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Analyses of Intrinsicity in terms of Naturalness¹

DAN MARSHALL

Abstract

Over the last thirty years there have been a number of attempts to analyse the distinction between intrinsic and extrinsic properties in terms of the facts about naturalness. This article discusses the three most influential of these attempts, each of which involve David Lewis. These are Lewis's 1983 analysis, his 1986 analysis, and his joint 1998 analysis with Rae Langton.

1 Introduction

The distinction between intrinsic and extrinsic properties is important in its own right, and also plays an important role in many areas of philosophy.² What it is for a property to be intrinsic might be characterised as follows:³

- (1) Being F is an intrinsic property =_{df} Necessarily, anything that is F is F in virtue of how it is, as opposed to how it is related to things wholly distinct from it or how things wholly distinct from it are.

An extrinsic property, on the other hand, is just a property that is not intrinsic. The properties of *being made of tin* and *having 80kg mass* are plausibly examples of intrinsic properties. The properties of *being next to a tin* and *being an uncle*, on the other hand, are examples of extrinsic properties.

The above analysis of 'intrinsic property', together with examples of intrinsic and extrinsic properties such as those above, arguably allow people to latch onto the intended notion of intrinsicity.⁴ The analysis, however, appears to be circular. For it to be true, the phrase 'in virtue of how it is' must be understood to mean 'in virtue of how it is intrinsically'. If it instead means 'in virtue of how it is both intrinsically and extrinsically', the characterisation will be false, since it will falsely classify all properties as intrinsic. For example, if 'in virtue of how it is' means 'in virtue of how it is both intrinsically and extrinsically', the property of being an uncle will be falsely classified as being intrinsic, since anyone who is an uncle is an uncle in virtue of how they are both intrinsically and extrinsically.⁵ The analysis, therefore, essentially analyses intrinsicity in terms of itself.⁶

Over the last thirty years, there have been a number of attempts to give a non-circular analysis of 'intrinsic property' in terms of facts about naturalness, together with broadly logical notions, such as possibility, parthood, and the operators of predicate logic. In this article, I will discuss the three most important of these attempts. In section 2, I will discuss David Lewis's 1983 analysis, which was proposed in (Lewis 1983b). In section 3, I will discuss Lewis's related 1986 analysis, which was proposed in (Lewis 1986b). Finally, in section 4, I will discuss the joint analysis of Rae Langton and David Lewis, which was proposed in (Langton and Lewis 1998).

Before discussing these analyses, two preliminary issues need to be addressed. First, it might be easy to analyse ‘intrinsic property’ given special metaphysical assumptions about properties. Suppose, for example, properties are sparse, so that, while there is the property of having unit positive charge, there is no property of being an uncle. Then, if all the sparse properties are intrinsic, ‘For any p , p is an intrinsic property =_{df} p is a property’ might be an analysis. Similarly, if all intrinsic properties lack proper parts, while all extrinsic properties have proper parts, then ‘For any p , p is an intrinsic property =_{df} p is a property that lacks proper parts’ might be an analysis.

I will set aside the possibility of such analyses by only considering attempts to analyse ‘intrinsic property’ that do not rely on special assumptions about properties.⁷ For definiteness, I will assume a neutral theory of properties that does not build in any special features that make it easier to analyse ‘intrinsic property’. In particular, I will assume that properties are abundant, so that every well-defined one-place predicate expresses a property, and that all properties are mereologically simple. For simplicity, I will also assume a classical theory of possible worlds, which allows there to be things that exist at multiple worlds, and there to be things that exist at non-actual worlds that do not exist at the actual world.⁸ I will also assume that the properties are the sets of pairs of things and worlds, so that each property p is the set $\{ \langle x, w \rangle \mid x \text{ has } p \text{ at } w \}$.⁹

Secondly, it might be thought easy to analyse ‘intrinsic property’ using only broadly logical notions, without relying on any special assumptions about properties or appealing to any further notion such as naturalness.¹⁰ Jaegwon Kim (1982), for example, has formulated an account which, if successful, would provide just such an analysis. Define something to be *accompanied* iff it coexists with a wholly distinct contingently existing thing; otherwise, define it to be *lonely*.¹¹ Kim’s analysis, in effect, is (2).

- (2) For any p , p is an intrinsic property =_{df} it is possible for something to have p and be lonely.

Unfortunately, however, as David Lewis pointed out, Kim’s analysis fails since it falsely classifies the extrinsic property of being lonely as intrinsic.¹² Moreover, it can be shown that, given plausible assumptions (and the neutral theory of properties assumed above), any attempt to analyse ‘intrinsic property’ using only broadly logical notions must fail. The plausible assumptions are that there are two incompatible intrinsic properties p and q such that: Ai) necessarily, anything having either p or q is a concrete existent having no proper parts; Aii) for any x , the number of worlds at which x is lonely and has p is equal to the number of worlds at which x is lonely and has q ; Aiii) there is a world at which p is had by something lonely and a world at which p is had by something accompanied; and Aiv) neither p nor q are actually had by something lonely. A possible example of such a pair of properties are *being a positron* and *being an electron*.

A sketch of the argument showing that ‘intrinsic property’ cannot be analysed given these assumptions and the theory of properties assumed above is the following.¹³ Let r be the property of being either lonely and having q or else accompanied and having p . Then, while $p = \{ \langle x, w \rangle \mid \text{at } w, x \text{ is lonely and has } p \} \cup \{ \langle x, w \rangle \mid \text{at } w, x \text{ is accompanied and has } p \}$, $r = \{ \langle x, w \rangle \mid \text{at } w, x \text{ is lonely and has } q \} \cup \{ \langle x, w \rangle \mid \text{at } w, x \text{ is accompanied and}$

has p }. For each x , the worlds at which x is lonely and has p satisfy the same broadly logical predicates as the worlds at which x is lonely and has q , where a broadly logical predicate is a predicate containing only broadly logical expressions.¹⁴ Since r can be obtained from p by replacing the worlds at which there is a lonely thing having p with the worlds at which there is a lonely thing having q , it follows that r satisfies the same broadly logical predicates as p . If ‘intrinsic property’ could be analysed using only broadly logical notions there would be a broadly logical predicate that symbolises ‘intrinsic property’ and which only applies to intrinsic properties. Since p is intrinsic and r is extrinsic, and p and q satisfy the same broadly logical predicates, there is no such predicate, and hence ‘intrinsic property’ cannot be analysed using only broadly logical notions.

2 Lewis’s 1983 analysis

Lewis’s 1983 analysis and his 1986 analysis are often identified with each other, but they are in fact importantly different. Lewis’s 1983 analysis analyses ‘intrinsic property’ in terms of ‘duplicate’, and ‘duplicate’ in terms of ‘perfectly natural property’. The analysis is given by (3) and (4).

- (3) For any p , p is an intrinsic property =_{df} i) p is a property, and ii) for any x and y such that x is a duplicate of y , x has p iff y has p .
- (4) For any x and y , x is a duplicate of y =_{df} x and y have exactly the same perfectly natural properties.

This statement of Lewis’s analysis requires Lewis’s theory of possible worlds, according to which things in the actual world have duplicates that exist at non-actual worlds. We can reformulate Lewis’s 1983 analysis so that it is compatible with the classical theory of possible worlds assumed in section 1 by rewriting it as (5) and (6).

- (5) For any p , p is an intrinsic property =_{df} i) p is a property, and ii) for any x and y , and for any worlds w_1 and w_2 such that x at w_1 is a duplicate of y at w_2 , x has p at w_1 iff y has p at w_2 .
- (6) For any x and y , and for any worlds w_1 and w_2 , x at w_1 is a duplicate of y at w_2 =_{df}, for any perfectly natural property q , x has q at w_1 iff y has q at w_2 .

What is a perfectly natural property in Lewis’s 1983 analysis? Lewis is officially neutral in (Lewis 1983b) between i) analysing ‘perfectly natural’ in terms of immanent universals, ii) analysing it in terms of tropes, and iii) regarding it as a primitive predicate that is given no formal analysis.¹⁵ I will discuss only the last option since the first two options require the existence of universals and tropes satisfying special metaphysical assumptions.¹⁶

Even if ‘perfectly natural’ is regarded as a primitive predicate, it still requires explanation since it is a purely technical term. The explanation that Lewis provides, as far as it goes, is in terms of Armstrong’s theory of universals. Roughly, according to (Lewis 1983b),

p is a perfectly natural property iff it would be necessarily coextensive with a universal if Armstrong's (1978a, 1978b) theory of universals was correct. Given Armstrong's (1978a, 1978b) theory of universals, for each qualitative property p that makes for resemblance between its instances and is possibly causally relevant, there is a unique universal that is necessarily coextensive with p , and there are no more universals than these.¹⁷ Roughly, then, a property is perfectly natural according to (Lewis 1983b) iff it is qualitative, makes for resemblance and is possibly causally relevant.

This characterisation, however, is only rough. Armstrong's (1978a, 1978b) theory of universals holds that there are extrinsic universals, since extrinsic properties can be qualitative, make for resemblance and be causally relevant.¹⁸ The rough characterisation above, therefore, has the undesirable consequence that there are extrinsic perfectly natural properties, which would render Lewis's 1983 analysis false. As a result of this, the perfectly natural properties in (Lewis 1983b) are not the properties that would correspond to universals if Armstrong's theory was correct. Instead, they are the properties that would correspond to universals if a modified version of Armstrong's theory, according to which there are no extrinsic universals, was correct. As Lewis writes:

But here I must confess that the theory of universals for which I offer new work cannot be exactly Armstrong's theory. For it must reject extrinsic universals; whereas Armstrong admits them. . . (Lewis 1983b, p. 357)

It would therefore seem that a property is perfectly natural, according to (Lewis 1983b), iff it is qualitative, makes for resemblance, is possibly causally relevant, and is intrinsic.¹⁹ Given this explanation of 'perfectly natural', however, Lewis's 1983 analysis is conceptually circular, since it analyses 'intrinsic property' in terms of 'perfectly natural', which is then explained in terms of 'intrinsic'. Lewis's 1983 analysis therefore fails to non-circularly analyse what it is for a property to be intrinsic.

3 Lewis's 1986 analysis

Lewis's 1986 analysis (formulated so as to be compatible with the classical theory of possible worlds) retains (5) from Lewis's 1983 analysis, but replaces (6) with the more complicated (7).²⁰

- (7) For any x and y , and for any worlds w_1 and w_2 , x at w_1 is a duplicate of y at $w_2 =_{df}$ there is a one-to-one correspondence f between x 's parts at w_1 and y 's parts at w_2 such that, for any perfectly natural relation R , for any x_1, x_2, \dots that are part of x at w_1 : x_1, x_2, \dots stand in R at w_1 iff $f(x_1), f(x_2), \dots$ stand in R at w_2 .

The reason Lewis cited for giving this more complicated analysis, rather than the simpler 1983 analysis, was that he wished to remain neutral over whether there are any complex perfectly natural properties, such as *being methane* or *being the fusion of two electrons one metre apart*. Suppose, for example, that x is the fusion of two electrons that are one metre apart, and y is the fusion of two electrons that are two metres apart. Then x and

y plausibly have the same simple perfectly natural properties. If there are no complex perfectly natural properties, then, Lewis's 1983 analysis classifies x and y as duplicates, and hence falsely classifies the property of being the fusion of two electrons one metre apart as extrinsic, as it is had by x , but not by y . Lewis's 1983 analysis therefore fails if there are no complex perfectly natural properties. Lewis's more complicated 1986 analysis, on the other hand, is compatible with there being no complex perfectly natural properties.

Given (Lewis 1986b) wishes to avoid commitment to complex perfectly natural properties, 'perfectly natural' in (Lewis 1986b) cannot mean 'qualitative, resemblance making, possibly causally relevant, and intrinsic', since Lewis presumably accepts that there are complex properties that are qualitative, resemblance making, possibly causally relevant and intrinsic. So what does it mean?

In explaining 'perfectly natural', Lewis wrote:

Sharing of [the perfectly natural properties] makes for qualitative similarity, they carve at the joints, they are intrinsic, they are highly specific, the set of their instances are *ipso facto* not entirely miscellaneous, there are only just enough of them to characterise things completely and without redundancy.

Physics has its short list of 'fundamental physical properties': the charges and masses of particles, also their is so-called 'spins' and 'colours' and 'flavours', and maybe a few more that have yet to be discovered. (Lewis 1986b, p. 60, author's emphasis)

One natural interpretation of this passage is that the perfectly natural properties and relations are the simple properties and relations. However, given this interpretation, Lewis cannot be neutral over whether there are complex perfectly natural properties, since on this interpretation there cannot be any.

The most charitable interpretation of Lewis is plausibly that he is not in fact neutral over whether there are any complex perfectly natural properties. Instead, he is neutral over which of two different notions of 'perfectly natural' is best to employ. The first of these notions is the notion of the perfectly natural employed in (Lewis 1983b), according to which there are complex perfectly natural properties, while the second is the one according to which the perfectly natural properties and relations are the simple properties and relations.

Let us call the first conception of 'perfectly natural' the *broad* conception, and the second conception the *simple* conception. Given the broad conception, Lewis's 1986 analysis is arguably equivalent to his 1983 analysis, and faces the circularity objection discussed in section 2. Given the simple conception, on the other hand, Lewis's 1986 analysis is not equivalent to the 1983 analysis, and avoids the circularity objection, since, provided we can make sense of the notion of being a simple property or relation, we appear to be able to make sense of the simple conception of 'perfectly natural' without using the notion of intrinsicity. In the following, I will therefore only consider Lewis's 1986 analysis with 'perfectly natural' having its simple reading.

One objection to Lewis's 1986 analysis, so understood, is that the notion of a simple property is obscure or ill-defined. A second objection concerns the fact that Lewis's 1986

analysis automatically classifies all perfectly natural properties as intrinsic. According to this second objection, there is no reason to think that this consequence of Lewis's analysis is true.²¹

Assuming that the first objection fails, and we do have a sufficiently good understanding of what it is for a property or relation to be simple, the intuitive characterisation of intrinsicity given in section 1 provides a response to the second objection. If x is F in virtue of how it is related to some wholly distinct thing, then *being F* must plausibly be analysable in terms of one or more simpler relations, and hence cannot itself be simple.²² More generally, if x is F (at least partly) in virtue of how it is related to things wholly distinct from it or how things wholly distinct from it are, then *being F* cannot be simple since it must be analysable in terms of simpler properties or relations that either specify how x is related to things wholly distinct from it, or specify how things wholly distinct from it are. Given the simple conception of 'perfectly natural', it therefore follows from the initial characterisation of 'intrinsic property' given in section 1 that all perfectly natural properties are intrinsic, just as Lewis's 1986 analysis requires.

A third objection concerns non-qualitative intrinsic properties. Given the simple conception of 'perfectly natural', it is plausible that non-qualitative properties and relations aren't perfectly natural.²³ For example, given the simple conception, the non-qualitative property of being Obama is plausibly not maximally simple, since it can plausibly be analysed in terms of the simpler relation of *being identical to* as follows: For any x , x is-Obama =_{df} ($x = \text{Obama}$). Given this is the case, and given non-qualitative properties do not supervene on qualitative properties, Lewis's 1986 analysis has the consequence that all non-qualitative properties are extrinsic. For example, let x be someone distinct from Obama who has the same qualitative properties at a world w that Obama has at the actual world. Then, given the perfectly natural properties and relations are all qualitative, Obama at the actual world is a duplicate of x at w , and hence, according to Lewis's 1986 account, Obama at the actual world has the same intrinsic properties as x at w . Since Obama at the actual world has the property of being Obama, while x at w lacks it, it follows from Lewis's 1986 analysis that being Obama is extrinsic. This consequence, however, appears to be false; the property of being Obama should be intrinsic since, necessarily, if something is Obama then it is Obama in virtue of how it is, as opposed to how it is related to things wholly distinct from it or how things wholly distinct from it are. The third objection to Lewis's 1986 analysis, then, is that it falsely classifies all non-qualitative properties as extrinsic.

In response to this objection, one might attempt to modify Lewis's analysis by replacing (5) and (7) with (8) and (9).

- (8) For any p , p is an intrinsic property =_{df} i) p is a property, and ii) for any x and y , and for any worlds w_1 and w_2 such that x at w_1 is a super-duplicate of y at w_2 , x has p at w_1 iff y has p at w_2 .
- (9) For any x and y , and for any worlds w_1 and w_2 , x at w_1 is a super-duplicate of y at w_2 =_{df} x 's parts at w_1 are the same as y 's parts at w_2 , and for any x_1, x_2, \dots that are

part of x at w_1 , and any perfectly natural relation R : x_1, x_2, \dots stand in R at w_1 iff x_1, x_2, \dots stand in R at w_2 .²⁴

While this modified analysis has the consequence that *being Obama* is intrinsic, it also has the consequence that *being non-identical to Obama* is intrinsic. Some, however, might think that this latter consequence is false on the grounds that Hilary Clinton is non-identical with Obama, not in virtue of how she is, but in virtue of how she is related to something wholly distinct from her, namely Obama.

A fourth objection is that Lewis's 1986 analysis fails to distinguish between necessarily coextensive properties that differ in their intrinsicity. For example, given numbers necessarily exist, Lewis's 1986 analysis either classifies *being made of tin* and *being made of tin and such that there is a number* as both intrinsic or both extrinsic. The first property, however, is plausibly intrinsic, while the second property is plausibly extrinsic.

A defender of Lewis's 1986 analysis might try to argue that *being made of tin and such that there is a number* is intrinsic, despite its appearance of being extrinsic.²⁵ Alternatively, she might try to modify Lewis's analysis so that it distinguishes between necessarily coextensive properties that differ in their intrinsicity.²⁶ Lewis's analysis holds that the intrinsic properties are those that *supervene* in the right kind of way on the perfectly natural relations. A promising alternative approach would be to hold that the intrinsic properties are those that are *analysable* in the right kind of way in terms of the perfectly natural properties and relations.²⁷ According to such an analysis, *being made of tin* would be intrinsic because it is analysable in the right kind of way out of perfectly natural properties and relations, while *being made of tin and such that there is a number* would be extrinsic because it is not analysable in the right kind of way out of perfectly natural properties and relations. This kind of approach might also be able to distinguish between the intrinsic *being Obama* and the possibly extrinsic *being non-identical to Obama*.²⁸

A fifth and final objection to Lewis's 1986 analysis is that it is incompatible with there being endlessly complex properties. An endlessly complex property cannot be analysed in terms of simple properties and relations, but only in terms of more and more simple properties and relations. If there are endlessly complex properties, then Lewis's analysis will fail to correctly classify them as intrinsic or extrinsic. According to the objection, since there are endlessly complex properties (instantiated at some possible worlds), or at least it is epistemically possible that there are, Lewis's 1986 analysis is either false or unknown to be true.

This fifth objection poses another serious challenge to Lewis's 1986 analysis. One option a defender of Lewis's analysis might adopt is to argue that no properties can be endlessly complex. Another option is to attempt to modify Lewis's analysis so that it handles endless complexity by appealing to the relation of comparative naturalness.²⁹

4 The Langton/Lewis analysis

Langton and Lewis's analysis (1998) aims not to analyse 'intrinsic property' but to analyse 'qualitative intrinsic property'. Define a property F to be *independent of accompaniment*

iff it is i) possible for a lonely thing to have F , ii) possible for an accompanied thing to have F , iii) possible for a lonely thing to lack F , and iv) possible for an accompanied thing to lack F . The Langton/Lewis analysis starts off from the idea that intrinsic properties are independent of accompaniment. As Langton and Lewis note, however, *being intrinsic* cannot simply be analysed as *being independent of accompaniment*, since there are disjunctive extrinsic properties that are also independent of accompaniment. An example is the extrinsic property of being either cubical and lonely, or else non-cubical and accompanied. Langton and Lewis claim, however, that among qualitative properties that are neither disjunctive nor the negations of disjunctive properties, the intrinsic properties are just those that are independent accompaniment, where the disjunctive properties are defined as follows:

[T]he *disjunctive* properties [are] those properties that can be expressed by a disjunction of (conjunctions of) natural properties; but that are not themselves natural properties. (Or, if naturalness admits of degrees, they are much less natural than the disjuncts in terms of which they can be expressed.) (Langton and Lewis 1998, p. 61, author's emphasis)

As a result, Langton and Lewis offer the following more complicated analysis. Define a property to be *basic* iff it is neither disjunctive nor the negation of a disjunctive property; and define a property to be *basic intrinsic* iff it is basic and independent of accompaniment. The Langton/Lewis analysis (modified to be compatible with the classical theory of possible worlds) is given by (10) and (11).

- (10) For any p , p is a qualitative intrinsic property =_{df} i) p is a property, and ii) for any x and y , and for any worlds w_1 and w_2 such that x at w_1 is a duplicate of y at w_2 , x has p at w_1 iff y has p at w_2 .
- (11) For any x and y , and for any worlds w_1 and w_2 , x at w_1 is a duplicate of y at w_2 =_{df}, for any basic intrinsic qualitative property q , x has q at w_1 iff y has q at w_2 .

Langton and Lewis hold that their analysis works with a number of different conceptions of naturalness. For brevity, however, I will focus on the Langton/Lewis analysis given Lewis's simple conception of naturalness discussed in section 3, together with 'more natural than' being taken to mean 'more simple than'.³⁰ I will also assume that the *more natural than* relation satisfies (RN).

- (RN) For any properties and relations p and q (that can be analysed in terms of the perfectly natural properties and relations), p is more natural than q iff p 's (minimal) definition in a fundamental language L is shorter than q 's (minimal) definition in L , where a fundamental language is one whose only non-logical vocabulary are names for each concrete object and predicates expressing each perfectly natural property and relation.³¹

(RN) is suggested by the following passage of Lewis's:

Some few properties are *perfectly natural*. Others, even though they may be somewhat disjunctive or extrinsic, are at least somewhat natural in a derivative way, to the extent that they can be reached by not-to-complicated chains of definability from the perfectly natural properties. (Lewis 1986b, p. 61, author's emphasis)

While Langton and Lewis only attempt to analyse 'qualitative intrinsic property', their analysis can be turned into an analysis of 'intrinsic property' that allows non-qualitative properties like *being Obama* to be intrinsic. All that needs to be done is to drop 'qualitative' from (10) and (11), and replace 'duplicate' with 'super-duplicate'.³²

Both Langton and Lewis's original analysis, and the above modification of it, face some of the same objections as Lewis's 1986 analysis. For example, the Langton/Lewis analysis faces the charge that the notion of a perfectly natural property, as well as the notion of one property being more natural than another property, are obscure or confused. It also faces the objection that it fails to distinguish between necessarily coextensive properties that differ in their intrinsicity.³³

A further objection faced by the Langton/Lewis analysis is that it takes sides on controversial metaphysical disputes. For example, the Langton/Lewis analysis is incompatible with the thesis that, for each x , there is a wholly distinct singleton set $\{x\}$ that exists at all and only the worlds at which x exists. The reason is that, given this thesis, nothing can be lonely, and hence no properties can be independent of accompaniment. As a result, given this thesis, the Langton/Lewis analysis entails that there are no basic intrinsic properties, and hence has the false consequence that all properties are extrinsic (apart from those that are necessarily had by everything or necessarily lacked by everything).³⁴

The final objection I will discuss is that the Langton/Lewis analysis has counterexamples. Consider, for example, the extrinsic property, C^* , of being such that there is a cube (expressed by ' $\lambda x \exists y Cy$ ').³⁵ This property is independent of accompaniment (given intrinsic properties such as *being a cube* are independent of accompaniment) since something can have this property by being a cube. It also seems to be neither disjunctive nor the negation of a disjunctive property. While C^* can be expressed as a disjunction of other properties, it apparently cannot be expressed as a disjunction of properties, all of whom are more natural than it. For example, while C^* can be expressed as a disjunction of *being a cube* and *being accompanied by a cube* (where the latter property is expressed by ' $\lambda x \exists y ((y \neq x) \wedge Cy)$ '), the latter property is plausibly less natural than C^* , since its minimal definition in a fundamental language is plausibly longer than the minimal definition of C^* in a fundamental language. The fact that C^* can be expressed as a disjunction of these properties, therefore, does not render it disjunctive.³⁶ Given C^* is neither disjunctive nor the negation of a disjunctive property, and is independent of accompaniment, the Langton/Lewis analysis classifies it as a basic intrinsic property, and hence falsely classifies it as intrinsic.

The property of being such that there is a cube has some distinctive modal features that might be taken to reveal its extrinsicity. For example, necessarily, if something has this property then all things have it. We might therefore try to modify the Langton/Lewis

analysis by adding further modal constraints on what it takes to count as intrinsic, so that C^* gets counted as extrinsic.³⁷ Other similar counterexamples, however, cannot be handled in this way. An example is the extrinsic property of having a part that is one meter away from something (which is expressed by ‘ $\lambda x \exists y \exists z ((y \text{ is part of } x) \wedge (y \text{ is one meter away from } z))$ ’). This property is independent of accompaniment (given intrinsic properties are independent accompaniment) since something can have this property by having one part that is one meter away from a different part. It is also plausibly neither disjunctive nor the negation of a disjunctive property. It therefore appears to be a counterexample to the Langton/Lewis analysis. Unlike *being such that there is a cube*, however, it does not appear to have a distinctive modal profile that reveals it to be extrinsic. As a result, not only does the Langton/Lewis analysis appear to have counterexamples, the chances of fixing it by adding extra modal conditions seem bleak.³⁸

5 Conclusion

The three most influential analyses of ‘intrinsic property’ in terms of naturalness each face serious difficulties. Lewis’s 1983 analysis appears to be circular, Langton and Lewis’s joint analysis appears to suffer decisive counterexamples, and Lewis’s 1986 analysis faces a number of other difficulties. In the case of Lewis’s 1986 analysis, however, there remains hope that an analysis retaining at least its spirit might yet be successful.

Notes

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²For example, the distinction between intrinsic and extrinsic properties has been used to state philosophical theories such as internalist and externalist theories of mental content, internalist and externalist theories of epistemic justification, theories of truthmaking, theories of events, and theories of the limits of our knowledge of the external world. It has also been used to formulate arguments, such as the argument from temporary intrinsics against endurantism. See (Weatherson 2001), (Cameron 2009), and (Humberstone 1996) for more discussion.

³‘ $\phi =_{\text{df}} \psi$ ’ abbreviates ‘For it to be the case that ϕ is for it to be the case that ψ ’, and ‘ F ’ is a schematic letter. For any x and y , x is *wholly distinct* from $y =_{\text{df}} x$ has no proper parts in common with y . See (Eddon 2011, fn. 2) for a list of similar characterisations of ‘intrinsic property’ given by other philosophers.

⁴I will take it that an analysis of ‘intrinsic property’ is a true sentence of the form ‘For any p , p is an intrinsic property $=_{\text{df}} \varphi(p)$ ’.

⁵Yablo (1999, p. 479) makes this point with respect to a different intuitive characterisation of intrinsicity.

⁶Another problem with this analysis of intrinsicity is that ‘in virtue of’ is arguably ambiguous. If ‘in virtue of’ is ambiguous, and this analysis is used to stipulate what ‘intrinsic’ means, then ‘intrinsic’ will arguably also be ambiguous.

⁷Cf. (Sider 1996, fn. 31). Analyses that rely on such special assumptions are bound to be controversial. They will also plausibly fail to accomplish some of the tasks we might want an analysis to accomplish. For example, provided the existence and mereology of properties are not conceptually necessary, an analysis

which relied on assumptions about these matters would also fail to be conceptually necessary, and hence would fail to clarify our concept of intrinsicity. Such an analysis would presumably also not help us find out whether any particular predicate expresses an intrinsic property, for in order to apply the analysis we would need to know whether the predicate expresses a property, or whether the predicate expresses a property with proper parts, which are matters we might not have any independent knowledge of. Such an analysis, however, might be able to accomplish some of the tasks associated with analysis. For example, such an analysis may still clarify what it is for a property to be intrinsic, and may also go some way towards revealing whether or not intrinsicity is a primitive aspect of reality.

⁸The classical theory of possible worlds I assume is the conjunction of the standard possible worlds analysis of possibility, which endorses ‘Possibly $\varphi =_{df}$ for some possible world w , at w , φ ’, with the thesis that the so-called simplest quantified modal logic, SQML, is valid. The classical theory of possible worlds entails classical possibilism given the assumption that there might have been more things than there actually are. See (Menzel 2008) for a discussion of SQML and classical possibilism. It entails there being things that exist at multiple worlds given the assumption that some existing things might have been different from how they actually are and yet still existed. I have assumed the classical theory of possible worlds rather than Lewis’s counterpart-theoretic theory since the latter is more complicated and introduces difficulties that do not arise given other theories of possible worlds.

⁹More generally, I will assume that i) the relations are the sets of sequences whose last member is a world, and ii) for things x_1, x_2, \dots , and for any world w : x_1, x_2, \dots stand in a relation R at w iff $\langle x_1, x_2, \dots, w \rangle \in R$. For definiteness, I will also assume that: i) Necessarily, each thing is either concrete, a possible world, the empty set, or a set built up out of these constituents (in accord with ZF set-theory with individuals), and that, necessarily, nothing is more than one of these things; ii) For any x and y a) x is concrete iff x is necessarily concrete, b) x is a possible world iff x is necessarily a possible world, c) x is a member of y iff x is necessarily a member of y , and d) x is a set with no members iff x is necessarily a set with no members; and iii) Necessarily, for any x that is not a concrete existent, x neither has proper parts nor is a proper part of anything else.

¹⁰A broadly logical expression is an expression containing at most ‘possibly’, ‘necessarily’, ‘is a possible world’, ‘obtains’, ‘property’, ‘relation’, ‘instantiates’, ‘is a member of’, ‘is a set’, ‘exists’, ‘is part of’, and the vocabulary first order predicate logic with identity. A broadly logical notion is a notion expressed by a broadly logical expression. ‘At’ can be defined in terms of broadly logical expressions as follows: (at w , φ) $=_{df}$ w is a possible world and, necessarily, if w obtains then φ .

¹¹The terms ‘lonely’ and ‘accompanied’ are due to (Lewis 1983a), as is the formulation of Kim’s analysis given here. Note that ‘lonely’ and ‘accompanied’ can both be defined using only broadly logical notions.

¹²See (Lewis 1983a).

¹³A rigorous version of this argument relying on slightly weaker assumptions is given in (Marshall 2009). It is also possible to derive this conclusion by relying on assumptions other than (Ai-iv). For example, given the radical essentialist thesis that, necessarily, every property had by an existing thing is had essentially, it is possible to show that ‘intrinsic property’ cannot be analysed using only broadly logical notions if there are two incompatible intrinsic properties p and q satisfying (Ai), (Aii*) and (Aiii-iv), where (Aii*) is the assumption that the number of worlds at which there is a lonely thing having p is equal to the number of worlds at which there is a lonely thing having q . All of these arguments require the background assumptions made in 9, or other suitable assumptions.

¹⁴See n. 10 for the definition of ‘broadly logical expression’.

¹⁵Lewis lists the trope possibility in (Lewis 1986a) and (Lewis 1986b), and says he should have listed it as a possibility in (Lewis 1983b). In (Lewis 1983b) he instead described a further option of analysing ‘perfectly natural’ in terms of a primitive resemblance predicate, but seems to reject this option in (Lewis 1986a) and (Lewis 1986b). This fourth option faces essentially the same circularity objection as levelled against the primitivist option below, since the kind of resemblance that must be used to analyse ‘perfectly natural’ is intrinsic resemblance.

¹⁶In particular, they require a sparse theory of these entities according to which there are only intrinsic universals and tropes.

¹⁷A *qualitative* property is intuitively a property that does not involve or concern any particular things. *Being made of tin* and *being an uncle* are examples of qualitative properties, whereas *being Dan* and *being next to Obama* are examples of non-qualitative properties.

¹⁸Armstrong later altered his theory of universals to avoid this consequence.

¹⁹It is often thought that Lewis employed the simple conception of ‘perfectly natural’ in (1983b) described in section 3, according to which conjunctive and structural properties are not perfectly natural. As Wolfgang Schwarz has pointed out to me, this interpretation gets some support from the fact that Lewis’s account of laws in (1983b) appears to require such an interpretation to be plausible. Lewis, however, clearly disavows such an interpretation, writing, for example, that he is “following Armstrong, *mutatis mutandis*, in declining to rule out perfectly natural properties that are conjunctive or structurally complex” (1983b, p. 364).

²⁰As ‘part’ is being used here, each thing is an (improper) part of itself. Properties are a special case of relations, since one-place relations are properties.

²¹This objection has been made, for example, by (Yablo 1999) and (Weatherson 2006).

²²A property p is analysable wholly in terms of a set S of relations and operators iff there is a true sentence of the form ‘ $\forall x(Px =_{df} Ex)$ ’, where P expresses p , and E is wholly composed of variables and expressions expressing the relations and operators in S .

²³Lewis endorses this claim.

²⁴ Assuming either *parthood* or *proper parthood* are perfectly natural, if x at w_1 is a super-duplicate of y at w_2 , then $x = y$.

²⁵For a critical discussion of this option see (Eddon 2011).

²⁶A philosopher who adopted this approach would need to modify the theory of properties assumed in section 1, which holds that necessarily coextensive properties are identical.

²⁷A property p is analysable in terms of a set S of relations and operators in the “right kind of way” iff there is a true sentence of the form ‘ $\forall x(Px =_{df} Ex)$ ’, where P expresses p , and E is wholly composed of variables and expressions expressing the relations and operators in S and meets further conditions to be spelt out.

²⁸Such an analysis need not appeal to any notion other than naturalness and broadly logical notions. I hope to develop an analysis of this type in a future paper.

²⁹One such approach is developed in (Sider 1993, ch. 4).

³⁰As far as I know, the Langton/Lewis analysis fares no better under any other conception of naturalness. For example, Sider (2001) has used the example of *being a rock* to persuasively argue that the Langton/Lewis analysis fails given a conception of naturalness according to which the natural properties are those that play a special role in our ordinary thinking, such as “those that do not strike us as being “strange” or “odd”... or as those for which we have simple words or concepts, or as those on which we have relied in past inductions”. The Langton/Lewis analysis, under such a conception of naturalness, will also face most of the objections described below that face the analysis given the simple conception of naturalness.

³¹What logical expressions do fundamental languages contain? An appealing answer can be given if operators, as well as relations, can be simple. We can then say that the logical operator expressions of a fundamental language are those that expresses perfectly natural operators. Given this answer, it is attractive to modify the definition of a fundamental language to allow fundamental languages to contain operator expressions that do not belong to the language of predicate logic, but express perfectly natural operators. According to the revised definition, a fundamental language is a first order language containing i) a predicate expressing each perfectly natural property and relation (and no other predicate), ii) an operator expression expressing each perfectly natural operator (and no other operator expressions), and iii) sufficiently many variables.

³²Or at least this is so given the classical theory of possible worlds. Whether this is so given a counterpart-theoretic account of possible worlds will depend on whether the counterpart theory adopted allows properties like *being Obama* to be independent of accompaniment.

³³This modification will also plausibly have the controversial consequence that *being non-identical to Obama* is intrinsic.

³⁴See (Cameron 2009) for more discussion.

³⁵This property was first raised as a counterexample to the Langton/Lewis analysis in (Marshall and Parsons 2001).

³⁶Langton and Lewis have responded to this apparent counterexample by claiming that C^* is less natural than *being accompanied by a cube* (see (Langton and Lewis 2001)). Their argument is that C^* is less natural than both *being a cube* and *being accompanied by a cube* since (1) C^* can be expressed as the disjunction ‘being either a cube or accompanied by a cube’, (2) disjoining unrelated properties always reduces naturalness, and (3) *being a cube* and *being accompanied by a cube* are unrelated properties. It is not clear, however, why (2) is meant to be true given the simple conception of naturalness, or what other as yet unarticulated notion of naturalness it might be true of. Even granting (2) is true, it is not clear what it is for two properties to be unrelated in the sense that is at issue in (2). As a result, it is not clear why *being a cube* and *being accompanied by a cube* are meant to be unrelated.

³⁷This in effect is what Brian Weatherson (2001) does.

³⁸Another similar counterexample to the Langton/Lewis analysis is the property of attending to something discussed by John Hawthorne (2001).

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