# Fundamentally, there are no relations

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"Relations – their nature, their types, their existence", Ligerz, 22nd of September 2016

## Overview of the argument

1. Russell's Rehabilitation of Relations
   (a) The irreducibility of relations
      i. Aristotle and the medievals did not have fundamental relations.
      ii. This view is intuitively plausible – problems with location, partial exemplification, direction.
      iii. A relation defined as a repeatable which imposes direction and orders / structures its terms.
      iv. Russell's argument, turning on asymmetric (i.e. anti-symmetric) relations.
      v. This came with a highly simplified story about the 'new logic'.
      vi. There are important differences between full predicate logic and its monadic fragment.
      vii. But they would not worry Leibniz.
      viii. Nor the British idealists.
      ix. For they concern relational vocabulary, not the question of truthmakers.
   (b) Russell against monadism
      i. Humberstone's result corroborates Russell's argument.
      ii. Russell himself stresses ineliminability of relational *vocabulary*.
      iii. In its simplest form, monadism is a reduction to relational properties.
      iv. Leibniz has been interpreted this way, but this is uncharitable.
      v. First problem: relational properties derive from relations:
         A. Hochberg's argument concerning identity conditions for relational properties.
         B. Mertzens' reduction, including a primitive 'toward'.
         C. Relations are needed to coordinate the relational properties.
         D. Russell's regress argument: relational properties do the job only *in so far* they are themselves related.
         E. Relational properties cannot be characterised by their impurity.
         F. This is why a tropist view looks attractive.
   (c) Particularism to the rescue?
      i. This is the second problem for monadism: it needs coordination of relational properties.
      ii. Tropist views: instances of relational properties could provide the ground of monadistic reduction.
      iii. Fisk: unreduced 'relatedness'.
      iv. Against Fisk: coordination cannot do the job unless it is adverbially modified; but if it is adverbially modified, it is a relation.
      v. This also applies to all other tropist views.
      vi. This also applies to diads or ordered tuples exemplifying the relations.
   (d) Internal relations no way out
      i. Many have said that supervenient relations are a 'free lunch', but it is unclear what this means.
      ii. Different notions of internality.
      iii. First problem: not all relations are internal; in particular: truthmaking of extrinsic predications is not.
      iv. Second problem: internal relations are relations as well; 'internal truth' is no way out.
   (e) Russell against monism
      i. Monism claims that relations supervene on structural properties of wholes
      ii. What kind of structural properties are needed? those that distinguish between (ab) and (ba).
      iii. Stripped to its essentials, Russell's argument is of the 'open question' type.
      iv. Intrinsic properties of wholes exist anyway, question is whether they are acceptable as truthmakers.
      v. Parsons does not address this challenge.
      vi. Overview of chapter 2.
2. Relational Facts and the Problem of Converses
   (a) The truthmaker argument for relations
      i. Definition of relational fact.
      ii. I accept the truthmaker argument for properties, but it turns on objective ressemblance.
      iii. Problems with the truthmaker argument for relations: there are more similarities than relations, so the similarities are between the structural properties, not the relations.

A. multigrade relations: adicity is exemplification specific; possible way out: they are exemplified by pluralities; but these still need to be ordered. Hence the similarity is at best between pluralities, but also has to take into account whether they enter individually or collectively into the relation; hence there are more similarities than relations.
B. reflexive exemplifications (Narcissus): self-loving is an important respect of similarity, but it does not stem from a separate relation, hence there are more similarities then relations.
C. symmetric exemplifications: reciprocal love is not just the holding of the relation in both direction, it's a way of loving, and a respect of similarity between couples.

iv. Hence no truthmaker argument for relations, but still for structural properties and for relational properties.
v. Even if they are not fundamental, relational properties exist (by the truthmaker argument above): they state the structuring effect of the relation, but not the direction it imposes.

(b) Converse Relations
i. Abstractionist notion of converse: different ordering of the relational properties is always possible.
ii. So there are converses even for reflexive relations.
iii. And there are converses for symmetric relations.
iv. These two problems can be 'solved', by fiat, at the type level.
v. But on the token level, we get three serious problems:
A. ontological profligacy
B. indeterminacy
C. regress

(c) Primitive directions
i. The problems have to do more with directions than with order.
ii. They sink the standard, 'directionalist' view.
iii. They also sink the primitivism of MacBride.
iv. Content-recarving is no way out.
v. Nominalisations are no way out, they are rather a version of positionalism.

(d) Reification of positions
i. Nominalisations and Williamson: non-reifying positionalism is unsuccessful.
ii. Russell's positionalism.
iii. Positionalism in Grossman and Bergmann.
iv. Hochberg's criticism and his positionalism.
v. Orilia's positionalism.
vi. Leo's positionalism.
vii. Fine's arguments against commitment to positions; (i) strictly symmetric relations: not all relations generate positions; (ii) multigrade relations: how many positions are generated? (iii) converses: positions differentially 'attach' to a relation and its converse.
viii. Dorr / Macbride arguments: no cross-relation identification of positions.
ix. My point: these makes them dependent particulars.
x. As with other dependent particulars (tropes), we get a regress problem.

(e) Neutral relations
i. Fine's notion of anti-positionalism and earlier versions in Russell and Armstrong.
ii. Macbride's interpretation of anti-positionalism as a form of resemblance nominalism.
iii. The need for paradigms; why this is especially problematic in the relations case.
iv. Fine's way out: substitution as primitive.
v. Substitution preserves structure, cannot generate it.
vi. Dorr's argument: generates spurious differences in the case of non-symmetric relations.
vii. This is because structure is irreducibly extrinsic on this picture.
viii. As with other extrinsic determinations, we get a regress argument.
ix. Overview of chapter 3.

3. Structure, not Relations
(a) Why relations cannot be fundamental
i. Prima facie tension between order and directions.
ii. It is not possible that both order and direction are fundamental.
iii. Incompatibility both for tropes and universals.
iv. Giving up uniqueness? connection with notion of analysis.
v. Direction is a way of looking at order.

(b) Lessons from Russell
i. Desiderata: (i) converse, (ii) identity for non-symmetric relations, (iii) identity for symmetric relations
ii. Recap of the arguments above: directionalism cannot account for (ii), positionalism cannot account for (iii), neutralism cannot account for (i).
iii. What the desiderata correspond to on the level of relational facts
iv. It cannot, however, be just an irreducible feature of relational facts; general problem with facts; that's why Russell is important.
v. Short summary of the development of his thought; purpose: to show how the person who perhaps thought most about it came to accept primitive structure.

(c) Aboutness and really relating relations

i. Multiple analysability of atomic relational propositions: (i) for Frege, a question about the object/concept distinction; (ii) for Russell, a question about the logical subject (where 'subject' is a thematic role).
ii. Taking aboutness as primitive, Russell introduces the 'logical notion of assertion'.
iii. Ramsey's criticism: Russell cannot account for the equivalence of 'Socrates is wise' and 'Wisdom is a characteristic of Socrates'.
iv. Bradley's criticism: the relational proposition cannot be about two things singly, but if about two things collectively it is not a relational proposition.
v. This is really Bradley's regress, short discussion of its formulations.
vi. Why 'standard solutions' do not address Bradley's regress so understood.

(d) Relations as terms, verbs and as forms
i. The 'logical notion of assertion' is 'given by the verb'.
ii. Connection to the question whether analysis is possible.
iii. This is Bradley's objection.
iv. First reply to Bradley: relations as terms and as really relating.
v. Why this is unsatisfactory: relations as terms do not relate (this is the narrow direction problem to be discussed below).
vi. Second reply: ingredient sense vs autonomous meaning.
vii. Why this is unsatisfactory: destroys the possibility of analysis.
viii. Third reply: form of the proposition (Theory of Knowledge version).
ix. Why this is unsatisfactory: Frege/Geach problem of embeddability.
x. This really is the same problem as Bradley's regress.

(e) The promise, and demise, of the multiple relation theory of judgment
i. Development of the MRTJ, and its promise.
ii. Why it affords a good illustration of Bradley's regress.
iii. Problem 1: beliefs come out always true OR objective falsehoods.
iv. Problem 2: narrow direction problem (this is the same as above).
v. Problem 3: wide direction problem.
vi. Solution 1: directionalism.
vii. Solution 2: positionalism.
viii. Solution 3: neutralism, substitutional theory.
ix. Solution 4: irreducible structure.
x. Overview of chapter 4.

4. The priority of structure

(a) Heterogeneous relations
i. Irreducible structure means irreducible form, holistic complexes
ii. Heterogeneous relations in Russell 1913.
iii. Exemplification in Frege.
iv. Non-relational structural properties in the emergentists.
v. How they provide an answer to the Ramsey problem.
vi. How they provide an answer to the Bradley's regress problem.
vii. They do not yet provide an answer to the unity of the proposition problem.

(b) Structure without relatedness
i. Logical relations in Hochberg.
ii. Logical relations are roles by another name.
iii. Structural properties in Armstrong.
iv. Structural properties are states-of-affairs types.
v. States-of-affairs types are roles, otherwise Lewis' arguments bite.
vi. Vectorial properties like instantaneous velocity.
vii. How structure-without-relatedness applies more generally to change.

(c) Structural properties and incongruent counterparts
i. Parsons' distributional properties.
ii. Problem 1: no account of change.
iii. Correia/Rosenkrantz tense properties of facts.
iv. Problem 2: irreducible adverbialism.
v. My account: determinables.
vi. Problem 3: spurious distinctions, incongruent counterparts.
vii. My solution (not available to Parsons or C/R): response-dependence of direction.

(d) Rôles and thematic relations
i. "Eo ipso" in Leibniz.
ii. "Quatenus" in Leibniz.
iii. Orilia's old Leibnizian theory.
iv. Orilia's new theory with linguistic thematic relations.
v. Problem: too much response-dependence, no solution to the unity of the proposition problem.

(e) Structured relational complexes
i. Qua object account of asymmetry.
ii. Relational individuation not generally possible.
iii. But possible in this special case.

iv. Holistic individuation is of mutually essentially involved entities.
v. These are roles, and they are occupied by things.
vi. Connection to response-dependence / social ontology / relational, but intrinsic (when the occupation of a certain role is essential to the things).
vii. Overview of chapter 5.

5. Varieties of Structuralism
   (a) Matter
      i. Why we need a stuff ontology
      ii. Three problems for an ontology of stuff:
         A. property exemplification by stuff;
         B. stuff having intrinsic structure;
         C. stuff undergoing intrinsic change.
      iii. Example: extended simples.
      iv. Rôles occupied by portions of stuff.
      v. Aristotelian hylomorphism: form is such a rôle.
   (b) Mixtures
      i. Mixtures a problem for everyone.
      ii. History: Aristotle, the medievals, Brentano
      iii. Fine's theory.
      iv. Criticism: unreduced dispositionality.
      v. Rôle theory provides an answer: another example of pure structure without relations.
   (c) Mathematical structuralism
      i. They are right to take merely weak discernibility to be ontologically significant.
      ii. But intrinsic/extrinsic does not apply to numbers as positions.
      iii. Nor does it give support to formalism.
      iv. Numbers are properties: rôles determined by a structure.
   (d) Physical structuralism
      i. Ontic structuralism as relational bundle theory presupposes a monadism
      ii. 'No objects'; 'only structure' – what could they mean?
      iii. Main problem: mathematics, not physics.
      iv. Solution: relations that have a nature.
      v. Problem: what nature do relations need to have to individuate indiscernibles?
      vi. Solution: conceptualism, but that is rôle theory by another name.
   (e) Epistemological structuralism
      i. Ramsey sentences as capturing observational content.
      ii. But we loose the objects, and with the relations we are not acquainted.
      iii. The Newman problem: only cardinality.
      iv. The model-theoretic argument: only structure.
      v. Ramseyian humility: only relational properties.
      vi. The common mistake: Kantian fallacy from 'as they appear to us' to 'how they appear to us'.
      vii. Solution: rôle theory: we are acquainted with the rôles by being acquainted with the complex.

# Preliminaries

A relation is any property (entirely qualitative entity) that has at least one possible exemplification which involves more than one particular.[1] Let us focus, for simplicity, on the dyadic case: we may take "$R$" to express a relation because it is possible that there are two things, $a$ and $b$, such that $aRb$. That $R$ is thusly exemplified by $a$ and $b$ means:

- that it imposes a direction on them: in the relational fact $aRb$, $R$ goes *from* $a$ *to* $b$, in so far as $a$ is its *first* relatum and $b$ is its *second* relatum;
- that it orders or structures $a$ and $b$: in the relational fact $aRb$, $a$ is $R$-related to $b$ while $b$ is such that $a$ is $R$-related to it,[2] in so far as $a$ is in the domain, while $b$ is in the codomain of the relation $R$.

While properties may have directions and impose order or structure, only relations exhibit both features.

# Problems for monadism

**The individuation of relational properties presupposes relations.** To say that, generally and as a matter of logical truth, if $a = b$, then $\lambda x(aRx) = \lambda x(bRx)$, we need to quantify over relations. The point is, I think, best put in terms of explanatory priority: The reason why loving-Superman and loving-Clark-Kent is one and the same property (and Lois Lane, as a matter of logic, exemplifies one iff she exemplifies the other), is that Superman is Clark Kent; therefore, the properties are not atomic, but derelativisations of the prior relation of loving.

1. I do not think talk of "exemplification" here is ontologically committing. To avoid quantification over such 'cases' of properties (not: tropes), we may say the following: Some property $R$ is a relation iff $\Diamond\exists X(RX \wedge \exists x, y(x\text{is one of the } X \wedge y\text{is one of the } X \wedge x \neq y)$.

2. Using converses (cf. below, p. **??**), we can attribute the same property to $b$ by "$b$ is $\breve{R}$-related to $a$".

This same argument also applies to what Mertz (1996: 44) means by a "property reduction of relations": that for any binary relation $\lambda x, y(Rxy)$ and relata $a$ and $b$, there exist monadic properties $\lambda x(Fx)$ and $\lambda x(Gx)$ such that

(1) $\ulcorner R(a,b)\urcorner$ is true $\Leftrightarrow Fa\&Gb\&\lambda x(Fx)$ toward $b\&\lambda x(Gx)$ toward $a$

where the "characteristic linking aspect of the relation" reduces to "a pale, contentless 'toward' – a blank connection" (Mertz 1996: 45).

**The coordination of relational properties in a relational fact presupposes relations.** Even if we, in the manner of Fisk (1972: 143) and Campbell (1990: 104), allow for different foundations in different exemplifications of relations (which thus supervenes without being reduced), we still have to explain *why* these foundations, in some particular case of loving, make Othello's love for Desdemona unrequited in one situation, and happily mutual in another, unfortunately merely possible, situation. Suppose we have, in a first situation, Othello ($a$), Desdemona ($b$), as well as (the foundation of) his loving her ($F_b a$) and (the foundation of) her being loved by him ($G_a b$). Why is this not also a situation where she loves him? With another – anti-symmetric and unreduced – relation, we are able to do so, for we have $\langle F_b a, G_a b, F_b F' G_a\rangle$ in one, and $\langle F_b a, G_a b, F_a b, G_b a, F_b F' G_a, F_a F' G_b\rangle$ in the other case: the anti-symmetry of $F'$ then lets us conclude that either $G_b \neq F_b$ or $F_a \neq G_b$, which allows us to distinguish the two situations.

Can we account for coordination in terms of 'correlation'?

> There will be foundations, $F$ and $G$, such that $(Rb)a$ coimplies $(Fa \cdot Gb)$. And there will be foundations, $H$ and $K$, such that $(Ra)b$ coimplies $(Hb \cdot Ka)$. The dissimilarity Russell seeks between the two relational properties consists in their derivations from different foundations. Even where $F$ is similar to $H$ and $G$ is similar to $K$, the derivations are from the two different bases, $(Fa \cdot Gb)$ for the relational property $(Rb)$ and $[(Hb \cdot Ka)]^3$ for the relational property $(Ra)$. One will still want to know how asymmetry comes from dissimilarity, which is symmetrical. Suppose $(Rb)a$ has as its foundational base $(Fa \cdot Gb)$. In case this is also the base for $(Ra)b$, $R$ is symmetrical. But if the base for $(Ra)b$, say $(Hb \cdot Ka)$, is incompatible with $(Fa \cdot Gb)$, then $R$ is asymmetrical. (1972: 146–147)

**Internal truthmaking does not do away with relations.** Peter Simons (2010: 204) has proposed to talk of relational predications being internally true, i.e. true just in virtue of the relata alone, rather than their being made true by internal relations. While Simons is right that we do not need an internal relation as a truthmaker for an internally true "$Rab$" *if* truthmaking is identified with necessitation, internal relations may still be needed, however, as truthmakers for other predications.[4] Consider the following three pairs of predications as an example:

(2) $a$ and $b$ have the same colour and $c$ and $d$ have the same colour.

(3) $a$ and $b$ have the same colour and $c$ and $d$ have the same shape.

(4) $a$ and $d$ have the same colour and $b$ and $c$ have the same shape.

If sameness of colour ($C$) and of shape ($S$) (or, equivalently, exact resemblance with respect to colour and shape) are internal relations, then the truthmakers for "$Cab$" ("$Ccd$") and "$Scd$" are just $a$, $b$ and $c$, $d$ respectively. So both (2) and (3) have the same truthmakers, namely $a, b, c$ and $d$. There is, however, a further similarity relation, of being similar with respect to *being same-coloured*, that holds between the pairs in (2), but not in (3). *Its* truthmakers, therefore, cannot be just $a, b, c, d$ – the internal relations $C$ and $S$ must be somehow involved. Not only must they be somehow involved in the truthmaking of the ascription of the relational predicate to the pairs, they must also be involved *as relating*. To see this, consider the following two situations: $A$, where $a$ and $b$ are two red circles and $c$ and $d$ two green triangles, and $B$, where $a$ is a red circle, $c$ is a green triangle and $b$ and $d$ are two red triangles. Clearly, the two situations are different – there are red triangles in one, but not the other. In both cases, (3) is true. If really the truthmakers of (3) are, in both cases, just $a, b, c, d, C, D$, then how are we to explain that in the first case $A$, they also make (2) true and (4) false, while in the in $B$, they make (4) true and (2) false. Again, we have a difference without a difference-maker. The only plausible explanation I can think of is that the truthmaking in (3) is not just done by $a, b, c, d, C$ and $S$, but also involves $Cab$ (as opposed to $Cad$ in (4)). So not only are the internal relations needed as truthmakers, they are needed *as relating*, i.e. as components of (internally related) states of affairs.

# Relational facts and the Problem of Converses

**No truthmaker argument for relations.** Three reasons why relations are unsuited to ground similiarities between relational facts:

1. they may be variegrade
2. they may be 'token-adic' (non-symmetric without anti-symmetric, non-reflexive without irreflexive)
3. they are quantifiable

**An abstractionist notion of converses.** That there are two relational properties whenever a dyadic relation is exemplified, leads us directly to the problem of converses. The converse of a binary relation is normally taken to be the unique relation that holds between the same particulars in the other direction.[5] There are two roads to its acceptance: the first one starts from the given binary relation $R$ and defines the converse as the unique relation that holds in the other direction – this is the route chosen by Russell and Whitehead in the *Principia*: the converse of $R$ is defined as the unique relation $\breve{R}$ which holds between $x$ and $y$ iff $R$ holds between $y$ and $x$ (Russell 1901b: 316, §1.7).[6] This operational conception of converses leaves it open whether the operation $X \mapsto \breve{X}$ is total. It may, for example, not be defined for relations without sense or direction.[7]

4. As the very existence of external relations is under dispute, I am concentrating on higher-order *internal* relations between internally related relational facts in the following. If there are external relations between such facts, the argument is even more straightforward.

5. "Converse", as I use it here, is a specification of the more general notion "permutation" for binary relations. An $n$-place relation will have $n!$ permutations, and they will be needed to account for it's $n$ relational properties and its $2^n - n - 1$ existential generalisations.

6. Cf. also Schröder (1895: 30), and (Whitehead & Russell 1910: 32). Given the definition of the *Principia*, it can be proved that every relation has a converse (1925: 238–239, *31.13). The same definition of converse was given by 1892: 246.

7. Russell (1901a: 48/307) says that distance is a symmetrical relation without sense.

A different route starts from the relational fact itself, identifies by analysis the relational properties exemplified and asks about their status. In the same way, it is then argued, the property of being $R$-related to $b$ is derived from and posterior to the relation $R$, the property of being such that $a$ is $R$-related to it is derived from and posterior to the relation $\breve{R}$. Sensible questions may then be asked about the relations $R$ and $\breve{R}$, which may or may not be identical, but are assured to exist in all cases.[8]

**Three problems.** We face a double dilemma, for both symmetric and asymmetric relations: If $R$ and $\breve{R}$ are different if they have different senses, then the relational fact $aRb$ is different from the relational fact $bRa$ even if $R$ is necessarily symmetric, contrary to what Russell (1903: 25, §28) asserts. If they can be identical, even if their senses are different, then what distinguishes $aRb$ from $bRa$ for asymmetric relations $R$? If the 'sense' of a relation is something over and above the order of its constituents, then how can we identify $aRb$ with $a\breve{R}b$ for necessarily symmetric $R$? If it just consists in this order, how can we distinguish $a\breve{R}b$ from $aRb$ for asymmetric relations? It just does not seem possible to hold both $a\breve{R}b = aRb = bRa$ for symmetric relations and $a\breve{R}b \neq aRb \neq bRa$ for asymmetric relations.

**Problem 1** : ontological profligacy.

> "If a book is on a table, *on the table* is a relational character truly predicable of the book. But this is inseparable from another relational character predicable not of the book but of the table. How are these two relational characters connected with each other? We may be tempted to say that the difference between them is purely verbal, so that, whether we say the *book is on the table* or the *table is under the book*, we are merely expressing the same fact in different language. But this cannot be true; for *being on* is different from *being under*; killing from being killed; loving from being loved. Yet it is plain that a single indivisible fact is referred to whether we say that the book is on the table or that the table is under the book." (Stout 1940: 121)
>
> "…it is hard to see how the state $s$ might consist *both* of the relation *on top of* in combination with the given relata and of the relation *beneath* in combination with those relata. Surely if the state is a genuine relational complex, there must be a *single* relation that can be correctly said to figure in the complex in combination with the given relata." (Fine 2000: 4)

**Problem 2** : indeterminacy. How can it be, Ramsey (1925: 14, 406) asked in the spirit of Leibniz's quote above, that $(\lambda x(aRx))b$, $(\lambda y(yRb))a$ and $(\lambda x, y(xRy))(a, b)$ represent (are logical forms of) the same proposition, given that they have different components? If they represent the same proposition, and stand for the same fact, however, what are their constituents? If relations are different from their converses, what could give us a reason to take one, but not the other, to be a constituent of a relational fact?

It is not just multiplication of entities that is at stake. Another problem is indeterminacy, both ontological and semantical. Armstrong (1997: 91), e.g., claims that $\breve{R}$ is not an increase in being, for every state of affairs containing it is identical with one containing just $R$. He does not tell us, however, which of the two relations is a constituent of this state of affairs. Williamson (1985) asks us to imagine two languages $L'$ and $L''$, both differing from our language $L$ only by inversing the order of arguments following $R$ and by replacing $R$ by its converse $\breve{R}$ respectively. By hypothesis, we cannot distinguish between $L'$ and $L''$. If relations were different from their converses, we could never distinguish our language from either $L'$ or $L''$ – we would never be able to know what our relational expressions are standing for. In both cases, the natural reaction is to say that there is no real question because for any relation $R$, $R$ and $\breve{R}$ are identical.[9] But how can they be identical, if they apply to the same relata only if these are respectively taken to be in different orders?

**Problem 3** : regress.

> "…when we analyze them, *greater* obviously differs from *less*; thus the two propositions ["$A$ is greater than $B$" and "$B$ is less than $A$"] seem to be composed of different constituents, and therefore to be necessarily distinct. To deny that they are distinct, it would be necessary to hold that both *greater* and *less* enter into each proposition, which seems obviously false, or else to hold that what really occurs is neither of the two, but that third abstract relation of which Leibniz speaks […]. In this case, the difference between *greater* and *less* would be one involving reference to the terms $A$ and $B$. But this view cannot be maintained without circularity: for neither the greater nor the less is inherently the antecedent, and we can only say that, when the greater is the antecedent, the relation is *greater*, when the less, *less*." (Russell 1901a: 41/300)

# Why relations cannot be fundamental

Relations have (at least) two essential features properties are lacking: direction and order. If $aRb$ we may both ask whether $R$ holds from $a$ to $b$ or in the other direction and whether $R$ holds of $a$ and $b$ in this or the opposite order. The two questions are different, but correlated. We may choose, without loss of generality, a binary relation $R(x, y)$ as our example. Suppose it holds between $a$ and $b$, in this order. It follows:

- that the relational fact $R(a, b)$ is *ordered*; it has an internal structure and consists of (at least) two parts, $a$ and $b$, distinguished by *how* they stand in the relation $R$: $a$ is $R$-ing $b$ while $b$ is $R$-ed by $a$;
- that, within the relation fact $R(a, b)$, $R$ not simply holds, but holds *in a certain direction*: it holds from $a$ to $b$, and is thereby different from its converse which would hold from $b$ to $a$.

8. I think this may plausibly be taken to be Russell's position in the *Principles*: That every relation has a converse is taken by Russell (1903: 25, §28) to be a primitive proposition, where he defines symmetrical relations as those identical to their converses. Russell (1903: 44, §48) uses the same language, saying that in a relational proposition we may regard either one of the terms as the logical subject. It may also be Maccoll's conception, who calls converse relations 'reciprocal' and claims that relations are synonymous with their converses (1902: 359).

9. Cf. Williamson (1985: 249) and Armstrong (1978: 42). Williamson's argument presupposes that relations are individuated by the semantical roles of expressions standing for them.

Armstrong and Fine argue for the identity of $a$'s being on top of $b$ and $b$'s being below of $a$, and of Don José's loving Carmen and Carmen's being loved by Don José on ontological grounds.[10]

Suppose that Othello ($a$) loves Desdemona ($b$), a fact we may equally well describe as Desdemona's being loved by Othello. Suppose furthermore that Desdemona does not love Othello, or, what comes to the same thing, that Othello is not loved by Othello. Without prejudging questions of identity, we can see these states as 'arising' out of the first by inversions of direction ($D$) or of order ($O$):

$$\begin{array}{ccc} R(a,b) & \xrightarrow{D} & \breve{R}(a,b) \\ {\scriptstyle O}\downarrow & & \downarrow{\scriptstyle O} \\ R(b,a) & \xrightarrow{D} & \breve{R}(b,a) \end{array}$$

Because, in this case, love is unrequited, we have non-identities holding on all four sides of the square: Order forces us to distinguish $Rab$ and $Rba$. Direction forces us to distinguish $Rba$ and $\breve{R}ba$. But their interplay forces us to identify $Rab$ and $\breve{R}ba$: we have identities along the two diagonals. This diagram thus 'commutes', i.e. $O(D(a \to b)) = D(O(a \to b))$. I submit that this is explained by the fact that one operation is the converse of the other, ie. only one of order or direction is fundamental. But which one is it? I will argue that it is order that explains direction, not direction that explains order.

# References


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10. Armstrong (2004: 149) calls the view that "$aRb$" and "$bRa$", for some symmetric relation $R$, represent two different necessarily coexistent states of affairs a "quite serious case of metaphysical double vision".