Erkenn (2018) 83:793–803
https://doi.org/10.1007/s10670-017-9914-2

ORIGINAL RESEARCH

Nominalism and Comparative Similarity

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Received: 30 June 2016 / Accepted: 5 June 2017 / Published online: 9 June 2017

Abstract Nominalism about attributes has serious difficulties in accounting for truths involving abstract nouns. Prominent among such truths are statements of comparative similarity among attributes (e.g., ‘Carmine resembles vermillion more than it resembles French blue’). This paper argues that one cannot account for the truth of such statements without invoking attributes.

Resemblance nominalists[1] hold nominalism about attributes, the view that no attributes exist.[2] This view has serious difficulties in accounting for truths involving abstract nouns. Prominent among such truths are statements of comparative similarity among attributes, such as (1)[3]:

(1) Carmine resembles vermillion more than it resembles French blue.

[1] See, e.g., Carnap (1967), Price (1953, Chapter 1), and Rodriguez-Pereyra (2002).

[2] I use ‘attribute’ for tropes (or particular attributes) as well as universals, and ‘nominalism’ for nominalism about attributes. This view differs from nominalism about universals in denying the existence of tropes as well as universals. See, e.g., Williams (1953) for an analysis of statements involving abstract nouns that invokes tropes. (Although the so-called trope theory is often considered a version of nominalism about universals, Williams presents a version of reductionist realism about universals (ibid., 9f)).

[3] Pap (1959, 334), Jackson (1977), Armstrong (1978, 58ff), and Yi (2014, 622–5) use such statements to argue against nominalism. Lewis (1983, 348f) and Rodriguez-Pereyra (2002, 91f; 2015) respond to their arguments.

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In this paper, I argue that one cannot account for the truth of such statements without invoking attributes.

1 Comparing the Maxima

Lewis (1983, 348f) gives two related paraphrases of 'Red resembles orange more than it resembles blue.' They can be taken to give two versions of a scheme for rendering statements of the same structure as (1). Applying the two versions of the scheme to (1) yield (1′a) and (1′b):

(1′) a. Some carmine particular resembles some vermillion particular more closely than any carmine particular resembles any French blue particular.
b. A carmine particular can resemble a vermillion particular more closely than a carmine particular can resemble a French blue particular.

In (1′a), the quantifiers *some* and *any* range over possibilia. We can take this to make the statement equivalent to (1′b), a modal statement involving only the usual, actualist quantifiers.[4] Rodriguez-Pereyra (2002), who holds nominalism, also proposes to render (1) as (1′a) or (1′b).[5] Unlike Lewis, however, he does not take them to paraphrase or give analyses of (1). He does not think that it is necessary to give nominalistic paraphrases of true statements involving abstract nouns to defend nominalism; it suffices, he holds, to formulate nominalistic statements that "say what makes [such statements] true", that is, nominalistic statements expressing their *truthmakers* (*ibid*., 92).[6] Accordingly, he holds that (1′b) expresses "what makes (1) true", and that this "is better expressed by" (1′a).

Lewis's scheme has serious problems that Rodriguez-Pereyra's modification inherits, as Yi (2014, 622–5) argues. Consider (2):

(2) Carmine resembles vermillion more than it resembles *triangularity*.

[4] Actualist quantifiers are those that (with respect to a possible world) range over entities that actually exist (in that possible world).

[5] I use 'render' in a broad sense to cover statements that express truthmakers of other statements as well as statements that give paraphrases or analyses.

[6] In his view, any true statement must have a truthmaker and the truthmaker of a true statement is what makes the statement true, "that *in virtue of* which it is true, or that which *makes* it true" (ibid., 29), or an entity whose existence "*necessitates* the fact" stated by the truth (ibid., 30).

The scheme renders this statement as (2′a) or (2′b):

(2′) a. Some carmine particular resembles some vermillion particular more closely than any carmine particular resembles any *triangular* particular.

b. A carmine particular can resemble a vermillion particular more closely than a carmine particular can resemble a *triangular* particular.

But these statements are false. (2′a) is false because a possible carmine particular *completely* resembles a possible triangular particular (the same particular might be both carmine and triangular)[7]; and it is the same with (2′b). So neither (2′a) nor (2′b) can be taken to paraphrase (2), which is true. Moreover, they cannot be taken to express the *truthmaker* of (2), either. A false statement has no truthmaker and cannot express the truthmaker of any true statement.[8]

2 Comparing the Minima

In response to Yi (ibid.), Rodriguez-Pereyra (2015) proposes another scheme for rendering comparative similarity statements. The possibilia version of this scheme renders (1) as follows:

(1*) Some carmine particular resembles some French blue particular *less closely* than any carmine particular resembles any vermillion particular.[9]

(In this statement, as in (1′a), the quantifiers range over possibilia.)[10] While Lewis's scheme compares the *maximum* degrees of resemblance, the new scheme compares the *minimum* degrees of resemblance. (So call it the *minima scheme* while calling Lewis's scheme the *maxima scheme*.) It is based on the idea that "if a determinate [property] resembles another determinate more closely than a third, the minimum degree to which something having the first determinate can resemble something having the second determinate must be greater than the minimum degree to which something having the first determinate can resemble something having the third determinate" (ibid., 226).

[7] By contrast, no possible carmine particular completely resembles a possible vermillion particular. But it is not necessary to assume this to conclude that (2′a) is false.

[8] See Yi (2014, 622–5) for more about Lewis's scheme.

[9] This is a reformulation of his possibilia rendering: "Every carmine particular resembles any vermillion particular more closely than some carmine particular resembles some French blue particular" (ibid., 225), where the two occurrences of *some* are meant to take scopes wider than *every* and *any*. He also gives its modal version: "A carmine particular must resemble a vermillion particular more closely than a carmine particular can resemble a French blue particular" (ibid., 225). This is meant to have the same truth condition as the possibilia rendering and has the same problems as those for the possibilia rendering discussed below.

[10] The same holds for (2*)–(4*) below.

The new scheme, the minima scheme, renders statements of comparative similarity among (determinate) properties[11] as statements about comparison of *degrees of resemblance* among particulars. If so, what is the *degree* of resemblance between particulars? In formulating the scheme, Rodriguez-Pereyra uses "the notion of resemblance . . . that accounts for sharing of *sparse* properties" (ibid., 225; original italics).[12] On this notion, "resemblance holds between any two particulars sharing some sparse property" (2002, 64), and the degree of resemblance between them is the *number* of sparse properties they share (ibid., 65f).[13]

Now, in proposing the minima scheme Rodriguez-Pereyra assumes that (1*) and the scheme's rendering of (2) [in short, (2*)][14] are true. (Otherwise they cannot express truthmakers of any statements.) But both renderings are false on the notion of resemblance he uses to formulate the scheme. He argues that (2*) is true because "the minimum degree to which a carmine particular can resemble a triangular particular (degree 0)" is smaller than "the minimum degree to which a carmine particular can resemble a vermillion particular (a degree greater than 0)" (2015, 225). But this argument rests on a false assumption: the minimum degree to which a carmine particular can resemble a vermillion particular is *greater than* 0. He supports this assumption by asserting that "no carmine particular can fail to resemble any vermillion particular" (ibid., 225). But a carmine particular cannot resemble a vermillion particular (on *his* notion of resemblance) unless they share a *sparse* property, and they might not share any such property. A carmine particular and a vermillion particular might share no non-color sparse property, and two such particulars share no sparse color property, either, because they have different determinate color properties.[15] Although they share some *determinable* color properties (e.g., red), this does not help because (in his view) "determinables are not sparse properties" (ibid., 227, note 8).[16] This means that both (1*) and (2*) are false.

Some might attempt to defend the minima scheme by taking sparse properties to include some deteriminables (e.g., red). This does not help. Consider statements about determinate mass properties of the following form[17]:

[11] In proposing the minima scheme, Rodriguez-Pereyra explicitly restricts it to statements about determinates.

[12] See Rodriguez-Pereyra (2002, 59–61) for his notion of *sparse property*.

[13] He says "*x* and *y* resemble each other to degree *n* if and only if they share *n* properties", where by 'properties' he means *sparse* (or *determinate*) properties (ibid., 65). See his subsequent discussion of degrees of resemblance among carmine, vermillion, and French blue particulars (ibid., 66). See also note 15.

[14] I.e., 'Some carmine particular resembles some *triangular* particular less closely than any carmine particular resembles any vermillion particular.'

[15] In his discussion of degrees of resemblance, he reaches the same conclusion. He says that the degree of resemblance between a carmine particular and a vermillion particular with no properties other than colors and shapes that share a determinate shape (e.g., circularity) is 1, not 0 only because they share the shape (2002, 66).

[16] In his view, determinables are disjunctive properties composed of their determinates (2002, 48f), and no disjunctive property is sparse (ibid., 51).

[17] Rodriguez-Pereyra (2002, 49) gives mass properties as examples of determinate and determinable properties.

(M_n) Being 1 kg (in mass) resembles being n kilograms more than it resembles being $n + 1$ kilograms [where n is a positive natural number].[18]

All such statements are true. But not all of their minima-scheme renderings can be true, no matter what mass properties are considered sparse. Let $d(n)$ be the minimum degree of resemblance between a particular of 1 kg and one of n kg. Then the rendering of (M_n)[19] cannot be true unless $d(n)$ is greater than $d(n + 1)$ (It is equivalent to '$d(n + 1) < d(n)$', for degrees of resemblance are cardinal numbers). So to make the renderings of all statements of the form true, the minimum degrees must form an infinite descending chain:

$$d(1) > d(2) > d(3) > \cdots > d(n) > d(n+1) > \cdots.$$

But this is impossible. The degrees of resemblance are natural or cardinal numbers (they are the *numbers of* sparse properties shared by particulars), and such numbers cannot form an infinite descending chain (for any collection of cardinal numbers has a smallest member).[20]

Note that the above objection does not depend on any assumption about what kind of determinables are (or are not) included among sparse properties. Thus the objection equally applies to the minima scheme based on Rodriguez-Pereyra's view that no determinable is sparse.

Instead of modifying his view of sparse properties, some might propose to characterize degrees of resemblance in terms of properties of a suitable kind that include sparse properties. (Call the properties used to analyze the degrees on this proposal *S-properties*.) They might then argue that the degree of resemblance between a carmine particular and a vermillion particular must be greater than 0 because some determinables that cover both carmine and vermillion (e.g., red)[21] are S-properties although they are not sparse properties.[22] But basing the minima scheme on the modified analysis of degrees of resemblance does not help to avoid the problem noted above. The scheme has the problem not because the degree of resemblance between particulars is given in terms of *sparse* properties, but because it is characterized as a cardinal number, the *number of* properties of a certain kind. While grounding all instances of (M_n) requires an infinite descending chain of degrees of resemblance, numbers of properties cannot form such a chain. For cardinal numbers are well-founded, and any collection of them must have a smallest member. So the same problem arises for the scheme based on the modified analysis,

[18] I use 'be n kg' as a predicate for particulars interchangeable with 'be n kg in mass' and 'have a mass of n kg', not as a predicate for mass properties interchangeable with 'be identical with the mass of n kg'.

[19] I.e., 'Some particular of 1 kg resembles some particular of $n + 1$ kg less closely than any particular of 1 kg resembles any particular of n kg.'

[20] Degrees of resemblance cannot be infinite numbers in Rodriguez-Pereyra's view (2002, 173), but even cardinal numbers that include infinite numbers cannot form an infinite descending chain.

[21] I say that a determinable R *covers* a determinate Q, if Q is a determinate of R.

[22] Thanks are due to an anonymous referee for *Erkenntis* for suggesting this response on behalf of Rodriguez-Pereyra. But I think the response conflicts with his notion of resemblance. As noted above, he says the notion is one that "accounts for sharing of *sparse* properties" (2015, 225; original italics), but the proposal relates resemblance to some non-sparse properties.

for this analysis also characterizes degrees of resemblance as cardinal numbers (viz., the numbers of S-properties shared by particulars).

Some might attempt to avoid the problem by rendering (M_n) in terms of *dissimilarity* instead of resemblance:

(M_n**) Some particular of 1 kg is more dissimilar to some particular of $n + 1$ kg than any particular of 1 kg is dissimilar to any particular of n kg.

They might then define the degree of dissimilarity between two particulars (e.g., one of 1 kg and one of 2 kg) as the number of S-properties that *distinguish* between them (e.g., being at least 2 kg).[23] But this proposal has the same problem in handling the mirror image of (M_n):

(M_n') Being 1 kg resembles being $(1 + (½)^{n+1})$ kg more than it resembles being $(1 + (½)^n)$ kg.

To make all the dissimilarity renderings of instances of (M_n') true, one would need an infinite descending chain of cardinal numbers as degrees of dissimilarity.[24]

3 The Ordinary Notion of Degree of Resemblance

Some might argue that problems of the minima scheme noted above stem from inadequacies of Rodriguez-Pereyra's notion of resemblance. They might then attempt to defend the scheme by basing it on an adequate notion or analysis of resemblance. I think his notion of resemblance is far removed from our ordinary notion and does not yield an adequate analysis of resemblance. But I do not think a correct analysis of resemblance helps to defend the scheme.

Rodriguez-Pereyra bases the minima scheme, as noted above, on a notion of resemblance on which the degree of resemblance between two particulars is the number of shared sparse properties so that they do not at all resemble each other unless they share a sparse property. Thus he holds that if three particulars with different determinate colors (e.g., carmine, vermillion, and French blue) have the same non-color properties, no two of them resemble each other more closely than they resemble the third (2002, 66).[25] This is not what we would say. If three particulars *a*, *b*, and *c* have the same non-color properties but are French blue, carmine, and vermilion, respectively, then "on our ordinary notion of resemblance, *b* and *c* resemble each other more closely than either of them resembles *a*", as he puts it (ibid., 66). While saying that this is "what one is tempted to say" (ibid., 66), he rejects it to hold the opposite view stated above. As we have seen, however, his

[23] This was suggested by James Davies.

[24] Some might propose to characterize degrees of resemblance as *ratios* between the numbers of properties of a suitable kind, as an anonymous referee for *Erkenntnis* suggests. While this proposal assumes that the relevant properties shared by particulars (and those that they individually have) are finite in number, one cannot maintain this assumption in specifying what properties to use to characterize degrees of resemblance to deal with instances of (M_n). In any case, the proposal does not help to make the minima-scheme renderings of its instances true. See the "Appendix" (see also note 31).

[25] See also note 15.

view contradicts even (1*),[26] which he assumes is true in proposing the scheme. If so, can one defend the scheme by reinstating the ordinary notion of resemblance?

I think that in the situation imagined above, the carmine and vermillion particulars resemble each other more than either does the French blue particular *because* the carmine and vermillion colors are closer to each other than either is to the French blue color. But this does not mean that there is an overall measure of resemblance on which *comparability* holds for any pairs of particulars,[27] for resemblance among particulars depends on features in multiple dimensions: color, shape, mass, etc. Suppose that A is a carmine particular of 1 kg, B a carmine particular of 2 kg, and C a vermillion particular of 1 kg (and that they have the same properties except color and mass properties). If so, A is closer to B *in color* than to C and closer to C *in mass* than to B. But this does not determine whether A has a higher degree of *overall* resemblance to B than to C or vice versa. In overall resemblance, A might not be closer to one of B and C than to the other. And this does not mean that A has the same degree of resemblance to B as to C.[28] If so, degrees of overall resemblance between pairs of particulars might form only a partial order: neither (A, B) nor (A, C) is a pair with a higher degree (of overall resemblance) than the other, although both have a lower degree than (A, A).

We can now see that basing the minima scheme on this ordinary notion of resemblance does not help to defend the scheme. Consider a true statement similar to (2):

(3) Carmine resembles vermillion more than it resembles *being* 1 kg (*in mass*).

The scheme renders this as follows:

(3*) Some carmine particular resembles some particular *of* 1 kg less closely than any carmine particular resembles any vermillion particular.

The scheme requires that (3*) be true. Assuming that it is, then, let a carmine particular (call it *A*) and a particular of 1 kg (call it *B*) witness its truth. We may assume that A has a determinate mass and B a determinate color.[29] So suppose, e.g., that A is 1 million kg and that B is black. Then A (being carmine) must resemble any vermillion particular whatsoever more closely than it resembles B. But this is false. A does not resemble a vermillion particular of 1 trillion kg (call it *C*) more than it does B. Neither (A, C) nor (A, B) is a pair with a higher degree of overall resemblance than the other, for neither the gap between the color differences

[26] The view contradicts (1′a)–(1′b) as well.

[27] That is, if (*x*, *y*) and (*z*, *w*) are two pairs of particulars, then either (a) *x* and *y* resemble each other more closely than *z* and *w* do, or (b) *z* and *w* resemble each other more closely than *x* and *y* do, or (c) *x* and *y* resemble each other just as much as *z* and *w* do.

[28] It is hard to see why the carmine–vermillion difference between A and C would amount to the 1-kg difference rather than, e.g., the 1-pound difference.

[29] Some might object to this assumption, but we can run the same argument with examples for which the counterpart of the assumption is irresistible, such as statements about mass and volume (e.g., ‘Being 1 cubic meter resembles being 2 cubic meters more than it resembles being 1 kg’).

(carmine vs. black and carmine vs. vermillion) nor the gap between the mass differences (1 trillion minus 1 kg and 1 million minus 1 kg) outweighs the other to yield a lower degree of overall resemblance.

Defenders of the scheme might argue that A *does* resemble C more than it does B because the gap between the color differences outweighs the gap between the mass differences. Some might perhaps hold that color and mass differences are commensurable in this way. But it is hard to see how those who do so can hold that the dissimilarity arising from the color difference between A and B (i.e., the carmine–black difference) cannot be outweighed by the dissimilarity arising from a far greater difference in mass between A and a possible vermillion particular (e.g., one of 1 quintillion kg).

Moreover, we can see that even postulating commensurability among degrees of resemblance in *all* possible dimensions of attributes does not help to defend the scheme. Suppose that Π is a physical quantity with three determinate values (π_1, π_2, π_3) that satisfies two conditions:

(i) A possible particular has the quantity Π if and only if it has mass (0 or positive).

(ii) The values of Π are linearly ordered with π_1 and π_3 at the opposite ends, and π_2 is the middle value that is as close to π_1 as to π_3.[30]

Then consider (4) and (4*):

(4) Being π_2 resembles being π_1 more than it resembles being 1 kg.

(4*) Some π_2 particular resembles some particular of 1 kg less closely than any π_2 particular resembles any π_1 particular.

(4*) cannot express the truthmaker of (4), because it is false. To see this, suppose that a π_2 particular, A, and a particular of 1 kg, B, witness the truth of (4*). Then A must have a determinate mass property, and B a determinate Π value [by (i)]. So suppose, e.g., that A is 1 million kg and that B is π_1 or π_3. Then any π_2 particular must resemble any π_1 particular more than A does B. But this is false. Let B′ be a π_1 particular of 0.1 kg (that has the same sparse properties as B except in mass and Π). Then A and B′ are π_2 and π_1, respectively, but they resemble each other less closely than A and B do. (They resemble each other in Π as much as A and B do, but resemble each other less closely in mass than A and B do.)[31]

[30] We can weaken this assumption: π_2 is as close to π_3 as to π_1 or closer to π_3 than to π_1. Moreover, it is not necessary to assume that there are no other determinate Π values; the argument given below goes through even assuming that Π has additional determinate values between π_1 and π_2 or between π_2 and π_3.

[31] Note that this does not depend on any assumption about degrees of resemblance (nor does it assume that the degrees of overall resemblance among pairs of particulars form a linear order). So (4) raises a problem for any account of comparative similarity that uses the minima scheme.

4 Concluding Remarks

We have examined two nominalist schemes proposed for comparative similarity statements, such as (1)–(4). The maxima scheme considers the highest degrees of resemblance between all possible particulars with one property and those with another, and the minima scheme the lowest degrees thereof. Both schemes fail, as we have seen. The maxima scheme fails, because particulars with two properties with little similarity (e.g., a color and a shape or mass property) might have the highest possible degree of resemblance (i.e., complete resemblance) because the *same* particular might have both of those properties. The minima scheme fails, because a property, P, might be more similar to another property, Q, than a third, R, while the lowest degree of resemblance between a P-particular and a Q-particular is not higher than that between a P-particular and an R-particular. It is straightforward to see this if we assume Rodriguez-Pereyra's analysis of resemblance, on which the degree of resemblance between particulars is the number of properties of a certain kind (e.g., sparse properties) that they share. And we can see it without assuming the disputable analysis of resemblance. As the falsity of (4*) illustrates, any two particulars with less similar properties belonging to different dimensions (e.g., being π_2 and being 1 kg) might resemble each other more closely than some particulars with more similar properties belonging to the same dimension (e.g., being π_1 and being π_2), for the degree of resemblance between those particulars is not determined by the less similar properties but is affected by other properties they have (e.g., other mass properties and Π values).

And it is hard to see what else nominalists can propose to account for the truth of statements of comparative similarity among attributes. Some might consider rendering them as statements with *ceteris paribus* clauses, such as (1†):

(1†) *Other things being equal*, carmine particulars resemble vermillion particulars more closely than they resemble French blue particulars.

But the clause does not help to handle statements comparing properties in different dimensions, such as (2). The *ceteris paribus* scheme renders (2) as follows:

(2†) *Other things being equal*, carmine particulars resemble vermillion particulars more closely than they resemble triangular particulars.

But this is false. Just because a carmine particular, a vermillion particular, and a triangular particular have the same properties except color and shape properties does not mean that the carmine and vermillion particulars resemble each other more closely than the carmine and triangular particulars do. The latter might be identical or qualitatively indiscernible, but the former cannot. So I conclude that one cannot account for the semantics of comparative similarity statements without assuming the existence of attributes.

Acknowledgements The work for this paper was supported in part by a SSHRC research grant (Grant No. 435-2014-0592), which is hereby gratefully acknowledged. I presented the paper in a Canadian Philosophical Association meeting. I wish thank the audience for useful discussions. I also wish to thank

Kevin Kuhl, Marion Durand, James Davies, Chung-Hyoung Lee, and two anonymous referees for *Erkenntnis* for useful comments on previous versions of this paper.

Appendix

To defend the minima scheme, some might propose to characterize degrees of resemblance as *ratios* between the numbers of properties of a suitable kind (in short, S-properties). On this proposal, the *ratio proposal*, the degree of resemblance between two particulars is the ratio between two numbers: (a) the number of S-properties they share, and (b) the sum of the numbers of S-properties they individually have.[32] This proposal does not help to defend the scheme, either. For the ratio is ill-defined because both (a) and (b) would have to be infinite numbers. (Moreover, they would have to be the same infinite number.)[33]

Call mass properties among S-properties *MS-properties*. Then proponents of the ratio proposal would have to include some (in fact, infinitely many) determinables among MS-properties. To see this, consider, e.g., (M_2) and its minima-scheme rendering, (M_2*):

(M_2) Being 1 kg resembles being 2 kg more than it resembles being 3 kg.
(M_2*) Some particular of 1 kg resembles some particular of 3 kg less closely than any particular of 1 kg resembles any particular of 2 kg.

If all S-properties are determinates, a particular of 1 kg might share no S-property whatsoever with a particular of 2 kg, which makes (M_2*) false on the proposal. To avoid this problem, some might include among S-properties the determinable property of *being at least* 1 kg *and at most* 2 kg (in short, $P[1, 2]$). They might then argue that (M_2*) is true because this is an S-property that covers both being 1 kg and being 2 kg, but not being 3 kg. So they might include among MS-properties all the mass properties of the form $P[r, s]$ (i.e., being at least r kg and at most s kg), where r is a positive real number smaller than s.[34] In their view, then, any possible particular with a determinate mass (e.g., 1 kg) has infinitely many MS-properties (e.g., $P[1, r]$ for any real number $r > 1$), and any two possible particulars with determinate mass (e.g., 1 kg and 2 kg) share infinitely many MS-properties (e.g.,

[32] The proposal is meant to avoid the problem of infinite descending chain (see the last paragraphs of Sect. 2 and note 24). Ratios between natural numbers (unlike natural or cardinal numbers) can form an infinite descending chain (e.g., 1, ½, ¼, etc.), and one might argue that there is an infinite descending chain of degrees of resemblance among particulars because different particulars have different numbers of S-properties.

[33] See notes 35 and 36.

[34] By doing so, they might aim to deal with all truths of the form 'Being 1 kg resembles being r kg more than it resembles being s kg' (where r and s are real numbers). It is not necessary to include all mass properties of the form. For example, one may include only those of the form $P[r, s]$ where r and s are positive *rational* numbers (see note 35). To respect similarity among mass properties (or resemblance in mass among particulars), however, an S-property that covers two determinates must cover any determinate that lies between them. One cannot include properties with 'gaps' in determinates they cover, such as *being* 1 kg *or* 3 kg, which does not cover some determinates (e.g., being 2 kg) that being 1 kg resembles more than it resembles being 3 kg.

$P[1, r]$ for any number $r \geq 2$).[35] If so, the degree of resemblance between two such particulars cannot be defined and (M_2*) fails to be true.[36]

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35 Moreover, any such particulars share (and lack) as many MS-properties as those they individually have. If one includes all determinables of the form $P[r, s]$ matching real numbers, the relevant numbers of properties are uncountable numbers. One can avoid this by including only determinables of the form matching rational numbers. On this proposal, too, the relevant numbers are infinite.

36 Suppose that A and B are particulars of 1 kg and 3 kg, respectively, that share no determinate properties. Then let B′ be a particular of 2 kg that has the same non-mass properties as B. Then A and B do *not* resemble less closely than A and B′ do (B and B′ have the same number of S-properties, and A and B share (and lack) as many S-properties as A and B′ do).