Not quite like links in a chain: Exemplification and the unity of the proposition

word count: 8100 words

16th November 2005

Abstract

Whenever something has a property, that property is exemplified. Before Frege, it seemed obvious to many that this makes a property stand in some kind of relation to the particular. Frege did away with the logical reasons to hold such a view, while Strawson and Armstrong criticised its metaphysical motivations. In my talk, I plead for a return to our pre-Fregean innocence.

Armstrong's main reason to forsake a realist exemplification relation for Strawsonian obscurantist "non-relational tieness" is Bradley's regress: if exemplification were a relation, it would have to be exemplified to relate a property and a particular; but then this further (instance of the) exemplification relation would have to be exemplified, etc. I will argue that, for intrinsic properties, the regress is harmless for the same reasons that the truth-regress from "p" to "it is true that p" and then to "it is true that it is true that p" is, and that exemplification of intrinsic properties is all we need.

Once the good standing of exemplification as a relation is restored, its dividends may be cashed in: representing the exemplification relation in the logical form of atomic predications allows for a robust semantics of adverbs and adverbial locutions as copula modifiers, a semantics that can be extended to modality, essence and tense; on an ontological level, the exemplification relation explains the dissimilarity of particulars and universals, allows for a roughly Aristotelian categorisation of reality and helps to provide an ontological ground for what some have called "aspects" or "respects" of things, "qua objects" or "things under a description".

Even granted its usefulness, however, many will reluctant to accept exemplification in the absence of a metaphysical picture. I will argue that exemplification is usefully construed as the having of qualitative parts, as being located in qualitative space. The 'unity of the proposition', on this construal, is the being enfolded of a property within its particulars, the property's being part of what, not just how, they are.

1 Properties

Following David Armstrong, I take properties and relations to be monadic and polyadic universals respectively, wholly present wherever there are particulars having or 'exemplifying' them.[1] Properties make things what they are. How things are, their qualitative character, does not depend on how we happen to call them. So properties and predicates are different things. Properties carve nature at its joints and bestow causal powers on the things that have them. So properties are sparse: they group things into 'elite' classes and ground genuine, mind-independent resemblances between them. It is doubtful whether we already know any of the most fundamental properties whose distribution among particulars would give us a complete inventory of the world. Properties are had by particulars and properties alike. A *second-degree property* is a property of properties; a *second-order property* is a property of particulars that is entailed by a property of their properties.

[1] Following Aristotle (*Int.*: 17a39-40), I mean by "particular" anything that is not capable of multiple exemplification, by "universal" anything that is. I call "exemplification" the general relation between particulars a and universals F which holds iff a is F. "Instantiation", on the other hand, is used to denote the relation between a token and a type. What is special about the type-token case is that types determine not only some, but *all* the (contextually salient) repeatable features of their tokens. Whenever a property is exemplified, there is an instance (a 'particularized' property) and an exemplification of it (an exemplifying particular).

Universals differ from tropes by being strictly identical in different exemplifications. If they are exemplified, the whole of them, not only a part, is exemplified. Although they are not, like tropes, dependent on a specific particular, universals are dependent on there being any particulars exemplifying them:

1 (Exemplification Thesis). *All (actual) universals are exemplified.*

Armstrong argues for (1) on the basis of what he calls "naturalism", i.e. the doctrine that all there is is part of the single world of space and time. (1) seems, however, to follow directly from what it means for a universal to be actual: If a universal is not exemplified, it is nowhere wholly present. Because it cannot be only partially present, it is nowhere present at all. How could a universal be actual while not being present in the actual world? This, I take it, is just what it means to be *merely* possible.

(1) is often taken as a reason to believe in immanent (Aristotelian, *in re*), as opposed to transcendent (*ante rem*, Platonic) universals. It is unclear, however, what immanence amounts to. My proposal is that immanence is parthood. At first sight, this may seem implausible.[2] Not even Aristotle believed it (*Cat.* 2: 1a24-25, 5: 3a31-32). The plausibility it may have, I think, stems from two considerations: a general ban on necessary connections between distinct existences, lately come to be known as the doctrine of *Humean supervenience*[3] and the fact and the nature of the property transfer between universals and their exemplifications.[4] I thus will try to defend a variant of the following:

2 (Immanent Universals). *A universal is a (non-spatiotemporal) part of every particular that exemplifies it.*

(2) has explicitely been ascribed to Armstrong by Lewis (1986b: 93), as well as the claim that all universals are intrinsic to their instances.[5] Lewis himself takes it to be part of the theory of universals he is comparing with trope theories.[6] What can be said in favor of (2)? It conforms to the way we speak, e.g. when we say of resembling particulars that they share (some of) their properties or that they have them in common. It seems natural to explain the sharing of properties in terms of overlap.[7]

Can we even go further? Does (2) not only give us a necessary, but also a sufficient condition on exemplification? Not so: not all universals that are part of a are exemplified by a. There are, in other words, both upwards and downwards specific properties. A property is upwards unspecific provided

[2] Merz calls it the "commonsense, but misleading, model" in its "naive form" (Mertz 1996: 19).

[3] Cf. Lewis (1986c: xi–xiv), Lewis (1994), Loewer (1996).

[4] Notice, e.g., that (1) implies that instances of universals have a location. As any Aristotelian theory of universals will not want to separate them from their exemplifications, we can, at least obliquely, ascribe a location to universals. Universals are repeatable entities: they are wholly present at all the different locations of their exemplifications. How is this *prima facie* astonishing fact of co-location to be explained?

[5] I think (2) is a plausible interpretation of Armstrong's 1978 work, although even there he says that the identity in nature of two particulars having the same properties is "literally inexplicable" and calls exemplification a "non-relational tie" (Armstrong 1978a: 109). He says, however: "I take it that the Realist ought to allow that two "numerically diverse" particulars which have the same property are not wholly diverse. They are partially identical in nature and so are partially identical." (Armstrong 1978a: 112) Most such passages can be reinterpreted in accordance with the later doctrine by taking "particulars" to be "thick particulars", "identity" to be "loose identity" or properties to be not parts but constituents ('nonmereological parts', whatever this means) of states of affairs (and therefore of thick particulars).

[6] "A universal is supposed to be wholly present wherever it is instantiated. It is a constituent part (though not a spatiotemporal part)9 of each particular that has it. […] Things that share a universal have not just joined a single class. They literally have something in common. They are not entirely distinct. They overlap." (Lewis 1983: 10–11). Cf. also Lewis (1986a: 80–81 and fn. 6): "Whenever it [a universal] is instantiated, it is a nonspatiotemporal part of the particular that instantiates it." and Lewis (1986b: 64, 67): "It [the universal of charge] is located there, just as the particle itself is. Indeed, it is part of the particle. It it not a spatiotemporal part…[…] I reserve the word "universal" strictly for the things, if such there be, that are wholly present as non-spatiotemporal parts in each of the things that instantiate some perfectly natural property.".

[7] This is weak evidence, however. We would still have to show that "part" is not used equivocally when applied to material and immaterial parts. There is some prima facie evidence for this, however, stemming from the fact that we accept arguments as the following: Jones belongs to the City Council. The City Council is part of the District Council. Thus, Jones belongs to the District Council. More importantly, I think that material parts and properties share enough structural features for (2) not to equivocate on "part": both the parts and the properties of a depend ontologically (at least if (1) is true) on a, they inherit their localization from a, they stand (as will be argued below) in an internal relation to it and they mereologically compose two entities that are intimately bound together, namely a and its nature. Whether (2) or any modified form of it is acceptable, however, will in the end on the general virtues of the theory built upon them.

that, if it is had by an object x, it is also had by any object y of which x is a part. It is downwards unspecific if it is inherited by all the parts of an objects that has it.[8] So we need further conditions on parthood to turn (2) into an account of exemplification.

On my reading of it, (2) gives an account of exemplification in terms of some kind of parthood. David Armstrong has given two arguments and one more general reason for the thesis that no such account is going to work.[9]

His first argument is based on 'Bradley's regress' (which he also calls the 'relation regress') and is designed to show that exemplification is not a relation. If exemplification were a relation between, say, a particular a and a property F, and hence a universal, a further relation would be needed to connect a, F and the exemplification relation (Armstrong 1978a: 20, 41, 54, 70). An ontologically and epistemologically vicious regress would follow.[10] This argument assumes that if exemplification were a relation, it would be an external one.[11] If exemplification were internal,[12] the regress is harmless, as I will try to show later.

If exemplification were a matter of parthood, the second argument goes, it would be an internal relation and hence not hold contingently (Armstrong 1997: 115). But it seems that both some given particular and a universal it (actually, but not necessarily) exemplifies can exist without being related by exemplification. For a relation to be internal, in Armstrong's use of the term, is for it to be necessitated ***by the properties*** of the relata. In this sense, exemplification is an internal relation: given a particular has the properties it in fact has, it exemplifies exactly the universals it in fact exemplifies. This does not, as Armstrong seems to think,[13] imply that it does so necessarily. There is an important distinction to be drawn between intrinsic and essential properties of particulars.[14]

The more general reason for Armstrong's disbelief in (2) is that he has come to adopt a doctrine he calls "Factualism", i.e. the view that the world consists of states of affairs. He does so for various reasons, the most important being that he thereby evades the problem of explaining exemplification (Armstrong 2002: 33). As we are trying to solve this problem directly, this reason for Armstrong is not a reason for us. Taking states of affairs (or, for that matter, 'thick' particulars) as basic, we give away any chance of solving what Armstrong used to and I still take to be the grand problem of any realist theory of universals: exemplification.[15]

What we have to do then, is to defend the claim that exemplification is an 'internal' relation which may hold contingently and to develop a theory allowing us to take exemplified properties to be parts of their exemplifying particulars. First, however, we have to develop some machinery.

[8] This second-degree property is called "dissective" by Casati & Varzi (1994: 104), following Goodman (1951), and "cumulative" by Simons (1987: 111).

[9] At least if we understand "part" in (2) in the mereological sense. I think – *contra* Armstrong – that there is no other clear sense in which we can understand "part", though I will not argue for this here.

[10] "It appears, then, that the Relation regress holds against ***all*** Relational analyses of what it is for an object to have a property or relation. If a's being F is analyzed as a's having R to a θ, then $Ra\theta$ is one of the situations of the sort that the theory undertakes to analyze. So it must be a matter of the ordered pair $\langle a, \theta \rangle$ having R' to a new θ-like entity: θ_R. If R and R' are different, the same problem arises with R' and so ***ad infinitum***. If R and R' are identical, then the projected analysis of $Ra\theta$ has appealed to R itself, which is circular." (Armstrong 1978a: 70–71)

[11] "But in general at least and perhaps in every case, the fact that an object instantiates a certain property does not flow from the nature of the object and the nature of the universal that are involved." (Armstrong 1989b: 109) In (1997: 101) he says that the "connection between things and their properties" is an external relation.

[12] I am here using "internal" and "external" in Armstrong's sense. The distinction corresponds roughly, in the terminology we will develop below, to the one between intrinsic and extrinsic relations.

[13] It is difficult to find Armstrong explicitly advocating this doctrine. The above quoted argument for exemplification being external, however, continues with "The connection is contingent." (Armstrong 1989b: 109). He also believes that the 'thick' particular has its properties essentially.

[14] ***Being n meter tall*** is an intrinsic, but not an essential property of mine.Armstrong (1997: 92) himself warned against the confusion of intrinsic and essential properties. (2) gives us another reason not to identify intrinsic with essential properties: it is an intrinsic property of any particular that it has just the parts it actually has. But not all particulars have all their properties essentially. So immoderate mereological essentialism and (2) do not go together. In any case we have to restrict necessity of constitution to ***material*** constitution.

[15] "It is interesting, but somewhat saddening, to notice that the great modern defenders of transcendent universals, Moore and Russell, do not even consider this problem of the nature of the relation between particulars and Forms to which Plato gave such close attention." (Armstrong 1978a: 67) It is interesting, but somewhat saddening, that the same can be said of the great contemporary defender of universals.

2 Intrinsic properties and natures

An intrinsic property, intuitively, is a property had by a thing solely in virtue of how that thing is in itself. An intrinsic property of a, according to a widely accepted recent definition (Lewis & Langton 1998 Lewis 2001), is a non-disjunctive property a could have even if it were the only existing thing or a truth-functional compound of such a property.[16] An intrinsic property of a is a property which is shared by all the intrinsic duplicates of a. What all and only such intrinsic duplicates of a have in common is what I will call the *intrinsic nature* of a.

Intrinsic natures are properties with extraordinary features. They are properties of the form *being indiscernible from* a, or, equivalently, *having all the properties of* a. Because "being indiscernible from a" is an 'impure' predicate (involving reference to a specific particular), Armstrong would deny that it applies in virtue of an universal (1978b: 78, 1989a: 96). As he accepts natures, which he defines as conjunctions of all the properties of a particular (Armstrong 1978a: 114, 122 et seq.), I have to argue that the nature of a is the property *being indiscernible from* a. My argument is the following: while it is up to (present and future) science to decide which properties are had by a, we know a priori that these, whatever they are, have a conjunction (we also know, by (**??**), that they have a fusion). Whatever this conjunction is, it certainly is a property and a property exemplified by a.[17] This property is a's nature, and it is the scientists' task to discover it. Their contingent, a posteriori identifications (e.g. of water with H_2O) take the form of passing from a naming (i.e. epistemologically simple) and external (relational) predicate to an analyzing one, which spells out the complexity of the corresponding universal (Armstrong 1978b: 58). We may thus legitimately take "being indiscernible from a" for a naming predicate, which applies in virtue of some universal of which we know only that it is the nature of a, whatever that will turn out to be.[18]

Another and better reason to deny that natures are properties is the following: properties are things which can be exemplified *repeatedly*; natures, on the other hand, are necessarily only exemplified once; hence natures are not properties. I deny the second premiss, which amounts to the claim that intrinsically indiscernible particulars are necessarily identical, on the basis that there are apparently coherent scenarios featuring non-identical indiscernibles.[19] Granted, then, that natures are properties, what kind of properties are they? For reasons exposed above, I take them to be *fusions* (in the sense of (**??**) rather than conjunctions of all of a particular's intrinsic properties. This also has the advantage of allowing us to include intrinsic properties of parts into the intrinsic nature of the whole. a's nature, then, is the fusion of all and only the intrinsic properties of a and its parts.

To be indiscernible from a, a particular b not only has to share all of a's properties, but it also has to *lack* all the properties a does not exemplify. What all and only the intrinsic duplicates of a have in common is not only that they exemplify all of a's intrinsic properties, but also that they do not exemplify intrinsically any other properties. How can we incorporate this closure condition? One way to go is to take the intrinsic nature of a to be the fusion of all intrinsic properties of a and its parts together with a further, second-order relational property that supervenes on the fusion's relation

[16] For the sake of simplicity, I am assuming that the property in question is had by a and that a is not the only thing actually existing. Lewis & Langton (1998) are working with a wider notion of properties than the one I use here, one according to which every class of possible objects is a property (Humberstone (1996: 245) calls these properties "properties$_n$"). This restriction will not matter in the following; it just allows us to restrict truth-functional compounds to conjunctions.

[17] I will argue below for the claim that this equally holds of the fusion. It will also be noted that I therefore reject at least the *de dicto* reading of what Armstrong (1978b: 11) calls "the Irish principle", that whenever it can be proved a priori that a thing falls under a certain universal, then there is no such universal.

[18] In the terminology of Humberstone (1996: 253), *being indiscernible from* a and *having properties* F, G, ... (where this is supposed to be a list of all of a's properties) are the same property$_n$ (by being necessarily coextensive), but not the same property$_c$ (by involving different conceptual parts). This important distinction is obscured by Armstrong's equivocal use of "pure". He calls, on the one hand, all those predicates "pure" which do not involve non-vacuous reference to a particular (Armstrong 1978b: 15), presumably following Fine (1977: 137). Impure predicates in this sense, however, may well satisfy his 'official' definition: "a predicate which applies to particulars purely in virtue of the universals which the particulars instantiate." (Armstrong 1978b: 174)

[19] Consider e.g. Lewis (1989: 63)'s scenario of two-way eternal recurrence, where exactly similar events and individuals occur infinitely many times over (cf. also Armstrong 1978a: 118). Another set of examples is provided by larger or smaller worlds, worlds that differ from our only in having more or less individuals (and universals) and being otherwise qualitatively identical to our world. For even more examples, see Armstrong (1978a: 95 et seq.).

to the property *being an intrinsic property of a part of* a.[20] *Being an intrinsic property of a part of* a is a property had by all and only the intrinsic properties of a and its parts.[21]

Take, as an example, a particular a having properties F, G and H. Suppose this to be a complete description of a's nature. The fusion $F \oplus G \oplus H$ then stands in a certain relation T (which Armstrong (1997: 199) calls "alling" or "totalling") to the second-degree property *being a property of* a. Thus the fusion has the second-degree property *standing in the* T *relation to being a property of* a. From this second-degree property, we get a second-order property of a itself, namely *having* F, G, H *as only properties*. This is a fourth property of a and a property a could have lacked.[22] If *having* F, G, H *as the only properties* is a further property of a, should we not have included it from the outset (thus embarking on a regress)? No, because second-order properties of a particular (defined as properties entailed by properties of its properties) do not have to be included in a complete description of it. Likewise, there is not any fifth property: a's fourth property is not part of that fusion that stands in the T relation to *being a property of* a; there is no way therefore to include it in the collection of those properties of which it is said that they suffice for a complete description of a.[23]

The nature of a gives us a complete description of *one* thing. This becomes apparent if we consider fusions of natures: If F and G are natures and c exemplifies $F \oplus G$, then c must have at least two proper parts a and b such that a is F and b is G; the fusion of two natures is thus a structural property. $F \oplus G$ is what Armstrong (1978a: 138) calls "particularising", it "yields an unambiguous answer to the question whether or not a particular is *one* instance of it" and divides its reference.[24]

3 Properties of higher degrees

The main obstacle to (2) are properties of higher degrees and relations, the latter being not 'in', but 'between' their exemplifying particulars. I will treat these two problem cases in turn.

If properties have properties and properties are parts, properties have properties as parts. Is this plausible? Armstrong thinks it is:

> "It is, then, a hypothesis well worth examining, that what unifies the class of universals which constitute the class of lengths is a series of partial identities holding between the members of the class." (Armstrong 1978b: 121)

We have to distinguish carefully between two different cases: properties can *entail* other properties (whatever we mean by that) and properties may *exemplify* properties. Second-degree properties of the second kind give rise to entailment relations: Everything red is coloured, because *being a colour* is exemplified by *being red* and *being coloured* is the second-order reduct of *being a colour*. Properties of properties are, according to the proposal under examination, parts of them, but not any part of a property is a property of it.[25] Following Chisholm (1982: 143), we can distinguish between three types of relations between properties: F *implies* G iff whenever F is exemplified, G is exemplified; F *includes* G iff whatever exemplifies F exemplifies G. F *involves* G iff whoever conceives F conceives G.

[20] Here I am borrowing from the account of totality facts given in Armstrong (1989a: 95–96, 115) (cf. also Armstrong 1997: 199-200). Armstrong (1997: 35) considers the possibility that *methane* could contain a negative element of the sort *having hydrogen atoms as constituents that are not bonded to any other atoms than to the constituent carbon atom*.

[21] I will later have to justify the assumption that *being a property of* a is a property.

[22] This could be denied by arguing that nothing could *differ* from a just by lacking this fourth property. We can, however, make sense of difference *in certain respects*. Something b which is F, G, H and I could differ, in so far as it is F, G and H, from a only in the 'totality' property the latter has and the former lacks.

[23] Therefore T should better not be characterised as a "totalling" relation – it is, after all, not a relation that holds between *all* of a's properties and *being a property of* a. The distinction between properties had by a and properties that have to be mentioned in a complete description of a is better illustrated with fusions: if F and G are properties of a, then $F \oplus G$ is a property of a that does not have to be included in a's complete description either.

[24] Armstrong (1978a: 138) calls a property *strongly particularizing* "if it divides its exemplifications, yielding nothing but discrete, non-overlapping particulars".

[25] *Being one half-meter in length* is, if Armstrong (1978b: 122) is right, part of *being less than one meter in length*. Any property of a is part of a's nature; there are, however, properties which are exemplified only by a, not by its nature.

Chisholm (1982: 145) goes on to defend the claim that two properties are identical iff they mutually include and involve each other. Inclusion is plausibly identified with parthood: whenever it is the case that, for all possibilia x, if Fx then Gx, then G is part of F. Implication is a special case of inclusion: F implies G iff any world which exemplifies *having an F part* exemplifies *having a G part*, i.e. iff *being a world with an F part* includes *having a G part*.[26] If F and G are the same property, they must at least be necessarily coextensive, that is they must include each other, i.e. have the same parts. Mutual inclusion alone is not enough, for we do not want to identify any pair of necessarily coextensive properties.[27] What more is required? Their parts must be arranged in the same way. This becomes apparent if we remember that we are here using "inclusion" in the non-standard way defined by (**??**): having the same parts may mean different things, if fusion is not associative. Property identity includes such structural features: the component properties of the fusions have to stand in the same relations to each other.

We may now generalise our account to second-degree properties. Although the (Lewis & Langton 1998) definition does not give us this result, it seems intuitively that all second-degree properties are intrinsic to the first-degree properties that exemplify them: how could two duplicate properties differ? Properties, after all, are purely qualitative. The exemplification requirement (1), however, seems to render properties of properties extrinsic.[28] Given (2), however, appearances mislead us. Although nothing can have the property *being a colour* without there being a particular exemplifying a particular colour property, the colour property and the particular will, given (2), not be wholly distinct from the second-degree property. My contention that second-degree properties are intrinsic rests on the claim that *being a property of* a is intrinsic to any of a's properties. If there were different duplicate properties, say F and F', it seems plausible to suppose that duplicate *particulars* would differ with respect to them, i.e. that there are duplicates a and a' differing only in that a is F and not F' and a' is F' and not F.[29] So F has *being a property of* a and lacks *being a property of* a' while F' lacks the first and has the second. But this cannot be, for *being a property of* a and *being a property of* a' are identical if a and a' are duplicates (that is what it means to be a duplicate). So nothing can exemplify only one of them. I conclude, then, that all higher-order properties are intrinsic.

Every second-degree property gives rise to a second-order property. Suppose G is a property of F, which is exemplified by a ($GF \wedge Fa$). Then a has the second-order property *having a property which is* G: $(\lambda x\ \exists X(GX \wedge Xx))\ a$. It has it intrinsically iff the relevant property X is intrinsic. How do second-degree and corresponding second-order properties relate to each other? As in the case of F and *having an F part* I think they are, ontologically speaking, identical, even though ascribed to different things. Second-degree properties of a's nature thus do not have to be treated separatedly: we can safely subsume them under a's intrinsic nature, where the latter is understood as to include intrinsic second-order properties as well.

4 Relations

What now about relations, these being not "in", but "between" their terms? In this section, I will try to give a reductive account of relations in terms of relational properties.[30]

Although philosophers usually assume that what they say about properties easily generalises to relations, relations pose problems that do not arise (at least not as sharply) in the monadic special case.

[26] This account allows for gradual distinctions between (mere) implication and inclusion, depending on how big we choose the entities mentioned in the specialisation of "F includes G".

[27] This is especially plausible in cases where the necessity in question is 'weak', e.g. physical or biological necessity, as it is in the case of Quine's famous examples *having a heart* and *having kidneys*.

[28] Lewis & Langton (1998: 127) claim that *being a universal* and *being a state of affairs* will come out extrinsic under their definition.

[29] Suppose not: then $\neg F \wedge F'$ (or, equivalently, $F \vee F'$) is intrinsic. But how can it be a matter of how a thing is all by itself to exemplify only one but not the other of two duplicate properties?

[30] This claim is independent of my thesis on exemplification. If I am wrong about relations, I could still be right about the exemplification of properties.

It is, e.g., unclear whether and where relations can sensible said to have a location.[31] Relations, but not properties, can be merely partially exemplified.[32] Relations, finally, seem to contain a mysterious "direction" component which we do not find in their monadic cousins. Other problems concern the relation between relations and relational properties. Necessarily, whenever a dyadic relation R is exemplified, say by a and b, ***having R to a*** and ***having R to b*** are exemplified too, by b and a respectively. This necessary connection between (apparently) distinct existences has to be explained (away). Armstrong (1978b: 78) thus proposes to reduce 'qualitative' relational properties to relations and properties via the following equivalence (cf. also Armstrong 1997: 92):

(1) a has R to an F $\iff$ $\exists x(x$ is an F and a has R to $x)$

The main reason why I feel uneasy about this strategy is that relations are properties anyway, namely properties of the fusion of their relata.[33] Even if Armstrong (1989b: 98) thinks that this does not "sound right", (2) implies that the relation that holds between parts of a fusion is located where the fusion is. What, then, is the connection between a relation linking some terms and the structural property of the fusion it gives rise to?

Different sorts of relations give us different sorts of properties of the fusion of their relata. Relational properties allow us to factor out the contributions the parts make to these properties of the whole and to account for the second-degree properties of such relations (properties of the fusion of the related particulars). It is therefore natural to ask whether we can not only account for relational properties in terms of relations, but also go the other way round and explain the holding of a relation by the exemplification of relational properties. A first candidate accomplishing this is the following (letting "$\dot{R}$" denote the converse of R):

(2) a has R to b $\iff$ $\exists F, G$ (F is the intrinsic nature of a
$\wedge$ G is the intrinsic nature of b $\wedge$ a has R to an F $\wedge$ b has $\dot{R}$ to a G)

This will not do, however. Define external relations to be those that do not supervene on the intrinsic properties of their relata, but on the intrinsic properties of the n-tuples of their relata (or, equivalently, of the fusion of their relata).[34] Such relations can differ between duplicates, i.e. things with the same intrinsic nature. For such external relations (2) does not hold, for then ***having R to a*** is not equivalent to ***having R to something that has a's nature***.[35] The reason for this, I think, that taking the pairs as the supervenience basis is not enough: we have to go for the fusions.

Let us call a *foundation* of a relation R any property on which it supervenes. Josh Parsons (2003), defending the British idealists against Russell, has argued that relations supervene at least on structural properties of worlds, if not of anything smaller. The argument is simply that by (1) any relation holds between some things; because wholes inherit the truth-making properties of their parts,[36] any fact that makes true the statement that the relation holds among these things also makes true a non-relational statement about something of which these things are part.[37] So every relation R has a foundation, denoted by "$\bar{R}$". Supervenience on structural properties is not, however, enough to get rid of relations, for structural properties could still essentially involve relations.

[31] Armstrong (1989b: 98), hesitatingly, accepts the view that they are unlocated, without explaining how a mere difference in arity could account for such a drastic difference in ontological character.

[32] Armstrong (1978b: 77) reduces only partially instantiated relations to relational properties, but this seems ad hoc. Moreover, populating the universe with properties like ***expecting the Second Coming*** does not match well with his realism.

[33] Armstrong (1978b: 71) called such properties of fusions "relationally structural properties", but now (1989a: 106) thinks that (at least) internal relations are non-relational structural properties of the fusion of their terms. External relations, on the other hand, are now no longer taken to be properties of the fusion of their relata but nonmereological constituents of a state of affairs containing them (Armstrong 1997: 104).

[34] Relations that supervene on the intrinsic properties of their relata taken individually are called "internal", such that do not supervene on either kind of intrinsic properties are neither internal nor external.

[35] Presumably for this reason, Armstrong (1978b: 78) has argued that properties like ***having R to a*** do not count as relational properties, as they are expressed by 'impure' predicates (cf. also Armstrong 1997: 93).

[36] Parsons takes his clue from Simons (1987: 165): "If x makes p true and x is included in y, then y makes p true."

[37] Maximally, this will be a world, if we do not (as we should not) accept relations spreading over different worlds.

We thus have to proceed further: From the foundation of a relation, we get its *adicity* with respect to a specific exemplification. *Contra* Armstrong, I do not take the adicity of a relation to be invariable: relations can hold between various numbers of relata. For any exemplification of a relation R, we get its adicity by successively reducing the size of the world of which its foundation $\bar{R}$ holds. If at any stage we get an object, a, which has $\bar{R}$ but lacks *has a proper $\bar{R}$ part*, we stop. It does not matter if our minimal supervenience base for R is not unique or if it is gerrymandered; all we need is a principled way of counting its relevant parts.[38] Suppose, then, that we have a binary relation R, holding, by (1), between a and b. I claim that R is either internal or external, i.e. that it is intrinsic to $a \oplus b$. Suppose it is not. Then $\bar{R}$ is an extrinsic property of either a, b or $a \oplus b$. Then there is an extrinsic property of $a \oplus b$ on which R supervenes.[39] But this means that $\bar{R}$, which we assumed to be a property of $a \oplus b$, is not a supervenience base for R after all. The minimal supervenience base for R will include more objects than just a and b and so we were wrong to assume that R is binary.[40] Relations, then, supervene on intrinsic properties of the fusion of their relata. Such properties are compositional properties of the form *having parts standing in relation R*.[41] Why is such a property intrinsic? Suppose a has it. Then a has parts $a_1, \ldots, a_n$ such that $R(a_1, \ldots, a_n)$. Any a_i then has a relational property F_i of the form $\lambda x \exists x_1, \ldots x_{n-1}(A_1 x_1 \wedge \ldots \wedge A_{i-1}x_{i-1} \wedge A_{i+1}x_{i+1} \wedge \ldots \wedge A_n x_n \wedge R(x_1, \ldots, x_{i-1}, x, x_{i+1}, \ldots, x_n)$. where "$A_i$" denotes x_i's nature. Although *having an F_i part* is an extrinsic property of a, the conjunction of all these properties which is *having parts standing in relation R* is intrinsic.[42]

Internal and external relations differ with respect to the relational properties they give rise to. If R is an internal relation holding between a and b, the relational property $\lambda x(Rxb)$ of a supervenes on the intrinsic properties of a and b. If we let "B" denote b's intrinsic nature, $\lambda x \exists y(Rxy \wedge By)$ thus is an intrinsic property of a. If R is an external relation, however, we need an instance of (**??**): the relational property of a is then $\lambda x \exists y(Rxy \wedge By \wedge x \text{ is part of a } C)$, which is extrinsic. Internal, but not in general intrinsic, relations thus give rise to intrinsic relational properties of their relata. Internal relations, being nothing over and above the intrinsic properties of their relata on which they supervene, are not really 'relations' in the (for us) problematic of this term: they are not mysteriously 'between' anything, they are located where their terms are and they account for resemblances between different things.[43]

What about external relations? Having a foundation, they supervene on *extrinsic* properties of their relata, e.g. *being part of an R-connected whole*. More importantly, the converse is true as well: Extrinsic properties are relational properties. Let F be such an extrinsic property had by a. Consider, again, the minimal supervenience base and thus the minimal object b a property G of which includes *having a F part*. Let H be the nature of $a \setminus b$. Then F is *being part of a G* or, equivalently, *being part of a whole which has an F and a H part*, which is a relational property.

Do we then have a property reduction of relations? A word of caution: There are good reason to think that relational *talk* is irreducible, that we cannot do without talking of and quantifying over relations. First-order logic, but not its monadic fragment is undecidable. Hochberg (1988: 196), e.g., has argued that relational properties do not give us expressive power enough to state their own identity conditions: to say that, generally and as a matter of logical truth, if $a = b$, then $\lambda x(aRx) = \lambda x(bRx)$,

[38] I do not have any principled method to do this. I do not have to, however, as I assumed that every exemplification of a relation is by a definite number of objects (even if the relation itself does not have a fixed adicity).

[39] Proof: Suppose $\bar{R}$ is an extrinsic property of a. Then there is a duplicate a' of a that lacks $\bar{R}$. So $a' \oplus b$ is a duplicate of $a \oplus b$ that lacks *having an $\bar{R}$ part*. If R supervenes on $\bar{R}$, then it also supervenes on this property of the whole.

[40] A word of caution is in order here with respect to n-adic relations that we get from $n+1$-adic ones not by 'completion', but by quantification or identification of argument places (Humberstone 1996). I do not know whether I have to introduce 'arbitrary object' in order to substantiate my claim that, e.g., *belonging to the same owner than* is, in reality, triadic.

[41] See Lewis (1989: 62). As an example, take the relation *being north of* holding between Edinburgh and London. This relation is external for *being north of London* does not supervene on the intrinsic properties of Edinburgh. *Having two parts x and y such that x is north of y*, however, is an intrinsic property of London $\oplus$ Edinburgh.

[42] To see this, consider a binary relation R. I claim that "$\lambda x(\lambda y(Rxy)a)b$" and "$(\lambda x(Rxb))a \wedge (\lambda y(Ray))b$" ascribe the same property to a and b, namely that R holds between them. But "$\lambda x(\lambda y(Rxy)a)b \leftarrow ((\lambda x(Rxb))a \wedge (\lambda y(Ray))b)$ is just what is known as α-conversion. Schoenfinkel observed already in 1924 that α-conversion allows us to reduce functions of several variables to unary functions (cf. Barendregt 1981: 6, 22).

[43] One even could, as Armstrong does, argue that resemblance or, equivalently, partial identity is the only internal relation.

we need to quantify over relations. Humberstone (1996: 219, 259) has shown that any monadically representable relation R, i.e. any relation such that xRy iff $Fx \wedge Gy$ for all x and y satisfies the following condition of "forgetful transitivity":

(3) $\forall x, y, u, z((Rxy \wedge Ruz) \rightarrow Rxz)$

As this obviously is not true of all dyadic relations, not all such relations are monadically representable. I acknowledge that it is useful, even indispensable, to quantify over relations and to separate their expressions syntactically from the individual terms with the referents of which they form relational properties. This is not to say, however, that we have to acknowledge relations as a separate and irreducible *ontological* category.

As Castañeda has remarked *à propos de* Plato, a's having R to b and b's having $\dot{R}$ to a are better thought of as two *prongs* of one state of affairs.[44] If a and b stand in the nonsymmetrical relation R, it is wrong to say that they have R as common part. For if we reduce a's having R to b to a's having the property *having* R *to* b and b's having the property *having* $\dot{R}$ *to* a, we have reduced the relation to two *different* properties, which are bound together by a "law of joint exemplification" (Castañeda 1972: 470). What is the ontological ground of such a necessary connection between distinct (non-overlapping) entities? Their being parts of something with a nature, which is a structural property of the fusion of their exemplifying particulars. This structural property we denote by "R". It is being composed of *having* R *to* b and *having* $\dot{R}$ *to* a and has this internal structure intrinsically. We cannot, however, identify R with *having* R *to* $b \oplus$ *having* $\dot{R}$ *to* a, for we want our relations to be universals, shared by all fusions of objects that exemplify them. To get genuine universals, we have to make use of the fact that any relation R has a foundation, a structural property of the fusion of its relata on which it supervenes. Let "$\bar{R}$" denote the foundation of R. Then it seems plausible to adopt the following thesis for any two-place relation R:

(4) $R =$ *having* R *to a part of a* $\bar{R} \oplus$ *having* $\dot{R}$ *to a part of a* $\bar{R}$

This, however, is still defective, for the foundation of R can differ between different exemplifications of it. Fortunately, we do not really need it anyway. As we want to give an ontological, but not a terminological reduction of relations, we have to account only for specific exemplifications of relations. Whenever we have such an exemplification of R, say by a and b, however, we have:

(5) $aRb \iff (\lambda x(x \textit{ has } R \textit{ to } b) \oplus \lambda y(y \textit{ has } \dot{R} \textit{ to } a))\,(a \oplus b)$

All we need the existence of a foundation for is to substantiate the claim that x *has* R *to* b and y *has* $\dot{R}$ *to* a are not unduly 'impure'. We have thus have at least an *ontological* reduction of relations to relational properties.[45] We can now answer the questions asked above: Where are relations located? In their relata, or, what amounts to the same, in the fusion of their relata. What is partial exemplification? It is exemplification of (literally) only a part of the relation. Does sharing of relations account for similarity? It does not give us similarity of relata, but similarity of fusions of the relata. What is the ontological difference between internal and external relations? Internal relations are relations that hold in virtue of (nonrelational) properties of the relata: they are (literally) composed of nonrelational properties. External relations, however, are (fusions of) relational, hence extrinsic, properties.

[44] "The sentence "Simmias is taller than Socrates" does not reveal the truth it expresses perspicuously, because this sentence mentions only one Form, tallness, whereas the truth or fact in question involves two Forms, tallness and shortness." (Castañeda 1972: 469)

[45] This, I think, is most plausibly to be taken for the Leibnizian view, called "Monadic Realism" by Armstrong (1978b: 84) and considered to be logically, but not epistemically, possible.

5 Exemplification explained

What, finally, is exemplification? Assuming the mind-independent existence of universals, exemplification is a relation E, a "one over many" and a genuine universal, that holds contingently between different entities capable of independent existence. This seems to suggest a Bradleian regress. The exemplification regress, however, is harmless. Exemplification is a relation that holds only if exemplified, but whose exemplification does not require a *further* relation of exemplification, but just the two relata, together with their properties, including their relational properties of standing in the exemplification relation with respect to each other. If a exemplifies F, there is a relation, to be sure, but a relation whose relational properties are just F and the nature of a. We do not have to introduce a second exemplification relation E' to account for the fact that $E(F, a)$, for "$E(F, a)$" is made true by what a is and by what F is.[46] The truth conditions for "$E(F, a)$" do not involve further exemplification relations, but only a and F. The harmless exemplification regress may in this respect be compared to the truth-regress (if p is true, then it is true that p is true and so forth), on all sides agreed to be harmless:[47]

> "The subsequent facts in the chain are not involved in the specification of the truth conditions for the initial statements, which is what would make the chain a vicious regress." (Hochberg 1988: 193)

Exemplification, in other words, is an intrinsic relation. Exemplification of intrinsic properties is even internal.[48] For extrinsic properties F, however, exemplification is an external relation. For even though Fa implies that F is part of a's nature, some of a's duplicates, sharing only their intrinsic, but not in general their extrinsic nature with a, may lack it.

As we have (I hope successfully) reduced relations to properties, we need only *one* exemplification relation.[49]

Whenever exemplification is exemplified, say by a and F, two relational properties are exemplified, namely *being exemplified by* a ($\lambda x E(x, a)$) and *exemplifying* F ($\lambda x E(F, x)$). From our account of second-degree properties it follows that the former, but not in general, of course, the latter is a property had intrinsically. This seems reasonable: Given how a property is all by itself, it follows which particulars exemplify it, whereas it does not follow from how a particular is all by itself which properties it does exemplify. It has to be noted, however, that given our account of relations and our reduction of extrinsic to relational properties, any property is had intrinsically by *something*, by a world if not by anything smaller than a world. This now gives us a way to say what fusion of properties we mean by the nature of a:

Definition 3. *The nature of* a *is the fusion of all universals that overlap* a *and are not properly included in any universal which overlaps* a.

The nature of a is the least universal which contains all nonspatiotemporal parts of a. The intrinsic properties of a are, as we have seen, those properly included in a. The *extrinsic nature* of a thus is the fusion of all universals which overlap, but are not included in a nor included in any universal overlapping a.

Our account of natures now gives us a way to say what exemplification is:

Definition 4. *A particular* x *exemplifies a (monadic) universal* F *(has the property* F*) iff* F *is part of* x*'s nature. Some particulars* $x_1 \dots x_n$ *exemplify an* n*-ary universal* R *(stand in the relation* R*) iff* $x_1 \dots x_n$ *exemplify the corresponding relational properties.*

[46] A similar point is made by Forrest (1993: 56).

[47] E.g. by Armstrong (1978a: 56) and Armstrong (1997: 119)). One could even consider the truth regress to be but a special case of the exemplification regress: if a sentence-type is a property of sentence-tokens, then truth is both a second-degree and a second-order property, of types and tokens respectively.

[48] If a and a' are duplicates and F is intrinsic, either $Fa \wedge Fa'$ or $\neg Fa \wedge \neg Fa'$, i.e. either $E(F, a) \wedge E(F, a')$ or $\neg E(F, a) \wedge \neg E(F, a')$.

[49] The second-level ternary relation H (exemplification of first level binary relations) of Williamson (1985: 251) thus becomes just a special case E: $Rxy \leftrightarrow H(R, x, y) \leftrightarrow E(R, x \oplus y)$.This is good, for it seems that there may well be a finite upper bound to the adicity of relations (e.g. if the universe would contain only finitely many objects).

Recall now our problems with upwards specific properties. Being part of a particular, apparently, sometimes suffices for F to be a property of it, sometimes it does not. In both cases, however, F is wholly present where the particular is, the difference being only that it is sometimes more easily ascribed not to the particular itself but to a proper part of it. It is perhaps helpful to compare this peculiar situation to the way we ascribe locations to things. Some parts 'inherit' their location from the wholes of which they are parts, while others do not. Although part of a fusion with the Eiffel tower, the chair I am sitting on is wholly here and not at all in France. My foot, on the other hand, is here, where I am sitting, although it would, were it detached, be about half a meter away.[50]

Up- or downwards specificity is an objective fact, a substantive second-degree property. How is it to be explained? With natures. Our comprehension schemata (**??**) and (**??**) give us what we need to draw the relevant distinctions, namely enough unspecific properties of the forms *having a (proper) part with nature F* and *being a (proper) part of a fusion with nature G*. Let's choose *having a rabbit as a part* as upwards unspecific (or equivalently, *being part of a rabbit* as a downwards unspecific) and *being a rabbit* as specific property.[51] The fusion of a particular rabbit a and my nose b has both universals as parts, but it is not a rabbit, although it has a rabbit as part. How can we account for that difference? In terms of totality properties. Whereas *being a rabbit* is part of a fusion that stands in the T relation to *being a property of* a but is not part of a fusion that stands in the T relation to *being a property of* $a \oplus b$, *having a rabbit as a part* is part of both fusions. Thus the latter, but not the former universal is included in the 'totality' property of $a \oplus b$. By (**??**), this gives us a property, i.e. *being part of a fusion that stands in the T relation*, that distinguishes the two universals. Thus there are two ways for a universal to be part of a particular. It can be a *mere part*, i.e. be part of it, but not be included in its 'totality' property, or it can be an *constituent part*, being both a part and included in its 'totality' property. If F is a mere part of a, it is not exemplified by it, for it is then part of the property *having an F part* which itself is exemplified by a.

This distinction allows us to reconcile the transitivity of parthood with the nontransitivity of exemplification as follows: If F is a property of a and G a property of F, then G is part not only of F, but also of a. It will not, however, in general be a constituent part and so transitivity is blocked.[52] If a nature F (i.e. a property which has a 'totality' property as a part) is part of a particular a, either F or *having an F as a (proper) part* is included in a's 'totality' property. As natures are radically specific (not exemplified by proper fusions nor proper parts of their exemplifications), no nature is at the same time a mere and a constituent part of the same particular. So natures are structural in a way other universals are not.

This has two welcome consequences. We are given, first, a procedure to 'read off' a particular decomposition of a complex particular into simpler parts from its nature. It will be an objective fact whether the nature F of a proper part will be included as F or as *having a proper F part* in the nature of the whole.[53] The F part will be uniquely determined by the specificity of natures. We then see why it is reasonable to expect from a theory of universals that it "carves nature at its joints", i.e. distinguishes 'well-' from 'ill-defined' parts. Second, we can (in principle) uniquely compose any fusion of natures into a determinate number of parts that are natures. Whenever we are given such a fusion F, we take the particular that exemplifies it, which will always be mereologically complex, say $a \oplus b$. If a has a nature G which is part of F, we decompose $F = A \oplus G$. If not, we decompose the particular

[50]Of course, this has something to do with my being able to move my chair without moving the Eiffel tower and my incapacity to move my foot without moving my body.

[51]My choice of unspecific property may be criticized as prejudiced. It is difficult, however, to find completely unspecific properties which are not of the form *being partly an F*. Most properties, perhaps all, are only relatively unspecific (if they are not outright specific), i.e. had by some, but not all mereological fusions of which their exemplifications are parts.

[52]Exploiting (**??**), we can explain the otherwise mysterious fact that second-degree properties give rise to second-order properties. For *having a (constituent) part that is G* will be a property of a, whether or not G is.

[53](**??**) and (**??**) give us a general method to deal with specific but non-structural properties. If F bestows extra causal powers on $a \oplus b$, powers which cannot be accounted for in terms of properties of either a or b, they both have the property of being part of an F that is composed of an A and a B (the natures of a and b respectively) and having those extra powers. a has the property of adding up with a B to an F, and b has the property of adding up with an A to an F. In mereological terms, a has as a property $F \backslash$*being b* and b conversely has the property $F \backslash$*being a*. If a has causal powers bestowed by F, but looses these when integrated into $a \oplus b$, then there must be something about $a \oplus b$'s nature G that inhibits the displayal of F-powers by proper parts. So a has these powers only if it not only has F, but also if it lacks the property *being part of a G fusion*.

differently, $a \oplus b = c \oplus d$, and repeat the procedure. When we have found enough natures to get our original F as their fusion, we stop.

Being a constituent part of a or, equivalently, according to (4), *being exemplified by* a is a property of F and hence a constituent part of F just in case a is F. I deny necessity of constitution for particulars, at least if "constitution" is taken to include nonspatiotemporal parts. Universals, on the other hand, have all their constituent parts essentially. This can be seen as follows: If a property F has constituent parts G and H, G and H are wholly present when- and wherever F is exemplified. So G and H are exemplified too, either by a part of the particular a that exemplifies F or by a itself. If it were possible that F lacked G, then, by the necessity of (1), it could have been wholly present while lacking a part. This, however, is impossible. This form of 'necessity of constitution' does not hold for mere parts, however. If G is only a mere, but not a constituent part of F, F could be exemplified without G being exemplified. Although every particular could have other properties than F (and thus has counterparts which are not F), F could not have been exemplified by other things wholly distinct from the Fs there are.[54] I am thus claiming that there is a further asymmetry between the relational properties *being exemplified by* a ($\lambda x E(x, a)$) and *exemplifying* F ($\lambda x E(F, x)$). I want to argue that the former, but not, of course, the latter is an essential property.[55]

This asymmetric existential dependence explains two things. First, it explains the exemplification requirement (1). If it is impossible that there are bare particulars, this does not follow from what it takes to be a particular. (1), on the other hand, holds, as I have argued, only in virtue of what universals are. Second, it also explains why the identity of universals implies at least necessary coextensiveness of the corresponding naming predicates. The mere possibility that a universal could not apply to a particular which is, in fact, red, suffices to show that the universal in question is not *red*.

An interesting distinction is made by Fine (1994: 60): Although Socrates is essentially a man (or so let us assume), it is false that Socrates has essentially the property of being a man. This means: property abstraction does not preserve essentiality. Even if F is an essential to a, $\lambda x I(F, x)$ is not.[56]

Having now the distinction between properties and (mere) universals at our disposal, it is to be noted that the above diagnosed asymmetry holds only for properties: only properties could not have had other instances than they actually have, whereas (mere) universals could have been parts of other particulars. If F is an constituent part and hence a property of a, it is part of a's nature (that fusion of universals that are part of a that stands in the T relation to *being a property of* a). a's nature can be a part only of a. If F, on the other hand, were a part of b which is not (actually) F, then it would be a mere part, so it would not be part of b's nature and not a property of b. So the properties of a are exactly those universals that are necessarily parts of a.[57] Universals that are mere parts of a, on the other hand, are not essentially parts of a. For although they have their property *being part of a fusion (of properties) with nature* F essentially and the nature F of a's nature contains *being the nature of* a, a could have had another nature - in which case the universals in question would still be parts of something with nature F, but no longer parts of the fusion of properties which is the nature of a.

[54]Obviously, this asymmetry does not hold if F is essential to all particulars that exemplify it. This, however, is not the case for all properties.

[55]Long ago, Kit Fine (1977: 141) drew an important distinction between two ways sets of possible worlds can be evaluated. This distinction is best brought out by considering the set of all possible worlds. Viewed as a proposition, Fine says, this set exists necessarily: whatever our possible worlds are, they necessarily form a set (or a proper class for that matter). Viewed as a set, however, its existence depends essentially on the existence of each possible world. If their existence were contingent, then the existence of their set would be so too. My point is that universals behave like sets and not like propositions: they depend on the existence *and* on the nature of their exemplifications; if they were different, the universal would be another one than it actually is.

[56]I take this explanation to be superior (at least for our purposes) to that of Fine who distinguishes between a property occurring in predicative or in subject position. For this distinction is applicable only to (conceptual, predicate-induced) properties$_c$ (cf. Humberstone 1996) and not to (the more interesting) properties$_n$ or even to universals .

[57]It is misleading, though convenient, to speak of necessity here: the necessity of "Fa" flows from the nature of F, not of a.

6 Concluding remarks

Although there remains much to be done, I hope to have shown that the seemingly absurd thesis that exemplification is (a kind of) parthood has more to it than is visible at first sight. My aim was to show how a more general theory of exemplification could look like and what problems such a theory would have to address. A more modest aim was that David Lewis' views on exemplification, who stand out for taking the mereological metaphors seriously, are in need of a more elaborate defense than he cares to give. Exemplification, after all, seems to be an issue quite near to the metaphysical bottom of things and that, after all, should be the place where philosophers fancy to be.

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