comprised of more atoms only in virtue of having a counterpart comprised of more atoms, and *having a counterpart comprised of more atoms than x is* is independent of accompaniment. For let x be some person Jane. Then the property in question becomes *having a counterpart comprised of more atoms than Jane is*. However, to avoid non-qualitative properties, let us suppose for simplicity that Jane is comprised of exactly n atoms. Then the property had by Jane in virtue of which she could be comprised of more atoms is *having a counterpart comprised of more than n atoms*. But this property is independent of accompaniment, since:

- i accompanied things (Jane) and lonely things (a lonely duplicate of Jane) have it;
- ii accompanied things (a water molecule) and lonely things (a lonely duplicate of a water molecule) lack it.

(I'm assuming that a water molecule couldn't be comprised of more atoms, since then it wouldn't be essentially a water molecule.) Thus *possibly being comprised of more atoms*, a property that is intuitively extrinsic on a counterpart-theoretic analysis, is always had in an intrinsic fashion and is hence intrinsic according to the in-virtue-of account. This account of intrinsicity, then, won't be of any help to the counterpart theorist.

The combinatorial account proposed by Brian Weatherson [Weatherson, 2001] is, technically, a duplication account, but as it avoids a variety of objections that arise for both Perfect and Disjunctive, it is worth considering as well. The details of the account are as follows. Let an I-set be any set of properties closed under the following conditions:

- (B) if $F \in I$ and $G \in I$ then their boolean combinations are;
- (M) if $F \in I$ then *Having n parts that are $F \in I$ and Being entirely composed of exactly n things that are $F \in I$* ;
- (T) if $F \in I$ and $G \in I$ and there is a possible world with $n + 1$ pairwise distinct things, and something in some world is F and something in some world is G , then there is a world with exactly $n + 1$ pairwise distinct things such that one is F and the other n are G ;
- (S) if $F \in I$ and $G \in I$ and it is possible that regions with shapes d_1 , and d_2 stand in relation A , and it is possible that an F wholly occupy a region with shape d_1 , and a G wholly occupy a region with shape d_2 , then there is a world where regions with shapes d_1 , and d_2 stand in A , and an F wholly occupies the region with shape d_1 , and a G wholly occupies the region with shape d_2 .

Weatherson then gives a weakening of Langton and Lewis's definition of disjunctiveness: a property F is disjunctive if it is a disjunction of conjunctions such that at least one conjunct of each disjunct is more natural than F . The rest is similar to Disjunctive. A property is basic intrinsic if it is neither disjunctive nor the negation of a disjunction, and it is a member of at least one I-set. Finally, a property is intrinsic if it never differs among duplicates.

Now consider again *possibly having fewer atoms (than one actually has)*. First, it is neither disjunctive nor the negation of a disjunction. It is equivalent to *having fewer atoms (than one actually has) or having a counterpart with fewer atoms (than one actually has)*, but seeing that the first disjunct is impossible, it is equivalent to the second disjunct alone which is no more natural than *possibly having fewer atoms*. Second, we can verify that *possibly having fewer atoms* is in at least one I-set, e.g. the smallest set containing the property that is closed under (B) and (M). So, again, we see that some modal properties counterpart-theoretically construed are intrinsic on the combinatorial account even though they are intuitively extrinsic.

One thing (T) is intended to rule out are properties that are not independent of some of their boolean combinations, like *being such that a cube exists* which is not independent of its negation.¹¹ For that property to be in an I-set, its negation would have to be (by (B)), but then there would have to be a world (by (T)) according to which one thing is such that there is a cube and another such that there are no cubes. Such a situation does not arise for *possibly having fewer atoms* since there can be a world containing two things, one of which could have had fewer atoms and the other not; a lump of atoms could have had fewer atoms, but a single atom not.

Intrinsicity plays an important role for Lewis. For instance, the relation of comparative similarity amongst worlds used in Lewis's analysis of counterfactuals is an internal relation, i.e. one that supervenes on the intrinsic natures of its relata. If there is no account of intrinsicity that is both compatible with counterpart theory and clearly non-modal, significant portions of Lewis's total theory are left hostage to a suspiciously modal primitive. Reduction will only be achieved when an adequate and clearly reductive account of intrinsicity is put forth as an alternative to DA.

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¹¹In general, a property ϕ is independent of another ψ iff it is possible for: (i) a ϕ to have ψ , (ii) a ϕ to lack ψ , (iii) a ψ to lack ϕ , (iv) something to lack both ϕ and ψ .

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