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Explaining the differential application of non-symmetric relations

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Abstract
Non-symmetric relations like *loves* or *between* can apply to the same relata in non-equivalent ways. For example, *loves* may apply to Abelard and Eloise either by Abelard's loving Eloise or by Eloise's loving Abelard. On the standard account of relations (Directionalism), different applications of a relation to fixed relata are distinguished by the *direction* in which the relation applies to the relata (e.g., from Abelard to Eloise rather than from Eloise to Abelard). But neither Directionalism nor its most popular rival, Positionalism, offer accounts of differential application that generalize to relations of arbitrary symmetry structure. Here, I develop an alternative account, Relative Positionalism, which distinguishes different applications of a relation to fixed relata in terms of the ways in which the relata are characterized relative to one another. In presenting and defending Relative Positionalism, this paper covers some of the same ground as my [2016], but avoids the latter's algebraic approach and focuses on interpretative issues—in particular, how to make sense of relative property instantiation—that were not addressed in the earlier paper.

Keywords Relations · Non-symmetric relations · Converse relations · Differential application · Symmetry

1 Introduction

In at least some cases, the *order* of relata-designating terms in relational claims is semantically significant. For example,

(*lovesAE*) Abelard loves Eloise

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may be true, while
(*lovesEA*) Eloise loves Abelard

is false. More generally, let *R* be any n-ary relation that is not *completely symmetric*[1] and let '***R***' be a n-place predicate standing for *R*. Then there are non-equivalent claims of the form

(*) $\boldsymbol{R}x_1 \ldots x_n$
($*_P$) $\boldsymbol{R}x_{P(1)} \ldots x_{P(n)}$

(where P is a permutation of the indices 1, …, n).

For relation *R* designated by predicate '***R***', call claims of the form (*) *atomic R-claims*. Call pairs of the form (*) and ($*_P$) *permuted R-claims*. The primary question addressed in this paper is how in general to understand the difference in the content of non-equivalent permuted *R*-claims. In other words, given non-symmetric *R* and fixed relata $x_1, \ldots x_n$, what more is there to the content of (*) besides the claim—common to both (*) and ($*_P$)—that *R* holds, somehow or another, among $x_1, \ldots, x_n$? An adequate answer to this general question would tell us, in particular, what more (*lovesAE*) says than that the *loves* relation holds, somehow or another, among Abelard and Eloise.[2]

Note that for a fixed predicate '***R***' designating the n-ary relation *R*, the n! ($= 1 \times \cdots \times n$) permutations of 1, …, n can be partitioned[3] by grouping permutations P and Q in the same partition-class if and only if, necessarily, ($*_P$) and ($*_Q$) are equivalent for all $x_1, \ldots, x_n$ in the domain of *R*. I will assume that any such partition of the permutations of 1, …, n represents the *symmetry structure* of the n-ary relation *R*.[4] A secondary question addressed in this paper is—what, in general, determines differences in the symmetry structures of n-ary relations. An adequate answer to this question would tell us, in particular, what is different about the binary *loves* relation as compared to the binary *next to* relation which allows the former to hold in two distinct ways among two relata while the latter can hold in only one way among two relata.

[1] Throughout this paper, I use the following terminology to distinguish different levels of symmetry for an n-ary relation *R* denoted by the predicate '***R***':

R is *completely symmetric* just in case: necessarily, for any $x_1, \ldots, x_n$ in the domain of *R* and any permutation P of 1, …, n,

$$\boldsymbol{R}x_1 \ldots x_n \text{ iff } \boldsymbol{R}x_{P(1)} \ldots x_{P(n)}.$$

R is *non-symmetric* just in case: *R* is *not* completely symmetric.

R is *completely non-symmetric* just in case: for *any* permutation P of 1, …, n, possibly, there are $x_1, \ldots, x_n$ such that

$$\boldsymbol{R}x_1 \ldots x_n \text{ and not } \boldsymbol{R}x_{P(1)} \ldots x_{P(n)}.$$

R is *partly symmetric* just in case: *R* is *neither* completely symmetric *nor* completely non-symmetric.

[2] Here and throughout this paper, I take plural terms like "Abelard and Eloise" to refer to an *unordered* plurality of individuals (unless the plural term is explicitly modified by the qualifier "in that order").

[3] A *partition* of a set S is a set of pairwise disjoint subsets $S_1, \ldots, S_m$ of S such that $S_1 \cup \cdots \cup S_m = S$.

[4] I am glossing over some details that I do not have room for in this paper. See (Donnelly 2016). The general idea is that the exact partitioning of permutations depends on which predicate designates *R*, but I assume that partitions determined by any two predicates designating *R* are at least isomorphic and thus represent the same structure.

Borrowing vocabulary from Fine (2000, p. 8), we may say that nonequivalent permuted *R*-claims express the *differential application* of the relation *R* to fixed relata. Using this terminology, the two central questions for this paper are:

(DiffApp1) What, in general, does the difference between different applications of a fixed relation to fixed relata consist in?

(DiffApp2) What, in general, determines the different capacities for differential application in relations of the same arity?[5]

The standard answer to **(DiffApp1)** has its roots in Russell's account of relations from his 1903 *Principles of Mathematics*. Russell claims here that, at least in the binary case, relations apply to their relata in a *sense*, or direction,—i.e., binary relations apply to relata by *proceeding from* one relata *to* the next.[6] Following Gaskin and Hill (2012) and Ostertag (2019), I call Russell's account of relations *Directionalism*.[7] Directionalism explains the difference in the content of (*lovesAE*) and (*lovesEA*) by appealing to two distinct directions in which the *loves* relation might apply to Abelard and Eloise. (*lovesAE*) claims that *loves* holds *from* Abelard *to* Eloise, while (*lovesEA*) claims that *loves* holds *from* Eloise *to* Abelard.

Directionalism has been the target of criticism dating back at least to Williamson (1985) and, more recently, Fine (2000). Briefly, the primary complaint about Directionalism has been that, because it is committed to the existence of distinct converses, Directionalism leads to ontological excess or semantic indeterminacy (or both). To see how, note first that given Directionalism, any *non-symmetric* binary relation *R* would seem to have a *distinct* converse R^{-1} which holds in the opposite direction—i.e., R^{-1} holds from y to x just in case *R* holds from x to y. The purported ontological problem is that claims like (*lovesAE*) and

(*lovedbyEA*) Eloise is loved by Abelard

seem to describe the *same* relational state or fact. But if Directionalism does indeed entail that all binary relations have converses, then either (i) (*lovesAE)* and (*lovedbyEA*) describe a single relational state/fact structured by the distinct relations *loves* and *is loved by* or (ii) (*lovesAE)* and (*lovedbyEA*) describe distinct but redundant relational states/facts.[8]

[5] While **(DiffApp1)** has received a fair amount of attention in the literature on relations, question **(DiffApp2)** is rarely addressed. One exception is (Dixon 2019). See, in particular, Dixon's (Q1) and (Q2) (2019, p. 68), both of which address questions along the lines of **(DiffApp2)**.

[6] See Russell (1903, Sect. 94):

> …it is characteristic of a relation of two terms that it proceeds, so to speak, *from* one *to* the other. This is what may be called the *sense* of the relation, and is, as we shall find, the source of order and series. …We may distinguish the term *from* which the relation proceeds as the *referent*, and the term *to* which it proceeds as the *relatum*. The sense of a relation is a fundamental notion which is not capable of definition.

[7] In Fine (2000) and elsewhere, Russell's account of relations is called "the standard account".

[8] See, e.g., Fine (2000) and MacBride (2007) for discussions of the ontological excess problem for Directionalism.

The purported semantic problem is that, given Directionalism, it must be indeterminate whether any relational predicate denotes a given relation or, instead, one of its converses. Very briefly, the complaint is that conventions for relational ordering and for fixing the denotations of relational predicates are interdependent. For example, claims of the form

(*lovesxy*) *x* loves *y*

may be true in exactly the same circumstances as are claims of the form

(*lovedbyxy*) *x* is loved by *y*

if the two sorts of claims are associated with opposite conventions for specifying the direction of the application of the relation to the relata through the order of the relata-designating terms in the claim. If there is no way of specifying the direction of relational application independently of assumptions about the denotations of relational predicates and no way of specifying the denotation of relational predicates independently of conventions about the direction of relational application, then the denotations of relational predicates must be indeterminate.[9]

I am concerned here with neither the ontological excess objection to Directionalism nor the semantic indeterminacy objection to Directionalism. Instead, I focus in the next section on a more fundamental problem afflicting Directionalism, as well as proposed alternatives to Directionalism—that these accounts of relations do not deliver satisfactory general answers to questions **(DiffApp1)** and **(DiffApp2)** concerning differential application. I take its failure to explain differential application to be the most fundamental problem for Directionalism because Directionalism is introduced for the sole purpose of explaining differential application and has no other apparent motivation. Moreover, it seems incredible that there should be no answer to at least question **(DiffApp1)**. Distinctions between the different applications of a relation to fixed relata are so intuitive and easy to grasp, even in cases involving unfamiliar relations or relata, it would be surprising if there were no general account of distinctions in the content of claims like (*lovesAE*) and (*lovesEA*). (By contrast, the assumptions behind the ontological excess and the semantic indeterminacy objections to Directionalism are much less intuitive. I doubt, for example, that many people have strong intuitions about whether or not a single relational state can be structured by distinct converse relations.)

An important further reason for focusing on **(DiffApp1)** and **(DiffApp2)** is that while most alternatives to Directionalism deny that relations have distinct converses and thus avoid the ontological excess and semantic indeterminacy objections to Directionalism, none have provided answers to **(DiffApp1)** and **(DiffApp2)** that generalize to relations of arbitrary symmetry structure. Since Directionalism itself fairs no better with **(DiffApp1)** and **(DiffApp2),** we have reason to direct attention to the common problem of finding satisfactory general answers to **(DiffApp1)** and **(DiffApp2)**.

The remainder of this paper proceeds as follows. After showing that Directionalism and its primary rivals fail to meet two minimal criteria for satisfactory explanations of differential application (Sect. 2), I introduce Relative Positionalism and explain

[9] See Williamson (1985) and van Inwagen (2006) for discussions of the semantic indeterminacy problem for Directionalism.

its answers to **(DiffApp1)** and **(DiffApp2)**. I focus initially on Relative Positionalism's account of binary relations (Sect. 3), before indicating how this account can be expanded to cover also higher arity relations (Sect. 4). Admittedly, Relative Positionalism carries very strong metaphysical commitments of its own. It requires that individuals may instantiate certain properties relative to other individuals or to sequences of individuals. I address criticisms of Relative Positionalism in Sect. 5. My conclusion is that despite its strong commitments, Relative Positionalism deserves serious consideration because it is the only account of differential application proposed so far that extends to fixed arity relations with any symmetry structure.

In presenting and defending Relative Positionalism, this paper covers some of the same ground as my earlier [2016]. However, the main focus of the earlier paper is an algebraic proof that Relative Positionalism has adequate structural resources for a general account differential application. Here, I present Relative Positionalism in a way that does not rely on abstract algebra (which, I think, some readers find off-putting) and focus on interpretive issues—in particular, how to make sense of relative property instantiation—that were not addressed in the earlier paper.

2 Two minimal criteria for accounts of differential application

I take the following to be minimal constraints on satisfactory answers to (**DiffApp1**) and (**DiffApp2**). First, I assume that any satisfactory answer to (**DiffApp1**) must explain our obvious ability to distinguish cases of differential application without abstruse background assumptions concerning the structure of relations. Even small children can understand and correctly explain the difference between what is claimed in (*lovesAE*) and what is claimed in (*lovesEA*). A satisfactory general answer to (**DiffApp1**) must somehow underwrite the terms in which correct ordinary explications of specific cases of differential application are framed.

Second, I assume that satisfactory answers to (**DiffApp1**) and (**DiffApp2**) must be able to explain the differential application of *any* non-symmetric relation *R* of finite fixed arity. Recall that non-symmetric relations may be either *completely non-symmetric* (as is the *loves* relation) or *partly symmetric*. (See footnote 1 for definitions of terms distinguishing levels of symmetry.) For example, the ternary relation *between* (holding among three things just in case one is between the other two) is partly symmetric. To see that it is not completely symmetric, note that the following two claims may differ in truth-value.

(*betweenMLC*) Moe is between Larry and Curly.
(*betweenLMC*) Larry is between Moe and Curly.

To see that it is also not completely non-symmetric, note that (*betweenMLC*) is necessarily equivalent to:

(*betweenMCL*) Moe is between Curly and Larry.

Whereas binary relations must be either *completely symmetric* or *completely non-symmetric*, relations of arity greater than two may be *partly symmetric* (as is *between*). To further complicate the situation for higher arity relations, partly symmetric relations of the same arity may have different symmetry structures. Whereas the ternary relation *between* may apply to fixed relata in *three* possible ways, the ternary *stand clockwise in a circle* relation applies to fixed relata in only *two* possible ways. The variety of possible symmetry structures for n-ary relations increases rapidly as n increases. There are four possible symmetry structures for ternary relations, eleven possible symmetry structures for quaternary relations, nineteen possible symmetry structures for quinary relations, and increasingly many more possibilities for n-ary relations with n greater than 5.[10] I assume that satisfactory general answers to (**DiffApp1**) and (**DiffApp2**) must be applicable to finite fixed arity relations with any possible symmetry structure. Even if we are not committed to the strong assumption that there *are* relations of any possible symmetry structure, there seems to be no non-question-begging reason for ruling out relations with particular symmetry structures.

One reason why Directionalism cannot offer a satisfactory answer to (**DiffApp1**) is that its central assumption—that relations apply to their relata in an order—is obscure and fails to connect with ordinary thinking about relational claims like (*lovesAE*) and (*lovesEA*).[11] Non-philosophers do not explain the difference between (*lovesAE*) and (*lovesEA*) in terms an *order* in which Abelard and Eloise are supposed to stand in the *loves* relation. Not only can we apparently get by just fine without invoking orders of relational application in intuitive understandings of differential application, it is hard to see how the idea of an order of relational application could be filled out. It is not as though relata are somehow fed into a relation as paper is fed into a printer or wood into a chipper. Relations are not the kinds of things that can "pick up" their relata in a temporal or spatial succession. Perhaps there is some other way for relations to apply to their relata in an order, but no one has tried to explain what this is supposed to be.

An additional shortcoming of Directionalism is that it does not have the right structure to explain the differential application of partly symmetric relations like *between* or *stand clockwise in a circle*.[12] If the different ways R can hold among $x_1,\ldots, x_n$ amount to just different orders of application of R to $x_1 \ldots x_n$, then *any* difference in the order of $x_1,\ldots,x_n$ should correspond to a different way for R to hold among $x_1,\ldots,x_n$. Otherwise, the order in which R applies to $x_1 \ldots x_n$ would not, on its own, determine a distinctive application of R to $x_1 \ldots x_n$—some further ingredient would be required. But not every ordering of the stooges amounts to a different way for *between* or *stand clockwise in a circle* to hold among them. There are *six* ways to linearly order the stooges (corresponding to the six permutations of any three-membered set) but only *three* ways for *between* to hold among them and only two ways for *stand clockwise in a circle* to hold among them. Thus, Directionalism does not meet our second minimal criterion—it cannot explain the differential application of fixed arity relations with any symmetry structure.[13]

10 Here, I assume that the number of possible symmetry structures for n-ary relations is equal to the number of non-isomorphic subgroups of the symmetric group of order n (where the *symmetric group of order n*, S_n, is the group of all permutations of n things). See Donnelly (2016) for further discussion of the application of algebra to relational symmetry structures.

11 This point has been made elsewhere. See, e.g., MacBride (2014, pp. 4–6).

12 This point is also made at Gaskin and Hill (2012, p. 175).

13 Even when limited to binary relations—which cannot be partly symmetric—Directionalism's answer to **(DiffApp2)** is problematic since it would seem to require that non-symmetric binary relations apply to

What about alternatives to Directionalism? Might they fare better in providing answers to **(DiffApp1)** and **(DiffApp2)** that satisfy our two minimal criteria? One alternative to Directionalism, Macbride's Ostrich Realism (2014), denies that there are any informative answers to **(DiffApp1)**. After examining and rejecting various accounts of differential application, Macbride concludes that "we should just take the difference between *aRb* and *bRa* as primitive. This means that our understanding of what makes the difference between *aRb* and *bRa* is schematic—it depends in particular cases upon the character of the *R* in question."[14]

Another alternative to Directionalism, Fine's *Antipositionalism*, explains differential application through substitution relations among relata in relational states (2000, pp. 25–32).[15,16] Fine's proposal is that the difference between, e.g., the state described in (*lovesAE*) and that described in (*lovesEA*) amounts to a difference in how these two states result from substitution into an exemplar state. For example, the state described in (*lovesAE*) is the result of substituting Abelard for Emily and Eloise for Laney Lou in the state of Emily's loving Laney Lou, while the state described in (*lovesEA*) is the result of substituting Eloise for Emily and Abelard for Laney Lou in the state of Emily's loving Laney Lou. In general, on Fine's account two relational states involving the same relation and same relata differ insofar as their substitution relations with the relata in an exemplar state for that relation differ.

I don't see how Fine's Antipositionalism can give us an account of the difference in the content of (*lovesAE*) and (*lovesEA*). Not only is there no implicit or explicit reference to other *loves* states in either (*lovesAE*) or (*lovesEA*), it is also unclear how substituting into an exemplar state could help clarify the distinction between Abelard's loving Eloise and Eloise's loving Abelard if we don't have an independent account of how the exemplar state itself differs from its differential opposite (viz., how Emily's loving Laney Lou differs from Laney Lou's loving Emily). Fine denies that there is any way of distinguishing different applications of a relation to fixed relata except through substitution relations among states involving that relation (2000, p. 30). In particular, Fine denies that relational states have any internal structure—e.g., a lover role and a beloved role—through which we might distinguish a particular application of a relation in a way that does not rely on connections with other relational states (Fine 2007, p. 57). Thus, according to Antipositionalism, any exemplar *loves* state is itself distinguished from its differential opposite only through the same substitution relations which are supposed to distinguish other *loves* states from their differential opposites through reference to the exemplar state. But this account never seems to

Footnote 13 continued
their relata in an order, while symmetric binary relations apply in no particular order to their relata. But it is not clear why binary relations would apply to their relata in such different ways.

[14] Gaskin and Hill (2012) similarly conclude that there is no general explanation of distinctions among different applications of a relation to fixed relata.

[15] Fine introduces the term "completion" to stand for whatever we take the result of applying a relation to relata to be—a relational state, fact, proposition, or something else. For simplicity, I will just assume that relational completions are states.

[16] See Leo (2016) for a further development of Fine's account of relations.

cash out the distinctions among different applications of the *loves* relation that are tracked by its substitution relations.[17]

Antipositionalism's account of differential application is also quite far from the ordinary way of distinguishing between the content of relational claims like (*lovesAE*) and (*lovesEA*). We do not normally invoke exemplar loving states or consider the results of substituting one person for another within loving states to distinguish the claims made in (*lovesAE*) and (*lovesEA*). Instead, we focus on what each of the claims says about Abelard and Eloise (in particular, what each claim says about who is loving whom). Thus, insofar as it accounts at all for the differential application of a relation to fixed relata, Antipositionalism fails to satisfy our first criterion of providing a framework to support correct ordinary explanations of specific cases of differential application.

A final alternative to Directionalism, Positionalism,[18] does seem to fit ordinary ways of distinguishing between the content of claims like (*lovesAE*) and (*lovesEA*). According to Positionalism, each n-ary relation R has up to n associated unary properties called *positions* (or roles). The different ways for $x_1,\ldots,x_n$ to stand in R correspond the different ways of assigning $x_1,\ldots,x_n$ to R's positions. For example, (*lovesAE*) describes one way for the *loves* relation to hold among Abelard and Eloise—that in which Abelard occupies the *lover* position and Eloise the *beloved* position. (*lovesEA*) describes a distinct way for the *loves* relation to hold among Abelard and Eloise—that in which Eloise occupies the *lover* position and Abelard the *beloved* position.

However, as has been pointed elsewhere,[19] Positonalism does not offer answers to **(DiffApp1)** and **(DiffApp2)** that generalize to relations of arbitrary symmetry structure. For example, Positionalism does not account for the differential application of relations with a cyclical symmetry structure like the ternary *stand clockwise in a circle* relation. Roughly, this is because the two different ways for Moe, Larry, and Curly to stand in this relation are not differentiated by distinct *absolute positions* occupied by the stooges—no one of the stooges plays a distinctive role in any application of *stand clockwise in a circle* to the stooges. Instead, the two different ways the stooges might stand in the *stand clockwise in a circle* relation are distinguished by the ways the stooges are positioned *relative to one another*—namely, with either Moe, followed by Larry, followed by Curly in the clockwise direction or with Moe, followed by Curly, followed by Larry in the clockwise direction. Thus, though Positionalism, unlike Directionalism and Antipositionalism, does seem to offer an answer to **(DiffApp1)** that meets our first minimal criterion, its answer does not satisfy our second minimal criterion.

Unlike question **(DiffApp1)**, question **(DiffApp2)** is rarely addressed in accounts of relations. I assume that both MacBride's Ostrich Realism and Fine's Antipositionalism would deny that there is any general account of differences in the symmetry structures

[17] See Gaskin and Hill (2012, pp. 176–182) for more on this and other criticisms of Antipositionalism. For further criticisms of Antipositionalism, see MacBride (2007, 2014) and Dixon (2019).

[18] Versions of positionalism are considered in Fine (2000) and MacBride (2007) and endorsed in Castenada (1982), Williamson (1985), King (2007), Orilia (2011), Gilmore (2014), and Dixon (2018).

[19] See Fine (2000, p. 17, n. 10), Macbride (2007, pp. 41–44), Gaskin and Hill (2012, p. 175). See Donnelly (2016, p. 89, n. 22) for an algebraic characterization of the kinds symmetry structures to which Positionalism is limited.

of relations of the same arity. (Fine says, for example, that it "is a fundamental fact for …[the antipositionalist] that relations are capable of giving rise to a diversity of completions in application to any given relata and there is no explanation of this diversity in terms of a difference in the way the completions are formed from the relation by assigning the relata to different argument-places" (2000, p. 19).) And it is clear that because of the limits on the kinds of symmetry structures it can handle, Positonalism cannot provide an answer to **(DiffApp2)** that extends to relations of arbitrary symmetry.

3 Relative positionalism—binary relations

Since neither Directionalism nor the primary alternatives to Directionalism can provide satisfactory general explanations of differential application, we should look for an alternative account of relations that can. The account developed in this paper, Relative Positionalism, is a variation on Positionalism which, at least in the case of binary relations, shares Positionalism's intuitiveness. However, unlike Positionalism, Relative Positionalism offers an explanation of differential application which extends to fixed arity relations with any symmetry structure.

I defer the discussion of Relative Positionalism's account of higher arity relations to Section IV. In this section, I focus only on Relative Positionalism's account of binary relations.

Consider the distinction between what is claimed in (*lovesAE*) and what is claimed in (*lovesEA*). Both statements claim that the *loves* relation holds among Abelard and Eloise. The obvious difference in the content of the two claims is that whereas (*lovesAE*) says that Abelard loves and Eloise is beloved, (*lovesEA*) says that Eloise loves and Abelard is beloved. This, I take it, amounts to a difference in the way (*lovesAE*) and (*lovesEA*) characterize each of the two relata, Abelard and Eloise, individually—either as *lover* or as *beloved*. But (*lovesAE*) does not merely claim that Abelard is a *lover of someone or other* and Eloise is *beloved by someone or another*. If that were all there is to the content of (*lovesAE*) besides the assertion that the *loves* relation holds (in some way or another) among Abelard and Eloise, then (*lovesAE*) would be true if, say, Eloise loves Abelard, Abelard loves Moe (but not Eloise), and Eloise is loved by Larry (but not by Abelard). Analogous comments apply to (*lovesEA*). Importantly, the crucial characterizations of the relata which distinguish the content of (*lovesAE*) from that of (*lovesEA*) are not absolute but relative. (*lovesAE*) characterizes Abelard as *lover*, not absolutely (or, so to speak, from the standpoint of the world at large), but *relative to Eloise*. In so doing, (*lovesAE*) also characterizes Eloise, relative to Abelard, as *beloved*—since what it is for Abelard to be a *lover* relative to Eloise is for Eloise to be *beloved* relative to Abelard. Thus, the difference in the content of (*lovesAE*) and (*lovesEA*) amounts to a distinction in the way the relata are characterized relative to one another.

Relative Positionalism proposes that any cases of the differential application of a binary relation to fixed relata are distinguished by the ways in which those relata are characterized *relative to one another*.[20] How might we fill out Relative Positionalism's underlying assumption that one individual may be characterized, not absolutely, but relative to another individual? I propose that any individual may function not only as the *target* of characterizations (i.e., as itself an instance of properties), but also as a *standpoint* or *parameter* from which individuals are characterized.[21] Note that certain familiar kinds of properties only make sense when assigned relative to a particular individual. From my own standpoint, there is a clear distinction between people who are *beloved* and people who are not *beloved*. But this cannot be an absolute distinction since people who are *beloved* for me are not *beloved* for everyone and people who are *beloved* for other people need not be *beloved* for me. Similarly, from my own (current) standpoint, there is a distinction between locations (cities, buildings, etc.) that are *north* and those that are *south*. But different locations are *north* or *south* relative to different people (or cities, buildings, etc., …), so this cannot be an absolute distinction. I take *beloved, lover*, *north*, and *south* to be unary properties—they characterize individuals like Eloise or Toronto, not pairs of individuals. But they are unary properties which are instantiated, not absolutely, but relative to particular individuals.

Note that the Empire State Building may be *north* relative to me even if I do not believe that it is, either because I do not know where the Empire State Building is or because I have an imperfect sense of direction. And individuals (other buildings, cities, people, etc…) are *north* or *south* relative to the Empire State Building even though the Empire State Building itself has no beliefs or perceptions at all concerning any individual's location. Thus, relative properties like *lover*, *beloved*, *north*, or *south*, are not subjective characterizations. Whether or not Y is *north* relative to X does not depend on X's perceptions and beliefs (or whether X has any perceptions or beliefs). However, there should at least be this connection between relative properties and subjective phenomena—if X is the kind of thing that has perceptions and beliefs, then X's perceptions and beliefs are *accurate* only insofar as they correctly reflect the ways in which individuals are characterized relative to X. My belief that the Empire State Building is *north* is accurate only if the Empire State Building is, in fact, *north* relative to me.

Relative Positionalism makes the strong claim that the holding of a binary relation among two individuals consists in each of the relata being characterized in particular ways relative to one another. For relations like *loves* or *north of*, there are two distinct associated relative properties, $R_1 \neq R_2$, such that for any x, y,

relative to y (x is R_1) iff relative to x (y is R_2). (CONJ)

[20] Relative Positionalism is not an entirely new account of relational claims. In Sect. 2, Part 7 of *The Categories*, Aristotle introduces the category of *relatives*, giving as examples property pairs such as *inferior/superior*, *half/double* and *slave/master* and explaining that, e.g., something is said to be "superior" by reference to something else (which, in turn, is said to be "inferior" by reference to the first thing). See Tegtmeier (2004) for a comparison of Aristotle's account to Russell's earlier and later accounts of relations. There are similar threads in Hector-Neri Castañeda's readings of Leibniz's and Plato's treatments of relations (Castañeda 1982). Ultimately, however, Castañeda attributes to both Plato and Leibniz versions of Positionalism, not Relative Positionalism.

[21] Thus, when I say that, e.g., Eloise is *beloved* from Abelard's standpoint, this should not be understood to imply that there is, besides Abelard, a distinct entity which is Abelard's standpoint. Rather, Abelard's standpoint is just Abelard himself insofar as he functions as parameter at which things in the world are characterized.

Call relative properties satisfying (CONJ) *conjugates*. For example, *north* and *south* are conjugate relative properties, as are also *lover* and *beloved*.

Unlike non-symmetric binary relations, symmetric binary relations like *next to* have only one associated relative property. Let *next* be the property had by x relative to y when x is next to y. I take it that x qualifies as *next* from y's standpoint just in case x is sufficiently nearby, relative to y, on some contextually determined standard of closeness. If x is in this sense *next*, relative to y, then y must be *next*, relative to x. Thus, *next* is *self-conjugating*, where relative property R_1 is self-conjugating just in case:

relative to y (x is R_1) iff relative to x (y is R_1). (S-CONJ)

The general formulation of Relative Positionalism for binary relations is as follows.

Let R be any binary relation. According to Relative Positionalism, there are relative properties R_1 and R_2 (*not necessarily distinct*) such that

(i) R_1 and R_2 are (self-)conjugates (i.e., if $R_1 \neq R_2$, R_1 and R_2 are conjugates and if $R_1 = R_2$, R_1 is self-conjugating) and
(ii) for any individuals x, y, R holds among x and y iff relative to y (x is R_1) or relative to y (x is R_2).

Call R_1 and R_2 the *relative properties* of the relation R. Note that given requirement (i), it follows from (ii) that R holds among x and y iff either:

(*) relative to y (x is R_1) and relative to x (y is R_2), or
(**) relative to y (x is R_2) and relative to x (y is R_1).

For binary relations, Relative Positionalism's answer to question (**DiffApp1**) is that different applications of R to fixed relata x, y are distinguished by differences in the distributions of R's relative properties R_1 and R_2 among x, y. It follows from conditions (i) and (ii) above that there are at most *two ways* in which R can hold among x and y—namely, the ways corresponding to the relative property distributions (*) and (**) above.

Note that (*) and (**) amount to the *same way* for R to apply to x and y in case $R_1 = R_2$. Relative Positionalism's answer to (**DiffApp2**) for binary relations is that R has the capacity to hold in two ways among fixed relata if and only if R has two distinct relative properties, R_1 and R_2. Otherwise, R has only one relative property (i.e., $R_1 = R_2$) and can hold in only one way among fixed relata.

Note, crucially, that Relative Positionalism's account of differential application must deny that relative property ascriptions are merely disguised relational claims. For example, if

relative to Eloise(Abelard is a *lover*) (@*E*, *loverA*)
relative to Abelard(Eloise is *beloved*) (@*A*, *belovedE*)

were merely alternative phrasings of the relational claims (*lovesAE*) and (*lovedbyEA*), then obviously such relative property ascriptions would not help distinguish the content of relational claims in the way proposed above. (@*E*, *loverA*) and (@*A*, *belovedE*) are instead what Fine calls *external* relativizations (Fine 2005, p. 279).[22] Abelard functions

[22] See also Kölbel (2003), Lipman (2016), and Spenser (2016) for further discussion of (internal vs.) external relativization.

in (*@A*, *belovedE*) not as a relatum of a relation but rather as the parameter (or, what I call the "standpoint") at which the property ascription—*Eloise is beloved*—is assessed. In other words, Abelard's function in (*@A*, *belovedE*) is analogous to that of the worlds at which propositions are evaluated in possible worlds semantics or that of the times at which propositions are evaluated in temporal logics.

So understood, relativized property ascriptions such as (*@E*, *loverA*) and (*@A*, *belovedE*) introduce a kind of orientation not present in relational claims like (*lovesAE*) or (*lovedbyEA*). Whereas (*lovesAE*) characterizes both Abelard and Eloise by predicating the *loves* relation of them, (*@E*, *loverA*) characterizes only Abelard by predicating the unary property *lover* of him (from the standpoint of Eloise) and (*@A*, *belovedE*) characterizes only Eloise by predicating the unary property *beloved* of her (from the standpoint of Abelard). In this way, relative property conjugates, like *lover* and *beloved*, differ from Directionalism's relation converses. Relation converse pairs like, *loves* and *islovedby*, apply to the exact same relata, differing only in the supposed direction of their application to these relata, but not in which individual is the target and which is the parameter of a particular characterization.

4 Relative positionalism—higher arity relations

The second minimal criterion for satisfactory answers to (**DiffApp1**) and (**DiffApp2**)—that they generalize to relations having arbitrarily complex symmetry structures—can be evaluated only by considering n-ary relations for n > 2. As noted in Sect. 2, there are only *two* possible symmetry structures for binary relations. Any binary relation is either completely symmetric or completely non-symmetric. But there are *four* possible symmetry structures for ternary relations, *eleven* possible symmetry structures for quaternary relations, *nineteen* possible symmetry structures for quinary relations, and increasingly many more possibilities for n-ary relations as n increases. A minimally adequate account of differential application must be able to accommodate increasingly complex patterns of differential application in higher arity relations.

Unlike Directionalism, Positionalism, Antipositionalism and Ostrich Realism, Relative Positionalim offers an account of the differential application of any finite fixed arity relation in terms of the structure of relations. But I warn the reader in advance that Relative Positionalism's treatment of higher arity relations posits an increasing complexity in relative property instantiation to match the increasing complexity of symmetry structures for higher arity relations. Relative Positionalism's treatment of higher arity relations is thus less intuitive than its treatment of binary relations. Some may see this as a mark against Relative Positionalism. However, in Relative Positionalism's defense, it is hard to imagine how any theory of relations could offer a simple account of differential application in quaternary or quinary relations—the eleven distinctions among the possible symmetry structures for quaternary relations and the nineteen distinctions among the possible symmetry structures for quinary relations are not themselves easy to grasp.

A simple example of a partly symmetric relation is the ternary relation *between* discussed in Sect. 2. Recall that *between* can apply in three different ways to fixed relata. These are illustrated below for the relata Moe, Larry, and Curly (Figs. 1, 2, 3).

Fig. 1 (*betweenMLC*) Moe is between Larry and Curly.
(*betweenMCL*) Moe is between Curly and Larry

Fig. 2 (*betweenLMC*) Larry is between Moe and Curly.
(*betweenLCM*) Larry is between Curly and Moe

What do the distinctions among these three applications of *between* to the stooges amount to? Intuitively, the different applications of *between* to the stooges are distinguished only by which one of the stooges occupies the middle position relative to the other two.

Can this intuitive explanation of the distinctions among different applications of *between* to the stooges be expressed in terms of the ways the stooges are characterized relative to one another? I think so. Here, though, we must be careful. As I have framed it, the intuitive explanation characterizes one stooge as *middle* relative to the other two. But it is not clear what sense can be made of a standpoint (i.e., a parameter of property attribution) that is supposed to be a combination of two individuals. There is a subjective perspective (that of Larry) which, insofar as it is accurate, reflects the way things in the world are characterized relative to Larry and another (that of Curly) which, insofar as it is accurate, reflects the way things in the world are characterized relative to Curly. But there is no subjective perspective which, insofar as it is accurate, reflects the ways things in the world are characterized relative to Larry *and* Curly. Moreover, such familiar parameters as possible worlds and times are not combined for joint assessments—there is no complete and consistent way things are at a combination of two times or at a combination of two worlds.

Ultimately, I propose that individuals may be characterized from *embedded standpoints*—i.e., from the standpoint of one individual as it is structured by that of another individual. To motivate this added complexity with intuitive observations, note first that two (or more) individuals may stand in certain relations, not absolutely, but only relative to another individual. For Moe to occupy the middle position relative to Larry and Curly (as in Fig. 1) is for Curly to stand *opposite of* Larry relative to Moe. Note that the holding of the *opposite of* relation between Larry and Curly is standpoint-dependent. If I were positioned to the right of Curly in Fig. 1, then Curly would not be opposite of Larry, from my standpoint (since both Larry and Curly would be on the same side of me).

Other examples of standpoint-dependent spatial relations are *closer than*, *farther than*, *in front of*, and *in back of* where these relations are taken to depend on a framework imposed by an outside reference object. Note that the standpoint-dependent *in front of* and *in back of* relations match the uses of, respectively, “in front of” and “in back of” in which any object Y on a straight path between X and reference object

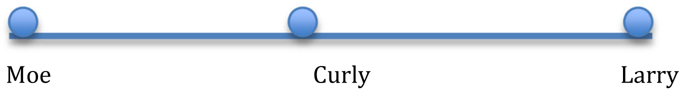

Fig. 3 (*betweenCLM*) Curly is between Larry and Moe. (*betweenCML*) Curly is between Moe and Larry

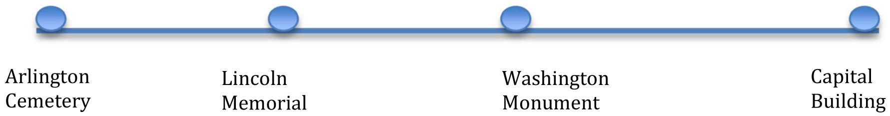

Fig. 4 Relative to the Capital Building, the Washington Monument is in front of the Lincoln Memorial. Relative to Arlington Cemetery, the Lincoln Memorial is in front of the Washington Monument

RO counts as *in front of* X, relative to RO, and any object X such that a straight path between X and RO includes Y counts as *in back of* Y, relative to RO.[23] For example, if I am standing at the Capital Building in Washington D.C., then the Washington Monument is *in front of* the Lincoln Memorial (and the Lincoln Memorial is *in back of* the Washington Monument), relative to me. See Fig. 4. By contrast, the Washington Monument is *in back of* the Lincoln Memorial (and the Lincoln Memorial *in front of* the Washington Monument) from the standpoint of a person in Arlington Cemetery. Relative to the Washington Monument itself, the Lincoln Memorial is *opposite of* the Capital Building (and me, or anyone else, positioned at the Capital Building), since the Lincoln Memorial and the Capital Building lie on straight paths proceeding in opposite directions from the Washington Monument.

Ultimately, Relative Positionalism distinguishes applications of relative relations like *opposite of*, *in front of*, and *in back of* through doubly-relative unary properties. But before complicating our account by introducing doubly-relative properties, it is worth appreciating how the relative relations *in front of*, *in back of*, and *opposite of* distinguish the applications of *between* depicted in Figs. 1 and 2. In the arrangement depicted in Fig. 1, the stooges stand in the following relations relative to one another:

(@M, *oppof*LC) relative to Moe (Larry is *opposite of* Curly);
(@L, *infront*MC) relative to Larry (Moe is *in front of* Curly);
(@C, *inback*LM) relative to Curly (Larry is *in back of* Moe).

In Fig. 2, by contrast, the stooges are arranged as follows relative to one another:

(@L, *oppof*MC) relative to Larry (Moe is *opposite of* Curly);
(@M, *infront*LC) relative to Moe (Larry is *in front of* Curly);
(@C, *inbackML*) relative to Curly (Moe is *in back of* Larry).

[23] This use of orientation predicates like "in front of" or "in back of" is distinct from another common use of such terms which depends on the intrinsic orientation of one of the relata. On this alternative use of "in front of", X counts as in front of Y iff X is on Y's front side. For example, on the intrinsic-orientation use of "in front of", the Washington Monument is in front of me just in case it is on the front side of my body (i.e., I am facing it). Note that none of the examples used in the body of this paper make any assumption about the intrinsic orientation of relata. In particular, none of the examples involving the stooges include any information about which directions they are facing.

For a rigorous discussion of the notoriously multi-faceted and confusing ordinary uses of spatial terminology, see Herskovits (1986).

But note, crucially, that *in front of* and *in back of* apply in two different ways to fixed relata relative to a fixed standpoint. For example, (@C, *inbackLM*) and (@C, *inbackML*) describe different arrangements of Moe and Larry relative to Curly—the former holds in the arrangement of Fig. 1, but not in that of Fig. 2, while the latter holds in the arrangement of Fig. 2, but not in that of Fig. 1. To distinguish among different applications of *between*, we must ultimately distinguish among different applications of *in back of*. Merely noting that *in back of* holds, somehow or another, among Moe and Larry relative to Curly does not distinguish the Fig. 1 application of *between* from the Fig. 2 application of *between*.

Applying the method of the previous section to the present case, Relative Positionalism distinguishes (@C, *inback* LM) and (@C, *inback* ML) by positing unary properties, *front* and *behind*, had by the relata, Moe and Larry, relative to one another. Here, however, the unary properties characterize Moe and Larry relative to each other *relative to Curly*, since it is from Curly's standpoint that *in back of* holds among Moe and Larry. In this way, the relative positionalist ultimately appeals to *embedded standpoints* in her account of n-ary relations for n > 2. The general idea is that from Moe's standpoint on its own, objects are characterized as *near* or *far*, *beloved* or *hated*, *north* or *south*, and so on, as proposed in Sect. 3. But additional structure may be imposed on Moe's standpoint when other individuals are characterized relative to Moe from an outside standpoint, such as that of Curly. Relative to Moe alone, no individual counts as *front* or *behind* (in the sense intended here—see footnote 23 for an alternative use of spatial prepositions). But to embed Moe's standpoint within Curly's standpoint is to supply external structure in terms of which other objects may be, e.g., *front* or *behind*, *closer* or *farther*, *more beloved* or *less beloved,* as characterized relative to Moe from Curly's standpoint. These doubly-relative characterizations depend not just on Moe but also on the individual functioning as the outside reference point. If I stand to the left of Larry in Fig. 1, then relative to me, relative to Moe, Larry is *front* and not *behind* as he is relative to Moe, relative to Curly. As another example, Eloise may be *more beloved*, relative to Moe, relative to Abelard (i.e., more beloved than Moe from Abelard's standpoint), but *less beloved*, relative to Moe, relative to Larry (i.e., less beloved than Moe from Larry's standpoint).

Note the significance of ordering in doubly-relativized characterizations. X's characterization relative to Y, relative to Z is, roughly, how X figures in comparison to Y within a framework imposed from Z's standpoint (where Z is the outside parameter of the double-relativization). Thus, whereas Larry's spatial characterization, relative to Moe, *relative to Curly* depends on a spatial framework *centered at Curly*, Larry's spatial characterization relative to Curly, *relative to Moe* depends on a spatial framework *centered at Moe*. As another example, Eloise is *more beloved*, relative to Moe, relative to Abelard if given evaluations determined from Abelard's standpoint, Eloise ranks as more beloved in comparison to Moe. Whether Eloise is characterized as *more beloved*, *less beloved*, or neither, relative to Abelard, relative to Moe depends on rankings determined from Moe's (not Abelard's) standpoint.

In terms of the doubly-relative unary properties *front* and *behind*, (@C, *inback*LM) is the application of *in back of* to Larry and Moe relative to Curly in which:

(@C, @M, *behind*L) relative to Curly (relative to Moe (Larry is *behind*));
(@C, @L, *front*M) relative to Curly (relative to Larry (Moe is *front*)).

By contrast, (@C, *inbackML*) is the application of *in back of* to Larry and Moe relative to Curly in which:

(@C, @L, *behind*M) relative to Curly (relative to Larry (Moe is *behind*));
(@C, @M, *front*L) relative to Curly (relative to Moe (Larry is *front*)).

Unlike *in back of* and *in front of*, the relative relation *opposite of* applies in only *one way* to fixed relata, relative to a fixed standpoint. There is only one way for *opposite of* to hold among Larry and Curly relative to Moe—the way expressed in (@M, *oppof* LC) and depicted in Fig. 1. This is because when *opposite of* holds among *x* and *y*, relative to a third individual *z*, then each of *x* and *y* plays the same role relative to the other in standing on an opposing side of *z*. Thus, the binary relative relation *opposite of* has only one associated doubly-relative property, *opposite*.

In terms of the three doubly-relative properties *front*, *behind*, and *opposite*, Fig. 1 depicts the application of *between* to the stooges in which

(@M, @L, *opposite*C) relative to Moe (relative to Larry (Curly is *opposite*));
(@M, @C, *opposite*L) relative to Moe (relative to Curly (Larry is *opposite*));
(@L, @M, *behind*C) relative to Larry (relative to Moe (Curly is *behind*));
(@L, @C, *front*M) relative to Larry (relative to Curly(Moe is *front*));
(@C, @M, *behind*L) relative to Curly (relative to Moe (Larry is *behind*));
(@C, @L, *front*M) relative to Curly (relative to Larry (Moe is *front*)).

By contrast, Fig. 2 depicts the application of *between* to the stooges in which:

(@L, @M, *opposite*C) relative to Larry (relative to Moe (Curly is *opposite*));
(@L, @C, *opposite*M) relative to Larry (relative to Curly (Moe is *opposite*));
(@M, @L, *behind*C) relative to Moe (relative to Larry (Curly is *behind*));
(@M, @C, *front*L) relative to Moe (relative to Curly (Larry is *front*));
(@C, @L, *behind*M) relative to Curly (relative to Larry (Moe is *behind*));
(@C, @M, *front*L) relative to Curly (relative to Moe (Larry is *front*)).

Note that implication relations hold among instantiations of the three doubly-relative properties for the *between* relation. For any individuals *x*, *y*, *z*,

relative to *x* (relative to *y* (*z* is *front*))
iff relative to x (relative to *z* (*y* is *behind*))
iff relative to *z* (relative to *x* (*y* is *opposite*))
iff relative to *z* (relative to *y* (*x* is *opposite*))
iff relative to *y* (relative to *z* (*x* is *behind*))
iff relative to *y* (relative to *x* (*z* is *front*)).

Thus, any instantiation of any one of *front*, *behind*, *opposite* by *x* relative to *y*, relative to *z* determines the remaining five instantiations of *front*, *behind*, *opposite* among *x*, *y*, *z* and thus also determines a particular way for *between* to hold among *x*, *y*, *z*. It follows that the number of distinct ways the ternary *between* relation can hold among fixed relata must match its number of doubly-relative properties—three.

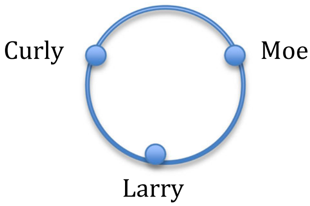

Fig. 5 (*circleMLC*) Moe, Larry and Curly stand clockwise in a circle. (*circleLCM*) Larry, Curly and Moe stand clockwise in a circle. (*circleCML*) Curly, Moe and Larry stand clockwise in a circle

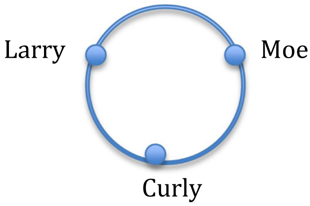

Fig. 6 (*circleMCL*) Moe, Curly and Larry stand clockwise in a circle. (*circleLMC*) Larry, Moe and Curly stand clockwise in a circle. (*circleCLM*) Curly, Larry and Moe stand clockwise in a circle

Fig. 7 (LineSLMC) Shemp, Larry, Moe and Curly stand (in that order) in a line. (LineCMLS) Curly, Moe, Larry, and Shemp stand (in that order) in a line

Recall that, unlike the ternary *between* relation, the ternary relation *stand clockwise in a circle* applies in only *two* different ways to fixed relata. Relative Positionalism explains why these two ternary relations differ in the number of ways they may hold among fixed relata by pointing out that, unlike *between*, *stand clockwise in a circle* has only two doubly-relative properties. To see this, consider the arrangements of the stooges represented in Figures 5 and 6.

Insofar as *stand clockwise in a circle* applies as depicted in Fig. 5, there are only two different ways in which one of the stooges may be characterized from the embedded standpoints of the other two. Either stooge x is ahead of stooge y along a path in the clockwise direction originating at stooge z (as, e.g., Larry is ahead of Curly in the clockwise direction from Moe in Fig. 5) or stooge x is behind stooge y along a path in the clockwise direction originating at stooge z (as, e.g., Curly is behind Larry in the clockwise direction from Moe in Fig. 5). The only other way for *stand clockwise in a circle* to hold among the stooges is that in which all of the stooges' doubly-relative property instantiations are switched, as depicted in Fig. 6.

For n-ary relations with n > 3, the relative positionalist claims that there are not only doubly-relative, but also triply-relative properties, quadruply-relative properties, and so on. Here we must allow that just as one individual may be characterized as, e.g., *front* or *behind,* relative to a second individual from the standpoint of a third individual, so also tuples of four or more individuals may be characterized relative to each other. As one brief example, consider the four stooges as they are arranged in Fig. 7. (Note that Fig. 7 depicts a situation in which both of (LineSLMC) and (LineCMLS) are true, since the linear arrangement of the stooges depends only on their positions relative to one another. Analogous comments apply also to Fig. 8.)

Fig. 8 (LineMLSC) Moe, Larry, Shemp and Curly stand (in that order) in a line. (LineCSLM) Curly, Shemp, Larry, and Moe stand (in that order) in a line

Here, Shemp is *behind*, relative to Larry, relative to Moe (i.e., Shemp is located after Larry along a straight path originating at Moe). But Shemp is not behind Larry relative to Moe in just *any* direction. He is located after Larry in the direction that counts as *behind* relative to Moe in the orientation determined by Curly's standpoint (i.e., in the direction *from Moe* in which both Larry and Shemp count as behind Moe *relative to Curly*.) By contrast, in the arrangement depicted in Fig. 8, Shemp is still *behind*, relative to Larry, relative to Moe, but now both Larry and Shemp are in front of Moe relative to Curly.

In general, Moe's standpoint alone can orientate individuals relative to Larry by determining what counts as *behind*, *front*, etc. relative to Larry, relative to Moe. When further structure is imposed on Moe from Curly's standpoint, then we can further characterize individuals relative to Larry as: (i) behind Larry, relative to Moe *in the direction that counts as behind Moe* relative to Curly or (ii) behind Larry, relative to Moe *in the direction that counts as in front of Moe* relative to Curly. Admittedly, there are no English names for triply-relative properties like these. But we could introduce terms like "behind–behind" and "behind–front" where for all x, y, z, w

relative to x (relative to y (relative to z (w is *behind–behind*))) $=_{\text{def}}$
relative to y (relative to z (w is *behind*)) & relative to x (relative to y (w is *behind*));
relative to x (relative to y (relative to z (w is *behind-front*))) $=_{\text{def}}$
relative to y (relative to z (w is *behind*)) & relative to x (relative to y (w is *front*)).

Note that Shemp's being *behind–behind* relative to Larry, relative to Moe, relative to Curly is one way for the quaternary *stand* (*in that order*) *in a line* relation to apply to the stooges. Another way for the *stand (in that order) in a line* relation to apply to the stooges is the arrangement illustrated in Fig. 8, in which Shemp is *behind-front* Larry, relative to Moe, relative to Curly.

In general, Relative Positionalism claims that n-ary relation R holds among $x_1, x_2, \ldots, x_n$ just in case each of $x_1, x_2, \ldots, x_n$ is characterized in certain ways from the (multiply embedded) standpoints of the other relata. More precisely:
Let R be any n-ary relation. According to Relative Positionalism, there are unary properties $R_1, R_2, \ldots, R_{n!}$ (not necessarily distinct)[24] such that for any individuals x_1, $x_2, \ldots, x_n$, any permutation P of 1, …, n, and any natural number j such that $1 \leq j \leq n!$, the following are equivalent:

[24] It is its significantly wider range of possible distinct relative properties per relation—between 1 and n!—as comparted to Positionalism's range of 1 to n possible distinct positions per relation that enables Relative Positionalism, unlike Positionalism, to accommodate all possible symmetry structures for finite fixed arity relations.

(i) R holds among $x_1, x_2, \ldots, x_n$;
(ii) for some $1 \leq i \leq n!$, relative to $x_{P(1)}$ (relative to $x_{P(2)}$ (… (relative to $x_{P(n-1)}(R_i\, x_{P(n)})$)…));
(iii) for some permutation Q of 1, …, n, relative to $x_{Q(1)}$ (relative to $x_{Q(2)}$ (… (relative to $x_{Q(n-1)}(R_j\, x_{Q(n)})$)…)).

Call $R_1, R_2, \ldots, R_{n!}$, the *relative properties* of the relation R. For example, the relative properties of the ternary *between* relation are the three doubly-relative properties *opposite*, *front*, and *behind*. Note that the equivalence of (i)–(iii) entails that if R holds among $x_1, x_2, \ldots, x_n$, then each of R's relative properties characterizes at least one of $x_1, x_2, \ldots, x_n$ from some embedded standpoint of the remaining relata. In fact, Relative Positionalism holds that R's relative properties are *conjugates* in the following sense:

For any $1 \leq i, j \leq n!$, there is a permutation P of 1, …, n such that for all $x_1, x_2, \ldots, x_n$,

relative to x_1 (relative to x_2 (… (relative to $x_{n-1}(R_i\, x_n)$)…)) iff relative to $x_{P(1)}$ (relative to $x_{P(2)}$ (… (relative to $x_{P(n-1)}(R_j\, x_{P(n)})$)…)). (CONJ)

Relative Positionalism's answer to (**DiffApp1**) is that different applications of an n-ary relation R to fixed relata $x_1, x_2, \ldots, x_n$ are distinguished by the ways $x_1, x_2, \ldots, x_n$ are characterized relative to one another through R's relative properties. More precisely, given distinct relative properties for R, $R_i \neq R_j$, one way for R to hold among $x_1, x_2, \ldots, x_n$ is for x_n to be characterized relative to the other relata as:

relative to x_1 (relative to x_2 (… (relative to $x_{n-1}(R_i\, x_n)$)…)).

Another way for R to hold among $x_1, x_2, \ldots, x_n$ is for x_n to be characterized relative to the other relata as:

relative to x_1 (relative to x_2 (… (relative to $x_{n-1}(R_j\, x_n)$)…)).

Given that R's relative properties are pairwise conjugates, it follows that the number of ways for R to hold among fixed relata equals the number of R's distinct relative properties. Thus, Relative Positionalism partly answers **(DiffApp2)** by claiming that *n*-ary relations R and R^* differ in the number of ways they can hold among fixed relata if and only if R and R^* differ in their numbers of relative properties. At one extreme, if R has only one relative property, then R can apply to fixed relata in only one way and is *completely symmetric*. At the other extreme, an n-ary relation with n! distinct relative properties can apply in n! different ways to fixed relata and is *completely non-symmetric*. The ternary relations *between* and *stand clockwise in a circle* are intermediate cases of *partly symmetric* ternary relations with, respectively, three and two distinct relative properties.

Elsewhere (in Donnelly (2016)), I have used abstract algebra to prove that Relative Positionalism posits a relational structure complex enough to answer questions **(DiffApp1)** and **(DiffApp2)** for finite fixed-arity relations with *any* symmetry structure. More precisely, I show that given an arbitrary *n*-ary relation R, it is possible to assign relative properties to sequences of relata in such a way that non-equivalent R claims differ by permutations assigning different relative properties to some sequences of relata, while equivalent R claims differ by permutations assigning the same relative properties to all sequences of relata.

This shows that Relative Positionalism has a significant advantage over Directionalism, which can only explain the differential application of *completely symmetric* or *completely non-symmetric* relations, as well as Positionalism, which can only explain the differential application of relations whose symmetry structure is generated by two-cycles (i.e., by permutations which switch the places of two relata).[25] As far as I know, no proposed account of relations besides Relative Positionalim posits a relational structure complex enough to support the increasingly many possible patterns of differential application for *n*-ary relations as *n* increases.

Thus, Relative Positionalism meets the two minimum requirements for satisfactory explanations of differential application laid out in Sect. 2. It supports intuitive explanations of distinctions between different applications of a relation to fixed relata by invoking differences in the ways the relata are characterized relative to one another. And its account of differential application generalizes to finite fixed-arity relations with any symmetry structure.

5 Criticisms and responses

5.1 Criticism

Relative Positionalism has at least as much (if not more) of a problem with ontological excess as does Directionalism. Just as Directionalism commits us either to relational states structured by both a relation and its converse (e.g., by both *loves* and *islovedby)* or to duplicate relational states (e.g., both Abelard's loving Eloise and Eloise's being loved by Abelard), so also Relative Positionalism commits us either to relational states structured by a relation and its conjugate relative properties (e.g., by all three of *loves*, *lover*, and *beloved*) or to duplicate states (e.g., all three of: Abelard's loving Eloise, Abelard's being a lover relative to Eloise, and Eloise's being beloved relative to Abelard).

5.2 Response

Directionalism commits its proponents to redundant relations or redundant relational states, because distinctions between converse relations or converse relational states depend on the vacuous notion of an *order* (or direction) in the application of a relation to its relata. If there were real differences among orders of relational application, then converse relations and converse relational states would not be redundant. Instead, there would be a real difference between *Abelard's loving Eloise* and *Eloise's being loved by Abelard*, since the relations structuring these states would apply to Abelard and Eloise in opposite orders. But given the difficulty of making sense of what it is for a relation to apply to one relata first and the other second, it seems, rather, that there is actually no difference at all between *Abelard's loving Eloise* and *Eloise's being loved by Abelard*.

[25] See Donnelly (2016) for details. Relations with symmetry structures too complex for Positionalism include the ternary *stand clockwise in a circle* and the quaternary relation holding between x, y, z, and w when the distance between x and y is equal to the distance between z and w.

Directionalism has a problem with ontological excess not because its proponents are committed to distinct (but necessarily co-instantiated or co-occurring) relations and relational states, but because its proponents are committed to distinct relations and relational states with no clear account of the purported difference between them.

By contrast, Relative Positionalism can account for the distinctions between a relation and the conjugate relative properties for that relation. The relative positionalist can say that *one* relational state appears in different ways from the different standpoints of the relata. The state of *Abelard's loving Eloise* is from Abelard's standpoint, Eloise's being *beloved* and from Eloise's standpoint, Abelard's being a *lover*. Unlike Directionalism's converse relations, *loves* and *islovedby*, it is clear what the difference between being a *lover* and being *beloved* amounts to. The former consists in being the source of certain kinds of strong positive feelings, while the latter consists in being the target of certain kinds of strong positive feelings. It is also clear that Eloise's being *beloved* and Abelard's being a *lover* are characterizations of the state of *Abelard's loving Eloise* from distinct standpoints—respectively, that of Abelard and that of Eloise. Thus, while Relative Positionalism does posit multiple aspects of a single relational state, these aspects differ both in content and in the standpoint functioning as the parameter of characterization.[26]

5.3 Criticism

Relative Positionalism posits complicated nested standpoints to account for the differential application of partly symmetric relations. Wouldn't it be simpler to deny that there are such relations? After all, most discussions of relations focus only on binary relations, for whose differential application either Directionalism or Positionalism might offer some account.

5.4 Response

We could deny that there are any higher-arity partly symmetric relations, but there is no apparent reason to do so. Granted, if we could establish that there is no way of accounting for differential application in partly symmetric relations, this could perhaps be a reason to deny that there are such relations. But Relative Positionalism does offer an account of differential application in partly symmetric relations (of arbitrary arity and with arbitrary symmetry structure). This shows that there are, after all, accounts of the differential application of partly symmetric relations.

5.5 Criticism

Granted, Directionalism and Positionalism cannot explain differential application in partly symmetric relations like *forms a circle in the clockwise direction.* Neither

[26] In Donnelly (2016), I suggest that the relative positionalist might hold that only relative properties, not relations, are fundamental entities. I still find this an appealing option for the relative positionalist, allowing her to minimalize her ontological commitments. But I prefer to focus in this paper on the more important question of whether Relative Positionalism offers a viable general explanation of differential application.

account can explain why, e.g., the relational state described in *(circleMLC)* differs from that described in *(circleLMC)* or why there are three ways for *between* to apply to the stooges but only two ways for *forms a circle in the clockwise direction* to apply to the stooges. But neither can Relative Positionalism explain why the relational states described in *(circleMLC)* and *(circleLMC)* differ or why different ternary relations can apply to fixed relata in different numbers of ways.

5.6 Response

The problem with other accounts of relations is not that they cannot explain *why* particular applications a relation to fixed relata differ or *why* some relations can apply to fixed relata in more ways than do other relations of the same arity. It is, rather, that they cannot explain *what* the distinction among different applications of a relation to fixed relata consists in or *what* determines different capacities for differential application in relations of the same arity. Unlike Directionalism and Positionalism, Relative Positionalism can explain what the difference in the content of (*circleMLC*) and (*circleLMC*) amounts to—a difference in the ways the stooges are characterized relative to one another—and what determines the different capacities for differential application of *between* and *forms a circle in the clockwise direction*—a difference in their numbers of relative properties.

5.7 Criticism

Relative Positionalism requires that any relatum of any relation—buildings, stones, refrigerators, and so on—has its own standpoint. That's crazy.

5.8 Response

Relative Positionalism does not require that relata *have* standpoints. It requires that relata *are* standpoints, where (as explained in Sect. 3) a *standpoint* is a parameter at which property attributions are assessed. As emphasized in Sect. 3, being a standpoint in this sense does not presuppose an experiential point of view. For example, times or possible worlds are commonly taken to be parameters at which property attributions are assessed. But no one worries that times can function in this sense as parameters only if times have their own experiential point of view. Granted, allowing that not only times and possible worlds, but also buildings, stones, refrigerators, and all other relata are parameters of property attribution incurs the cost of a complicated account of property instantiation. The primary claim of this paper is that this is a cost that may be worth paying for a satisfactory account of differential application.

6 Conclusion

I have proposed here an account of differential application. Relative Positionalism can explain both what distinctions among different applications of a relation to fixed relata consist in **(DiffApp1)** and what creates different capacities for differential application in relations of the same arity **(DiffApp2)**. Admittedly, Relative Positionalism's account of relations makes the strong claim that individuals may have certain kinds of properties relative to other individuals, or to sequences of other individuals. In effect, Relative Positionalism requires that individuals may function as parameters (or standpoints) of truth assessment and that sequences of individuals may function as embedded parameters of truth assessment.

Such strong claims might be too high a price to pay for an account of differential application. But given that no other theory of relations proposed so far offers answers to **(DiffApp1)** and **(DiffApp2)** that generalize to relations of arbitrary symmetry structure, Relative Positionalism deserves serious consideration. It would be highly surprising if there were no general account of the distinctions among different applications of a relation to fixed relata, given that these kinds of distinctions are so easy to grasp, even in cases of unfamiliar relations. Though Relative Positionalism's assumptions concerning relative property instantiation are complicated, they are based in the commonsense intuition that different applications of a relation to fixed relata are distinguished by the ways in which the relata are characterized relative to one another.

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