

All Relations Are Internal – the New Version

English version of “Toutes les relations sont internes – la nouvelle version,” *Philosophiques* 38 (1/2011), pp. 219-39; also in Anne Reboul (ed), *Philosophical Papers Dedicated to Kevin Mulligan* < <http://www.philosophie.ch/kevin/festschrift/> > (2011).

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1. The Bradley thesis and the Mulligan thesis

Bertrand Russell’s criticism of F. H. Bradley’s view that all relations are internal is one of several hallmarks in the birth of analytic philosophy. In his 1910-11 papers on external relations, Russell is somewhat unclear about whether he wants to claim only that there are *some* external relations, or if he wants to claim that all relations are external (Russell 1992a,b); but at least in a 1924 paper it becomes clear that he means only the weaker claim (Russell 2004, p. 335).¹ Bradley, however, is clear that there are no external relations at all.² To both Bradley and Russell their dispute had far-reaching ontological consequences. They took Bradley’s view to imply ontological monism and Russell’s ontological pluralism. If all relations are internal then, one might argue, what appear to us in perception and first reflections to be a plurality of different entities is after all only aspects of one single indissoluble all-embracing unity. Now, Bradley meant that the view that all relations are internal is only the best we can get in thought; reality as an all-embracing unity transcends thought and is inexpressible. Therefore, it can also truly be said that Bradley was of the opinion that at bottom there are no relations, only the absolute unity known from religious mysticism (Candlish and Basile 2009, sect. 6).

As far as I know, no analytic philosopher has tried to stage a comeback for Bradley’s monism, but Kevin Mulligan has from an ontological-pluralist position argued that all relations are “thin” and internal; and that none is “thick” and external.³ This means, he says:

a vindication of a view near the heart of the pre-Russellian philosophy of relations, but a vindication that detracts not a jot from the discovery of the logic of relations nor from the claim that relations are irreducible. (Mulligan 1998, p. 326)

Mulligan is a trope nominalist that believes in the existence of atomistic monadic tropes (property instances), but he also accepts relational tropes in the spatiotemporal world; if only they are “thin.” He puts forward his view on relations in the paper “Relations – Through Thick and Thin” (1998), but the view is fore-shadowed in his “Internal Relations” (1993). In meta-ethics, concepts such as ‘good’, ‘right’, and ‘ought’ are called thin, whereas concepts such as ‘courageous’, ‘generous’, and ‘nasty’ are called thick.

Remarkably, I would say, Mulligan’s radical and original view has received very little attention.⁴ In Section 3, I will extensively present his notions of ‘thin’ and ‘thick’, but let me nonetheless at once use

¹ It can be noted that Russell’s 1903 criticism of Bradley in *The Principles of Mathematics* (2006) does not contain the distinction between external and internal relations, and that G. E. Moore’s famous paper “External and Internal Relations” (1960) is from the early twenties.

² “I do not admit that any relation whatever can be merely external and make no difference to its terms (Bradley 1908, p. 575).”

³ Let it be added, though, that he cautiously calls his view a “suggestion” and “speculative”; furthermore, he ends the paper by saying that “we may well find ourselves on the slippery slope towards either conceptualism or eliminativism about relations” (Mulligan 1998, pp. 326, 327, and 350, respectively).

⁴ I know only of two papers where his view is discussed, not only mentioned. In the first, D. v. Wachter (1998) argues that if all relations are internal (with which he agrees) then there are no relations, since internal relations do not (contra Mulligan) add anything to being; in the second, K. Trettin (2004) speaks positively of how Mulligan analyzes relations by means of ontological dependence relations, and she supports (contra Wachter) the view that there can be relational tropes. I will not discuss this issue, where I side with Mulligan and Trettin; see (Johansson 2012).

them in order to state what my main criticism will amount to, and say something about the relationship between Bradley's thesis and Mulligan's thesis.

Explicitly, Mulligan states that (i) "all the thin relations I appeal to can be characterized as internal relations (1998, p. 327)"; implicitly, he seems to be of the opinion that (ii) all external relations are thick relations. Of course, (iii) no relation should be regarded as being both thin and thick, or (iv) both internal and external. From a purely logical point of view, the conjunction of the propositions (i) to (iv) do not imply that there are no *thick internal relations*, and I will in Section 5 argue that in fact there are. Mulligan, however, thinks there are none, and claims that "in every case [of a thick relational predicate], the real truth-maker is a thin relation (1998, p. 333)." This means that even though I think Mulligan is right in his claim that all thin relations are internal, I think that thin relations and internal relations cannot be identified. Therefore, I can claim that I, not Kevin Mulligan, am the one who really is in favor of relations "through thick and thin."

Since Bradley is an ontological monist and Mulligan a pluralist, there must be some difference in the way they defend the view that all relations are internal. In my opinion, one difference goes back to an ambiguity in the characterization of internal relations (about this, see the end of Section 3) and another difference is that Mulligan is clear about the differences between (a) relations, (b) monadic/intrinsic properties, and (c) relational properties, whereas Bradley sometimes confuses the last two. Before I start my presentation and discussion of Mulligan's views, I will at once spend some words on the second difference.

At least at the time of the debate with Bradley, Russell wanted to get rid of modal talk, but in this, like many others, Mulligan included, I will not follow suit in the whole paper. In 1911 Russell writes:

This doctrine [that relations are external] is not correctly expressed by saying that two terms which have a certain relation might have not had that relation. Such a statement introduces the notion of possibility and thus raises irrelevant difficulties. The doctrine may be expressed by saying that (1) relatedness does not imply any corresponding complexity in the *relata*; (2) any given entity is a constituent of many different complexes. (Russell 1992b, p. 128)

Point (1) is directed at Bradley who says that "a relation must at both ends affect, and pass into, the being of its terms (1908, p. 364)." In his direct reply to Bradley in 1910, Russell defines 'external relation' as follows:

I maintain that there are such facts as that x has the relation R to y , and that such facts are not in general reducible to, or inferable from, a fact about x and a fact about y only; they do not imply that x and y have any complexity, or any intrinsic property distinguishing them from a z and a w which do not have the relation R . This is what I mean when I say that relations are external. (Russell 1992a, p. 355)

Let me illustrate; let x be a first green trope (or color spot) g_1 , y a first brown trope b_1 , and R a spatial distance of 5 meter between the tropes. No physical law or logical impossibility seems to stop the world from containing also a second green trope g_2 (z) and a second brown trope b_2 (w) that are only 3 meters apart. According to Russell's definition of external relation, this means that the relations *5 meters apart* and *3 meters apart* are external relations – with *relata* that have no internal complexity. On the other hand, the relation *being of the same color as* that holds between g_1 and g_2 as well as between b_1 and b_2 is, according to the definition, not an external relation. Anyone who accepts the existence of tropes or property instances has to admit all that.

Next, let me for the sake of exposition make the assumption that space is what it is assumed to be in Newtonian physics, i.e., a passive receptacle that in principle could have been empty. This means that there are relational properties in the situation at hand. Each of the simultaneously existing four tropes has a specific relational property to a region of space. Assume that g_1 has the relational property of *occupying region r_1* , g_2 the relational property of *occupying r_3* , b_1 that of *occupying r_2* , and b_2 that of *occupying r_4* . Now, if (wrongly) these four different relational properties are regarded as being intrinsic properties of the tropes in question, then g_1 (being in r_1) and g_2 (being in r_3), on their part, and b_1 and b_2 , on theirs, are not completely qualitatively identical. And this means that the relations

5 meters apart and *3 meters apart* do not come out as being external relations. Not keeping a thing's intrinsic properties and relational properties clearly distinct, and (because of this) not allowing space to be regarded as a passive receptacle that does not affect its relata, is one of Bradley's mistakes; and one that to my mind Russell never really pin-points.

In my symbolism, Mulligan's analysis of the described situation looks like this. First, there are four cases of the relation of (simultaneous) occupation, *O*, i.e., *relations*, not intrinsic properties or relational properties: g_1Or_1 , b_1Or_2 , g_2Or_3 , and b_2Or_4 , respectively. Second, there are thin and internal distance relations between all the different spatial points and regions; the two relevant ones can be symbolized as $r_1D_1r_2$ and $r_3D_2r_4$, respectively. The fact that g_1 has the relational property of *being five meters (D_1) from b_1* can from a Mulliganian ontological point of view best be described by the conjunction $g_1Or_1 \ \& \ b_1Or_2 \ \& \ r_1D_1r_2$. Now, if Mulligan can show that *occupation*, just like spatial distance, is an internal relation, he has with respect to this example shown that only internal relations are involved. I will in Section 4 return to this question.

It should be noted what happens in the case above if the four tropes are exchanged for four enduring colored leaves that can change color; call them G_1 , B_1 , G_2 , and B_2 . With respect to the relations *5 meters apart* and *3 meters apart*, it doesn't matter whether the relata are the tropes or the leaves. According to the definition of external relation, the distance relations in question are in the case of both kinds of relata external relations. But with respect to the relation *having (being of) the same color as* this is not the case. When the relata are g_1 and g_2 (or b_1 and b_2) the relation is internal, but when the relata are the enduring leaf entities G_1 and G_2 (or B_1 and B_2), it is external. Why? Answer: if G_1 is green as long as it endures, but G_2 after some time changes color to red, then *having the same color as* cannot be regarded as an internal relation between G_1 and G_2 .

Since the relation *having the same color as* can be a relation between two entities only if these have a color, it brings clarity to the discussion if one calls the property instances (tropes) of the leaves the 'primary relata' of the relation in question, and the leaves themselves 'secondary relata' of the relation. One can then state a general truth: the relation *having (being of) the same color as* is always internal with respect to its possible primary relata, but it may be external with respect to secondary relata.

Let me now for the moment leave Bradley and Russell, and turn to Mulligan and his ontologically pluralist view that all relations are internal. During the presentation and discussion I will, among other things, use four distinctions that I think seldom are given due importance. Therefore, I would like to highlight them at once (the first two distinctions I have already used). They are:

1. Relations vs. relational properties
2. Primary vs. secondary relata of relations
3. Strongly vs. weakly internal relations
4. Determinate vs. determinable properties and relations.

I will in all that follows accept Mulligan's presupposition that there are tropes, even though, in contradistinction to Mulligan, I am convinced that there are both tropes and universals (Johansson 2009a); for such a view see also E. J. Lowe (2006). However, my belief in the necessity of postulating both tropes and universals is of no consequence for the arguments I shall put forward. Moreover, Mulligan seems to accept a (thin) relation of exemplification, and this relation can take care of the relationship between a universal and its instances (tropes).

2. Relations as truth-bearers and as truth-makers

Mulligan takes it for granted not only that there are tropes, but also that one has carefully to keep truth-bearers and truth-makers distinct;⁵ and with this assumption I agree without any qualifications. His thesis can then be stated thus:

- There are thick relational predicates and, because of this, thick relational truth-bearers, but there are no thick relational truth-makers, only thin ones.

⁵ I am using hyphens since Mulligan is using hyphens.

There are three structurally similar claims that I would like to present, too. They align well with Mulligan's views (1998, pp. 332–33, 349):

- a) Where there is a relational truth-bearer there may be no relational truth-maker at all;⁶ example: the truth-bearer 'the morning star = the evening star' has as a truth-maker only the object Venus.⁷
- b) Where there is a truth-bearer with a thick monadic property predicate there may be a relational property as a truth-maker; example: the truth-bearer 'Sam is 2 meter tall' has as truth-maker the state of affairs that Sam's length trope is two times that of the standard meter.
- c) Where there is a truth-bearer with a relational property predicate there may be only monadic properties and a relation as truth-makers; example: the truth-bearer 'Sam's length trope is two times that of the standard meter' has as a truth-maker the state of affairs consisting of (i) Sam's length trope, (ii) the length trope of the standard meter, and (iii) the length relation between the tropes.

In point c), the relational property mentioned in point b) is reduced away. And as far as I can see, if Mulligan's analysis of relations is true, this must always be the case for relational properties. That is, even though truth-bearers can have relational property predicates as parts, there can be no truth-making relational properties, not even thin ones; there are only monadic properties and thin relations.

3. Thin and thick relations

I have already mentioned the relationship between Mulligan's thin–thick distinction and the internal–external distinction. There are two other distinctions that are close to Mulligan's correlative thin–thick construal: formal–material and topic-neutral–topic-partial. However, he rejects an identification of thin–thick with either of them. He relies wholly on a characterization by enumeration. His list of thin relation predicates and corresponding thin relations is finite. Here is his list of thin relations:

identity
resemblance
greater than/lesser than/same as
distance
dependence
entailment
justification
exemplification (1998, p. 342)⁸

His list of thick relation predicates is in principle infinite, and his examples (all listed below) show why; it is in each case easy to fill in new relational predicates for the 'etc.' sign that I have added. Mulligan divides many of the thick relation predicates into three groups. In the list below, his groups are the first three ones; the other two groups are creations of mine ('–' is a variable for relational expressions):

1. Comparative thick relational predicates:
'–is happier than–', '–is heavier than–', etc.

⁶ For the view that *no* relational truth-bearer has a relational truth-maker, see (Wachter 1998) and (Heil 2009); for the falsity of this view, see (Johansson 2012).

⁷ If the example is analyzed as Frege wants, i.e., that the sentence claims that the two names refer to the same object, then one should perhaps say that the truth-maker is not only Venus, but also two name-named relations. This does not affect Mulligan's main thesis, since the naming relation can be regarded as a thin relation.

⁸ He also mentions two other thin relational predicates, '–inheres in–' and '–is between–and–' (1998, p. 327), but he seems to regard these as reducible to the relations of *dependence* and *greater than/lesser than*. Also, he seems to regard *greater than* and *lesser than* as two distinct relations, but I think there is only one relation referred to by the two converse predicates '–greater than–' and '–lesser than–' (Johansson 2011). In his so-called 'The 1913 Manuscript', Russell is of the same opinion (Russell 1992, pp. 86–87).

2. Social thick relational predicates:
 ‘–is married to–’, ‘–interrogated–’, ‘–beat (in a game)–’, ‘–voted for–’, ‘–owns–’, ‘–is legal tender in–’, ‘–promises–’, ‘–orders–’, ‘–declares–’, etc.
3. Behavioral thick relational predicates (that need not be social):
 ‘–kills–’, ‘–loves–’, ‘–gives-to–’, ‘–prefers-to–’, ‘–hits–’, ‘–fled–’, ‘–kisses–’, etc.
4. Other thick relational predicates:
 ‘–causes–’ and ‘–intentionality–’.
 (The latter predicate is short for ‘–has an intentional act directed at–’; it subsumes predicates such as ‘–sees–’, ‘–sees that–’, ‘–believes that–’, which means that the intentionality talked about can be either non-conceptual, as in seeing, or conceptual, as in believing.)
5. Especially problematic thick relational predicates:
 ‘–is to the north of–’, ‘–is located at–’, ‘–is part of–’, ‘–occupies–’.

To start with, let me say that I agree with Mulligan that there really is a kind of deep divide between his examples of thin and thick relational predicates, respectively; a divide that makes the connotations of the terms ‘thin’ and ‘thick’ fit well. Let me next very briefly sketch how he analyzes the first four groups; analyses with which I am quite sympathetic. Crucial is one of the thin relations mentioned, the dependence relation. The fact that x depends on y can be captured by locutions such as ‘ x cannot exist unless y exists’ (Correia 2008, p. 1014; but he wants it qualified) and ‘necessarily, x exists only if y exists’ (Lowe 2005, sect. 1).

Look now at the first group and the truth-bearer ‘Mary is happier than Erna’; and let me use the distinction between primary and secondary relata in order to present Mulligan’s position. The primary relata are Mary’s happiness and Erna’s happiness, and the secondary relata are Mary and Erna. The truth-bearer sentence is in fact ambiguous. Does it mention the primary or the secondary relata of the *happier than* relation?

When it mentions the primary relata, Mulligan says that the truth-maker consists of three parts: (i) the two thick happiness tropes in question, (ii) the thin and internal relation *greater than*, and (iii) a thin and internal *dependence* relation between the thin relational trope *greater than* on the one hand and the two thick monadic tropes on the other. When it mentions the secondary relata, he says there is an external relation (1998, p. 345) – but without saying anything else and without explaining in what way this external relation disappears in the complete picture. The simplest thing to do would have been to explicitly qualify his general thesis that all truth-maker relations are thin and internal and claim only:

- All truth-maker relations are thin and internal with respect to their primary relata.

The analysis made of the truth-bearer ‘Mary is happier than Erna’ has a structure that can easily be applied to all corresponding two-term comparative thick relational predicates R :

- If the truth-bearer aRb mentions the primary relata of the comparative relation R , then the truth-maker consists of (i) a and b , (ii) the relation *greater than*, *lesser than*, or *same as*, and (iii) a *dependence* relation between this relation and the pair a and b .

When analyzing the second group, that comprising social thick relational predicates, Mulligan brings in John Searle’s analysis of social facts (Searle 1995). Searle claims that social-institutional facts are constituted by collective intentionality. If, for instance, it is true that Sam is married to Mary, this is so only because a certain kind of behavior is collectively regarded as a marriage. Social-institutional facts exist because we believe they exist, and they require conceptual intentionality. Mulligan’s move is then to claim that the relational predicate ‘–intentionality–’ has only thin truth-makers, in particular, the relation of *dependence*.

Mulligan makes his case about intentionality mainly by analyzing the veridical perception described by ‘Sam sees Mary’. Disregarding at first causal theories of perception, he claims that the

truth-maker is (i) Sam's visual content and (ii) either a relation of *dependence* or one of *justification* between this visual content and Mary. The first truth-maker part is not a relation, and the relations in the second part are thin relations. The same analysis structure is then extended to '–sees that–' and '–believes that–', where conceptual intentionality comes in.⁹ His general view might be put like this:

- If the relational predicate R in the truth-bearer aRb is a social thick relational predicate, then the truth-maker consists of (i) a , b , and some intentional acts of at least a , and (ii) a number of *dependence* (or *justification*) relations between relevant concepts, their referents, and a collective of which at least a is a member.

The first step in Mulligan's analysis of the third group, behavioral thick relational predicates, is to claim that all of them in some way or other fall back on the predicate '–causes–'. The second step is to claim that the truth-makers for '–causes–' seem in fact on opposite philosophical views of causality always to be thin relations. (Note: this view takes care also of causal theories of perception.) If Hume's analysis of the relation of *causality* is true, then Mulligan retorts: "Mere co-existence or co-occurrence is a thin relation if anything is (Mulligan 1998, p. 340)." If, on the other hand, *causality* is regarded as a type of necessary co-occurrence, then, Mulligan says, it seems to be reducible to a number of *dependence* relations between events, processes, episodes and/or states. (I would add that some specific spatiotemporal relations are needed, too, but be this for the moment as it may.) With respect to non-Humean analyses of causality, the general structure of Mulligan's view might be put like this:

- If the relational predicate R in the truth-bearer aRb is a behavioral thick relational predicate, then the truth-maker consists of (i) a , b , and some of their property instances, and (ii) a number of *dependence* relations between these.

Very briefly stated, and some qualifications aside, Mulligan thinks that the thick relational predicates of groups two and three fall back on the two relational predicates of group four ('–causes–' and '–intentionality–'), and that these can be shown to denote only thin and internal relational truth-makers; in particular, the relation of *dependence*.

Let me now return to the difference between Bradley and Mulligan. Mulligan defines internal relations as follows:

we may say that a relation is internal with respect to objects, a , b , c etc., just if, *given* [italics added] a , b , c etc., the relation must hold between and of these objects. (1998, p. 344)

In the first of my Russell quotations, Russell speaks of (but dismisses) two-term external relations as relations where "two terms which have a certain relation might have not had that relation." If, contrary to Russell, such modal talk is accepted, we get by exchanging 'might have not' ('possibly not') for 'necessarily' ('not, possibly not') the definition of (two-term) internal relations which Mulligan, David Armstrong (1978, 1997), and most contemporary analytic philosophers use: a relation is internal iff, necessarily, *given* the relata a and b , then aRb . That is, two-term internal relations are relations where two already given relata that have a certain relation, necessarily have that relation. But I think Bradley had a stronger characterization in mind, one that comes close to the *dependence* relation that Mulligan works with.

Surely, Mulligan's *dependence* relation is an internal relation according to the definition given, but it is stronger: a depends on b iff, necessarily, a exists only if b exists. The first relatum cannot exist if the second does not; and this is not necessarily the case with the relata mentioned in the definition of internal relations. In my opinion, Bradley argues that monadic properties *depend* on relations and that relations *depend* on monadic properties, i.e., that monadic properties and relations are *mutually*

⁹ This analysis makes it possible to claim that the order or direction that is part of the meaning of the social relational predicates does not correspond to anything in a relation, not even a thin one, but to something in the first relatum. I have argued in favor of such a view (Johansson 2010b), but Mulligan does not touch upon this issue.

dependent on each other. He does not claim only that, *given* monadic properties (tropes) and relations there must be, in turn, relations between these. In order to clearly see everything at stake here, I think the contemporary notion of ‘internal relation’ should be divided into two sub-notions: ‘strongly internal relation’ and ‘weakly internal relation’, respectively. They can be defined as follows.

- There is between *a* and *b* a strongly internal relation iff, *a* cannot exist if *b* does not exist, and vice versa.
- There is between *a* and *b* a weakly internal relation *R* iff, *a* and *b* can exist independently of each other, but if both exist then, necessarily, *aRb*.¹⁰

Looking at Mulligan’s examples of thin internal relations, it is clear that at least *resemblance*, *greater than*, *lesser than*, and *same as* are weakly internal relations. To use my earlier examples, necessarily, the green trope *g*₁ *resembles* the green trope *g*₂, but the tropes can exist or not exist independently of each other; similarly, given the natures of Mary’s and Erna’s states of happiness, necessarily, Mary’s happiness is *greater than* Erna’s happiness, but the two happiness states might exist independently of each other. The view that all internal relations are strongly internal relations leads to ontological monism, but the view that many internal relations are only weakly internal is compatible with ontological pluralism. It is essential to Mulligan’s view that he allows weakly internal relations; and this fact should be noted.

So far so good, I am prepared to say, but let us now look at the relation of *occupation*.

4. The problematic relation of occupation

Already Bradley was clear about the central place that spatial relations between entities must be afforded in discussions about internal and external relations, and Mulligan is of the same opinion. Bradley writes:

At first sight obviously such external relations seem possible and even existing. They seem given to us, we saw, in change of spatial position and again also in comparison. That you do not alter what you compare or re-arrange in space seems to Common Sense quite obvious. (Bradley 1908, p. 575).

In his fifth group of relational predicates, Mulligan regards ‘–occupies–’ as the basic predicate. If (to take the other predicates) *a* is to the north of *b*, then *a* occupies one spatial region and *b* another; if *a* is located at a certain place, then *a* occupies a spatial region; and if *a* is part of *b*, then *a* occupies one spatial region, *b* another, and the latter region has the thin relation of *greater than* to the former. About *occupation* Mulligan says:

Unfortunately, as we saw, the relational predicate “occupies” does not seem to have any internal relation as its semantic value. Occupation is an external relation through and through, the very model of an external relation, and mentioned so often by Russell for just that reason. [...] However, there are two ways of dissolving the external relation of occupation. (1998, p. 345)

In his attempted dissolving, Mulligan for some unexplained reasons takes it for granted that the relation of external relations must be enduring things. As is clear from my introductory example about the tropes *g*₁, *b*₁, *g*₂, and *b*₂, I tend toward another opinion, namely that (thin) external spatial relations between tropes are possible. I will not, however, dwell on this issue.¹¹

The “two ways of dissolving” talked about in the quotation are two different ways of claiming that in fact there are no enduring things/substances. Seemingly enduring things must be regarded either as

¹⁰ I have earlier made this distinction (Johansson 2004 [1989], chs. 8–9), but then in terms of ‘internal relations’ (= strongly internal) and ‘grounded relations’ (= weakly internal). However, since the wide definition of ‘internal relation’ has become the predominant one, I think the new name proposals are better.

¹¹ Mulligan could retort that spatial *relational property predicates* such as ‘–occupies *r*_{*n*}’ must, when applied to tropes, be regarded as representing something that is part of the identity of the tropes in question.

space-time worms or as so-called *entia successiva*, i.e., as a number of succeeding temporary substances. And in either case, Mulligan says, *dependence* relations are enough to explain the seeming existence of enduring entities. The conclusion is: since there is nothing that can be related in external relations, there can of course be no external relations. Again, I will without argument state dissent; I think we cannot make ontological sense of everything in our spatiotemporal world without postulating a number of enduring entities, both kinds of things and kinds of persons.

Mulligan is quite clear about the metaphysical cost of his analysis of the relation of *occupation*: “Each of these two ways of dissolving occupation involves rejecting what seems to be an assumption of naive physics, that there are enduring substances (1998, p. 346).” That is, despite his ontological pluralism, Mulligan’s view that all relations are internal has, like Bradley’s, ontological consequences that run counter to common sense. Also, let it be noted, if Mulligan’s analysis of *occupation* is not valid, then neither is his analysis of *causality*; both causes and effects occupy spatiotemporal regions.

5. Thick internal relations

Accepting and using Mulligan’s very distinction thin–thick, I will now claim and argue that not all internal relations are thin; there are thick internal relations, too. My claim affects only four of the thin relations he lists: *resemblance*, *greater than*, *lesser than*, and *same as*. I will (leaving *lesser than* and *same as* aside) argue that there are thick internal *resemblance* relations and thick internal *greater than* relations. Both these relations (as well as *lesser than* and *same as*) are weakly internal relations, whereas the other relations in Mulligan’s list of thin relations seem to be strongly internal relations; at least if also a notion of one-sided strongly internal relation is introduced. Therefore, I can agree with Mulligan on a qualified view that is entailed by his general views:

- All strongly internal relations are thin relations.

It has often been remarked that *resemblance* is always *resemblance in a certain respect*, and I will later comment on this view. But for the moment I will simply assume that this is true. There can be resemblances between weights, between areas, between temperatures, between colors, between shapes, and so on, but not resemblances across these “respects.” For instance, no weight resembles a temperature, and no color a shape. To this view, it is often objected that we do distinguish between warm and cold colors, and that therefore one should be cautious when claiming what I have claimed. But I disagree; no one has ever seriously tried to measure the warm-cold dimension of color hues in degrees Celsius, Fahrenheit, or Kelvin. Rather, one should be semantically cautious, and not be too quick to assume that there is no distinction at all to be made between the literal (prototypical) meaning and metaphorical (non-prototypical) meanings of words. Only temperatures can resemble temperatures, and only colors can resemble colors, but some colors can nonetheless become associated with some temperatures; the relations of *resemblance* and *association* are different relations.

If it is true that *resemblance* is always *resemblance in a certain respect*, it must also be true that *greater than* is always *greater than in a certain respect*. Let it not be misunderstood; I think there are abstract objects *resemblance simpliciter* and *greater than simpliciter*, but I do not think that they can have exemplifications in the spatiotemporal world without being tied to a so-called ‘respect’. Try to pick out two spatiotemporal entities where one is *greater than* the other without thinking of the respect in which the relation holds; I find this impossible.

Whereas the relational predicates ‘–resembles–’ and ‘–is greater than–’ are thin predicates, the relational predicates ‘–resembles–with respect to X’ and ‘–is greater than–with respect to X’ must be deemed thick relational predicates; X being just the name of an arbitrary respect such as color, weight and temperature.

Think now of the truth-bearer expressed by the sentence ‘the water temperature (*a*) is colder than the air temperature (*b*)’; and assume that the sentence is used in such a way that it is true. Question: can its truth-maker be only the state of affairs consisting of *a*, *b*, and the thin relation *greater than*? Answer: no, it cannot, because it is then not ascertained that *greater than* has the temperature respect instead of other respects such as weight and volume that cannot connect temperature tropes. The truth-maker must consist of *a*, *b*, and the thick relation *greater than with respect to temperature*. I hope that, without further examples, it can be seen that a structurally similar kind of remark can be made in relation to quite a number of truth-bearers such as ‘*a* is heavier than *b*’, ‘*a* is longer than *b*’, ‘*a* is

brighter than b ', ' a is harder than b ', etc. In the cases mentioned, the respects are, in turn, weight, length, light intensity, and hardness.

As I have tried to make clear in two other papers, the truth-maker fact just highlighted is not only a fact to take into account in subtle ontological discussions; it is very important both to the philosophy of science (Johansson 2009b) and to metrology, the science of measurement (Johansson 2010a). Without relations such as *greater than with respect to X* there would be no metric or ordinal measurement X-scales at all, only classifications by means of names. And without relations such as *exact resemblance with respect to X*, it would be impossible to use a measurement scale on two different occasions, and truly claim that if the measurement values are the same then the objects measured have the same determinate property.

What I have so far called a 'respect' is normally called a 'determinable' (Sanford 2006). The determinable–determinate distinction and the genus–species distinction have certain features in common, but they also differ importantly, which makes the term 'determinable' (or synonymous expressions) necessary. Let me mention the similarities first. Necessarily, if there is a scarlet trope, then there is a red trope, and if there is a red trope, then there is a color trope; necessarily, if there is a cat, then there is a mammal, and if there is a mammal, then there is an animal. Conversely, necessarily, if there is a color trope, then it has to have a certain determinate color hue; necessarily, if there is an animal then it has to be of a specific species.

The difference between the distinctions is that whereas mammals can be defined as animals that have certain specific properties, and cats be defined as mammals with certain specific properties, red cannot be defined as colors that have certain properties (red is not a property of color), and scarlet not as red that have certain properties (scarlet is not a property of red). Species have properties by means of which they can be characterized, but determinates can only be characterized by means of resemblance relations to other determinates.¹²

In this terminology, one of my claims is that the basic scales of mathematical physics cannot be understood without thick internal relations such as *greater than with respect to the determinable X* and *resemblance with respect to the determinable X*. In some way or other the unity behind a scale has to be explained. As I have already pointed out, this cannot be done by the thin relations *greater than simpliciter* and *resemblance simpliciter*. How, then, does Mulligan handle this problem?

In his paper "Relations – Through Thick and Thin" (1998), he does not mention the determinable–determinate distinction, but in the earlier "Internal Relations" (1993) he does. He admits that the distinction might be useful in certain kinds of ontologies, but not in his own; he explicitly rejects "relations between a determinate concept (expressed by an adjective such as 'red') and its determinable ('coloured') (1993, p. 8)." He says that "the trope nominalist will want to hold them at arms length (ibid.)." In the framework of his 1998-paper, this view of his can be re-phrased as follows:

- There are determinable predicates and, because of this, determinable truth-bearers, but there are no determinable truth-makers, only determinate ones.

I have from an immanent-realist position with respect to universals argued that there are not only the most specific determinate universals and their instances; there are universals and corresponding instances that are highest determinables, too (Johansson 2000). Mulligan, as I have mentioned, rejects universals, but why does he not accept trope determinables as truth-makers? His main reason why a trope nominalist should reject such entities is that:

he hopes to retain such relations only at the level of concepts and do the ontological work done by determinable properties in non-nominalist systems with the help of higher-order relations of greater or lesser similarity and dissimilarity amongst groups of resembling tropes. (1993, p. 8)

Let us now see what such a construction by means of higher-order resemblance relations amounts to. In order to do so, we have to go back to the remark that resemblance, necessarily, is resemblance in a

¹² For more details about how the distinctions differ, especially in the formal structure of the corresponding classification hierarchies, see (Johansson 2008, sect. 3).

respect. The trope nominalist can say that although this remark certainly is true for comparisons of things, because things always have several different kinds of properties, it is not true when it comes to tropes. Since tropes are simple there is no respect or determinable, and none is needed in order to make comparisons between them. In the discussion that follows I will use different determinate length tropes as examples.

I agree with the trope nominalist that all lengths of e.g. 15.0031 meter can be regarded as exactly similar without bringing in any determinable.¹³ In the abstract meter scale, the value 15.0031 meter can be taken as denoting the class of all real and possible length tropes that have this length. The value chosen is a completely arbitrary value, which means that to each value of the meter scale there is a specific and distinct exact-resemblance class of tropes. Between all these exact-resemblance classes there are other – higher-order¹⁴ – relations of resemblance; not of exact resemblance but relations of greater or lesser similarity. Therefore, the whole meter scale can be identified with such a class of exact-resemblance classes. I think such a view is what Mulligan hints at and has in mind, and no determinable has so far been mentioned.

At first, the construction looks simple and elegant, but one thing is missing. One has to explain not only the relations within the length scale, but also why certain entities cannot possibly become part of it. There are two kinds of questions: what makes the exact-resemblance classes denoted by 1, 2, and 3 meter belong to the same scale, and what makes 1 kg, 2 s, and 3 m/s necessarily excluded from it? As far as I can see, the latter question cannot be answered without bringing in determinables and, thereby, *thick* comparative relations. There is a great dissimilarity between 10 m and 10^{100} m, but there is an even greater dissimilarity between 10 m and 10 kg. There must be something that creates a border for how large dissimilarities there can be in one and the same scale. What follows is a brief exposition of what I have once called ‘the gap argument for determinables’ (2000, sect. 3).

If we take two arbitrary length tropes, we can always (at least in thought) find a number of other length tropes by means of which we can connect the first two in a continuous chain. And the same goes for two mass tropes, two temperature tropes, and so on. It is more or less true also of two arbitrary shapes, even though there is no shape scale. But it is impossible to find a trope chain that connects a length trope with a mass trope, a temperature trope, or color trope; and vice versa in all combinations. There is in this sense an ontological gap between the kinds of tropes in question, which also explains why we cannot give additions such as 2 m + 3 kg a meaningful sum. How ought a trope nominalist best explain these fundamental gaps? As a realist, I have argued that the positing of determinables as universals and as instance must be the best and simplest way to explain the unity of the basic scales. All determinate length instances also contain an instance of a length determinable, and all determinate mass instances also contain an instance of a mass determinable. A 10 m length instance differs less from a 10^{100} m instance than from a 10 kg instance because it has a determinable in common with the former instance but not with the latter. And what lacks the length determinable can never become part of the length scale. My proposal for the trope nominalists is then of course that (having rejected universals) they posit trope determinables and relations of exact resemblance between these. The cost would be that they have to delete the view that tropes are simple.¹⁵ On my proposal, there can be no trope determinate without a trope determinable within itself, and no trope determinable without some trope determinate within itself.

The view put forward by no means implies that to every determinable predicate there is a corresponding truth-maker determinable. Quite the contrary, since there are truth-maker determinables only where there are ontological gaps of the kind mentioned. Determinable predicates can by definition be ordered into levels; for instance, on top of the determinate predicate ‘scarlet’, we find the predicate determinables ‘red’ and ‘color’. Of these, ‘color’ is connected with a gap, but ‘red’ is not. Red tropes can by means of other color tropes be continuously linked to any other arbitrary chosen

¹³ The difference is that I regard the resemblances grounded in and emerging “bottom-up” from instances of a determinate monadic universal, whereas the trope nominalist regards the instances (tropes) as receiving their general property identity “top down” from the exact resemblance relation under discussion.

¹⁴ It might be argued, though, that the resemblances between the classes at bottom are first-order resemblances between tropes in the different classes.

¹⁵ The common view that tropes are simple is nicely worked out in (Maurin 2002); since Mulligan says nothing to the contrary, I have interpreted him as having the same view.

color trope. The extensions of predicates such as ‘red’, ‘blue’, and ‘yellow’ are created by means of conventions. That is, even though we have the predicate ‘red’ there is no truth-maker determinable red; the predicate denotes only a disjunction of truth-maker determinates which all have the same truth-maker determinable, namely color. The conventionality of the common color predicates exists so to speak in-between the most specific determinates and the color determinable.

Let me end this brief argument; the main point is hopefully clear. I think it is impossible for Mulligan and other trope nominalists to explain the basic scales of mathematical physics without bringing in at least trope determinables. Their class-of-classes constructions rely wholly on resemblance relations, but these cannot possibly take account also of the “gaps” needed for the constructions. And where there are determinables there are thick internal relations.

6. Sometimes there is something new under the sun

What has been claimed in philosophy will be claimed again, what has been argued will be argued again; there is nothing new under the philosophical sun. So, many people seem to think; but I think the saying is false. Bertrand Russell’s claim about external relations was quite original, and so is Kevin Mulligan’s distinction between thin and thick relations. Even though, contra Mulligan, I am confident that there are thick internal relations, and also think that there might be thin external relations, I find it a very innovative move of his to bring the distinction between thick and thin concepts and descriptions into the philosophy of relations.

Acknowledgements I would like to thank Jan Almäng, Christer Svennerlind, and Erwin Tegtmeier for comments on an earlier version of the paper.

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