

Kvantifikator för en Dag

Essays dedicated to Dag Westerståhl on his sixtieth birthday



Why There Cannot Be Transitivity With Respect to Supervenient Properties

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Abstract

This paper presents an argument to the effect that the relation of exact similarity with respect to properties that are supervenient cannot be transitive. The point of departure is that, while a difference in respect of supervenient properties entails a difference in respect of subvenient properties, exact similiarity in respect of supervenient properties is compatible with differences in respect of subvenient properties. It is logically possible that two such sets of differences that each individually is insufficient for a difference as regards the supervenient property together are sufficient for such a supervenient difference. This possibility claim is incompatible with the necessity claim entailed by the transitivity of exact similarity. Several objections to this argument are then considered.

1. The Argument

I shall here present an argument to the effect that the relation of *exact similarity* with respect to properties that are *supervenient* cannot be transitive. The properties I shall be talking about are intrinsic ones in the sense that it is possible to perceive something, X, as having such a property by perceiving only X and its parts. Thus, I interpret the intrinsicality of properties in a perceptual rather than in an ontological way, that is, as properties that it is possible to *perceive* X as having by perceiving only X and its parts rather than as properties that X *has* independently of everything external to X. I do so because I want to make room for the possibility that an intrinsic property may be subjective in the sense that X's having such a property is analyzable in terms of some kind of subjects responding with some sort of psychological state to X under certain conditions. Since these subjects are likely to be

external to X, X will not have any property analyzable in this way independently of everything external to X.

According to an informal understanding of the notion of supervenience, to say that S is a supervenient property of X means that there have to be other properties of X, basic properties, B, *in virtue* or *because of* which X has S, properties that *determine* or *explain* X's having S. It is natural to take this to imply that X's possession of B is not determined or explained by X's having S. Thus, the notion of supervenience is asymmetric.

I shall not say more about the force of the italicized expressions “in virtue of” etc. than that I shall take them to express some form(s) of logically contingent dependency.¹ That is, X's having some feature F does not supervene upon its having B if it is true that X has F in virtue of its having B simply because the latter logically entails the former. For I shall take it that we do not want to hold that, say, X's having some less specific or more determinable property such as being yellow or green or being coloured is supervenient upon X's being yellow. They are not genuinely supervenient upon X's being yellow, since X's having them is not anything over and above X's being yellow. (As will transpire, some such determinable properties are transitive.)

The properties of being of positive or negative (not neutral) value or, in other words, being good or bad, are paradigm examples of supervenient properties. Another set of examples are so-called secondary qualities, such as having a particular colour or a taste. (These properties are often held to be subjective in something like the sense sketched above.) It may be that we should distinguish between the supervenience of value and that of secondary qualities. As has been pointed out, e.g., by Simon Blackburn (1988: pp. 66ff), it appears to be a matter of *linguistic competence* to know that value properties are dependent upon other properties. You show that you are not in command of the terms “good” and “bad” if you think that something can be good or bad without being so in virtue of some other properties that it has. In contrast, knowing how to apply colour terms apparently does

¹ Thus, I shall not, and need not, here go into such matters as Jaegwon Kim's distinction between strong and weak supervenience (see, e.g., “Concepts of supervenience” and “Supervenience as a philosophical concept”, reprinted in Kim, 1993). For I am concerned with something these forms of supervenience have in common.

not entail knowledge that if something has some colour, it has it in virtue of some other properties.²

This difference between values and secondary qualities may be the reason why the notion of supervenience was first introduced in value theory by, G. E. Moore.³ I think that this difference also provides a more solid ground for making the claim that value properties are *essentially* or *by their nature* supervenient than for making this claim about secondary properties.⁴ We can safely claim that in all possible worlds in which something is of value, it must be so in virtue of having some other properties. But perhaps we can imagine worlds in which what is in this world a secondary quality, like colour, is not a supervenient property (and for that reason is not properly called “secondary” in that world). Indeed, this may be how colour is conceived by the naive or direct realism of common sense. If there is this difference between value properties and secondary qualities — I do not want to commit myself to this claim — my argument will imply a stronger conclusion with respect to value properties. For it will imply something that holds true of them in every possible world.

It follows from the informal notion of the supervenience of a property that if there is something, Y, that is exactly similar to X in respect of the base B, X and Y are also exactly similar in respect of the supervenient S. In other words, if there is a difference between X and Y with respect to S — if X has S but Y lacks it, or if X has S to a greater or smaller degree than Y, etc. — there must be a difference in respect of B between X and Y. Otherwise the difference in respect of S cannot be explained in terms of B.

In contrast, supervenience does not imply that if there is no difference or exact similarity between X and Y with respect to S, then there is no difference between them with respect to B. Differences in respect of B which are insufficient to generate differences in respect of S may well exist. As a matter of contingent fact, it could have been the case that whenever there is a difference as regards B, there is also a difference as regards S (though

² Thus, it is not surprising that there are views which deny the supervenience of colours by identifying them with the physical properties that cause subjects to have colour experiences. I believe that these views are false for I take colours and other secondary qualities to be properties whose essence is revealed in our experiences rather than properties which cause these experiences. Otherwise they would not be supervenient which I assume, at least for the sake of illustration.

³ (1922: p. 261). The *term* was introduced by R. M. Hare (1952: p. 145).

⁴ As will transpire, this claim is not wholly incontestable, since on some metaethical theories value properties are *definable* in terms of the properties in virtue of which things are valuable.

this is presumably not so). But if we were *requiring* this of the notion defined, we would be defining a stronger notion than supervenience.

For the purposes of my argument, I need not plunge any deeper than this into the notion of supervenience, since I have already secured the implication of supervenience which forms the first premise of my argument:

Simp: If S is a property of objects that supervenes upon their having B, then, for all objects X, Y and Z, even if both X and Y and Y and Z are exactly similar with respect to S, it is logically possible that there are differences with respect to B between both X and Y and Y and Z.

To illustrate: even if the wines X and Y taste equally good to (some) human beings, and the same is true of the wines Y and Z, it is possible that there are some differences as regards the taste-producing properties between both X and Y and Y and Z which are so small that (the relevant) human palates do not register them. (Of course, the palates of some other beings may be more discriminating in which case the objects will not have the different property of tasting equally good to these beings.) Or to take a negative example: even if the physical stimulations X and Y are felt to be equally painful and bad to (some) humans, and the same is true of Y and Z, it may be that there are differences between X and Y and Y and Z that are too small to be registered by (the relevant) human nervous systems. It is said, for instance, that in order for electrical impulses to be transmitted across synapses, they must reach certain thresholds.

These are examples of the very simplest kind of value judgements. As we shall see, there is reason to focus on such simple examples. But although they are very simple, it is controversial how they should be properly understood. In the example of pain, there are three things whose precise relations to each other are debatable: the painfulness of a sensation (for the subject), the (intrinsic) dislike of or aversion to it (which the subject has), and the (intrinsic) badness of it (for the subject). To simplify matters, we may however for

present purposes assume that both the painfulness and the badness (for the subject) are definable in terms of (its) dislike (although I do not think this is true).⁵

The next step in the argument is a claim about the possible differences as regards B between X and Y and Y and Z of which *Simp* speaks:

Add: Even if there are differences in respect of B between X and Y and between Y and Z neither of which are sufficient for differences in respect of S between X and Y or between Y and Z, but X is exactly similar to Y and Y to Z with respect to S, it is *logically possible* that there are differences in respect of B between X and Z that are sufficient for a difference with respect to S between X and Z.

That the differences with respect to B neither between X and Y nor between Y and Z are sufficient for there to be a difference with respect to S between X and Y or Y and Z must be compatible with there being *another* difference in respect of B between X and Z which *is* sufficient to manifest itself in a difference with respect to S between X and Z. For instance, the following is clearly logically possible: the difference between X and Y and between Y and Z with respect to B (e.g., taste- or pain-producing properties) each is one unit, but the difference in this respect between X and Z is two units, and a difference of two units is minimally sufficient to give rise to a difference as regards S for the subjects in question.

This additive possibility is one reason for the name of the second step of the argument. The other reason is that it is an additional premise, supplying the link between supervenience and transitivity. This link comes out in the third step:

Trans: If *Add* is true, it must be false that the relation of exact similarity with respect to S is transitive, that is to say, it must be false that it is a *logically necessary* truth that if X and Y and Y and Z are exactly similar with respect to S, then X and Z are exactly similar with respect to S.

⁵ Note that even if this were true, it would not follow that the painfulness and the badness of a stimulus are the same, since a stimulus may be worse by having longer duration.

If *Add* is true, it must be logically possible that there be a difference with respect to S between X and Z, though there is no such a difference between X and Y or Y and Z for, as we have seen, the latter similarity is compatible with there being a difference with respect to B between X and Z which is *sufficient* to manifest itself in a difference with respect to S. If it is logically possible that there is a difference which is sufficient for another difference, it must be logically possible that the second difference obtains.

Now, from *Add* and *Trans* we may infer by means of *modus ponens*:

Conclusion: The relation of exact similarity with respect S is not transitive, i.e., it is non-transitive.

According to *Simp*, this is true of S because of something that follows from the fact that S is supervenient, namely that there may be differences in the subvenient properties, though there are no difference in the supervenient ones. So, the non-transitivity of exact similarity as regards these properties follows from their supervenience.

It may *in fact* be true of some, or even all, objects X, Y and Z, that if X and Y and Y and Z are exactly similar with respect to S, X and Z will also be exactly similar in this respect. This may be because it is in fact not only the case, as the notion of supervenience implies, that if two things are exactly similar in respect of B, they are also exactly similar as in respect of S but, conversely, that if they are exactly similar in respect of S, they are exactly similar in respect of B. This possibility refutes the (implausible) claim that the relation of exact similarity as regards supervenient properties is *intransitive*, not my claim that it is *not* transitive, or non-transitive. The fact that in some, or even all, cases it is true that, if X and Y and Y and Z are exactly similar as regards S, then X and Z are exactly similar as regards S, does not establish that this is so as a matter of *logical necessity*, which is what the denial of the transitivity of the relation of exact similarity denies. This fact only establishes that it does not follow that X and Z are not exactly similar as regards S, which would follow if the relation were intransitive.

Instead of saying that some particulars are exactly similar with respect to some feature F, it could be said that they are *the same or identical* with respect to F. But this manner of expression may mislead the unwary into thinking that what is meant is that the particulars

involve *numerically the same instantiation* of F. This would be so if the particulars are numerically identical. It is then necessarily true of any feature F, including supervenient ones, that if one of the particulars has F, the others will have F, too. Thus, numerical identity implies exact similarity with respect to any (time-indexed) feature that the identical items may have. Now, some have objected to my argument that it cannot be right because it implies, absurdly, that exact similarity is not transitive in this sort of case. But it does not. It is perfectly compatible with this relation being transitive in these case in which it is underpinned by numerical identity. For the relation of exact similarity or no difference with respect to F can also hold when the relata do not involve numerically the same exemplification of F. It is enough for *Conclusion* if it is not transitive here.

2. “Top-down” or “bottom-up”?

This is my simple argument. Let us now look at some possible objections. The first reverses the inference from *Add* and *Trans* to *Conclusion*. Its main thesis is:

Rev: The relation of exact similarity with respect to S *is* transitive; so *Add* is false.

The argument behind *Rev* might be spelt out more fully as follows: when the difference with respect to B between X and Y, B_{XY} , is insufficient to make a difference in respect of S between X and Y, and the difference with respect to B between Y and Z, B_{YZ} , is insufficient to make a difference with respect to S between Y and Z, it is logically impossible that the difference with respect to B between X and Z, B_{XZ} , is sufficient to make a difference in respect of S between X and Z, since in virtue of the transitivity of the relation of exact similarity in respect of a property, it is logically necessary that X and Z are exactly similar in respect of S. The heart of my argument is that there is a clash between a necessity statement as regards exact similarity with respect supervenient properties, which entailed by the claim that this relation is transitive, and a possibility statement as regards differences in the subvenient properties. *Rev* uses the necessity to reject the possibility instead of using the possibility to reject the necessity as I did in my argument.

Rev reasons as though a supervenient property determines its base rather than the other way around. Therefore it may be said to reason “top-down” instead of “bottom-up” as I did

when inferring *Conclusion. Rev* assumes that if transitivity implies that X and Z are exactly similar with respect to S, this somehow *constrains or determines* B_{XZ} , so that it cannot be sufficient for X and Z to be different as regards S. This turns things upside down, however: it is part of the meaning of the concept of supervenience that it is subvenient properties and their relations that determine supervenient properties and their relations and not the other way around. Besides, it seems not only a logical possibility, but a matter of empirical fact that, in some cases, a number of differences in respect of subvenient properties which are individually insufficient to give rise to perceptible differences in supervenient properties together add up to a supervenient difference (see the wine and pain cases).

3. Appeals to Extrinsicity

Another type of objection to my argument runs as follows: if X and Z differ with respect to S, it is, given transitivity, either the case that Z differs from Y with respect to S or that Y differs from X with respect to S (or both). So, we may take it that even if each of B_{XY} and B_{YZ} is individually insufficient to make up a difference with respect to S between X and Y and Y and Z, at least one of them is sufficient to make up such a difference *when the other difference is present*. The gist of this objection is then this:

Odiff: Although each of the differences B_{XY} and B_{YZ} are individually insufficient to make up a difference with respect to S between X and Y and between Y and Z, at least one of them can be sufficient to make up a difference with respect to S *when the other difference is present*.

My reply to *Odiff* is that, if the difference B_{XY} or the difference B_{YZ} (or both) is thought to be sufficient to make a difference with respect to S between X and Y or Y and Z (only) when the other difference is present, we should expect that the resulting difference in respect of S between, say, Y and Z is not an *intrinsic* difference, i.e., a difference that can be perceived to hold between Y and Z by perceiving only Y and Z and their proper parts. For the difference underlying this difference, namely, B_{YZ} when B_{XY} is also present is clearly an *extrinsic* difference between Y and Z, a difference which can be perceived to obtain only by

perceiving *something external* to Y and Z, namely X. Therefore, we should expect the same to be true of the difference in respect of the supervenient property between Y and Z which is assumed to obtain because of the difference as regards B between X and Y in addition to the difference between Y and Z.

In contrast, an intrinsic relation between Y and Z with respect to S supervenes upon B_{YZ} *alone*. According to observation, this relation is one of exact similarity. This is the relation my argument against the transitivity of being exactly similar with respect to S is about. That is, it is about a relation that holds intrinsically between its relata in the perceptual sense that one can perceive whether, e.g., Y and Z are exactly similar with respect to S by perceiving only Y and Z and their proper parts. But *Odiffo* postulates peculiar base properties, e.g., B_{YZ} when B_{XY} is also present. Now, it seems to me very doubtful that there are any such base properties that give rise to supervenient properties: we certainly do not observe these supervenient properties, e.g., a difference between Y and Z in respect of S. But even if there are such supervenient properties, they must surely be extrinsic, since the properties upon which they supervene are plainly extrinsic.

There is a similar objection which also tacitly appeals to extrinsicity. The core of this objection is that how, e.g., Y is with respect to S depends upon whether it is compared to X or Z. This objection explains how Y can be exactly similar as regards S to both X and Z, though they are not exactly similar to each other, by claiming that Y is not the same with respect to S when it is compared to X as when it is compared to Z.⁶ But if how Y is as regards S depends upon the object to which Y is compared, how Y is as regards S cannot be an intrinsic feature of Y as defined by me. It will be an extrinsic feature, dependent upon whether X or Z is the object of comparison. To find out how Y intrinsically is as regards S, you will have to perceive Y by itself. This is the feature with which my argument is concerned. But, according to this objection, this feature cannot show up both when Y is compared to X and to Z with respect to S. If that is correct, it is true that my argument against transitivity will be undercut. It does not follow, however, that transitivity is vindicated, for this objection suggests another argument against transitivity: if how Y is with respect to S as

⁶ This is a point Frank Jackson makes (1977: pp. 113-4).

compared to X must be distinguished from how Y is as compared to Z, there is no basis for any inference as to how X and Z are as regards S when compared to each other.

In opposition to this objection, I would however like to maintain that, although it may seem impossible that one and the same thing, Y's S-ness, can be exactly similar to both X's and Z's S-ness, when X and Z are different with respect to S, this is in fact not so. It is not impossible if how something intrinsically is with respect to S can remain the same, though the stimulation causing this varies within a certain range. For then the stimulation Y may lie within the same range as the stimulation X and within the same range as stimulation Z — at a point at which these ranges overlap — though X and Z do not lie in the same range.

Imagine, again, that it takes a difference of two units of stimulation for there to be any difference in respect of S (painfulness, say) and that X consists in one unit of stimulation, Y in two units and Z in three units. X is then S-in-virtue-of-one-unit, Y is S-in-virtue-of-two-units and Z is S-in-virtue-of-three-units. By hypothesis (since a one-unit difference in stimulation is insufficient to give rise to a difference as regards S), X and Y are qualitatively identical as regards S-ness, and so are Y and Z. Hence, being S-in-virtue-of-one-unit-or-two-units expresses one kind of S-ness, and so does being S-in-virtue-of-two-units-or-three-units. But being S-in-virtue-of-one-unit-or-two-units and being S-in-virtue-of-two-units-or-three-units does not express one kind of S-ness, since X which is S-in-virtue-of-one-unit and Z which is S-in-virtue-of-three-units differ in respect of S. Nevertheless, since Y is S-in-virtue-of-two-units, and this is a common element of the two disjunctive properties, Y is both S-in-virtue-of-one-unit-or-two-units and S-in-virtue-of-two-units-or-three-units. So, Y can after all exhibit only one kind of intrinsic S-ness and still be exactly similar in respect of intrinsic S-ness to both X and Z, though X and Z are distinct from each other as regards intrinsic S-ness.

4. An Attempted Parallel with Primary Properties

A further line of attack attempts to draw a parallel between exact similarity in respect of a supervenient property and exact similarity in respect of a property that is not supervenient upon any other properties in the object that possesses it. I shall call the latter properties *primary*.

Suppose that both X and Y and Y and Z are exactly similar with respect to a primary property, P. This is of course compatible with their being different with respect to other primary properties, -P. But no difference in respect of -P can make it the case that X differs from Z in respect of P since, by hypothesis, an object's having P is not supervenient upon its having some other property. Hence, if there is a difference between X and Z with respect to P, this must be explained by or grounded in there being a difference in respect of *this* property, P, between X and Y or Y and Z (or both). So, if no such differences between X and Y or Y and Z are observed, unobservable differences as regards P must be postulated.

Imagine that one observes a difference in *length* (weight, etc.) between X and Z, though according to our most accurate measurements of X and Y and of Y and Z, the members of each pair are equally long. Then, provided that the comparison of X and Z is correct, we are forced to conclude that there must be unobserved or unmeasurable differences *in length* between X and Y or Y and Z (or the particles constituting them and the spaces in-between these particles).

Could one not make the same move in the case of supervenient properties? This should not be confused with the objection codified by *Odiff*. Now we are not assuming, for instance, that the difference B_{YZ} when B_{XY} is also present is sufficient for a difference in respect of S, a difference which is not felt or noticed. We are rather assuming that B_{YZ} *by itself* could be sufficient for an unnoticeable or unfelt difference as regards S, e.g., as regards pain. Thus, the difference in pain between Y and Z could well be intrinsic. Derek Parfit seems to assume the existence of such unnoticeable differences as regards pain when he writes:

I believe that someone's pain can become less painful, or less bad, by an amount too small to be noticed. Someone's pain is worse, in the sense that has moral relevance, if this person minds the pain more, or has a stronger desire that the pain cease. I believe that someone can mind his pain slightly less, or have a slightly weaker desire that his pain cease, even though he cannot notice any difference (1984: p. 79).

We have assumed, with Parfit, that a sensation of pain becomes less painful "in the sense that has moral relevance", i.e., becomes less bad, when one has a weaker desire that it

cease. To fail to notice that one's desire that a pain cease has become weaker is then to fail to notice that the pain has become less painful and bad. Certainly, people can be suspected of sometimes making mistakes when they introspectively investigate their desires. For instance, somebody who sincerely reports not minding people of other races might be suspected of being mistaken if he is observed to avoid the company of such people. This is because the behavioural evidence contradicts his introspection.

But suppose instead that the behavioural evidence supports the introspective finding that there is no difference in respect of degree of being disliked between X and Y and between Y and Z: the subject does not show any sign of choosing one member of these pairs in preference to the other. Suppose, for instance, that he is simultaneously pricked by pins in his left and right hands, and both his introspective scrutiny and his behaviour support the view that there is no difference in his aversion to the two pains. Then it seems that there is no reason to hypothesize that the subject's aversion to one pain is stronger or weaker than his aversion to the other, and, hence, that one pain is for him worse or better than the other than that this case is parallel to a case in which the comparison concerns some primary property (and there is transitivity).

However, to assume that there *must* be such unfelt or unnoticeable differences as regards S between X and Y or Y and Z and, hence, that the difference B_{XY} or the difference B_{YZ} *must* be sufficient for a difference in respect of S because there is a difference between X and Z in respect of this property, would betray a misunderstanding of the nature of supervenient properties, of their dependence upon subvenient properties. For the difference in respect of S between X and Z can be explained in terms of the difference B_{XZ} , of this difference being sufficient to make up a difference in respect of S between X and Z, though the differences B_{XY} and B_{YZ} are not sufficient for a difference in respect of S. Therefore, a postulation of unobservable differences in respect of S between X and Y and between Y and Z is not necessary to make the difference between X and Z intelligible, as it is in the case of primary properties.

Now, if it is not *necessary* that there be a difference in respect of S between either X and Y or Y and Z when there is such a difference between X and Z, there is no transitivity with respect to S. Transitivity implies that it would be incoherent to assume that there is a difference in respect of S between X and Z, though there is no such difference between X

and Y or Y and Z. But this is not incoherent, since the difference between X and Z can be explained in terms of differences as regards the subvenient properties that, as a matter of definition, must underlie supervenient properties. So, there must be a difference like B_{XZ} to which an explanation of the difference in respect of S between X and Z can refer.

Furthermore, the postulation of such unfelt and unnoticeable differences in respect of S is not only redundant, but impossible, if S is a subjective property in the sense defined earlier, as painfulness presumably is. If pain by its nature is something that is felt by a subject, if its *esse* is *percipi*, it cannot have unfelt aspects. This rules out that my judgement that X and Y are feeling equally painful to me can be rejected because of differences in painfulness that are not felt by me. Moreover, it is difficult to see what sense could be given to the concept of dislike or aversion if it is not construed as something that entails either behavioural tendencies of withdrawal or differences of feeling. But in the cases we have considered, there are not, by hypothesis, differences of either kind.

When considering whether transitivity can fail with respect to pain and secondary qualities, like colours, it is vital not to imagine these qualities in isolation from their bases, e.g., to conjure up a line-up of one pain or colour which is indistinguishable from a second which in turn is indistinguishable from a third. For then non-transitivity appears inconceivable, since abstracting supervenient properties from their dependence upon bases effaces what distinguishes them from primary properties.

On the other hand, it should be emphasized that supervenient properties are distinct from their bases. This distinguishes them from the sort of unspecific or determinable properties — e.g., properties like being yellow or green and having some colour — that at the outset I disqualified from being supervenient by the requirement that a supervenient property must not be entailed by its base. Even so, exact similarity with respect to these particular properties is clearly not transitive. Imagine that X is a two-coloured object, both yellow and green. So are Y and Z. Imagine further that Y has the same yellow shade as X, but a different green shade, whereas Z has the same green shade as Y, but a different yellow shade. Then X and Y are exactly similar as regards both yellowness or greenness and some of their colours, and the same is true of Y and Z. But X and Z are not exactly similar as regards either of these properties.

In contrast, exact similarity with respect to the analogous property of weighing either 2 or 3 grams *is* transitive. So, this relation is not non-transitive with respect to all of these disjunctive, determinable properties. It seems to me that it is transitive when the alternatives are exclusive, but non-transitive when they are not exclusive (e.g., nothing can weigh both 2 and 3 grams, but something can be both yellow and green). But the important thing in this context is that the tight relation these properties have to their ‘bases’, i.e., the more determinate properties which entail them, disqualifies them from being supervenient. Otherwise, my thesis that exact similarity with respect supervenient properties is non-transitive would be falsified.

Instantiating these determinable properties is not ontologically anything over and above instantiating the more determinate properties which entail them. This is not to say that these determinable properties are not genuine properties. The property of, say, being yellow is determinable, too. Nothing is simply yellow: it is some specific shade of yellow. Being yellow is not a property that things have over and above a specific shade of yellow. Still, few would deny that it is a genuine property.

According to some metaethical theories, the relation between value properties and the properties they are supposed to supervene upon is entailment as in the case of the determinable properties under discussion. Thus, the relation would not qualify as supervenience in my understanding. It follows from what has been said that the relation of being exactly similar in respect of value properties, thus conceived, could be transitive. According to most metaethical theories, however, value properties have the ontological distinctness required by supervenience. Strictly speaking, it is only with respect to value properties, thus conceived, that my thesis implies that the relation of exact similarity is non-transitive.

5. Roughness and Precision of Comparison

Comparisons concerning supervenient properties may be rough. A comparison of value is rough, e.g., when you compare complex things which must be evaluated along several dimensions that have to be weighed against each other, especially if evaluation along each of these dimensions is not a straightforward matter. Suppose, for instance, that you were to evaluate the greatness of novelists that are very different as regards style, content etc., like

Joyce, Kafka and Proust. The judgement that these writers are equally great novelists is obviously rough. If you compare a long string of novelists who are only roughly similar, you may find each indistinguishable from the next and still end up with objects that are distinguishable because differences hid by roughness eventually mount up to noticeable differences. This is what the sorites type of argument exploits. Clearly, it is not to be expected that judgements of similarity under conditions of rough comparability ensure transitivity.

A comparison between two simultaneous stimuli in respect of painfulness and badness can clearly be more precise than such rough comparisons as between the aforementioned novelists. It seems that it can be as precise as any comparison of the value of two things can possibly be. If so, the outcome of this comparison in respect of painfulness and badness can be that one stimulus is *exactly* as painful and bad as the other, that there is *no* difference whatsoever between them *in respect of painfulness and badness*.

It may be objected that someone with more acute pain receptors than mine could feel a difference between the stimulations X and Y (and Y and Z), though I do not. True, but this does not show that there is any difference between the pains *I* am feeling when I am stimulated by X and Y. Furthermore, consider a creature whose pain receptors are as acute as the laws of nature permit. Even for this creature there is likely to be minute differences in physical stimulation between which it could not distinguish, and these could add up to differences between which it could distinguish. This would be so, though there is no creature who could distinguish between stimulations between which this creature could not distinguish and the comparisons it makes with respect to painfulness are as exact as such comparisons can be. Therefore, the cases we have considered are not to be viewed as instances of a sorites paradox in which unfelt or unnoticeable differences in respect of a feature add up to a difference that is felt and noticed.⁷

Another objection is that the comparison between, e.g., the stimuli Y and Z in respect of painfulness is not as exact as it can be if only Y and Z themselves are considered; it can be made more exact by comparing them to something else such as X. Then, it may be said, the difference between Y and Z in respect of painfulness is revealed. In reply note, first, that

⁷ It is agreed that sorites paradoxes are fallacious arguments because they lead to conclusions that are clearly false — e.g., that something which is manifestly a heap is not a heap — though it is debatable exactly where they go wrong.

this objection makes the question-begging assumption that transitivity holds. Secondly, this objection is at odds with the intuition that exact similarity in intrinsic respects between two entities, like Y and Z, is an *intrinsic* relation between them such that it is possible to determine whether it holds between them by examining only Y and Z (and their proper parts), and nothing external like X. This is how we could understand the relation in the case of intrinsic primary properties without getting non-transitivity as a result. So, if it is conceded that we could not understand the relation in the same way as regards supervenient properties without getting non-transitivity, the disanalogy between supervenient and primary properties which I aim to establish has been conceded.

The objection under consideration can however be understood as claiming that Y's and Z's different relations to X only provide *evidence* of unnoticed intrinsic differences between Y and Z as regards painfulness, not that it is *constitutive* of Y and Z being exactly similar as regards painfulness that it is true of everything, W, that if either Y or Z is exactly similar to W as regards painfulness then the other is also exactly similar to W as regards painfulness. It is hard to see how it could be constitutive of Y's and Z's being exactly similar in respect of painfulness that they have the same relations in respect of painfulness to other things, unless the relevant respect of painfulness is construed non-intrinsically or externally, as involving relations to other things. On the other hand, if Y's and Z's relations to other things in respect of painfulness is construed merely as empirical evidence, the objection instead falls prey to counterarguments given in section 4. Such evidence only warrants the postulation of differences in the supervenience bases that are sufficient to explain the relations at the supervenient level.

It must however be granted that comparisons with respect to some primary properties may be more precise than comparisons with respect to supervenient properties. This is why they may throw up differences in respect of such properties in the bases underlying indistinguishable supervenient properties. But, as we have seen, this does not imply that there are after all differences *as regards the supervenient properties* or that the comparison with respect to these properties is not as precise as it could be. Thus, the source of the relevant non-transitivity is not that we are dealing only with rough similarity which leaves room for some unrecognized differences as regards the properties compared.

6. Conclusion

I see no way to resist my argument to the effect that the relation of exact similarity with respect to properties that are supervenient in the sense specified is non-transitive. This conclusion places us in a dilemma as regards properties like value properties and secondary qualities: we must reject either the idea that they are supervenient in this sense or the idea that the relation of exact similarity is transitive as regards them. We can reject the first idea by claiming either that (a) these properties are supervenient in some other sense or that (b) they are not supervenient at all. Alternative (a) could be defended by claiming that the concept of supervenience entails that there are differences in supervenient properties whenever there are differences in their bases. A defence of alternative (b) could maintain that so-called supervenient properties are definable in terms of their bases. The latter alternative seems the more plausible one, though to my mind it, too, has little plausibility. However, it is part of my claim that any property is supervenient.

Finally, I would like to mention that for value, whose supervenience is more firmly entrenched, my argument against the transitivity of exact similarity could be extended into an argument against the transitivity of the relations *intrinsically better/worse than* (all things considered). Imagine, for instance, that the painful stimulation Y is slightly shorter than X, though there is no difference in the felt intensity of the pain. Then Y is intrinsically better than X. If the same is true of Y and Z, Z will be intrinsically better than Y. Still, it might be that Z is not intrinsically better than X because Z is felt to be more intense than X, and this outweighs the longer duration of X.

Alternatively, we may imagine that X is minimally less painful than Y but that Y is markedly shorter than X. The same goes for Y and Z. Then Y may be intrinsically better than X and Z may be intrinsically better than Y because the greater difference in duration outweighs the smaller difference in intensity. Yet, it may be that Z is not intrinsically better than X because, owing to unmanifested differences in the subvenient properties, the difference in intensity between X and Z may be greater than the sum of the differences in this respect between X and Y and Y and Z. Therefore, it is possible that the difference in intensity between X and Z in X's favour outweighs the difference in duration in Z's favour.

In the case of both examples, non-transitivity may come out as more plausible if the series are made longer.⁸

Initially, it may strike one as impossible that *intrinsically better/worse than* and *intrinsically as good/bad as* are non-transitive. Similarly, it may initially strike one as impossible that there are so-called non-transitive dice, such that, over a long sequence of throws, X beats Y, Y beats Z, but Z beats X. But once we are given a mathematical explanation of how this is possible, this resistance disappears, and we have no greater difficulty to deal with such dice than, say, to play rock, paper and scissors. (Suppose, for instance, that the six faces of X are 3, 3, 5, 5, 7, 7, of Y 2, 2, 4, 4, 9, 9 and of Z 1, 1, 6, 6, 8, 8; then X will beat Y 5/9 of the time and the same goes for Y and Z, and Z and X.) In the light of the explanations here given, I think we could likewise learn to accept the non-transitivity of *intrinsically better/worse than* and *intrinsically equally good/bad as*. This is crucial for the treatment of certain moral problems, such as what Parfit has called the repugnant conclusion (1984: chap. 17) and the fact that we can together make things better or worse, though the contribution of each of us makes no evaluative difference (1984: pp. 78-80).⁹

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⁸ Cf. the arguments against transitivity that have been presented by Stuart Rachels (1998) and (2001) and by Larry Temkin (1996).

⁹ This paper has been presented at Rutgers University, University of Massachusetts at Amherst, Gothenburg University and University of Copenhagen. I wish to thank these audiences for valuable comments. Special thanks are however due to Roger Crisp, Fred Feldman, Chris Heathwood, Kris McDaniel, Derek Parfit, Wlodek Rabinowicz and Larry Temkin.

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