Intrinsic and Extrinsic Properties

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If we know what shape is, we know that it is a property, not a relation.
(Lewis 1986c: 203)

Intrinsicness as exemplification independence

An intrinsic property, intuitively, is a property that a thing has in virtue of the way it is in itself. Clear and simple as the notion seems at first blush, it has turned out to be surprisingly difficult to define an extensionally adequate and philosophically fruitful notion of intrinsicness. I will show how this intuition first became fleshed out in the work of Jaegwon Kim and how Kim's account was criticised by David Lewis who subsequently proposed three different accounts of intrinsicness. I will then discuss some objections and test the predictive success of Lewis' definition by showing how well it accommodates alleged counterexamples. Finally I will identify the main shortcoming of Lewis' most recent redefinition and its predecessors: the existing definitions do not allow us to capture the intuitively basic and philosophically fundamental conceptual connection between intrinsicness and ordinary parthood. Properties had by a thing in virtue of the way it is in itself include properties it has in virtue of having such-and-such parts. Whenever conversely some thing is part of another thing, there is a region of intrinsic match shared by both. Building on ideas of Stephen Yablo, I will try to remedy this proposal.

Here are a number of intuitions: an intrinsic property is a property a thing a has in virtue of the way it is in itself; the world outside a cannot influence a's having its intrinsic properties; the fact that a either has or lacks the property in question is a fact just about a alone; intrinsic properties are those that characterise things directly, not via their relations to other things: they are local and internal and do not depend on what is going on outside a. Helping ourselves to the notion of a duplicate, a perfect copy of some thing a distinguishable from a only by its relations to other things, we can characterise an intrinsic property of a as a property had by all the duplicates of a. The duplicates of a, on the other hand, are just those particulars that share their intrinsic properties with a.

This, however, is just a start: we would like to have a *criterion* for intrinsicness which gives us these results. Jaegwon Kim (1982: 59–60, 184), building on Chisholm (1976: 127), qualifies a property as intrinsic iff it is compatible with loneliness, i.e. can be had by a something that is unaccompanied by any wholly distinct contingently existing thing. Lewis (1983a) remarked that this definition falsely classifies *being lonely* as intrinsic. Another problem has been pointed out by Dunn (1990a: 182): every logical truth p will determine an intrinsic property *being such that* p. Lewis (1983b: 26) then defined intrinsic properties as those invariant among duplicates where duplication is the sharing of all natural properties.[1] Here is Lewis' first proposal:

Definition 1 (Lewis$_1$-intrinsicness)**.** *F is intrinsic iff for all x and y, if x and y have the same natural properties, then Fx iff Fy.*[2]

[1]Lewis classifies them as "perfectly natural". As we do not yet have any use for the comparative notion, we choose the shorter term for the moment.

[2]The quantifier used in def. 1 is, of course, possibilist. Sider (1996: 8–10) sharply criticised Dunn (1990a) of having misinterpreted the account of Lewis (1986b) by formalising it with actualist quantifiers (Dunn in fact only proposed schemata). I think, however, that Sider interprets Dunn rather uncharitably, for *being a duplicate of b* (where this is taken to be a relational property (cf. Dunn 1990a: 203, n. 7)) – which Dunn accuses Lewis of classifying falsely as intrinsic, – would *not* come out as intrinsic on the Lewis-interpretation Sider attributes to Dunn, where the duplicates are required to be world-mates. "Having

Def. (1) classifies all and only those properties as intrinsic that supervene on the natural properties, whatever these are, thereby characterising all natural properties as intrinsic *ex officio*.

Lewis (1986c: 60) kept the account of duplication as the sharing of all natural properties and tentatively suggested that the clas of natural properties could be characterised as a minimal supervenience base for any properties whatsoever. The definition of Lewis$_1$-intrinsicness therefore has the drawback that all natural properties come out intrinsic *ex officio*,[3] whereas it seems up to total science to decide whether some extrinsic properties are natural (Yablo 1999: 480). Philip Bricker (1993: 288–289) has argued that general relativity commits us to extrinsic perfectly natural properties of points, namely their local metric. Armstrong (1978: 78–79), for one, admits extrinsic universals. Another pack of problem pertains to the characterisation of the class of natural properties as a minimal supervenience base.[4]

The most important reason, however, to be dissatisfied with Lewis$_1$-intrinsicness is its appeal to natural properties to define duplication. Even if naturalness and intrinsicness are two different notions, the two are too closely related to shed much light on each other.

In 1998, David Lewis and Rae Langton made a fresh attempt to break into the interdefinability circle of intrinsic properties and duplication. Starting with a most liberal notion of properties (such that any class of possibilia is or defines a property),[5] they define the *basic intrinsic* among the pure, i.e. qualitative properties as those that are independent of accompaniment and loneliness, i.e. can be had and lacked by an accompanied thing and had and lacked by a lonely thing, and which are neither disjunctive nor negations of a disjunctive property (Lewis and Langton 1998: 121). Something is accompanied if it coexists with a contingent wholly distinct thing and it is lonely if it coexists only with its proper parts (if it has any). A property is *disjunctive* iff it can be expressed by a disjunctive predicate but is not natural and much less natural than either of its disjuncts. It is co-disjunctive iff it can be expressed by the negation of such a disjunctive predicate. Two (actual or merely possible) things are *duplicates* iff they have the same basic intrinsic properties. This makes duplication an equivalence relation. A property is intrinsic iff it supervenes on the basic intrinsic properties. We have Lewis' second proposal:

Definition 2 (Lewis$_2$-intrinsicness). *A property F is intrinsic iff for all x and y, if x and y have the same pure, non-disjunctive and non-co-disjunctive properties independent of accompaniment, then Fx iff Fy.*

If we assume that every accompanied thing has a lonely duplicate and every lonely thing has an accompanied duplicate, then every intrinsic property which is contingent, not disjunctive and not the negation of a disjunctive property is basic intrinsic (Lewis and Langton 1998: 126–127).

Lewis and Langton (1998) defined intrinsicness as a non-relational property of properties; intuitively, however, an intrinsic property is a property which exclusively characterises *the entities by which it is exemplified*. This feature may vary among the exemplifications of the property in question.[6] It

the same natural properties" should be understood as abbreviating "having the same natural properties and standing in the same natural relations".

[3] This is explicitly acknowledged by Lewis (1983b: 28) and Lewis and Langton (1998: 131).

[4] As Sider (1996: 22–23) remarked, there is no reason to assume that there is a uniquely determined minimal supervenience base, for supervenience is preserved by automorphisms that negate some or all of the subvening properties or exchange them for their grue/bleen variants.

[5] In the following, I will understand "property" in this liberal sense. Whenever it matters, I will call them, following Humberstone (1996: 245), "properties$_C$".

[6] It is not easy to come up with examples which do not prejudge some of the issues to be discussed later, e.g. whether dispositional or impure properties may count as intrinsic. Some cube and a quantity of water of cubical shape, however, will do, I think, for the roundness of the latter seems to be due to the recipient containing it and does not seem to me an intrinsic property of the quantity of water. Dunn (1990a: 203, n. 6) mentions *being such that Socrates is wise* as an intrinsic property of Socrates, but not of Reagan. Sider (1996: 3) claims that *being green or being 10 feet from some red thing* is an intrinsic property (only) of green objects.

therefore seems advisable to tentatively adopt the following *local* notion of intrinsicness, which takes "intrinsic" not to be a second-order property, but a relation between properties and individuals:

Definition 3 (Local version of Lewis$_2$-intrinsicness). *A property is* intrinsic to a *iff it does not differ between duplicates of* a.

Not any property intrinsic to some thing is intrinsic *tout court*. *Being such that there is a cube*, e.g., is intrinsic to cubes, though certainly not intrinsic *tout court* (Marshall and Parsons 2001: 349, n. 2). Properties intrinsic to a are closed under negation and conjunction (and hence disjunction).[7] Properties that are had by a and are intrinsic to a are had by a *intrinsically*. As Dunn (1990a: 183) urged, the class of properties had by a intrinsically is closed under implication.[8] Properties intrinsic to all particulars or, equivalently, had intrinsically by all their exemplifications, are intrinsic *tout court*.[9] We have the following dual of our notion of local intrinsicness:

Definition 4 (Dual to Lewis$_2$-intrinsicness). *A property is* extrinsic to a *iff it differs between duplicates of* a.

The class of properties extrinsic to a is closed under negation, but neither under disjunction nor conjunction.[10] The class of properties that a has extrinsically is closed under conjunction.[11] A (nonempty) property is extrinsic *tout court* iff is is extrinsic to (or, equivalently, had extrinsically by) at least one particular.[12] *Purely extrinsic* properties are properties extrinsic to all particulars.[13] *Positive extrinsic* properties are properties extrinsic to all their exemplifications.[14] *Negative extrinsic* properties are extrinsic to all their non-exemplifications.[15] Properties that are both positive and negative extrinsic are purely extrinsic.

Basic intrinsicness of binary relations[16] is defined in an entirely parallel way.[17] Two ordered pairs $\langle x, y\rangle$ and $\langle x', y'\rangle$ are *duplicate pairs* iff $\langle x, y\rangle$ and $\langle x', y'\rangle$ stand in the same basic intrinsic relations.

[7] Proof: Let P be a property intrinsic to a. If $\neg P$ would differ between duplicates of a, there were two duplicates of a, b such that Pb and c such that $\neg Pc$. If two duplicates of a would differ in $P \wedge Q$ (or in $P \vee Q$), they had to differ in either P or Q, which is impossible if P and Q are intrinsic to a.

[8] Proof: Let P a property that a has intrinsically. Assume $\vdash P \to Q$. Any duplicate of a has P and thus Q; so Q does not differ between duplicates of a.

[9] Proof: A property P is intrinsic iff it does not differ between duplicates, i.e. iff $\forall x, y(\mathsf{Dupl}(x, y) \to (Px \leftrightarrow Py))$. This means that it is intrinsic to all particulars. Because duplication is symmetric, $\forall x, y(\mathsf{Dupl}(x, y) \to (Px \leftrightarrow Py))$ is equivalent to $\forall x, y(\mathsf{Dupl}(x, y) \to (Px \to Py))$. By commuting antecedents, we get $\forall x, y(Px \to (\mathsf{Dupl}(x, y) \to Py))$, which means that P is had intrinsically by all its exemplifications (cf. Humberstone 1996: 228). If we imagine the realm of (actual and possible) objects partitioned in duplication classes, an intrinsic property is one that does not divide any duplication class. Properties intrinsic *tout court* are closed only under negation.

[10] Proof: If P differs between two duplicates of a, then clearly so does $\neg P$. Although P and Q differ between duplicates of a, all duplicates could lack $P \wedge Q$ and all duplicates could have $P \vee Q$. Because the class of properties extrinsic to a is closed under negation but not under disjunction, it cannot be closed under converse implication neither. Assume the contrary and let P be extrinsic to a. Because $\vdash \neg P \wedge \neg Q \to \neg P$ and $\neg P$ is extrinsic to a, so is $\neg(\neg P \wedge \neg Q) \equiv P \vee Q$.

[11] Proof: Let P and Q be properties had extrinsically by a. Then there is a duplicate, a', of a that lacks P and hence also lacks $P \wedge Q$.

[12] Proof: A property is extrinsic $(\neg\forall x, y(\mathsf{Dupl}(x, y) \to Px \to Py))$ iff $\exists x, y(\mathsf{Dupl}(x, y) \wedge Px \wedge \neg Py)$, i.e. iff it is extrinsic to at least one particular.

[13] Such properties divide any duplication class (Lewis 1983b: 26, n. 16) and cannot be implied by a nonempty intrinsic property: Suppose P is intrinsic and exemplified by a. If $\vdash P \to Q$, then Qa and there is a duplicate b of a such that $\neg Qb$ (since Q is extrinsic to a). But then $\neg Pb$, contradicting the assumption that P is intrinsic to a.

[14] They do not include any duplication class. Lewis (1983a: 115) calls them, rather unhappily, "unconditionally extrinsic". Positive extrinsic properties are conjunctions of purely extrinsic and intrinsic properties (Lewis 1983b: 26, n. 16). They are the properties that imply accompaniment

[15] They do not exclude any duplication class and are disjunctions of purely extrinsic and intrinsic properties (Lewis 1983b: 26, n. 16). They are all the properties implied by loneliness (Humberstone 1996: 230).

[16] For our purposes here, any class of tuples of possibilia will be called a "relation".

[17] An ordered pair is *accompanied* iff it coexists with some contingent object wholly distinct from both relata. Otherwise, it is *lonely*. A relation is *independent of accompaniment and loneliness* iff it is possible that (1) an ordered pair is lonely and has it, (2) an ordered pair is accompanied and has it, (3) an ordered pair is lonely and has it, (4) an ordered pair is accompanied and has

A relation is *intrinsic* iff it does not differ between duplicate pairs. We can now distinguish further between internal and external relations.

Definition 5 (Internal and external relations)**.** *A relation is* internal *iff it supervenes on the intrinsic (and hence the basic intrinsic) properties of its relata.*[18] *A relation is* external *iff it it intrinsic but not internal.*[19]

Lewis and Langton (1998: 130) prove that every internal relation is intrinsic and that it is possible that not every intrinsic relation is internal.[20] An intrinsic relation R holding between a and b supervenes on the basic intrinsic properties of a, b and $a \oplus b$.[21] It is internal iff it supervenes on those of a and b alone. In the case of relations, we thus have a three-fold distinction between intrinsic internal, intrinsic external and extrinsic relations.

These definitions beautifully capture part of our pre-theoretic intuitions about things having some of their properties independently of what is going on around them and they have proved surprisingly resistant to a number of proposed counterexamples.

In order to apply disjunctiveness to properties (as opposed to predicates), Lewis and Langton help themselves to a primitive notion of naturalness: a property is disjunctive iff it can be expressed by a disjunction of natural properties but is not (or much less) a natural property than one of the properties expressed by a disjunct. In order to avoid classifying *being either square and accompanied or red and lonely* as intrinsic, e.g., we are invited to think it much less natural than either of its disjuncts. In other cases, their verdicts of comparative naturalness have seemed contrived to many.[22]

Lewis (2001: 387) proposes a less permissive criterion for 'bad disjunctions' (properties expressed by disjunctive predicates which are not intrinsic): a property is (badly) disjunctive iff it is equivalent to a disjunction such that each disjunct is more natural (not: much more natural) than the whole disjunction. He also makes a new attempt to characterise bad disjunctions directly, thereby cutting down his reliance on contentious judgements of comparative naturalness. The new definition runs as follows and Lewis' third proposal:

Definition 6 (Lewis3-intrinsicness)**.** *A property P is intrinsic iff (i) P is independent of accompaniment,*[23] *(ii) P is at least as natural as ($P \wedge \textsf{being accompanied}$), (iii) P is at least as natural as ($P \wedge \textsf{being lonely}$), (iv) $\neg P$ is at least as natural as ($\neg P \wedge \textsf{being accompanied}$), (v) $\neg P$ is at least as natural as ($P \wedge \textsf{being lonely}$).*

As the new approach no longer defines intrinsicness via duplication, no straightforward local analogue of def. 6 comes to mind. The notion of naturalness not only restricts the scope of the definition, as it did in def. 2, but directly applies at the level of predicates. As we will see at the beginning of

it. A pure relation is *basic intrinsic* iff it is independent of accompaniment and loneliness, not disjunctive and not a negation of disjunctive relation.

[18] Lewis (1986c: 62) calls an internal relation "intrinsic to its relata" (cf. also Lewis 1983b: 26, n. 16).

[19] Lewis (1983b: 26, n. 16) calls such a property of relations "intrinsic to its pairs".

[20] Lewis and Langton (1998: 129) mention spatio-temporal distance relations as intrinsic relations which are not internal (supervening on the duplication of pairs but not on the duplication of the relata taken separately). Other examples of external relations arise if a fusion $x \oplus y$ may have basic intrinsic properties F had by neither x nor y. Any relation between the parts supervening on such properties of the whole (e.g. *being such as to compose a fusion with property F*) will be external.

[21] This presupposes that properties of the form *having an F part* are intrinsic for basic intrinsic properties F, a claim I will defend below.

[22] To have *being the only round thing* classified as extrinsic, e.g., they are committed to the claim that *being accompanied by something round if round itself* is "much less natural" than *being accompanied by something round and round itself*. This seems "uncomfortable" to Yablo (1999: 481). In order not to classify *being such that there is a cube* as intrinsic (as Marshall and Parsons (2001: 3) claim they do), they have to claim that *being accompanied by a cube* is less natural than *being such that there is a cube*. And indeed they do: "...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." (Lewis and Langton 2001: 354).

[23] As before, this means that it is possible to be lonely (coexisting only with its proper parts) and have it, to be lonely and lack it, to be accompanied and have it and to be accompanied and lack it.

sct. , however, Lewis thinks of naturalness in terms of duplicate classes being more or less 'unified'. This gives us a way out:

Definition 7 (Local version of Lewis$_3$-intrinsicness)**.** *A property P is intrinsic to a iff (i) P is had and lacked both by lonely and accompanied counterparts of a, (ii) the class of all a-counterparts which have P is at least as unified as its subclass of accompanied P-counterparts of a, (iii) the class of all a-counterparts which have P is at least as unified as its subclass of lonely P-counterparts of a, (iv) the class of all a-counterparts which lack P is at least as unified as its subclass of accompanied $\neg P$-counterparts of a, (v) the class of all a-counterparts which lack P is at least as unified as its subclass of accompanied $\neg P$-counterparts of a.*

Given that there are enough counterparts, condition (i) means that neither the conjunction of all the essential properties of a with being lonely nor their conjunction with being accompanied implies either P or $\neg P$.[24]

Def. 6 is a specialisation of the "general independence principle" defended by Weatherson (2001: 371): if F and G are intrinsic, then they are not only independent of accompaniment, but equally independent of F- and G-accompaniment respectively.[25] If we take, following Lewis (2001: 383), the general independence principle to be a necessary condition on intrinsicness, *being such that there is a cube* can be excluded from the class of intrinsic properties by imposing closure under negation (Weatherson 2001: 373): *not being such that there is a cube* or, equivalently, *being neither a cube nor accompanied by a cube*, cannot be exemplified by something accompanied by another thing exemplifying *being such that there is a cube*.

Lewis (2001), however, points out two problems with the generalisation which are avoided in the special case of def. 6. One is that the application of the independence principle presupposes that we already know that some properties are intrinsic; the other one is that it will depend on our starting basis whether or not we will capture all intrinsic properties. Weatherson's general independence principle thus plays a role analogous to the recombination principle in Lewis' modal realism: it does not tell us what the entities in question are, nor does it pick out paradigms, but instead it imposes a closure condition on the class of entities in question.

Two further consequences of the Lewis$_3$-definition may be noted. Presupposing Lewis' doctrine of temporal parts, it classifies all properties as extrinsic that imply the existence of some thing at some other time than the one at which they are exemplified. It therefore supplants the original definitions of "t-intrinsicness" by Chisholm (1976: 127) and Kim (1982: 59–60,184), which were the target of Lewis (1983a):

Definition 8 (Chisholm-t-intrinsicness)**.** *F is t-intrinsic iff, possibly, there is an object x and a time t such that Fx at t though x only exists at t.*[26]

t-intrinsic properties, in short, are properties which can be exemplified by instantaneous objects.[27] Kim's definition is a straightforward transposition from the temporal to the spatial case:

Definition 9 (Kim-intrinsicness)**.** *F is intrinsic iff it is t-intrinsic and, possibly, there is an object x such that Fx though x exists without there being any other contingent object wholly distinct from x.*

[24] For the sake of simplicity, I will here in this chapter call "essential" a property of a that is shared by all its counterparts. The requirement that there be "enough" counterparts means that whenever P is had or lacked by some possible thing b having a's essential properties, a has a counterpart which also has or lacks P and shares its degree of accompaniment with b.

[25] F is independent of G-accompaniment iff all of the following are possible: (i) some F is lonely, (ii) some $\neg F$ is lonely, (iii) some F is accompanied by a G, (iv) some $\neg F$ is accompanied by a G, (v) some F is accompanied but not by a G, (vi) some $\neg F$ is accompanied but not by a G.

[26] I am substituting "t-intrinsic" for "is not rooted outside times at which it is had".

[27] Haslanger (1989: ??) defines a related notion for intrinsicness for properties of the form *being F at t* which she takes to be relational: *being F at t* is intrinsic to a iff whether or not a has it depends only on a at t.

Plugging in Lewis' doctrine of temporal parts, we get the account of intrinsicness as compatibility with loneliness criticised by Lewis (1983a) for counting *being lonely* as intrinsic: the condition that the property in question is t-intrinsic ("not rooted outside times at which it is had"), however, is with us from the start. In cases where we consider some temporal parts essential, this may give us counterintuitive results: suppose, e.g., that a certain football match essentially lasts 90 minutes. If the first half therefore essentially belongs to the match and if the second has some intrinsic properties (e.g. *being played by only 10 players of team A*), then this cannot be (or give rise to) an intrinsic of the whole match.[28]

This is not much of a problem for Lewis: We may either think that the objects in question overlap (which seems a very natural way to go) or deny the subtraction principle for essential temporal parts, i.e. not accept all parts of an essentially temporally interconnected whole as entities. So we have a very natural trade-off between intrinsicness and ontological independence, which will be further exploited in sct..

Another consequence is that both the Lewis$_2$- and the Lewis$_3$-definitions deal inadequately with parthood properties.

If we accept the subtraction principle, i.e. that, if a is a proper part of b, then they have a mereological difference (the common part of all things overlapping b but not overlapping a exists), properties only had by proper parts of something (as, e.g., *is a proper part of an F*) are not compatible with loneliness and hence extrinsic, independently of where F falls on the intrinsic/extrinsic divide. This is a result we may well wish to avoid.

It is interesting to note in this respect that Vallentyne's diagnosis of the problem cases, extrinsic disjunctive properties independent of accompaniment, differs from that of Lewis and Langton:

> The problem [...] is that [the definition of Kim-intrinsicness] is formulated in terms of logical independence (compatibility), and this fails to capture the relevant notion of independence. [...] It fails to capture the idea that an object can cease to be the only red object in the world by the "mere addition" of a red object to the world. (Vallentyne 1997: 211)

Vallentyne (1997: 212) thus proposes to classify those properties as intrinsic that are such that neither they nor their negations would be lost if their exemplifications were inhabitants of a maximally contracted world (a world as small as possible while still containing the exemplifying particular):

Definition 10 (Vallentyne-intrinsicness). *F is intrinsic iff for any world w, time t and object x, iff Fx ($\neg Fx$) at t in w, then Fx ($\neg Fx$) in each $x - t$ contraction of w, where an $x - t$ contraction of w is a world intrinsically identical to w but with all times other than t, all places not occupied by x, all things other than x and all laws of nature removed.*

Taking "contraction" seriously, Vallentyne in effect identifies intrinsic properties as those that are shared between a thing and the (mereologically) smallest intrinsic duplicate of that thing. Lewis and Langton (1998: 132) have shown that what they take to be the essence of Vallentyne's definition, that a property is intrinsic iff it never differs between a thing and a lonely duplicate of that thing, is equivalent to their own definition, provided that we assume that every thing has a lonely duplicate. In interpreting "smallest" as "lonely", however, they classify, on behalf of Vallentyne, all cross-border relational properties (properties relating things to space-time regions not occupied by them) as extrinsic.

[28] By "giving rise to", I want to draw attention to the fact that *being played by only 10 players of team A in its second half* differs from *being played by only 10 players of team A* only by a "purely grammatical" transformation as it were, though they are had by different things.

Impure properties, i.e. properties making essential reference to particulars, were excluded from candidates to Lewis-intrinsicness from the start: As Sider (1996: 20) has remarked, only purely qualitative properties have a chance of supervening on the natural ones . In the two later definitions, Lewis and Langton (1998: 118) and Lewis (2001: 382, n. 6) make it clear that they restrict intrinsicness to purely qualitative properties, on account of the fact that impure properties cannot be shared between counterparts nor (perhaps a fortiori) between duplicates. All of Lewis, Langton and Lewis/Langton acknowledge, however, that there seem to be intrinsic impure properties like *having Howard's nose as a part* (Lewis and Langton 1998: 118), *being shaped like the Eiffel tower* (Langton 1998: 39) or structural properties of the form *having an F part* (Lewis 1986c: 62) or *being such that my legs are longer than my nose* (Wasserman 2003: 4).

On what grounds, then, is the restriction to be justified? At first sight, the notion of impurity in play here seems to be the following:

Definition 11. *A property P is* impure *iff, for all a, it differs between counterparts of a.*

Unfortunately, def. 11 will not do, for any property that is had non-essentially by some thing will differ between counterparts of that thing. The characterisation of pure or "wholly qualitative" properties as those that "*can* be shared between counterparts" seems to involve us with intricate problems concerning iterated modalities. We could try to avoid these by settling for a stronger criterion:

Definition 12. *A property P of a is* impure *iff no counterpart of a has it.*

The problem with def. 12 is that it only works properly in combination with the doctrine of world-bound individuals, the claim that no two counterparts of one thing are world-mates, and also with a (modally) strictly referential reading of the proper names contained in the predicates which should come out, according to def. 12, as expressing impure properties. The normal, counterpart-theoretic analysis of a sentence like "it is possible that Lewis does not live in Princeton" is that there is a possible world in which there exist a counterpart of Lewis and a counterpart of the city of Princeton such that the first does not live in the second (Lewis 1968). If the properties *living in Princeton*, *living in the same city than Lewis* and *living in a house belonging to the same owner than the one in which Lewis lived in Princeton* are to come out impure under def. 12, however, the properties counterparts are said to lack are not the properties *living in a counterpart of the city of Princeton* etc. The properties in question, in other words, come out impure only if they are construed "haecceistically" from the outset, i.e. as distinguishing between counterparts. The problem is that not all intuitively impure properties admit of such a construal: *being a duplicate of a* is falsely classified as pure by (12), as is *having the same intrinsic nature as a*.

The problem, then, is that a notion of impurity along the lines of def. 12 applies to properties we may wish to classify as intrinsic.[29] This brings us to another advantage of Vallentyne-intrinsicness over Lewis, namely that of evading the objection of Dunn (1990a: 184) already mentioned above, that *being such that Socrates is wise* and *being such that Socrates is wise or not wise* come out Lewis_1-intrinsic, if they are not disqualified for impurity.[30]

Let us note the most important consequence of the restriction to pure properties: the definitions considered so far rest silent on what Humberstone (1996: 241) calls "part-directed relations":

Definition 13. *A relation R is* part-directed *iff it can hold between an object and a part of that object.*

[29] This problem is not solved by a definition of intrinsicness as purity, where relations to proper parts are allowed, as it has been proposed by Francescotti (1999).

[30] The former is only compatible with loneliness if it is construed rigidly, as depending on the wisdom of the actually existing Socrates. Contrary to Sider (1996: 24, n. 20), I think that this problem is different from the problem of avoiding its being the case that properties such as *being such that p* (for necessary *p*) come out intrinsic. Sider (1996: 10–11), without much argument, claims that the necessary and the impossible property come out intrinsic under at least one acceptable notion of intrinsicness.

The criterion of invariance among intrinsic duplicates gives results which are hardly justifiable when applied to relational properties which involve part-directed relations: *having a part with intrinsic property F*, e.g., comes out intrinsic if (but only if) duplication requires duplication of parts, though *having a as a part* does not come out intrinsic on any account of duplication.

Another unfortunate consequence of the restriction to pure properties has been noted by Dunn (1990a: 186), Sider (1996: 4), Humberstone (1996: 240) and Yablo (1999: 487): the theory is unable to account for intrinsic identity properties of the form *being a*. While such properties are neither intrinsic nor extrinsic according to the Lewis$_2$ and Lewis$_3$ definitions, they are Lewis$_1$-extrinsic, for a will have duplicates not sharing it. On Vallentyne's account, however, all identity properties come out intrinsic, as well as all locational properties on an absolutist conception of time and space (Vallentyne 1997: 215).[31] Weatherson has argued that such properties are correctly classified as extrinsic:

> One reason for this restriction [to pure properties] is that if there are any impure intrinsic properties, such as *being John Malkovich*, they will not have the combinatorial features distinctive of pure intrinsic properties. If F is a pure intrinsic property then there can be two wholly distinct things in a world that are F. [...] However, it is impossible to have wholly distinct things in the same world such that each is John Malkovich. (Weatherson 2001: 367)

Weatherson's example is not particularly well chosen: for is not the world portrayed in the film, where John Malkoviches abound, a possible world (and if not, where is the hidden contradiction)? Weatherson's contentious claim does not, all by itself, follow from the "independence platitude" he characterises as follows (Weatherson 2001: 370) and of which Lewis' and Langton's notion of independence from accompaniment is a precisification:

Definition 14 (Weatherson-intrinsicness). *A property F is intrinsic iff, for all a, whether a is F is independent of whether the rest of the world is H, i.e. whether a is F is entirely determined by the way a itself, and nothing else, is, and whether the rest of the world is H is determined by how it, and not a, is.*

If follows from this that whether or not an intrinsic property is exemplified should not depend on how many other things in that world have some other intrinsic property:

> ...if F and G are intrinsic properties that are somewhere instantiated [exemplified] then, for any n such that there is a world with $n + 1$ things, there is a world constituted by exactly $n + 1$ pairwise distinct things, one of which is F, and the other n of which are all G." (Weatherson 2001: 371)[32]

It is clear from this formulation how closely Weatherson-intrinsicness is tied up with combinatorialism about possible worlds. We will discuss, in sct. , another way of making this connection fruitful.

Intrinsicness as containment

We saw that parthood properties are misclassified by the Lewis$_3$-definition, but come out as Vallentyne-intrinsic. There is a refinement of Vallentyne's definition by Stephen Yablo which is not equivalent to the Lewis/Langton definition. Yablo (1999: 482) proposes the following definition:

[31] Yablo's solution to the latter problem is to claim that, on an absolutist or substantivalist conception of space-time, space-time points are entities which therefore can be either added or removed from worlds (Yablo 1999: 503, n. 19).

[32] "Constituted by exactly $n + 1$ pairwise distinct things" means that every contingent thing existing in the world in question is a fusion of parts of some of these $n + 1$ things (Weatherson 2001: 371).

Definition 15 (Yablo$_1$-intrinsicness). *A property F is intrinsic to a iff it cannot be lost or gained by adding a part to the world containing a.*

Assuming the left-to-right direction to be uncontroversial, Yablo argues for the converse from the assumption that every part of a world can exist independently and that worlds may overlap if they do not differ intrinsically.[33] Yablo's def. 15 improves on Vallentyne's def. 10 by not making appeal to intrinsic identity between worlds.[34] It presupposes instead that different possible worlds overlap – without, however, running into Lewis' notorious arguments against overlap (Lewis 1986c: sct. 4.2), for there is no intrinsic variation in the overlapping part.

Properties of a which a cannot lose come out intrinsic to a under def. 15 (Yablo 1999: 486). If we are, as Vallentyne is, interested in a global classification of properties (as opposed to properties-as-exemplified-by-some-given-particular), this problem arises only for properties which cannot be lost by any of their exemplifications ('absolutely essential' properties, in Yablo's terminology). For def. 10 claims that a property is intrinsic iff it is invariant under *every* contraction. If a essentially has the extrinsic property F but some other entity b has F non-essentially, then F comes out extrinsic on account of its being lost under a contraction with respect to b (Vallentyne 1997: 216). Obviously, this only works for properties which are not such that every object either has or lacks them essentially. With respect to these remaining cases, Vallentyne is prepared to bite the bullet:

> ...a universally essential property is such that either it, or its negation is "metaphysically glued" to every single object. If there are past-directed, or future-directed, universally essential properties, then times are not as independent as we intuitively think. For in that case, an object's existence at one time metaphysically requires that the object have certain features at another time. (Vallentyne 1997: 217)

Yablo, on the other hand, wants to be able to incorporate the alleged "Kripkean data" that there are absolutely essential, but extrinsic properties like *being descended from a particular zygote* z, *being human* or (because it implies the other two on a Kripkean essentialist theory) *being* a. Such properties are classified as intrinsic by his def. 15.

They are also classified as Lewis$_1$-intrinsic: if we take essential properties, as seems plausible in a Ludivician framework, to be properties invariant among counterparts, and assume that every duplicate of a is also a counterpart, there are no essential Lewis$_1$-extrinsics. Perhaps we could weaken that assumption, claiming only that everything has a duplicate which has a lonely counterpart.

As Yablo notes, if we accept uniqueness of composition and assume that every thing is the unique sum of "intrinsically natured atoms", i.e. mereologically atomic entities x_i which have their natures *being* x_i intrinsically, there will not be any essential extrinsic properties. If, on the other hand, there are any, then some identity property *being identical to* a will come out extrinsic. The problem then is that, for an extrinsic property F essential to a and had by it in w, the entity lacking F in another

[33] More precisely, his argument runs as follows:

1. Suppose F is extrinsic.
2. F can be lost through intrinsic variation in the outside world.
3. There are worlds w and w' such that a is F in w, a is not F in w' and w' differs from w only outside a.
4. There is a world w'' which is the part that w and w' have in common.
5. If a is F in w'', then it looses F by adding $w' \setminus w''$.
6. If a is not F in w'', then it gains F by adding $w' \setminus w''$.

It is clear that the crucial step is from (3) to (4).

[34] Vallentyne does not say that the worlds have to be intrinsic duplicates but he has to and indeed comes close to say it in so many words: "...one world is a contraction of a second world just in case it is *exactly like it* except that the first has some objects in it that the second doesn't." (Vallentyne 1997: 213) "Exactly alike" here has to mean "alike in all intrinsic respects".

world differing from w by intrinsic variation outside a will not be a and thus not be available as witness of F's extrinsicness. This is why Yablo undertakes the difficult project of providing us with a substitute: his candidate is basically the aggregate of all atoms which are parts of a:

Definition 16 (Yablo$_2$-intrinsicness)**.** *A property F is intrinsic to a iff, for every expansion w' of the very world w of a, Fa in w iff Fa' in w', where a' is whatever is constituted in w' by the a-portion of w.*

More specifically, the a-portion of w is the compound of atoms of w that constitutes a, i.e. that coincides with a (has the same parts than a) and is such that all its essential parts have parts which are not essential to a and such that every part essential to a has parts that are essential to it.

If a', which is constituted by this compound, fails to have the property F, F is extrinsic but may still be essential. A further complication arises from the fact that Yablo allows for different composition operations, differing in their modal existence conditions. If we require in def. 16 that *every* a' which is constituted in w' by the a-portion of w be G, we get a notion of intrinsicness which implies invariance among coincidents in the same world: for F to be intrinsic, it has to be impossible that F distinguishes coincidents in the same world. If we assume, with Yablo, that hypothetical properties do exactly that and that there are enough coincidents to witness the hypotheticality of hypothetical properties, all intrinsic properties have to be categorical. On a weaker construal of "whatever" in def. 15 or on different assumptions about the number of individuals or the nature of hypothetical properties, this conclusion does not follow and we can allow for intrinsic and hypothetical properties.

Though I share with Yablo the belief that intrinsicness is intimately tied up with part/whole, I do not think that his account in terms of constitution and coincidence captures that link. Constitution and coincidence, however construed, are relations between material objects, while part/whole and intrinsicness have a far larger realm of application. This can also be brought out by considering a further objection, which applies to all accounts of intrinsicness available in the literature.

The problem arises from the fact that we are able to understand and to make sense of a non-spatio-temporal sense of 'containment'. Imagine the following account of the familiar puzzle of material constitution: the statue and the lump of matter both exist, are different and do not share any parts. The statue, David, essentially has a certain form: nothing could be David without being, say, David-shaped. The lump of matter, on the other hand, also has this form, but it does not have it essentially. In addition, the lump of matter's having this particular form is all it takes for David to exist. Clearly, such a position is possible; the problem is that all accounts of intrinsicness discussed so far will classify the lump's property *being David-shaped* as extrinsic on such an account.

As the lump's property *being David-shaped* is not independent of accompaniment (whenever the lump has it, David exists), it is classified as Lewis$_2$-, Lewis$_3$-, Kim- and Weatherson-extrinsic, as well as as Vallentyne-extrinsic. Whether or not it counts as Yablo-intrinsic, depends on what we understand by a "adding a part to the world containing a" in def. 15. If we interpret it, as seems natural and is entailed by def. 16, as implying "adding things that do not overlap with a", then *being David-shaped* will be extrinsic as well on this account.

But, plainly, this is the wrong result. The problem, then, is that the adequacy of our explications of intrinsicness depends on ruling out an a priori not too implausible position in the philosophy of material constitution. So we have to dig deeper.

Theodore Sider (2001) has criticised the Lewis/Langton 1998 definition from yet another angle, namely for falsely classifying maximal properties as intrinsic. A property F is *maximal* iff, roughly, large parts of an F are not themselves F. More generally, a property F is *border-sensitive* iff whether it is exemplified by a depends on what is going on, intrinsically, outside a at its borders (Sider 2001: 358). Sider claims that many familiar properties, such as *being a house* or *being a rock* are maximal.[35]

[35] Sider's criticism presupposes one of the two solutions Lewis (1993) gives to the so-called "problem of the many" . Despite

If *being a rock* is maximal it has intrinsic duplicates which fail to be rocks because they are parts of rocks. So *being a rock* is extrinsic. As it is independent of accompaniment, however, Lewis has to claim that it is disjunctive, which does not seem very plausible. He is, however, prepared to bite the bullet (Lewis 2001: 382), even though this rules out one of the construals of naturalness of Taylor (1993) (the one which equates naturality with familiarity) among which Lewis and Langton (1998: 119–120) wanted to stay neutral. The Lewis$_3$-definition fares a little better: it allows us to count *being a rock* as extrinsic not in virtue of its being the property expressed by the the negation of the supposedly"bad" disjunction *being not intrinsically rock-like or else intrinsically rock-like but embedded in some more inclusive rock-like thing* but because *being a rock and being lonely* is more natural than *being a rock* – the former applying to all and only intrinsically rock-like lonely things, the latter not applying to things that are not rocks but would be rocks if they were not embedded within rocks.

Another objection, which applies also to Lewis' new account, has been put forward by John Hawthorne (2001). Take any binary relation R which may hold between a thing and one of its proper parts (which is "part-directed" in the sense def. 13) and consider its existential derivative $\lambda x(\exists y(xRy))$. This property is independent of accompaniment – so it either fails the tests of comparative naturalness of def. 6 or else is Lewis$_3$-intrinsic. If there are perfectly natural relations R the existential derivative of which are independent of accompaniment, however, it is very hard to see how $\lambda x(\exists y(xRy))$ could be more natural than or even as natural as $\lambda x(\exists y(xRy \wedge x \text{ is lonely}))$ or $\lambda x(\exists y(xRy \wedge x \text{ is accompanied}))$ (Hawthorne 2001: 401). So any such property *standing in R to something* will come out intrinsic – which, again, seems the intuitively wrong result.[36]

Intuitively, intrinsicness is closely bound up with parthood. A property is intrinsic iff it is entirely a matter of how a thing is by itself whether the thing has or lacks it. In all Lewis-definitions, "how a thing is by itself" is translated into "how a thing would be if it were lonely". This transition, however, is far from being mandatory: Another possible way to spell out the "by itself" clause, as Sider's examples show, is to count those features of a thing as intrinsic which are determined by what goes on inside its borders, i.e. on how its parts are and in what relations they stand.[37] What parts a thing has equally is a matter of how a thing is by itself. And how a thing is by itself will depend on what parts it has. The dependence of intrinsicness and parthood is two-way: x is part of y iff there is a region of intrinsic match between x and y.[38] There is thus a strong presumption to have *having an F part* count intrinsic with respect to a whole that has a part which has F intrinsically – at least with respect to an explication of intrinsicness that preserves its connection with parthood. We already noted that Lewis' definitions do not fall in this class. The construal of intrinsicness as interiority, as Humberstone (1996: 239) calls it, is however clearly present in Vallentyne, Yablo and Dunn.[39]

A possible reason to underestimate the connection between intrinsicness and parthood lies in the confusion, lamented by Humberstone (1996), between a property's being impure and its being rela-

all the intrinsically cat-like, but non-overlapping and hence non-identical aggregates on the mat, only one of them is a cat. This can be either be taken, on a supervaluationist treatment, to be a conceptual truth restriction acceptable precisifications of the vague term "cat"; alternatively, we can loosen our strict notion of identity and count the cats as one in virtue of their being almost identical.

[36] As Hawthorne (2001: 403) notes, this result could be avoided by a notion of duplication that requires duplicating parts for duplication of wholes and preserves part/whole relationships. This option will be explored below.

[37] A similar point is made by Humberstone (1996: 229): "...the idea of an intrinsic property is the idea of a property a thing has in and of itself: but *considering* a thing *in itself* is not the same as *supposing* the thing to be *by itself*."

[38] If x is part of y, x and a part of y are indiscernible, hence share their intrinsic properties. This is mirrored by the fact that the intrinsic properties F of x can be ascribed 'obliquely' to y under the form "has an F part" – which denotes an intrinsic property if F does.

[39] The last even helps himself to explicitly mereological terms: "Metaphysically, an *intrinsic* property of an object is a property that the object has by virtue of itself, depending on no other thing. Epistemologically, an intrinsic property would be a property that one could determine by inspection of the object itself – in particular, for a physical object, one would not have to look outside its region of space-time." (Dunn 1990a: 178)

tional.[40] Impurity, as noted in sct. , is a notion applying at the level of the *specification* of properties, i.e. of predicates, while it is properties that are or are not relational (or extrinsic). *Having* b *as a part*, typically, is an impure, but not a relational property of a thing.[41]

How, then, could we have a's property *having an* F *part* (where a's part in question is intrinsically F) come out intrinsic?

Lewis (1986c: 61) solved this problem by including an isomorphism condition into his definition of duplicates to allow for intrinsic structural properties: two things are duplicates iff they have the same basic intrinsic properties and there is an isomorphism between their parts preserving all their basic intrinsic properties and relations.[42] On this account, then, *having an* F *part*, for a basic intrinsic property F of a part of a, is classified as an intrinsic property of a.[43] If we keep the Lewis$_1$-definition of intrinsicness, we then have the following: If x and y are duplicates and x has a part z then y has a part which is a duplicate of z. Although it saves the intrinsicness of *having an* F *part*, this principle seems false. Duplication of wholes does not require duplication of parts: some duplicates of a whole may compensate for a dissimilarity in one part by a dissimilarity in another.

In order to account for the intrinsicness of *having* a *as a part*, Humberstone advocated tightening the duplication relation:

> The duplication relation is not enough to preserve all interior properties, since the impure intrinsics are not guaranteed to be inherited by duplicates of objects possessing them. (Humberstone 1996: 242)

He therefore introduces the notion of 'super-duplication': a' is a super-duplicate of a iff a and a' are duplicates and any part of a has a (similarly located and qualitatively indiscernible) part of a' as its counterpart.[44] The idea is that counterparthood heeds enough of extrinsic similarities to make a real difference to duplication (as hinted at in Lewis 1986c: 89). Humberstone recognises and acknowledges a major weakness of this proposal, i.e. that all properties of a which are shared by all its counterparts come out intrinsic. On a modal account of essence, a defender of the essentiality of origin would then have to claim that my being the offspring of a certain sperm and egg is an intrinsic property of mine.

Another weakness is that it goes too far: only *some* extrinsic similarities matter for the restriction of the relevant class of duplicates and we would like to capture which. These are those which make for *intrinsic* similarities of the wholes concerned, or, in other words, similarities with respect to *structural* properties.[45]

What we need, then, is an account which classifies as intrinsic those properties of the form *having a* F *part* that arise from intrinsic properties of parts and structural properties of wholes that record internal relations among their parts. As Humberstone realised, in order to have properties of the

[40] This confusion is especially vivid in the case of Moore (1922: 262) who classifies every difference in constitution as intrinsic.

[41] Though he uses a different terminology, this has been recognised by Sprigge (1983: 174): "They [some non-standard properties] are, at least in some sense, relational properties, though not, on the face of it, matters of the thing which possesses them being related to something 'outside itself'. An example is the property of containing London, shared by England, Britain, the UK, etc."

[42] I therefore think that the second clause in the (Lewis 1986c) definition of duplication does real work and that it would be an error to treat it, as Taylor (1993: 82) does, as redundant.

[43] Proof: Assume $\lambda x(\exists y,z(x=y\oplus z \wedge Fy))$ differs between duplicates, say a (having it) and a' (lacking it). Because they are duplicates and F is basic intrinsic property of a part of a, a' has to have an F part. But then it has $\lambda x(\exists y,z(x=y\oplus z \wedge Fy))$.

[44] He considers the possibility of requiring counterparthood of parts for counterparthood of the whole: "perhaps we can say that x is a super-duplicate of y when x is both a duplicate of y and also a counterpart (in Lewis' sense) of y" (Humberstone 1996: 243) As this, for the reasons mentioned in the main text, does not seem very plausible to me, I will not pursue this line further.

[45] Following Armstrong (1978: 69, 99) and Lewis (1986a: 86), I use the term "structural" for properties which are such that any particular exemplifying them must have proper parts exemplifying other properties.

form *having a F part* come out intrinsic for any F intrinsic to the relevant part b of a, we have to make our counterpart relation structural. For a' to be a counterpart of a, there has to be an isomorphism mapping any part b of a to a counterpart part b' of a'. Such an isomorphism condition seems to me much more plausible if imposed on the counterpart rather than the duplication relation.

Let us, following Bricker (1993: 274), call a counterpart relation between a and b that preserves all natural properties and relations of a and its parts a (a, b)-duplication relation. Such a (a, b)-duplication relation between a and b gives us a relation between their parts which is stronger than mere duplication: in order for a part b' of b to be a (a, b)-duplicate of a part a' of a, b' does not only have to be a duplicate of a', but also be related to other parts of b in a way similar to how a' is related to the other parts of a.

This, I think, allows us to capture the conceptual connection of intrinsicness with parthood in the following sense: structural properties which are intrinsic to wholes are preserved by (a, b)-duplication; although the intrinsic nature of a whole could be the result of parts with different intrinsic properties (the combination of the respective parts 'cancelling out' their intrinsic dissimilarity), any similarity between wholes must nevertheless be *grounded in* similarities of their respective parts: the parts just have to be chosen coarse-grained enough. If two wholes a and b are similar in spite of the fact that their respective parts a_1 and b_1 (and a_2 and b_2) are dissimilar, but the dissimilarity of the respective pairs is cancelled out by their combination, the parts to consider are not a_1 and a_2 (b_1 and b_2 respectively), but $a_1 \oplus a_2$ (and $b_1 \oplus b_2$). Wholes having dissimilar parts are only dissimilar *tout court* if there is no such way of grouping their parts such that the dissimilarity is cancelled out in this way.

We could therefore be tempted to give a definition of intrinsicness along the lines proposed by Bricker (1993: 289) for "locality":

Definition 17. *A property F is* local *iff, for any a and b, neighbourhoods A of a and B of b, if B is a counterpart of A and b is a (A, B)-counterpart of a, then Fa iff Fb.*

As with Yablo's definition, the important drawback of this move is that it applies only to entities for which a contrast analogous to that between a material object and the spatio-temporal region it occupies makes sense.

Taking into account the close connection between intrinsicness and parthood also helps us to solve the problem raised by Sider. If there are maximal properties, this means that there is an ontological distinction to be drawn between what Achille Varzi (1997: 42) calls (topologically) "open" and "closed" entities, i.e. entities which include their boundaries and those that do not. Houses and rocks, if *being a house* and *being a rock* are maximal, are closed – the open counterparts of a house which are embedded in a larger house are not houses, for they lack (counterparts of) parts the original house had, namely its boundary.[46] So we get the intuitively right result by requiring duplication of parts for duplication of the whole. But how exactly is this to be done?

Intrinsicness as substantiality

In her attempt to reinterpret Kant's notorious concept of noumenal causation as the thesis of epistemic humility, that we have no knowledge of the intrinsic properties of things, Rae Langton (1998)

[46] It might be replied that the embedded counterparts too have that boundary, just as a *fiat* and not a *bona fide* boundary. This line of thought, however, is mistaken: Varzi (1997: 45–46) conclusively argued against taking fiat boundaries to be possible bona fide ones. When I cut a soap in half, I do not 'actualise' a boundary that already, as it were, was there before, but I bring into being a new object, at the same time destroying another: "...fiat boundaries are not the boundaries that *would* envelop the interior parts to which they are associated in case those parts were brought to light by removing the rest [...]. Wherever you have a fiat boundary, you can have bona fide boundaries. But the former never *turns* into the latter – at most, it *leaves room* for them." Varzi (1997: 46)

makes some interesting remarks about the interdefinability of intrinsicness and the concept of a substance.[47] A substance, she thinks, is something which has intrinsic properties – intrinsic properties are properties had by substances.

Dunn (1990b: 13) makes some interesting observations regarding these matters. The objection he considers is that Lewis$_1$-intrinsic properties (and necessary properties on a counterpart-theoretic construal of trans-world identity) will, intuitively, not classify as intrinsic, for they whether or not they are intrinsic (or, with necessary properties, exemplified) will "not depend upon a alone, but also on its counterparts [duplicates], and this would cancel out the thought that $\Box F$ is intrinsic to a". The obvious response is that what duplicates (or, to some extent at least, counterparts) there are of a in other worlds *depends on* a *alone*. Dunn remarks that this line of thought is easily adapted to temporal and spatial dimensions:

> ...can it be an intrinsic property of an object that it always was, or always will be square? One cannot tell by inspecting an object only here *and now* that this is the case. But if one understands the object to be a substance enduring as the same object over time, its having been square, or its going to be square, can both be viewed as intrinsic to the object itself, though perhaps not intrinsic to the object at this moment. (Dunn 1990b: 13, n. 11)

Dunn's insight in this passage is that the question what properties are intrinsic depends on what the bearers of the property in question are taken to be – i.e. in what dimensions they are extended. We readily accept spatially extended entities and therefore consider parthood properties as intrinsic. A defender of persistence by endurance might claim that, contra Kim, my property of having been shorter than one meter is an intrinsic property of mine: the temporal part in virtue of which I have it is nothing other than myself. Analogously, a defender of modal continuants, trans-world individuals stretching over different possible world will count my property of being possibly bent as intrinsic.

We saw that Yablo's definition of intrinsicness presupposes world-overlap, though only overlap of intrinsically perfectly similar world-parts, thereby avoiding Lewis' famous problem of accidental intrinsics. Assuming the existence of universals and the traditional conception that they are wholly present when- and where-ever they are exemplified, world overlap cannot be avoided anyway.[48] But given universals, do we really need worlds overlapping in particulars? I think not.

In what way will our possible worlds overlap in virtue of universals? In just the way we need to define what it is for something to be a duplicate. Traditionally, a particular a is a substance iff it is possible that a exists independently. What, however, is independent existence? When does a particular a in a world w exist independently of anything else? Whenever there is no other particular which exists in that world. For Lewis, as Humberstone (1996: 261, n. 28) has remarked, a lonely object *is* a possible world. Substances, in other words, are entities that are possibly worlds.

By means of a suggestive analogy, Lewis (2001) tests his definition of Lewis$_3$-intrinsicness against judgements of intrinsic and purely extrinsic similarity:

> A property is a region in some sort of similarity space of actual and possible things. An unnatural property is like an irregularly shaped region of the plane: a continent with lots of promontories and inlets, or an archipelago. A natural property is like a regular region: a disk, a square, or a straight stripe (in the right sort of direction) across the entire plane. Lewis (2001: 385–386)

[47] I do not mean to endorse everything Langton proposes as Kant's view, nor do I want to take a stand on whether her interpretation is adequate. For some reasons to doubt the latter, cf. Rosefeldt (2001). What I personally find the most implausible consequence of her view is that intrinsic and extrinsic properties are "two, non-overlapping sets of properties" (Langton 1998: 12)

[48] This is explicitly acknowledged by Lewis (1983b: 11) who claims that we do not therefore have a problem analogous to the problem of temporary intrinsics for particulars, for universals do not have contingent intrinsic properties (Lewis 1986c: 205).

The comparative naturalness of properties can then be visualised by its spread and scatter on a two-dimensional plane, where horizontal distance measures intrinsic and vertical distance measures purely extrinsic dissimilarity (Lewis 2001: 390–395).

Because worlds, which I take to be maximal spatio-temporally interrelated wholes, are particulars, we can state our proposal thus:

Definition 18. *A particular a is a* substance *iff it is a counterpart of a world.*

(18) is intended to be neutral on what substances there are, e.g. on whether un-detached arms are substances or not. It does give us, however, a general characterisation of non-substances: Any particular x is not a substance iff x cannot exist but as proper part of something else.[49] Any substance has intrinsic properties and thus an intrinsic nature. We now have yet another pair of interdefinables:

Definition 19. *A property F is the intrinsic nature of a substance a iff it is the fusion of all universals that are part both of a and of all counterparts of a which are worlds.*

Substances and intrinsic natures are intimately connected: a substance is a maximal spatio-temporally interrelated whole; an intrinsic nature is a maximal nonspatiotemporal part of a substance. Now, at least, we can define duplication:

Definition 20. *Two things are duplicates iff they have the same intrinsic nature.*

I think that this gives us the right results. A property F is intrinsic to a iff it does not differ between duplicates of a, i.e. iff it is part of any substance which has the same intrinsic nature as a, i.e. iff it is part of the intrinsic nature of a. An extrinsic property, differing between duplicates a and a', is not part of their common intrinsic nature and thus differs between them and their lonely counterpart.

We now finally get the desired result. Suppose *having a F part* is extrinsic for an intrinsic F of a part b of a. Then there is a world a' which is a counterpart of a and which has no F part. So a' does not contain F. Because b has an intrinsic property, it is a substance, i.e. it has a counterpart b' which is a world. If a' would contain a counterpart b'' of b then b'' would have to be a counterpart of b'.[50] Being a counterpart of b', b'' would have F as part of its intrinsic nature. So a' cannot contain b'', so a and a' are not duplicates. So *having an F part* is intrinsic. Properties of the form *having b as a (proper) part*, however, will, in general, but not necessarily, be extrinsic, for it may well be that nothing having it is a substance.

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[49] The distinction between substances and non-substances allows us to distinguish derivatively between two sub-species of the part/whole relation. In some cases, e.g. when we say that ethics is part of philosophy, the ontological dependence is two-way: the whole generically depends on having *some* parts or other, the parts depend on there being a whole. No ethics without philosophy, no philosophy without there being philosophical disciplines. In other cases, we have generic dependence of the parts on the whole and specific dependence of the whole on the parts, e.g. when we say that the proposition that it rains is part of the argument "If it rains, I will be sad. It rains. So I will be sad." There would be no such argument if the proposition would not exist. The existence of the proposition, however, does not depend on any particular argument, but (perhaps) on there being arguments (at least of the trivial "If p, then p" form).

[50] I am assuming that any counterpart of a substance is a substance. This is justified because *being a substance* is essential to substances if anything is.

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