

Leibniz on the Reducibility of Relations

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Why there is no place for relations

Famously, Leibniz argued in his correspondence with Clarke that relations, if they existed, would be “in two subjects, with one leg in one, and the other in the other, which is contrary to the notion of accidents”¹

Bertrand Russell, in his *Principles of Mathematics* (1903: 221, §212), criticised both monadism and monism. Monadism (defended, according to Russell, by Leibniz and Lotze) holds that any truth of the form “ aRb ” is equivalent to some truth of the form “ $Fa \wedge Gb$ ”, while monism (represented, for Russell, by Spinoza and Bradley)² replaces “ aRb ” by some predication of the whole consisting of both relata taken together, “ $H(ab)$ ”. Against monadism, Russell urges that relational properties cannot be interpreted except as involving relations (1903: 222–223, §214). Against monism, he argues that it is unable to distinguish the two directions characteristic of (binary) asymmetric relations other than by distinguishing the two parts of the whole by some other asymmetric relation (1903: 224–225, §215), thus embarking on a regress.

While it may be granted – with Leibniz who held them to be “in the mind alone”³ – that relations are distinguished from their relata at least by reason, it is not clear whether this difference in the logical behaviour of predicates cuts any ontological ice (cf. Cover & Hawthorne 1999: 69). The real question, as the Stoics realised, is whether this distinction by reason (*rationis*) translates into a distinction in reality (*realiter*) or whether it is a distinction only on the basis of form (*formaliter*).⁴ This question, contrary to what is often assumed, cannot be decided on purely logical grounds: acknowledging that it is useful, and even indispensable, to use relational predicates in a description of the world that aspires to completeness, and to grant that their inclusion increases the expressive power of our language and is necessary to account for the validity of inferences we intuitively recognise as such, is not yet to say that we also have to acknowledge relations as a separate and irreducible *ontological* category: this latter question is to be decided by what the *truthmakers* of relational predications are.⁵

1. “...en deux sujets, qui auroit une jambe dans l’un, et l’autre dans l’autre, ce qui est contre la notion des accidens.” (Leibniz’s fifth letter to Clarke, 1890: 401 (translations: 1956: 71 and 1989: 339)).

2. Bradley rejects this interpretation, claiming that his monism is the view that “all predication, no matter what, is in the end untrue” (1935: 672, cited after Fortier (1996: 31)).

3. Cf. his letter to des Bosses: “[o]rders, or relations which join two monads, are not in one monad or the other, but equally well in both at the same time, that is, really in neither, but in the mind alone.” (1989: 203); “Ordines enim, seu relationes, quae duas monades jungunt, non sunt in alterutra monade, sed in utraque aequae simul, id est, revera in neutra, sed in sola mente...” (1879: 517) This is the “dogma concerning relations” Russell (1901a: 307) finds in Lotze and the relational theory of space and time.

4. In medieval times, this distinction was marked as “relations merely according to speech” (relationes secundum dici) and “relations according to nature or being” (relationes secundum esse) (cf. Brower 2010).

5. The question of the fundamentality of relations, as I understand it, is thus about what Campbell (1990: 101) calls ‘foundationism’ – the thesis that relations can be accounted for by reference to their foundations without ontic loss. It has been argued that the reducibility question has been about truthmakers all along: “...les philosophes scolastiques dans leur ensemble – y compris Guillaume d’Ockham – ne contestent nullement l’existence de faits relationnels objectifs, ou encore [...] leurs désaccords ne portent pas sur l’existence de propositions relationnelles (objectivement) vraies, mais seulement sur la nature exacte de leurs “vérifacteurs” (*truthmakers*).” (Clementz 2004: 500)

In the case of Leibniz, the need for an independent argument for the priority of relational properties has been aptly argued for by Cover & Hawthorne (1999: 73–76), mostly against Kulstad (1980), but also against Hintikka, Ishiguro and McCullough. Mugnai (2012) argues persuasively that Leibniz does not “attribute a real being to relational predicates”. Anja Jauernig, who holds that for Leibniz “extrinsic properties are ontologically more fundamental than abstract relations, and might, thus, legitimately be considered as the ontological grounds or foundations of the latter” (2010: 179), argues that Leibniz does not think that relations globally supervene on intrinsic properties, because the reduction may depend on laws which are only contingently true (2010: 200–201). Maunu (2004) explores a middle position, ascribing to Leibniz a ‘soft reductionism’ to monadic, quantified relational properties such as *loving someone*. Even if Maunu is right, however, there is a consensus that *if* Leibniz holds a reductionist view about relations, then it is a reduction to *non-relational* properties that is at stake.

These difficulties of a ‘reduction’ of relations to relational properties can be seen in the passage Russell (1900: 15) claimed to be “of capital importance for a comprehension of Leibniz’s philosophy”:

The ratio or proportion between two lines L and M may be conceived [of in] three several ways; as a ratio of the greater L to the lesser M ; as a ratio of the lesser M to the greater L ; and lastly, as something abstracted from both, that is, as the ratio between L and M , without considering which is the antecedent, or which the consequent; which the subject, and which the object. [...] In the first way of considering them, L the greater is the subject, in the second M the lesser is the subject of that accident which philosophers call *relation* or *ratio*. But which of them will be the subject, in the third way of considering them? It cannot be said that both of them, L and M together, are the subject of such an accident; for if so, we should have an accident in two subjects, with one leg in one, and the other in the other; which is contrary to the notion of accidents. Therefore we must say that this relation, in this third way of considering it, is indeed *out of* the subjects; but being neither a substance, nor an accident, it must be a mere ideal thing, the consideration of which is nevertheless useful.⁶

Russell interprets this passage as a statement of monadism and urges against it that relations are prior to the relational properties they give rise to:

The supposed adjective of L [“greater than M ”] involves some reference to M ; but what can be meant by a reference the theory leaves unintelligible. An adjective involving a reference to M is plainly an adjective which is relative to M , and this is merely a cumbrous way of describing a relation. [...] Apart from M , nothing appears in the analysis of L to differentiate it from M ; and yet, on the theory of relations in question, L should differ intrinsically from M . Thus we should be forced, in all cases of asymmetrical relations, to admit a specific difference between the related terms, although no analysis of either singly will reveal any relevant property which it possesses and the other lacks. (Russell 1903: 222–223, §214)⁷

6. This is the translation by Russell (1900: 14–15) of “La raison ou la proportion entre deux L et M peut être conçue de trois façons: comme raison du plus grand L au moindre M , comme raison du moindre M au plus grand L , et enfin comme quelque chose d’abstrait des deux, c’est à dire comme la raison entre L et M , sans considerer lequel est l’antérieur ou le postérieur, le sujet ou l’objet. [...] Dans la première consideration, L le plus grand est le sujet; dans la seconde, M le moindre est le sujet de cet accident, que les philosophes appellent relation ou rapport. Mais quel en sera le sujet dans le troisième sens? On ne sauroit dire que tous les deux, L et M ensemble, soient le sujet d’un tel accident, car ainsi nous aurions un Accident en deux sujets, qui auroit une jambe dans l’un, et l’autre dans l’autre, ce qui est contre la notion des accidens. Donc il faut dire, que ce rapport dans ce troisième sens est bien hors des sujets; mais que n’étant ny substance ny accident, cela doit être une chose purement idéale, dont la consideration ne laisse pas d’être utile.” (Leibniz 1890: 401, cf. also 1957: 144–145). As Russell (1900: 15) notes, the reality of relations, for Leibniz, consists in their being perceived by God (cf. the first draft of his letter to Bartholomeus des Bosses from the 5th of February 1912 [1879: 438], translated in 1989: 199). Russell (1900: 16) comments on this as following: “...Leibniz is forced, in order to maintain the subject-predicate doctrine, to the Kantian theory that relations, though veritable, are the work of the mind”.

7. As pointed out in fn. ??, Russell uses “asymmetrical” for anti-symmetric relations. This regress argument against monadism is employed by Russell against the axiom of internal relations: if the diversity of A and B is grounded in the natures of a and b , then “it

Russell’s point here is not just that the allegedly subvening relational properties are not intrinsic, but that they can only necessitate the relation if they differ in some specific way. This difference between the ‘correlative’ properties constitutes an additional, and unreduced, relational fact.

If “ a is greater than b ” is analysed as being founded on a ’s being 20 hectares and b ’s being 15 hectares, these foundations entail the relational fact only if and in so far as 20 is greater than 15. The reason this regress is vicious is not just, as Campbell (1990: 103) thinks, that Russell takes monadism to be proposing an eliminative analysis of relational *propositions*. Rather, the proposed analysis of “ aRb ” as “ $Fa \wedge Gb$ ” is incomplete in that the former, but not the latter, entails that $a \neq b$, and is in need of another conjunct, “ $FR’G$ ”, where $R’$ is another anti-symmetric relation.⁸ The problem that forces us into the regress is not that we need to deduce the anti-symmetry from rules in a syntactic system, but that two monadic foundations ground the ordered fact that makes the anti-symmetric predication true *only insofar as* they themselves stand in some ordering relation (and do so in virtue of standing in such a relation).⁹ Without such a relation funding the difference of the foundations or relational properties, we have “a conception of difference without a difference of conception” (Russell 1901b: 40/299) – a difference without difference-maker.¹⁰

The Problem of Structure

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 while b is R -ed;
- 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 .

The most important specificity of relations, in cases where we have at least a *prima facie* reason to believe in their existence, is their multiple adicity, the fact that they ‘involve’ more than one particular. This gives rise to what I will call “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. 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 \check{R} which holds between x and y iff R holds between y and x (Russell 1901c: 316, §1.7).¹¹ This operational conception of converses leaves it open whether the operation $X \mapsto \check{X}$ is total. It may, for example, not be defined for relations without sense or direction.¹²

will be necessary that A and B should have *different* adjectives, and the diversity of these adjectives cannot, on pain of an endless regress, be interpreted as *meaning* that they in turn have different adjectives” (1906: 38, cf. also 1906: 41–42). A very clear version of the argument applied to “earlier than” is in Russell (1959: 55)

8. Russell’s point thus does not, as Mates (1986: 218, n. 30), Campbell (1990: 103) and Cover & Hawthorne (1999: 78–79) claim, rest on a confusion of entailment with deductive consequence. (By saying this, I do not endorse the quite different, and in my view unjustified, criticism of Cover and Hawthorne by Maunu (2004: 152).) Rather, in MacBride’s apt words: “[Russell] would have been suspicious of the purported capacity of the terms described to make these propositions true without implicating relations in their explanatory wake...” (2011: 166).

9. The relation in question is not deducibility but what Moore (1900: 300–301) calls “logical priority” (giving the same examples). Compare Preti & Baldwin (2011: lx) for a similar use of this expression in Moore’s 1898 dissertation.

10. I disagree here with MacBride (2011: 162–166, cf. also MacBride (2016: 17–18)) who sees the problem as one of an unacknowledged ontological commitment. Like Bigelow & Pargetter (1990: 55–56), who give a very similar argument to Russell’s, I see the problem as one of an incompleteness of the purported explanation.

11. 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.

12. Russell (1901b: 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 \check{R} . Sensible questions may then be asked about the relations R and \check{R} , which may or may not be identical, but are assured to exist in all cases.¹³

The problem of converses has three aspects:

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, asked Ramsey (1925: 14, 406), 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 \check{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 inverting the order of arguments following R and by replacing R by its converse \check{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 \check{R} are identical.¹⁴ 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

13. 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).

14. 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.

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 1901b: 41/300)

The Problem of Relations

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 Desdemona. 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*).

$$\begin{array}{ccc} R(a,b) & \xrightarrow{D} & \check{R}(a,b) \\ o \downarrow & & \downarrow o \\ R(b,a) & \xrightarrow{D} & \check{R}(b,a) \end{array}$$

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 $\check{R}ba$. But their interplay forces us to identify *Rab* and $\check{R}ba$: we have identities along the two diagonals. This diagram thus ‘commutes’, i.e. $O(D(a \rightarrow b)) = D(O(a \rightarrow b))$. I submit that this is explained by the fact that one operation is the converse of the other, i.e. only one of order or direction is fundamental. But which one is it? I argue that it is order that explains direction, not direction that explains order.

What conception of *R* allows us to say that

- = “*Rab*” and “ $\check{R}(ba)$ ” denote the same relational fact;
- pos *R* holds, but \check{R} does not hold, between *a* and *b* (in this order);
- neg \check{R} holds, but *R* does not hold, between *a* and *b* (in this order).

To solve the problem of converses – to explain differential applicability (**pos** and **neg**) without intrinsic directions (\equiv) –, we need to loosen the connection between direction and order.

We may, and must, if the argument from the problem of converses is sound, hold that both “loving” and “being loved” stand for the same relation, even though they apply to their relata in a different order. To do this, we must loosen the connection between relations and direction: even though the ‘directions’ of *R* and \check{R} are different, this does not distinguish them as relations. The relation, equally well denoted by “*R*” or “ \check{R} ”, is not intrinsically, but only extrinsically directed. In this sense, it is “undirected”, or “neutral” (with respect to direction).

“Neutral relations”, Fine (2000: 3) says, do not hold of their arguments in any specifiable order. Fine’s starting point, as Castañeda’s, is the apparent absurdity of the claim that the fact of *a*’s being to the right of *b* is different from the fact of *b*’s being to the left of *a*. Fine’s conclusion is similar to Williamson’s: we cannot, in general, speak of the “first” and the “second” argument of some relation, identifying these in terms of closeness to the relational expression or their spatial position with respect to it. Similarly, Fine (2000: 6) concludes that “[neutral] relations should [...] be taken to apply to their objects without regard to the order in which they might be given”.

If we give up on the idea, as both Williamson and Fine urge, that relations relate their terms in some specific order, how can we then account for their differential applicability, i.e. the fact that the loving relation may hold between Don José and Carmen but fail to hold between Carmen and Don José? Fine presents us with two options: positionalism, which reifies argument places and includes them as constituents into relational facts, and anti-positionalism, which takes it to be a brute fact that (some) relations may, when applied to some given terms, yield more than one relational complex.

Fine (2000: 9) construes both these positions as introducing further *relata*, “for if there were not [any further *relata*] and if the notion [of exemplification] were indeed order-insensitive, then we would be left with something like the attenuated form of exemplification described above and there would be no way to account for differential application”. This does not follow, however. Positionalism, while committed to argument-places or ‘positions’, can incorporate them into the relation: they can contribute to the ontology of the relational fact not by being further *relata* related by the relation, but rather by being essential parts of the relation itself. Similarly, anti-positionalism can hold that the similarity between co-mannered completions (relational facts in which, as a directionalist would say, the relation applies to its arguments in the same order) is extrinsic, but non-relational.

Even amended in this way, Fine’s menu of options, however, is not exhaustive: it does not follow from the fact that relations do not exhibit *intrinsic* directionality that they are not directed at all. One and the same relation, $R = \check{R}$, could be extrinsically directed one way when exemplified by Othello and Desdemona in this order and be extrinsically directed another way when exemplified by Desdemona and Othello in this order.

Leibniz’s *eo ipso*

In “De Lingua Rationali”, Leibniz says:

Lingua rationalis ita utiliter constituetur, ut cuilibet vocabulo aliarum linguarum respondens possit, si velimus constitui, v.g. *Titius est magis doctus Cajus*. Sensus est: quatenus Titius est doctus, et Cajus est doctus, eatenus Titius est superior et Cajus est inferior. Haec analysis optima quidem est, sed non exprimitur vis singulorum verborum. Quod ut assequamur, dicendum erit: Titius est doctus et qua talis superior, quatenus inferior qua doctus est Cajus. (Leibniz 1999: 643)

Here, we seem to have a reduction to higher order predication of relations of comparison, and perhaps internal relations more generally. What about external relations? In the “Analysis of Prepositions”, written shortly afterwards, we find:

Accusativus sine praepositione, ut cum verbum activum asciscit accusativum patientis, ut Titius laudat Cajum, seu Titius laudat, quatenus Cajus est patiens. (Leibniz 1999: 652)

What about “quatenus”? Jauernig (2010: 202) interprets it as a relation:

The reality of relations of connection, by contrast, depends on God’s will, because they obtain in select possible worlds as a result of God’s (possible) free decrees. [footnote omitted] That is, ‘et eo ipso’ can be read as short for ‘and by that very fact, due to God’s free decrees’. [footnote: “Similarly, ‘quatenus’ can be read as short for ‘insofar as, due to God’s free decrees’.” In understanding Leibniz’s non-truth-functional connectives in this way, I am disagreeing with (among others) Burdick who claims that ‘et eo ipso’ brings the sentences ‘David is a father’ and ‘Solomon is a son’ “together mentally, i.e., without any additional ontological commitments” (“Leibniz’s Problem,” 10). On my view, ‘et eo ipso’ brings the two sentences

together via God's special decrees, which amounts to an additional ontological commitment. The latter assessment is supported by how Leibniz measures the perfection of worlds. The perfection of a world is determined by how much "being" or "essential reality" it contains, by how much variety there is, and by the simplicity of its order and laws." These decrees can be understood either as concerning certain (contingent) laws that govern the relations in question, such as, for instance, the decree of the laws of molecular genetics that govern family relations, or, more commonly, as concerning specific relations between particular things, such as, for instance, the decree that Caesar is spatially located on top of, or in the Rubicon at a certain time.

In "Grammaticae cogitationes", we find:

Optime sic explicabitur ut Paris est amator Helenae, id est: Paris amat *et eo ipso* Helena amatur. Sunt ergo duae propositiones in unam compendiose collectae. Seu *Paris est amator, et eo ipso Helena est amata. Ensis est ensis Evandri*, id est *Ensis est supellex, quatenus Evander est dominus. Poeta est lectus quatenus ille vel ille est legens*. Nam nisi obliquos casus resolvās in plures propositiones nunquam exhibis quin cum Jungio novos ratiocinandi modos fingere cogaris. Vel sic: *Paris amat Helenam* id est *[Paris] putat quod Helena est sibi futura jucunda. Ensis Evandri*, id est *Ensis qui est subditus quatenus Evander est dominus*. Subditum vel subditus est quod patitur quatenus alius agit, et quatenus is est justus. (Leibniz 1999: 115)

We may, following Leibniz, describe the relational complex on this non-fundamental level of analysis by "Othello loves in so far as Desdemona is loved" or "Othello loves and eo ipso Desdemona is loved". This analysis has three parts:

- (i) it ascribes to Othello the relational property of loving Desdemona and the non-relational property of loving (ie. loving someone, being a lover);
- (ii) it ascribes to Desdemona the relational property of being loved by Othello and the non-relational property of being loved (ie. being loved by someone, being someone beloved);
- (iii) it ascribes to the facts stated by (i) and (ii) the relation making true claims such as "*p* in so far as *q*" or "*p* and eo ipso *q*".

This three-pronged analysis allows us to keep what is right in the alternative accounts:

- In this sense of (i) and (ii), we may say, with Fine, that the asymmetric relation *R* distinguishes between two parts of the sum that exemplifies it by coordinating them with different things, e.g. lovers and beloved ones. This allows us to say that Othello, Don José and Abelard, say, have something in common: they are lover parts of fusions exemplifying the neutral amatory relation.
- In this sense of (i) and (ii), we may say, with the positionalist, that this difference between Othello and Desdemona, as parts of the relational complex, is due to their playing different rôles, ie. entering into this complex in different ways – as lover and as beloved respectively.
- The "*p* in so far as *q*" and "*p* and eo ipso *q*" locutions express that "*p*" and "*q*" have the same fundamental truthmaker.¹⁵

15. Mates (1986: 216) is right about this, though wrong in taking truthmaking to be implication (or rather: entailment): "[Paris is a lover, and eo ipso Helen is a loved one]" tells us that those "facts" or individuals-cum-accidents that make "Paris is a lover" true also make "Helen is a loved one" true; presumably, if those facts were more narrowly described, the resulting propositions [...] would actually imply that Paris loves Helen."