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How to Be a Postmodal Directionalist

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Abstract

According to directionalism, non-symmetric relations are distinct from their converses. Kit Fine (2000a) argues that the directionalist faces a dilemma; they must either (i) reject the principle Uniqueness, which states that no completion (fact, state of affairs, or proposition) is the completion of more than one relation, or (ii) reject the principle Identity, which states that each completion of a relation is identical to a completion of its converse (e.g., Dante's loving Bice is identical to Bice's being loved by Dante). Fine's argument has been regarded as a decisive blow to directionalism. But new strategies for replying to it can be developed with the tools of the postmodal metaphysician, who is comfortable individuating relations and their completions hyperintensionally, allowing for necessary connections between distinct entities, and making use of hyperintensional notions like essence and grounding. In what follows, I develop postmodal strategies for denying both horns of Fine's dilemma, concluding that the postmodal directionalist need not be concerned with Fine's argument.

Keywords: relations, directionalism, converses, completions, hyperintensionality

1 Introduction

According to directionalism, Bertrand Russell's (1903) account of relations, every relation applies to its relata in an order, and has a converse, which applies in the opposite order. Each symmetric relation is identical to its converse, while each non-symmetric relation is distinct from its converse.[1] Kit Fine (2000a) argues that the directionalist faces a dilemma; they must either (i) reject the principle Uniqueness, which states that no completion is the completion of more than one relation, or (ii) reject the principle Identity, which states that each completion of a relation is identical to a completion of its converse (e.g., Dante's loving Bice Portinari is identical to Bice's being loved by Dante). A completion is anything which results from a relation applying to some things in a certain way, e.g., a fact, a state of affairs, or a proposition, though, in what follows, I will restrict my attention to facts and states of affairs.[2] Fine's argument has been regarded as a decisive blow to directionalism. But new strategies for replying to it can be developed with the tools of the *postmodal* metaphysician, who is comfortable individuating relations and their completions hyperintensionally, allowing for necessary connections between distinct entities, and making use of hyperintensional notions like essence and grounding (see, for example, Nolan 2014 and Sider 2020: 1–3). In what follows, I argue that the directionalist can safely deny either of Fine's principles without taking on any commitments that would be unacceptable to the postmodal metaphysician.

In what follows, I cast completions as the postmodal directionalist likely would, viz., as finely individuated, structured entities. I also cast them as first-order entities, i.e., entities in the range of first-order quantifiers. But this does not mean that the discussion to follow will not be of interest to those preferring to regard completions as higher-order entities, i.e., entities in the range of higher-order, e.g., sentential, quantifiers. It would be a straightforward matter to reframe the discussion in a higher-order setting. For several reasons, we will see, it may actually be beneficial to do so.[3] And fortunately, working in a higher-order framework, which is sometimes thought to demand a somewhat coarse-grained individuation of completions (propositions) is not a non-starter for the postmodal metaphysician, with their hyperintensional predilections. Firstly, one might adopt a *hybrid* view of completions, which countenances *both* (hyperintensionally individuated) first-order completions *and* (perhaps more coarsely-grained) higher-order ones. Timothy Williamson (2013) notes the possibility of hybrid views in the case of propositions, while Lukas Skiba (2021) develops a hybrid view of properties and relations. Secondly, there are higher-order accounts of completions (propositions) that individuate them more finely than by logical equivalence (see Bacon 2024: ch. 6), finely enough not to run afoul of the demands imposed by hyperintensional notions like grounding. And, as Peter Fritz (2021) shows, certain higher-order languages, viz., standard type theories, can provide proxies for many structured propositions (see also Elgin 2024). One of the reasons that casting completions as higher-order entities in the following discussion may be beneficial is quite

[1] For the sake of simplicity and brevity, I restrict my discussion in the main text to binary relations, each of which has exactly one converse. The directionalist can accommodate n-ary relations for any $n \geq 2$, where $n \in \{2, 3, \ldots\}$, with any symmetry structure such a relation can have. See fn. 11 below. The claims I make in this paper, and my arguments for them, can be generalized accordingly, and are no less plausible once so generalized. I relegate discussions of such generalizations to footnotes in what follows.

[2] Fine (2000a: 4–5) introduces the term 'completion'. There are, of course, important differences between completions of these different sorts. For example, the fact that Dante loves Bice presumably exists only if Dante loves Bice, while this is usually thought not to be the case for the state of affairs of Dante's loving Bice, or for the proposition that Dante loves Bice.

[3] Certain reasons to prefer directionalism to *neutral* views of relations (see below) in higher-order frameworks, which I will not discuss here, I have already noted elsewhere (see Dixon forthcoming: fn. 5).

general; in a postmodal setting, natural questions arise concerning which grounding claims and essence claims hold of such entities. The following discussion, suitably reframed, will provide answers to some of these questions.

2 Directionalism and Fine's Argument Against It

Directionalism, as presented by Russell, features three central theses.[4]

(D1) Every relation has a *direction* (what Russell calls a 'sense'). It applies to its relata in an *order*, proceeding from one to another.

The relation *loving*, for example, is understood according to directionalism as applying first to Dante then to Bice when Dante loves Bice, or, alternatively, as proceeding from Dante to Bice.[5]

(D2) Every relation R has a *converse*, which applies to x and y in the opposite order to that in which R applies to them whenever R applies to x and y.

The converse of *loving*, for example, is *being loved by*. It applies first to Bice and second to Dante when Dante loves Bice — in the opposite order or direction to that in which *loving* applies to them under the same condition.

(D3) Every symmetric relation is identical to its converse, while every other relation is distinct from its converse.

(D3) is best understood as featuring the notion of *strict* symmetry, in Fine's (2000a: 17) sense.

Strict Symmetry
A relation R is *symmetric* $=_{df}$ necessarily, for any completions c and c' of a given sort (facts, states of affairs, or propositions) of R by the same objects, $c = c'$.

Being next to, for example, is symmetric. It can apply to Dante and Bice in only one way; Dante's being next to Bice is the same completion as Bice's being next to Dante. According to (D3), then, *being next to* is its own converse. When *being next to* applies to x and y in that order, (D2) requires that it (as its own converse) applies to y and x in the *that* order as well. This explains why *being next to* can apply to two objects in only one way. *Loving*, on the other hand, is non-symmetric. It can apply to Dante and Bice in more than one way; Dante's loving Bice is distinct from Bice's loving Dante. According to (D3), *loving* is distinct from its converse, *being loved by*. When *loving* applies to x and y in that order, (D2) requires that *being loved by* (as *loving*'s converse) applies to y and x in *that* order. But *loving* can apply to y and x in *that* order instead, in which case (D2) requires instead that *being loved by* applies to x and

[4] See especially Russell 1903: §§94–95 and §§218–19. The view is also known as 'the standard view' and 'the standard account'.

[5] While relations are characterized as having *directions* or *senses*, or applying in an *order*, according to directionalism, this needn't be understood as involving the reification of any of these things. What is important is that, according to (D1), a relation applies *first* to one relatum *then* to the other, or, alternatively, it proceeds *from* one *to* the other. An n-ary relation for $n > 2$ can be understood to apply first to one relatum, then to another, . . . , then to the remaining one, or, alternatively, to proceed from one relatum, to another, . . . , to the remaining one. See Dixon forthcoming: 4, fn. 6.

y in *that* order. This explains why *loving* can apply to two objects in two ways rather than only one.

Directionalism is to be distinguished from *neutral* views of relations, according to which relations are not inherently directional, and the manner in which a relation applies to its relata is not ultimately to be understood in terms of the order in which it applies to them, but in some other way. Absolute positionalists, for example, believe that each relation has a certain number of argument positions, and that each manner in which it can apply to some objects consists in a possible assignment of those objects to its argument positions. Neutral view theorists believe either that every relation is its own (only) converse (as in Williamson 1985) or that there *is* no meaningful notion of a converse of a relation (as in Fine 2000a). The idea is clearest in the case of non-symmetric relations. Rather than there being two relations, *loving* and *being loved by*, which are converses of one another, as is the case according to directionalism, the neutralist holds that there is only a single neutral amatory relation. The distinct converse predicates 'loves' and 'is loved by' are mere artifacts of language according to the neutral view theorist, and do not reflect what things are like in the non-linguistic world of relations.[6]

Fine's argument for his own neutral theory of relations consists, in part, of an argument against directionalism (2000a: §1). In short, his argument is that directionalism is inconsistent with the conjunction of the following two allegedly independently plausible principles (ibid.: 5).

Identity
Any completion of a relation is identical to a completion of its converse.

Uniqueness
Nothing is a completion of more than one relation.

When a relation applies to some things, a completion of it is formed. When Dante loves Bice, for example, there arises the fact that Dante loves Bice. There also arises the fact that Bice is loved by Dante. According to directionalism, *loving* and *being loved by* are converses of one another, but they are not symmetric, and so, by (D3), they are distinct. The directionalist must either deny that these facts are identical (i.e., deny Identity), or take the position that they are identical, but that that single fact is a completion of distinct relations (i.e., deny Uniqueness). Either way, the cost the directionalist incurs, in Fine's opinion, is unacceptable, and so, he thinks, the view should be rejected.

Fine's argument has been regarded by many as a decisive blow to directionalism. And, indeed, it should be compelling to the modal metaphysician, who rejects necessary connections between distinct entities, including relations, and who individuates

[6]Every theory of relations that has, to my knowledge, been defended in the literature other than directionalism is an example of a neutral view. These theories include various versions of absolute positionalism (Orilia 2011 and 2014, Gilmore 2013 and 2014, and Dixon 2018); antipositionalism, the view that the ways each relation can apply are determined by similarities and differences amongst all of its completions (Fine 2000a); relational primitivism, the view that there is no explanation for why each relation can apply in the ways it can — that it is a brute fact (MacBride 2014); and relative positionalism, according to which the ways each relation can apply are determined by the number of the relation's relative properties and the ways those relative properties can be instantiated by its relata relative to one another (Donnelly 2016 and 2021).

completions intensionally. After all, the application conditions of *loving* and *being loved by* are necessarily connected, where

> **Necessarily Connected Binary Relations**
> Binary relations R and R' are necessarily connected $=_{df}$ for some permutation p of $\{1, 2\}$, necessarily, for any x_1 and x_2, if Rx_1x_2 then $R'x_{p(1)}x_{p(2)}$.

In particular, (i) necessarily, for any x_1 and x_2, if x_1 loves x_2, then $x_{[2\,1](1)=2}$ is loved by $x_{[2\,1](2)=1}$, and (ii) necessarily, for any x_1 and x_2, if x_1 is loved by x_2, then $x_{[2\,1](1)=2}$ loves $x_{[2\,1](2)=1}$, where $\ulcorner[i_1\, i_2 \ldots i_n]\urcorner$ denotes the permutation of $\{1, 2, \ldots, n\}$ that maps 1 to i_1, 2 to i_2, ..., and n to i_n.[7] And the following intensional identity conditions for completions

> **Intensional Completion Identity**
> Completions c and c' of a given type (facts, states of affairs, or propositions) are identical iff necessarily, c exists/obtains/is true iff c' exists/obtains/is true.

ensure that the fact that Dante loves Bice and the fact that Bice is loved by Dante are identical, since each exists iff the other does.[8]

3 Two Versions of Directionalism

While Fine's argument may be compelling to the modal metaphysician, new strategies for replying to it can be developed with the tools of the *post*modal metaphysician, who is comfortable individuating relations and their completions hyperintensionally, allowing for necessary connections between distinct entities, and making use of hyperintensional notions like essence and grounding. In principle, the directionalist can do one of two things in response to Fine's argument. She can deny Uniqueness and embrace Identity, or she can deny Identity and embrace Uniqueness.[9] I will consider both strategies in what follows, concluding that the directionalist can adopt either without taking on any commitments that would be unacceptable to the postmodal metaphysician. First, however, it will be helpful to flesh out each of these versions of directionalism more carefully.

The version of directionalism which results from denying Uniqueness and embracing Identity is one according to which some completions are completions of more than one relation. The most natural way to develop directionalism in this way is to adopt

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[7] In general, where $n \geq 2$,

> **Necessarily Connected Relations**
> n-ary relations R and R' are necessarily connected $=_{df}$ for some permutation p of $\{1, \ldots, n\}$, necessarily, for any $x_1, \ldots, x_n$, if $Rx_1 \ldots x_n$ then $R'x_{p(1)} \ldots x_{p(n)}$.

Every relation is necessarily connected to itself according to this definition, by the identity permutation $[1\,2 \ldots n]$, i.e., by the permutation that leaves its relata where they are. Each symmetric relation is also connected to itself by one or more non-identity permutations that change the order of the relata, since each is a converse of itself.

[8] Gaskin and Hill (2012: 169) explicitly appeal to an intensional account of completions in justifying Identity in their reconstruction of Fine's argument against directionalism.

[9] Rejecting both would leave the directionalist with exceeding little to work with to develop their view in a principled manner, and so I ignore this strategy in what follows.

a principle like Uniqueness but that is weaker than it, so that the only identical completions are completions which either are completions of the same relation *or* are completions of distinct relations that are converses of one another.

Unique or Converses
For any completions c and c' of relations R and R', $c = c'$ only if either $R = R'$ or R and R' are converses.

I call the resulting version of directionalism ‘Identity-verifying directionalism’, or ‘IVD’ for short, since it ensures the truth of Identity by denying Uniqueness.

Of course, IVD should also be understood as being developed in such a way that it otherwise makes appropriate identifications and distinctions amongst completions. First, it will distinguish between any completions of any relations (identical or not) by different relata. Second, it will distinguish between any completions of any two distinct non-converse relations. Third, it will deliver the identifications and distinctions that are appropriate to the relation’s symmetry structure. So IVD will identify each completion of each non-symmetric relation by some objects in a given order with a completion of its converse by them in the opposite order. But it will not identify a completion of a non-symmetric relation with a completion of *it* in the opposite order, or with a completion of its converse in the *same* order. So, in the case of the non-symmetric relation *loving*, for example, Dante’s loving Bice will, according to IVD, be identical to a completion of *loving*’s converse, viz., Bice’s being loved by Dante, as Identity requires (top row of figure 1). But it will be distinct from Bice’s loving Dante

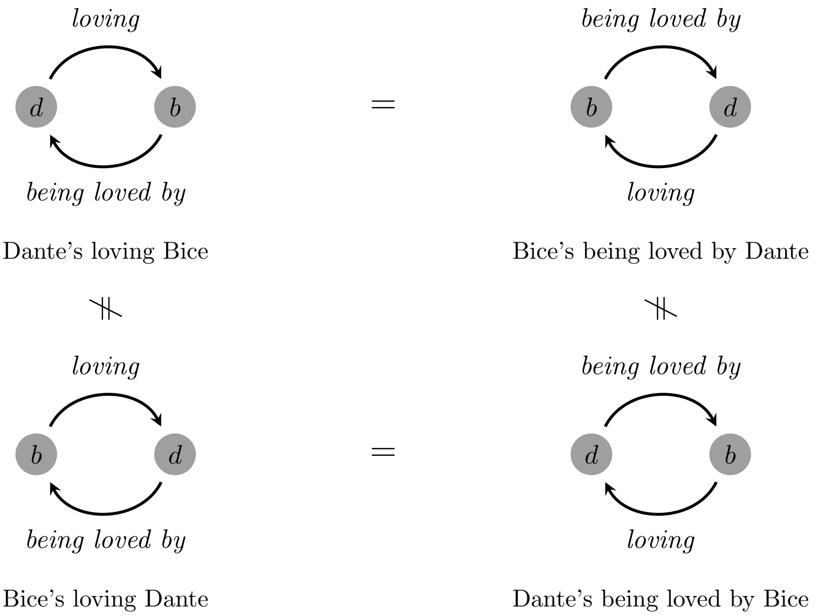

Fig. 1 Completions of a non-symmetric relation and its converse according to IVD. In this diagram and the one to follow, a relation applying to x and y in that order is represented by an arrow proceeding from x to y.

(Dante's being loved by Bice), as it should be, given that *loving* is non-symmetric (left column of figure 1).

For each symmetric relation, IVD will identify each completion of it by some objects in a given order with a completion of its converse (which is itself) in both the same and opposite orders. This is because, when a symmetric relation applies to two objects in some order or other, it must apply to them in *both* possible orders of the two objects. This means that there is only one way for such a relation to apply to them: the way where it proceeds from one to the other *and* proceeds from the other to the one. In the case of the symmetric relation *being next to*, for example, Dante's being next to Bice will, again, as Identity requires, be identical to a completion of *being next to*'s converse (which is itself), viz., Bice's being next to Dante (figure 2). But since *being next to* is

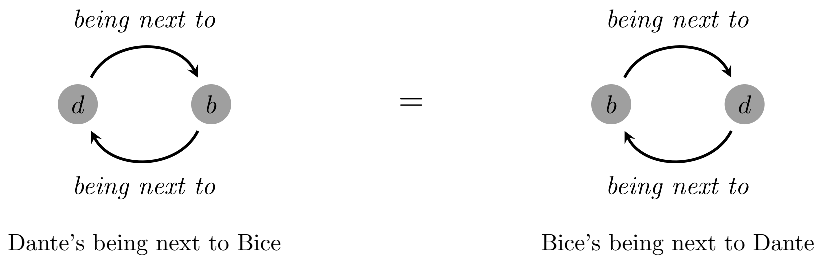

Fig. 2 Completion of a symmetric relation and its converse (itself) according to IVD and UVD

its own converse, when it applies to Dante and Bice in that order, it must apply to them in the opposite order as well, and so there is only one possible completion of it by Dante and Bice.

These points can be distilled into the following necessary and sufficient conditions for completion identities according to IVD. Read $\ulcorner[Rx_1 \ldots x_n]\urcorner$ as $\ulcorner$the fact that $Rx_1 \ldots x_n\urcorner$, $\ulcorner$the state of affairs of x_1, …, and x_n's R-ing$\urcorner$, or $\ulcorner$the proposition that $Rx_1 \ldots x_n\urcorner$, as appropriate.

Binary IVD Completion Identity
For any binary relations R and R' and any x_1, x_2, y_1, and y_2, completions $[Rx_1x_2]$ and $[R'y_1y_2]$ of a given sort (facts, states of affairs, or propositions) are identical iff $y_1 = x_{p(1)}$ and $y_2 = x_{p(2)}$ for some permutation p of $\{1, 2\}$, and either

(a) $R = R'$ and R (and so R') is symmetric with respect to p, or
(b) R and R' are converses and necessarily, for any z_1 and z_2, Rz_1z_2 iff $R'z_{p(1)}z_{p(2)}$,

where

Binary Permutation-Relative Strict Symmetry
A binary relation R is *symmetric with respect to* a permutation p of $\{1,2\}$ $=_{df}$ necessarily, for any x_1 and x_2, if $[Rx_1x_2]$ exists, then $[Rx_1x_2] = [Rx_{p(1)}x_{p(n)}]$. [10,11]

According to IVD, relata are naturally understood as being bound together in each completion not just by a relation in a given order, but also by its converse in the opposite order. The case of a completion of a symmetric relation is, according to IVD, just a special case of what goes on for relations and their converses in general; whether a relation is symmetric or non-symmetric, a completion of it is the result of it applying to some things in a given order, *and* of its converse applying to them in the opposite order. It is just that a symmetric relation is its own converse, so there is only one relation involved in a completion of such a relation.

Uniqueness-verifying directionalism (UVD) results from instead denying Identity and embracing Uniqueness, and ensures that completions of distinct relations are always distinct, even when those relations are converses of one another.

Binary UVD Completion Identity
For any relations R and R' and any x_1 and x_2 and y_1 and y_n, completions $[Rx_1x_2]$ and $[R'y_1y_n]$ of the same sort (facts, states of affairs, or propositions) are identical iff $R = R'$, and, for some permutation p of $\{1,2\}$, $y_1 = x_{p(1)}$, $y_2 = x_{p(2)}$, and R (and so R') is symmetric with respect to p.[12]

Like IVD, UVD will distinguish any completions of any relations by different relata. But it will also distinguish any completions of *any* distinct relations, even if they

[10]Every relation, even every non-symmetric relation, is symmetric with respect to the identity permutation. The reader might notice that there is some circularity between Binary IVD Completion Identity and the definition of permutation-relative strict symmetry. And that is right. But it is not problematic. Binary IVD Completion Identity is not itself a definition. Rather, it just specifies necessary and sufficient conditions for completion identities according to IVD *based on* (in part) the symmetries of the relations underlying them.

[11]For directionalism to accommodate n-ary relations for all $n \geq 2$, some relations with arity greater than 2 will have more than one converse. See Dixon forthcoming. Each converse of certain relations, viz., completely and partially non-symmetric n-ary relations for $n > 2$ (see Donnelly 2016: 84), necessarily apply in some but not all of the orders in which those relations in principle apply to n relata. The identity condition for completions of binary relations just introduced in the main text is therefore a special case of the following generalization to completions of any n-ary relation for $n \geq 2$.

IVD Completion Identity
For any relations R and R' and any $x_1, \ldots, x_n$ and $y_1, \ldots, y_n$, completions $[Rx_1 \ldots x_n]$ and $[R'y_1 \ldots y_n]$ of a given sort (facts, states of affairs, or propositions) are identical iff $R = R'$, $y_1 = x_{p(1)}, \ldots, y_n = x_{p(n)}$ for some permutation p of $\{1, \ldots, n\}$, and either

(a) $R = R'$ and R (and so R') is symmetric with respect to p, or
(b) R and R' are converses and, necessarily, for any $z_1, \ldots, z_n$, $Rz_1 \ldots z_n$ iff $R'z_{p(1)} \ldots z_{p(n)}$,

where

Permutation-Relative Strict Symmetry
An n-ary relation R is *symmetric with respect to* a permutation p of $\{1, \ldots, n\}$ $=_{df}$ necessarily, for any $x_1, \ldots, x_n$, if $[Rx_1 \ldots x_2]$ exists, then $[Rx_1 \ldots x_2] = [Rx_{p(1)} \ldots x_{p(n)}]$.

[12]In general, where $n \geq 2$,

UVD Completion Identity
For any relations R and R' and any $x_1, \ldots, x_n$ and $y_1, \ldots, y_n$, completions $[Rx_1 \ldots x_n]$ and $[R'y_1 \ldots y_n]$ of the same sort (facts, states of affairs, or propositions) are identical iff $R = R'$, and, for some permutation p of $\{1, \ldots, n\}$, $y_1 = x_{p(1)}, \ldots, y_n = x_{p(n)}$, and R (and so R') is symmetric with respect to p.

are converses of one another. This impacts how UVD treats non-symmetric relations. Dante's loving Bice will, according to IVD, be distinct from every completion of *being loved by*, including Bice's being loved by Dante, as Uniqueness requires (top row of figure 3 below). And of course it will still be distinct from Bice's loving Dante (left

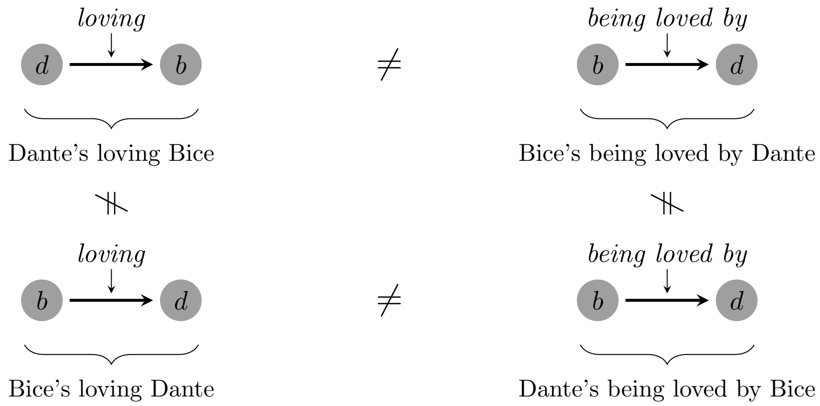

Fig. 3 Completions of a non-symmetric relation and its converse according to UVD

column of figure 3). Though, again in contrast to IVD, UVD will distinguish Bice's loving Dante from Dante's being loved by Bice (bottom row of figure 3). But because, according to directionalism, each symmetric relation is its own converse, UVD will be able to treat symmetric relations the same way as IVD did, identifying completions of *being next to* by the same things in opposite orders, as depicted in figure 2 above. A symmetric relation is still its own converse according to the UVD-ist, and so there is just a single way for a symmetric relation to apply to two objects: the way wherein it proceeds from one to the other *and* proceeds from the other to the one. So Dante's being next to Bice will still be identical to Bice's being next to Dante. Note that this does not constitute a violation of Uniqueness by the UVD-ist. Since a symmetric relation is its own converse, this completion is a completion of only one relation, viz., *being next to*. Incidentally, we should expect the neutral relations theorist to adopt the same identity conditions for completions as does the UVD-ist.

UVD posits more completions than we might have initially thought exist, e.g., Dante's loving Bice and Bice's being loved by Dante are distinct according to UVD. I'll discuss how this and other issues impact the postmodal directionalist's prospects of adopting the view in section 7 below. First, I wish to discuss the postmodal directionalist's prospects of adopting IVD. This will occupy us in the next three sections.

4 Explaining Completion Identities and Fine's Identity-Based Approach

Since the IVD-ist would be advocating a development of directionalism that rejects Uniqueness, it will be important for them to respond to Fine's case for that principle. Before that, however, it is worth noting a consideration *against* Uniqueness first. Andrew Bacon (2020 and 2023: 189) considers a higher-order analog of Uniqueness:

Predicate Structure
If $Fa = Ga$ then $F = G$. (C.f. Dorr 2016: 59)

Bacon (2023: 189) argues against this principle in a broadly positionalist framework on the basis of our ability to obtain different properties by filling different positions of an antecedently given relation with an argument. The proposition that Alice loves Alice, he argues, can be understood either as the result of filling the second position of *loving* with Alice to yield the property *being an x such that x loves Alice*, and then filling the single argument place of that property with Alice, or as the result of filling the *first* argument position of *loving* with Alice to yield the property of *being an x such that Alice loves x* and filling the single argument place of that property with Alice. These are different properties, and so it would appear that a completion can be a completion of distinct properties.

A suitably modified version of Bacon's case shows that a completion can be a completion of distinct relations, and thus that Uniqueness is false. Consider the ternary relation *being between*, and consider the completion of it Larry's being between Curly and Moe. This completion can be obtained by starting with *being between* and filling its third argument place with Moe, yielding the binary relation *being an x and y such that x is between y and Moe*, and then filling the two argument places of *that* relation with Larry and Curly to yield Larry's being between Curly and Moe. Or it can be obtained by filling the second argument place of *being between* with Curly, yielding the binary relation *being an x and y such that x is between Curly and y*, and then filling the two argument places of that relation with Larry and Moe to yield Larry's being between Curly and Moe.[13]

The directionalist might be able to bring the same argument to bear by countenancing partial saturations of directed relations, e.g., by conceiving of the relation *being an x and y such that x is between y and Moe* as the result of *being between* proceeding from nothing, to nothing, to Moe, and of *being an x and y such that x is between Curly and y* as *being between* proceeding from nothing, to Curly, to nothing. The directionalist could then regard these relations as distinct, and yet hold that Larry's being between Curly and Moe as being the completion of these two distinct relations. It shouldn't be especially problematic for a relation to proceed from nothing, or to nothing, as the directionalist is presumable capable of conceiving of a relation in isolation, in which it would do both. Either way, however, the issue is orthogonal to the directionalist's concern with Uniqueness that is my focus, since these relations

[13]Thanks to two anonymous referees for bringing this point to my attention. See Liebesman 2014: 413 and Trueman 2021: 146–47 for further criticism of Fine's motivation for Uniqueness.

at hand aren't converses of one another. Uniqueness could be restricted in a way that sets these sorts of cases aside, e.g., as

Uniqueness*
Nothing is a completion of more than one *indefinable* relation.

I take it that any relation R that is the result of filling an argument place of another relation R' is definable in terms of R. E.g., if R is *being an x and y such that x is between y and Moe*, then it can be defined as follows.

$Rxy =_{df}$ x is between y and Moe.[14]

So the directionalist will still need to respond to a restricted principle along these lines. (Uniqueness* is actually significantly stronger than it needs to be, but it makes the point I want to make.) Since the debate in the relations literature has focused on Uniqueness, as formulated by Fine (2000a), and since it is the focus of Fine's defense, I will couch the discussion that follows in terms of it, keeping the considerations that motivated us to replace it with something like Uniqueness* in the background henceforth.

I now turn to Fine's positive case for Uniqueness. Fine's principal argument for that principle is contained in the following passage.[15]

> [S]uppose we ask: how might we explain the identity of the single state s [of a's being on top of b/b's being beneath a] in terms of biased relations? ... [The only plausible explanation] is that the relations [*on top of* and *beneath*] result, via [their completion by a and b], in the same state s, which can therefore be explained either as the completion of *on top of* by a and b or as the completion of *beneath* by b and a. But then surely we need to explain how it is that these two completions result in the same state; and the only plausible explanation is that they are completions ... of a single underlying unbiased relation. (Fine 2000a: 15)

The explanatory targets in which Fine is interested include converse completion identities — why certain completions of relations are identical to certain completions of those relations' converses — why, for example, Dante's loving Bice is identical to Bice's being loved by Dante.

[14] See section 5 below for more on indefinable and definable relations.

[15] Fine says other things in his 2000a article that could be interpreted as arguments for Uniqueness. But they do not stand up to scrutiny. Fine's first move in defending Uniqueness (2000a: 4, 5–6) is simply to appeal to his intuition that no completion is a completion of more than one relation. But this can't get him very far. As Liebesman (2014: 422) suggests, it is unclear whether we have reliable intuitions about so abstract a principle as Uniqueness. Someone committed to directionalism cannot be expected to share this intuition. This may be why Fine offers other considerations in support of the principle, including the argument that is my focus in the main text. Second, Fine makes a comparison between relations and roads (2000a: 6), noting that roads are intuitively fundamentally adirectional (understood as the tarmac itself), directional senses (as in 'the road from Princeton to Trenton') being understood in terms of the adirectional notion. But the reverse seems to be true of other entities. The aerial connection between Glasgow and Barra, for example, seems to be best understood in terms of directional entities, viz., the daily flight from Glasgow to Barra and the one from Barra to Glasgow. (Assume for the sake of simplicity that these are the only two daily flights between these two airports.) And I see no reason to think that relations are more like roads than like aerial connections and individual flights. A third issue Fine discusses (2000a: 6–7) is that, while relational predicates of English tend to suggest that the relations they express are directional, there are possible languages whose relational predicates are not similarly suggestive. But this shows only that one should not appeal to the directionality of English relational predicates to support directionalism. Russell (1903: §219) appears to do this, and so it is worth warning against. But it does not constitute support for a neutral view of relations at the expense of directionalism. Nor does it constitute support for Uniqueness.

The proponent of a neutral view of relations, Fine is noting, can explain converse completion identities in the same way she explains the identity of any identical completions, viz., in terms of the identity of the underlying relations. The general strategy can be stated as follows.

The Identity-Based Approach to Explaining Completion Identities
If completions $[Rx_1x_2]$ and $[R'y_1y_2]$ are identical, then, for some permutation p of $\{1, 2\}$, the fact that $[Rx_1x_2] = [R'y_1y_2]$ is explained (fully and jointly) by the following facts:

(a) the fact that $R = R'$,
(b) the fact that $y_1 = x_{p(1)}$ and $y_2 = x_{p(2)}$, and
(c) the fact that R (and so R') is symmetric with respect to p.

I call this approach to explaining completion identities 'the identity-based approach' because it explains the identity of completions, in part, in terms of the identity of the relations of which they are completions.[16] Different neutral views will cash out (c) in different ways. The absolute positionalist, for example, will likely understand it as the the fact that R has only a single argument position that its relata occupy (as in Orilia 2011 and 2014 and Dixon 2018, for example). When $R = R'$ and $y_1 = x_1$ and $y_2 = x_2$, clauses (a) and (b) are plausibly all that is needed for the proponent of the identity-based approach to provide a complete explanation of why $[Rx_1x_2] = [R'y_1y_2]$, since every relation is symmetric with respect to the identity permutation (the permutation that leaves the relata where they are with respect to the relation). To keep the statement of the identity-based approach simpler, I have not included this caveat.

Consider what the identity-based approach says in cases of completions involving various sorts of relations, first, involving non-symmetric relations, on neutral views. According to a neutral view, Dante's loving Bice and Bice's being loved by Dante are identical, and a neutralist proponent of the identity-based approach will explain the identity of these completions, in part, in terms of the identity they posit between *loving* and its converse *being loved by*. Similarly, in cases of symmetric relations, like *being next to*, the neutralist will explain the identity of Dante's being next to Bice and Bice's being next to Dante, in part, in terms of the identity between *being next to* and its converse, *being next to* itself. And in the case of completions like Dante's loving Bice and Dante's adoring Bice, assuming *loving* and *adoring* are the same relation, neutral theorists will explain the identity of those completions, in part, in terms of the fact that *loving* and *adoring* are the same relation. Thus the neutral theorist can use the same strategy to explain converse completion identities that they use to explain all other completion identities. The directionalist would face a disadvantage if they had to employ different explanatory strategies in these two sorts of case. It is an open question how significant such a disadvantage this would pose for the directionalist. But, as I will explain below, the directionalist has options on which this is not the case.

[16] I do not take a position on what sort of explanations this strategy and the ones to follow supply, e.g., whether or not these explanations can be expressed using claims about ground. I grant that Fine's demand for explanations of converse completion identities (and completion identities in general) — of whatever sort he has in mind — is fair, and I assume that the sort of explanations the accounts supply are of whatever sort Fine has in mind.

The passage I quoted above indicates that Fine thinks that the explanations of converse completion identities that the identity-based approach can supply are superior to those that can be supplied by any view that regards some completions to be the result of the application of multiple relations, like IVD. Indeed, he seems to think that a view of the latter sort would be able to supply *no* plausible explanations of converse completion identities.[17] So the IVD-ist faces two questions:

(Q1) Can the IVD-ist supply alternative explanations of completion identities (including, of course, converse completion identities)?

(Q2) If so, are those explanations plausible enough for them to constitute a viable alternative to those supplied by the identity-based approach?

If either of these questions must be answered negatively, then the second horn of Fine's argument will go through for IVD; IVD will be at a disadvantage relative to Uniqueness-verifying views of relations when it comes to explaining completion identities. If both questions can be answered affirmatively, however, then the IVD-ist has a viable alternative way to explain completion identities. In the next two sections, I consider what I take to be the two most promising ways for the postmodal IVD-ist to develop an alternative account of explanations of completion identities. I point out an issue with the first that may make the postmodal metaphysician wary of it. I think the second may be plausible enough that the postmodal directionalist need not endorse UVD. Still, even if a postmodal directionalist reader disagrees, I will argue in section 7 that if IVD is inadequate, a postmodal directionalist will be able to adopt UVD in its place, and adopt the identity-based approach to explaining completion identities.

5 The Essence-Based Approach

In this section, I consider, and discuss a difficulty with, the idea that the IVD-ist can appeal to the *collective essence* of each relation and its converse to explain the identity of identical completions of them (and of completion identities in general).[18] An *essence* of a single thing (a *singular* essence) comprises the properties or facts about that thing which together make that object what it is (see Fine 1994a: 2). A *collective* essence comprises the properties or facts about some things, each of which is essential to them considered collectively, but none of which is essential to any of them considered individually (see Fine 1994b: §7, 1995a, 2000b, and 2015: 298).[19] The usefulness of

[17] This is Liebesman's (2014: 422–23) take on Fine's argument as well. Liebesman (ibid.: 423) and MacBride (2007: 55) suggest that Fine's complaint is motivated at least in part by a concern about unexplained necessary connections between the application conditions of distinct relations (non-symmetric relations and their converses) according to directionalism. Whether one takes this to be a component of Fine's argument or a distinct argument, the accounts of completion identities I develop in what follows can answer it as well; in each case, such connections can be explained in terms of essential connections between the application conditions of relations and their converses. (Rosen (2010: 121) suggests that claims about metaphysical necessity might be *grounded* in certain claims about essences.) Liebesman notes (ibid.: 423) that other explanations of these necessary connections are available, though he does not consider this one.

[18] Credit is due here to Maureen Donnelly, who suggests (2016: 99) that the relative positionalist can appeal to the natures of relative properties to explain the necessary connections which hold amongst their conditions of instantiation. Her suggestion helped inspire the account I develop in this section.

[19] I take the operator 'it is essential to Γ that φ', where 'Γ' is a plural variable and 'φ' is a schematic sentential variable, to be ambiguous between constitutive and consequential essence (see Fine 1994b: §3 and 1995b: 276). (In some special cases, which I will flag, the essence invoked will plausibly be consequential

the notion of collective essence has not gone unnoticed. Justin Zylstra (2019: 1088) notes, for example, that it is plausibly essential to negation and conjunction, taken together, that they "are truth-functionally complete, in the sense that they can express every truth-table", even though this is true of neither considered individually. While a postmodal directionalist, *qua* postmodal metaphysician, should be comfortable making use of the notion of essence, I will show in this section that it faces a serious difficulty, which, interestingly, will arise only in a postmodal framework, viz., in a framework which individuates completions hyperintensionally.

On this approach, the IVD-ist appeals in each explanation of a converse completion identity (and, I will explain, of *any* completion identity) to an essential property which concerns the application conditions of the underlying relation(s). To state this more precisely, it will be helpful to have in hand the notion of *essential reciprocal connectedness*:

Binary Essential Reciprocal Connectedness
The application conditions of binary relations R and R' are *essentially reciprocally connected by a permutation p of* $\{1, 2\} =_{df}$ it is part of the collective essence of R and R' (or of their singular essence when $R = R'$) that, for any y_1 and y_2, Ry_1y_2 iff $R'y_{p(1)}y_{p(2)}$.[20]

Essential reciprocal connectedness and, with it, the essence-based approach to follow, can be understood in a higher-order framework, so that, symbolically, the essence claim in the above definition is understood as

$$\Box_{R,R'}(Ry_1 \dots y_n \leftrightarrow R'y_{p(1)} \dots y_{p(n)}),$$

where $\ulcorner \Box_\Gamma \varphi \urcorner$ is read as $\ulcorner$it is essential to Γ that $\varphi\urcorner$ (see fn. 19), and Γ is a plural variable that ranges over properties and relations, understood as higher-order entities.[21]

The account of explaining completion identities that I have in mind can now be formulated as follows.

rather than constitutive.) I assume that constitutive essence is primitive, i.e., not defined in terms of other notions, as it is in, for example, Fine 2012: 79 and Rosen 2015: 195–96, where it is defined in terms of consequential essence and ground. For problems with such definitions, see Livingstone-Banks 2017 and Nutting et al. 2018. I do not think anything I say is affected by my choice in this matter. I do, however, suppose that essence (either constitutive or consequential) is not defined modally, for reasons discussed in Fine 1994a.

[20] In general, where $n \geq 2$,

***n*-ary Essential Reciprocal Connectedness**
The application conditions of n-ary relations R and R' are *essentially reciprocally connected by a permutation p of* $\{1, \dots, n\} =_{df}$ it is part of the collective essence of R and R' (or of their singular essence when $R = R'$) that $Ry_1 \dots y_n$ iff $R'y_{p(1)} \dots y_{p(n)}$.

[21] See Ditter 2022 and Skiba 2022: 11 ff. for similar extensions of Fine's box-subscript notation to higher-order expressions.

The Essence-Based Approach to Explaining Completion Identities
If completions $[Rx_1x_2]$ and $[R'y_1y_2]$ are identical, then, for some permutation p of $\{1, 2\}$, the fact that $[Rx_1x_2] = [R'y_1y_2]$ is explained (fully and jointly) by the following facts:

(a) the fact that $y_1 = x_{p(1)}$ and $y_2 = x_{p(2)}$, and
(b) the fact that the application conditions of R and R' are essentially reciprocally connected by p.[22]

I call this approach to explaining completion identities 'the essence-based approach', since it involves appealing to the essences of relations.

On this proposal, the identity of, for example, Dante's loving Bice and Bice's being loved by Dante is explained, in part, by the fact that it is part of the collective essence of *loving* and *being loved by* that, for any y_1 and y_2, y_1 loves y_2 iff y_2 is loved by y_1. When $R = R'$, the collective essence of R and R' can be understood as the singular essence of that single relation. Consider first a completion of a symmetric relation. The identity of Dante's being next to Bice and Bice's being next to Dante, for example, is explained, in part, by the fact that it is part of the (singular) essence of *being next to* that, for any y_1 and y_2, y_1 is next to y_2 iff y_2 is next to y_1. In other cases in which $R = R'$, as with Dante's loving Bice and Dante's adoring Bice, assuming that *loving* = *adoring*, the identity of these completions is explained, in part, by the fact that it is part of the (singular) essence of that single relation R that, for any y_1 and y_2, Ry_1y_2 iff Ry_2y_1.[23] So the essence-based approach supplies explanations of completion identities *in general* in the same terms, just as the adherent of the identity-based approach does. It is just that the former does so in terms of the essences of the underlying relations (singular or collective), while the latter does so in terms of their identity.

Nevertheless, I think that ultimately, the postmodal directionalist will be unsatisfied with the essence-based approach, because it will count as identical completions that should, at least by a postmodal metaphysician's lights, be regarded as distinct. In particular, it will incorrectly count as identical completions of non-converse relations that essentially apply in different orders. Such incorrect identities will not arise on an intensional account of relations:

Intensional Relation Identity
R and R' are the same relation iff necessarily, they apply to the same objects in the same orders (i.e., they are *intensionally equivalent*),[24]

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[22]The reciprocality of the essential connection between the application conditions of R and R' is important. Suppose one assumed that it was sufficient for $[Rx_1x_2] = [R'x_1x_2]$ that, for some permutation p of $\{1, 2\}$, it is part of the collective essence of R and R' that, for any y_1 and y_2, if Ry_1y_2 then $R'y_{p(1)}y_{p(2)}$. Then by adopting the essence-based approach, that individual would be forced to identify seemingly distinct completions, such as Dante's loving Bice and Dante's being aware of the existence of Bice. It is not implausible that it is part of the collective essence of *loving* and *being aware of the existence of* that, if the former applies to two things in a given order then the latter applies to them in the that order as well (though the reverse is admittedly not the case). But we should not count completions of them as identical. After all, Dante could be aware of the existence of Bice without loving her.

[23]It is in cases such as these that the essential property appealed to in the explanation appears to be of the relation's consequential essence, rather than its constitutive essence (see fn. 19). This is because, for any relation, it follows as a matter of pure logic that, for any objects, if it applies to them in a given order then it applies to them in that order. Thanks Martin Glazier for this observation.

[24]More formally, and in general, where $n \geq 2$,

R and R' are the same relation iff necessarily, for any $x_1, \ldots, x_n$, $Rx_1 \ldots x_n$ iff $Rx_1 \ldots x_n$.

But a postmodal metaphysician is likely to individuate relations and their completions more finely.

Distinct non-converse relations whose application conditions are essentially reciprocally connected will arise on what I take to be the most principled hyperintensional account of relations, based on a hyperintensional theory of properties like Gideon Rosen's.

Hyperintensional Property Identity
F and G are the same property iff

(a) F and G are definable and for all Φ, $\mathrm{Def}(F,\Phi)$ iff $\mathrm{Def}(G,\Phi)$; or
(b) F and G are indefinable and $\Box\forall x\,(Fx \leftrightarrow Gx)$. (Quoted from Rosen 2015: 202.)

The notion of definition at play in Rosen's theory of properties and in the discussion that follows is that of *real* definition, which provides an analysis of the *thing itself* (i.e., object, kind, property, relation, etc.), rather than of conceptual or lexical definition (ibid.). 'F' and 'G' are one-place predicates expressing properties. 'Φ' is an n-place complex predicate expressing a structured complex composed of properties and relations, possibly some objects, but typically featuring some unfilled argument places corresponding to the unfilled argument places in F or G. (As Rosen notes, Φ can be understood as a composite structured Russellian propositional function.) When one of 'F', 'G', or 'Φ' occurs in name position, it abbreviates the corresponding lambda abstraction denoting the property or relation it expresses, e.g., '$\Lambda x\, Fx$', which denotes the property *being an* x_1 *such that* Fx, and '$\Lambda x_1, x_2, \ldots\ \Phi(x_1, x_2, \ldots)$', which denotes the property *being* $x_1, x_2, \ldots$ *such that* $\Phi(x_1, x_2, \ldots)$. '$\mathrm{Def}(F,\Phi)$' says that *being* F is defined by (or consists in, or reduces to) *being* Φ (or to be F is to be Φ).

Extending Rosen's account of properties to binary relations in the most straightforward way yields the following.

Hyperintensional Binary Relation Identity
R and R' are the same relation iff

(a) R and R' are definable and for all Φ, $\mathrm{Def}(R,\Phi)$ iff $\mathrm{Def}(R',\Phi)$; or
(b) R and R' are indefinable and $\Box\forall x_1\forall x_2\,(Rx_1x_2 \leftrightarrow R'x_1x_2)$.[25]

Even this hyperintensional account of relations significantly narrows the range of relations to which one can look to find pairs of relations which would cause problems for

[25] For n-ary relations, for all $n \geq 2$,

Hyperintensional n-ary Relation Identity
R and R' are the same relation iff

(a) R and R' are definable and for all Φ, $\mathrm{Def}(R,\Phi)$ iff $\mathrm{Def}(R',\Phi)$; or
(b) R and R' are indefinable and $\Box\forall x_1 \ldots \forall x_n\,(Rx_1 \ldots x_n \leftrightarrow R'x_1 \ldots x_n)$.

One might consider formulating clause (b) instead in such a way that, when R and R' are indefinable, $R = R'$ if $\Box\forall x_1 \ldots x_n\,(Rx_1 \ldots x_n \leftrightarrow R'x_{p(1)} \ldots x_{p(2)})$ for *any* permutation p of $\{1,\ldots,n\}$. One might consider this even in the formulation of an intensional account of relations. But this would rule out directionalism by fiat. This can be seen in the case of binary relations. According to directionalism, the converse of a binary relation R is guaranteed to apply to two objects in the opposite order that R does. But directionalism sometimes distinguishes between relations and their converses. One's criteria of relation identity should not rule out the possibility of some relations being distinct from their converses, and therefore rule out the possibility of directionalism (nor should it rule out the possibility of some relations being identical to their converses, and therefore rule out the possibility of neutral views of relations for that matter).

the essence-based approach. Clause (b) effectively rules out pairs of non-converse *indefinable* relations that essentially apply in different orders for the same reasons that the intensional view rules out pairs of such relations *in general*.[26]

If there are going to be relations that cause problems for the essence-based approach in the eyes of the postmodal IVD-ist, they will arise due to clause (a) of Hyperintensional Relation Identity. They will be distinct *definable* relations that are plausibly defined in different ways, which are not converses of one another, but whose application conditions are nonetheless essentially reciprocally connected.[27] Unfortunately for the essence-based account, there appear to be such relations. *Being an x and y such that x is triangular and x is larger than y* and *being an x and y such that x is smaller than y and y is trilateral*, for example, are plausibly essentially such that one applies to x and y in that order iff the other does so in the opposite order. While the former is defined in terms of angles, the latter is defined in terms of sides, viz.,

x is triangular and larger than $y =_{df}$ (i) x is polygonal and x has exactly three angles and (ii) x is larger than y

x is smaller than y and y is trilateral $=_{df}$ (i) x is smaller than y and (ii) y is polygonal and y has exactly three sides,

So these relations have different definitions, and are therefore distinct according to Hyperintensional Binary Relation Identity. The following connection plausibly holds between the essences of angles and sides.

(SA) It is essential to any polygon that it has n sides iff it has n angles.

(SA), together with the essential reciprocal connectedness of the application conditions of the converse relations *being larger than* and *being smaller than*, guarantees that the application conditions of *being an x and y such that x is triangular and x is larger than y* and *being an x and y such that x is smaller than y and y is trilateral* are essentially reciprocally connected. As a result, the essence-based approach to completion identities will identify completions of them by the same objects in opposite orders. It would, for example, identify the completions

(C1) Alice's being triangular and larger than Bob
(C2) Bob's being smaller than Alice and Alice's being trilateral

[26] Rosen admits that the truth of clause (b) of Hyperintensional Property Identity as a way to fill out the hyperintensional account of properties is not as obvious as that of clause (a). This less-than-certainty admittedly transfers over to clause (b) of Hyperintensional Relation Identity, on which I rely in my reasoning here. Rosen mentions one consideration in favor of the former, however; he can see no reason to distinguish between intensionally equivalent indefinable properties that would not also motivate a distinction between Hesperus and Phosphorus (see Rosen 2015: 202–03). An analogous consideration seems no less plausible in the case of intensionally equivalent indefinable relations. An alternative, more fine-grained theory of relations could be acquired by replacing clause (b) with

(b′) R and R' are indefinable and $\Box_{R,R'} \forall x_1 \ldots \forall x_n \, (Rx_1 \ldots x_n \leftrightarrow R'x_1 \ldots x_n)$,

But even this account will not rescue the essence-based account of explaining completion identities from the problem to come, since the relations I discuss which produce the problem are definable.

[27] This rules out pairs of relations like *being a sister of* and *being a female sibling of*, since, if they are both definable, they are presumably definable only in the same way(s). Thanks to Martin Pleitz for this example.

The converse of *being an x and y such that x is triangular and x is larger than y*, however, is presumably not *being an x and y such that x is smaller than y and y is trilateral*, but is instead *being an x and y such that x is smaller than y and y is tri*angular, and so, by Binary IVD Completion Identity, completions of these relations by two objects in opposite orders, like (C1) and (C2), should be distinct.

The postmodal IVD-ist's willingness to countenance the tools of postmodal metaphysics results in all the more reason to think that completions of these relations by the same objects in opposite orders should be distinct. Among these postmodal tools is grounding — the distinctive hyperintensional notion of non-causal dependence that has, over the last 10 to 15 years, largely replaced supervenience and other intensionally defined notions in capturing claims of metaphysical dependence. And completions of *being an x and y such that x is triangular and x is larger than y* and *being an x and y such that x is smaller than y and y is trilateral* in opposite orders by the same two objects appear to have different grounds, and therefore must be distinct (cf. McDaniel 2015). Let me explain.

Consider the triangle and the square depicted in figure 4 below.

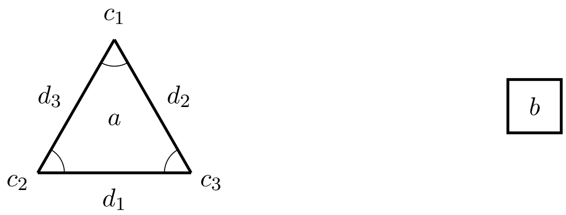

Fig. 4 A triangle a with angles c_1, c_2, and c_3 and sides d_1, d_2, and d_3 and a square b

a is triangular and larger than b. And b is smaller than a and a is trilateral. Given the following abbreviations,

Tx: x is triangular	Lx: x is trilateral
Gxy: x is larger than y	Sxy: x is smaller than y,

$Tt \,\&\, Gab$ and $Sba \,\&\, Lt$. And, by lambda abstraction, $[\lambda x \lambda y(Tx \,\&\, Gxy)]ab$ and $[\lambda x \lambda y(Sxy \,\&\, Ly)]ba$. $\Lambda x \Lambda y(Tx \,\&\, Gxy)$ and $\Lambda x \Lambda y(Sxy \,\&\, Ly)$ are the same two relations I introduced above.[28] Due to (i) the definitions of these relations, in terms of sides and angles, (ii) the plausible essential connection (SA) between the number of sides and angles of a polygon, and (iii) the essential reciprocal connectedness of the application conditions of *being larger than* and *being smaller than*, it is plausibly part of the collective essence of these relations that if one applies to x and y in that order then the other does in the opposite order. But the facts $[\lambda x \lambda y(Tx \,\&\, Gxy)ab]$ and $[\lambda x \lambda y(Sxy \,\&\, Ly)ba]$ have different grounds. Even if we assume, as the IVD-ist would have it, that the fact that a is larger than b is identical to the fact that b is smaller than a, $[\lambda x \lambda y(Tx \,\&\, Gxy)ab]$ is grounded in facts about angles c_1, c_2, and c_3 though

[28]I follow Fine's (2012: 67–68) convention regarding the typographical distinction between the formation of predicates from other predicates via lambda abstraction (λ) and the formation of terms for the semantic values of predicates from those predicates (Λ).

$[\lambda x \lambda y(Sxy \,\&\, Ly)ba]$ presumably is not, while $[\lambda x \lambda y(Sxy \,\&\, Ly)ba]$ is grounded in facts about sides d_1, d_2, and d_3 though $[\lambda x \lambda y(Tx \,\&\, Gxy)ab]$ presumably is not. Given the following abbreviations,

Ax: x is an angle Sx: x is a side Px: x is polygonal Hxy: x has y

the grounds of these two facts can be depicted as they are in figure 5 below. It would

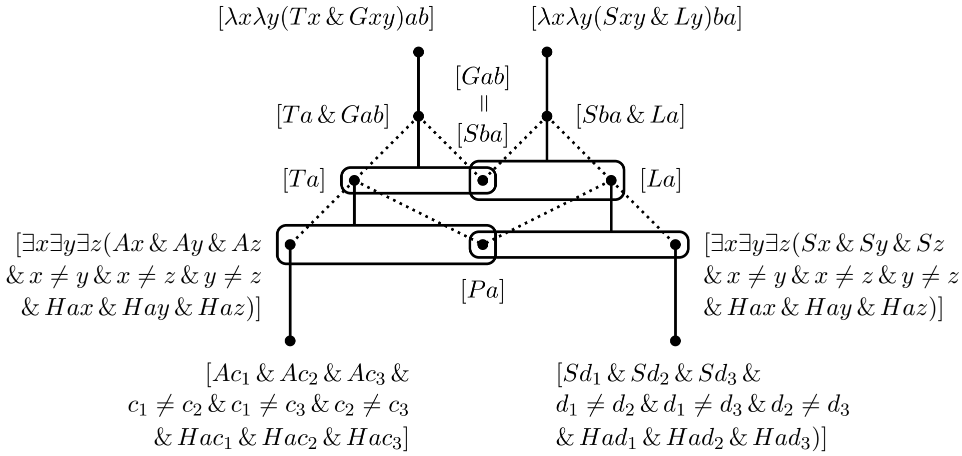

Fig. 5 The grounds of $[\lambda x \lambda y(Tx \,\&\, Gxy)ab]$ and $[\lambda x \lambda y(Sxy \,\&\, Ly)ba]$. A solid (or dotted) line running in a downward direction from a node x to another node y, which may run through one or more other nodes, indicates that x is fully (or partially but not fully) grounded in y. A solid line connecting a node x to a solid box enclosing nodes $y_1, y_2, \ldots$ indicates that x is fully grounded in $y_1, y_2, \ldots$

appear, then, that the postmodal directionalist will countenance non-converse relations whose application conditions are essentially reciprocally connected. Completions of these relations won't be identified on a definition-based hyperintensional account of the individuation of relations. Unfortunately, the essence-based approach identifies them anyway.

There are potential avenues the postmodal IVD-ist could take in response to this latest problem, though they might not satisfy everyone. First, the IVD-ist could take the position that the existence conditions of the sides and angles of every polygon are essentially connected in a way that would ensure that

(CD) It is essential to a that it has angles c_1, c_2, and c_3 iff it has sides d_1, d_2, and d_3.

They could argue that these essentially connected facts, namely,

[a has angle c_1] [a has angle c_2] [a has angle c_3]
[a has side d_1] [a has side d_2] [a has side d_3]

are, due to (CD), such that if something is grounded by any one of them, it is grounded by each of them.

Mutual Essential Existential Dependence
If it part is of the collective essence of two things that if either exists then the other does, then if something is grounded by one, then it is grounded by the other as well.

Perhaps the identities of the sides and angles of each particular polygon simply can't be sufficiently disentangled from one another for it to be possible for something to be grounded by one but not the others. Something similar could potentially be said of the existence and distinctness facts concerning the angles and sides, and so *each* of the conjuncts of the two facts at the bottom of figure 5. The above principle would ensure that these conjunct facts, which ground the two conjunctive facts at the bottom of figure 5, would ground exactly the same things, and so each of the existential facts in the second level of the diagram would have to be grounded by *each* of the conjunctive facts on the first level. Ultimately, $[\lambda x \lambda y(Sxy \,\&\, Ly)ba]$ and $[\lambda x \lambda y(Tx \,\&\, Gxy)ab]$ would be grounded by the same facts.

Another more extreme strategy the postmodal IVD-ist could adopt in an attempt to avoid the result that $[\lambda x \lambda y(Sxy \,\&\, Ly)ba]$ and $[\lambda x \lambda y(Tx \,\&\, Gxy)ab]$ have different grounds is to take the position that facts about the angles and sides of a particular polygon are appropriately *interdependent*, i.e., grounded in *one another* (as in, e.g., Thompson 2016). On this proposal, [a has angle c_1], for example, would be grounded in [a has side d_2] and [a has side d_3], and yet [a has side d_2] would be grounded in [a has angle c_1] and [a has angle c_3]. This would similarly ensure that the two conjunctive facts at the bottom of figure 5 would have exactly the same grounds, and so too would the existential facts at the level above, and ultimately $[\lambda x \lambda y(Sxy \,\&\, Ly)ba]$ and $[\lambda x \lambda y(Tx \,\&\, Gxy)ab]$ as well. But as an explanatory or dependence relation, grounding is usually considered to be asymmetric, and so this would be a costly move. And even for the apparently less radical previous option, if it cannot be independently motivated, the suggestion might be construed as *ad hoc*. It should also be noted that neither of these responses would, on its own, secure the identity of facts like $[\lambda x \lambda y(Sxy \,\&\, Ly)ba]$ and $[\lambda x \lambda y(Tx \,\&\, Gxy)ab]$. The IVD-ist must still contend with their *pro tanto* distinctness owing to them being completions of non-converse relations. So while some might be satisfied with one of the options outlined above, others may not be. They will want to explore alternatives to the essence-based approach to explaining completion identities. I consider what I take to be the most promising alternative in the next section.

6 The Converse-Based Approach

In the previous section, we saw that the essence-based approach may identify completions that should be kept distinct by the postmodal IVD-ist's lights. But perhaps they could instead adopt an explanatory approach according to which, when relations R and R' are converses of one another, it is *the fact that they are converses of one another* (as opposed to the fact that their application conditions are merely essentially reciprocally connected) that, in part, explains why completions of them by the same objects in certain different orders are identical. This *converse-based approach* to explaining completion identities would allow the IVD-ist to avoid the problem for the essence-based approach I discussed above. Since *being an x and y such that x is triangular and x is larger than y* and *being an x and y such that x is smaller than y and y is trilateral* are not converses of one another, completions like (C1) and (C2) would be counted as distinct.

The postmodal IVD-ist will presumably want to regard the notion of conversehood (or that of weak conversehood — see below) as primitive, and take facts about which (indefinable) relations are converses of one another as fundamental. It is true that, necessarily, for any x_1 and x_2, x_1 is triangular and taller than x_2 iff x_2 is shorter than x_1 and x_1 is trilateral. But *being a y and z such that y is shorter than z and z is trilateral* does not seem to be the converse of *being triangular and taller than.*[29] So, it would seem, the postmodal directionalist should assume only that

Binary Converse-Necessary Symmetry Link
If binary relations R and R' are converses, then, necessarily, for any x_1 and x_2, Rx_1x_2 iff $R'x_2x_1$.[30]

Note that this means that the notion of conversehood is hyperintensional, but this shouldn't be an unacceptable commitment for a postmodal directionalist. Unfortunately, however, the converse-based approach has another feature that may well be of more concern to the postmodal directionalist.

On the usual conception of a binary converse, R' is a converse of a relation R only if R' necessarily applies to some objects in the *opposite* order as R applies to them.[31] This means that no non-symmetric binary relation is its own converse, and thus that the converse-based approach would fail to identify any completion of such a relation with any completion of itself! The IVD-ist could avoid this problem by positing a different sort of explanation in such cases, e.g., in terms of the identity of the relation. But they would then have to give *two* sorts of explanations for completion identities. For example, while they could explain the identity of Dante's loving Bice and Bice's being loved by Dante in terms of the fact that *loving* and *being loved by* are converses of one another, they would have to explain the identity of Dante's being next to Bice and Bice's being next to Dante, and that of Dante's loving Bice and Dante's adoring Bice, in terms of the *identity* of *being next to* and itself and that of *loving* and *adoring*, respectively. Some may think that this would put them at a disadvantage relative to the proponent of the identity-based approach, who requires only one sort of

[29] This is related to the discussion in section 5 above. The point there can be adapted to show that not only can conversehood not be defined as necessary reciprocal connectedness, it can't even be defined in terms of *essential* reciprocal connectedness.

[30] In general, where $n \geq 2$,

n-ary Converse-Necessary Symmetry Link
If n-ary relations R and R' are converses, then, for some non-identity permutation p of $\{1, \ldots, n\}$, necessarily, for any $x_1, \ldots, x_n$, $Rx_1 \ldots x_n$ iff $R'x_{p(1)} \ldots x_{p(n)}$.

[31] A converse R' of an n-ary relation R will necessarily apply in a *different* order. See fn. 11.

explanation in all these sorts of cases (see section 4 above). In each case, the identity of the completions is explained in terms of the identity of the underlying relations.

Those IVD-ists who are so concerned could dispense with the traditional notion of a converse and adopt an alternative notion, that of a *weak converse*, which is extensionally just like the traditional notion except that it counts every relation, regardless of its symmetry structure, as a weak converse of itself.

Weak Converses
Relations R and R' are *weak converses* $=_{df}$ either $R = R'$ or R and R' are converses.

Actually, the postmodal IVD-ist's preferred move would probably be to take the notion of a weak converse as primitive and define the traditional notion of a converse in terms of it.

Converses
Relations R and R' are *converses* $=_{df}$ R and R' are weak converses and $R \neq R'$.

The *weak converse-based approach* to explaining completion identities could then be stated as follows.

The Weak Converse-Based Approach to Explaining Completion Identities
If completions $[Rx_1x_2]$ and $[R'y_1y_2]$ are identical, then, for some permutation p of $\{1, 2\}$, the fact that $[Rx_1x_2] = [R'y_1y_2]$ is explained (fully and jointly) by the following facts:
(a) the fact that $y_1 = x_{p(1)}$ and $y_2 = x_{p(2)}$, and
(b) the fact that the R and R' are weak p-converses,

where,

Weak Binary p-Converses
Relations R and R' are *weak p-converses*, where p is a permutation of $\{1, 2\}$ $=_{df}$ R and R' are weak converses and necessarily, for any x_1 and x_2, Rx_1x_2 iff $R'x_{p(1)}x_{p(2)}$.[32]

This weak converse-based approach would also properly distinguish (C1) and (C2). The postmodal IVD-ist would presumably take the notion of weak converse as primitive, and so it would be an option for them — and natural for them — to say that *being an x and y such that x is triangular and x is larger than y* and *being an x and y such that x is smaller than y and y is trilateral* aren't weak converses of one another. As a result, the identity conditions implied by the converse-based approach would yield the result that (C1) and (C2) and other completions of their ilk are distinct.

One might be concerned that the adoption of the primitive notion of a weak converse and the explanation of completion identities in terms of instances of it is *ad hoc*. But the mere fact that the traditional notion of a converse emerged first isn't enough

[32]In general, where $n \geq 2$,

Weak p-Converses
Relations R and R' are *weak p-converses*, where p is a permutation of $\{1, \ldots, n\}$ $=_{df}$ R and R' are weak converses and necessarily, for any $x_1, \ldots, x_n$, $Rx_1 \ldots x_n$ iff $R'x_{p(1)} \ldots x_{p(2)}$.

to conclude that its replacement by another notion for theoretical purposes is *ad hoc*. For its replacement to be *ad hoc*, it would have to be a significantly more natural or comprehensible notion than that of its replacement. But even if one thinks this spells doom for converse-based approaches to explaining completion identities, and to IVD-ism more generally, in the next section I will argue that the postmodal directionalist has another option: to adopt UVD, i.e., to reject Identity and endorse Uniqueness. And conveniently, we will see, this is an option for the postmodal directionalist *only if* IVD proves unworkable.

7 Uniqueness-Verifying Directionalism in a Postmodal World

Perhaps some postmodal directionalists will find IVD and either the essence-based approach or one of the converse-based approaches plausible. Still, as I noted at the end of the previous section, some might have reservations about it. This is enough at least to prompt us to evaluate the prospects of the postmodal directionalist adopting UVD, the second version of directionalism that was introduced in section 3. In this section, I will look at five considerations, any of which one might raise in an attempt to undermine the adequacy of UVD, and show, in each case, that it fails to do so.

One reason one might find UVD dissatisfying is if it was unable to supply explanations of completion identities. Fortunately, the UVD-ist can adopt the identity-based approach, as long as they interpret it in the right way when R (and so R') is symmetric. Recall that clause (c) says that, when $R = R'$ is symmetric with respect to a permutation p, then the identity of completions $[Rx_1x_2]$ and $[R'x_{p(1)}x_{p(2)}]$ is explained in part by the fact that R (and so R') is symmetric with respect p. But recall also that symmetry with respect to a permutation was defined in terms of completion identities as strict symmetry; for a relation R symmetric with respect to permutation p, $[Rx_1x_2] = [Rx_{p(1)}x_{p(2)}]$ (see section 3 above). To avoid circularity, the UVD-ist must define symmetry differently. An initial thought would be to define a relation R that is symmetric with respect to permutation p in terms of necessity, as being such that, necessarily, for any x_1 and x_2, Rx_1x_2 iff $Rx_{p(1)}x_{p(2)}$. But Dixon (2023), shows that such a move is inadequate in a hyperintensional environment where relations are individuated by their real definitions, as there are (definable) relations that are necessarily symmetric in this sense but are not strictly symmetric. A more promising strategy is for the UVD-ist to define a relation R that is symmetric with respect to permutation p as one that is identical to its p-converse, i.e., to the converse R' of R such that, necessarily, for any x_1 and x_2, Rx_1x_2 iff $Rx_{p(1)}x_{p(2)}$. The UVD-ist will then need to take the notion of a converse as primitive and hyperintensional, and take facts about which (indefinable) relations are converses of one another as fundamental (see section 6). But, as before, this shouldn't be a problem for a postmodal directionalist.[33]

Consider what the identity-based approach says in cases of completions involving various sorts of relations, first, involving non-symmetric relations, according to UVD.

[33] And just as was the case for the neutral theorist who makes use of the identity-based approach to explaining completion identities (see section 4), when $R = R'$ and $y_1 = x_1$ and $y_2 = x_2$, clauses (a) and (b) of that approach are plausibly all that is needed for the UVD-ist to provide a complete explanation of why $[Rx_1x_2] = [R'y_1y_2]$, since every relation is symmetric with respect to the identity permutation.

Recall (see section 4) that according to a neutral view, Dante's loving Bice and Bice's being loved by Dante are identical, and the neutralist proponent of the approach will explain the identity of these completions, in part, in terms of the identity they posit between *loving* and *being loved by*. According to UVD, these completions are distinct, and the UVD-ist can explain this distinctness in terms of the fact that *loving* and *being loved by* are, given their commitment to directionalism, distinct relations. In cases of a symmetric relations, like *being next to*, the neutralist and the UVD-ist agree that there is only a single relation involved in any completion of it. The neutralist thinks this is so for *every* relation. The UVD-ist thinks this is so by virtue of their commitment to the directionalist principle that every symmetric relation is its own converse. (Remember that, in any completion of a symmetric relation R by x_1 and x_2, R applies to x_1 and x_2 in that order *and* in the opposite order, so this means that the directionalist will take there to be only one way for a symmetric relation to apply to two objects, generating only a single possible completion of that relation by those objects.) So UVD-ists and neutral theorists alike will explain Dante's being next to Bice and Bice's being next to Dante, in part, in terms of the identity between *being next to* and itself. And in the case of completions like Dante's loving Bice and Dante's adoring Bice, assuming *loving* and *adoring* are the same relation, both sorts of theorist would explain the identity of those completions, in part, in terms of the fact that *loving* and *adoring* are the same relation. Thus the UVD-ist, like the neutral theorist, can use the same strategy to explain converse completion identities that they use to explain all other completion identities.

A second reason one might find UVD dissatisfying is the bare fact that it countenances distinct intensionally equivalent completions like Dante's loving Bice and Bice's being loved by Dante, and even (C1) and (C2). This is inconsistent with Hume's Dictum.

Hume's Dictum (extreme)
There are no metaphysically necessary connections between distinct entities.

But this sort of concern cannot be well-motivated from the standpoint of postmodal metaphysics. Views toward which this dictum is friendly are those which identify intensionally equivalent entities. The postmodal directionalist who embraces a world of hyperintensionally individuated relations and their completions would find it quite the opposite of compelling, and so should not regard its incompatibility with their view as being concerning in the least. Indeed, the very jumping off point of postmodal metaphysics seems to be the *denial* of this principle.

Perhaps for this very reason, Hume's Dictum has come under attack in the postmodal age, e.g., by Jessica Wilson (2010). Socrates and the set {Socrates}, for example, are distinct yet necessarily connected, in that neither can exist unless the other does. And even the next weakest version of Hume's Dictum Wilson considers, while she provides counterexamples even to it, doesn't preclude the distinctness of converse completions (or of completions like (C1) and (C2), for that matter).

Hume's Dictum (strong)
There are no metaphysically necessary connections between weakly modally distinct entities,

where

Weak Modal Distinctness
x and y are *weakly modally distinct* $=_{df}$ it is possible for one of x and y to exist without the other.

Dante's loving Bice and Bice's loving Dante are not modally distinct; neither can exist without the other. Hence Hume's Dictum (strong) doesn't rule out metaphysically necessary connections between them.

A third reason, related to the second, that one might find UVD dissatisfying is that it cannot, one might argue, *explain* why converse completions are intensionally equivalent. Fraser MacBride (2007: 27) and Gary Ostertag (2019: 1481), for example, seem to think that the best way to explain why converse completions are intensionally equivalent is just that they are identical. On their view, what explains why it is necessary that Dante's loving Bice exists/obtains/is true iff Bice's being loved by Dante exists/obtains/is true is that we are really only talking about a single completion. The UVD-ist would need to provide an explanation of necessary equivalences like this as well. Fortunately, the postmodal UVD-ist can appeal to the essences of these completions, or, ultimately, to the essences of the relations of which they are completions, viz., to the essential reciprocal connectedness of the application conditions of those relations. They could explain the necessary equivalence of Dante's loving Bice and Bice's being loved by Dante in terms of the fact that the application conditions of *loving* and *being loved by* are essentially reciprocally connected. The strategy would be similar to the essence-based approach to explaining completion identities; however, because the explananda in the case of the strategy under consideration are necessary equivalences, and not identity claims, it is not susceptible to the problem I noted in section 5 for the essence-based approach to explaining completion identities. Though, since it invokes essences, which cannot themselves be cashed out in modal terms, this explanatory strategy will likely only be acceptable to the postmodal UVD-ist.

A fourth reason one might find UVD dissatisfying is that it is inconsistent with the free modal recombinability of the fundamental (FMRF). (See Schaffer 2010a esp. sec. 1.4 and 2010b: 40 and Bennett 2017: 27.)

Free Modal Recombinability of the Fundamental
Any subset of fundamental entities can exist together.[34]

Let q and e be fundamental particles, with q more massive than e. The fact that q is more massive than e can't exist without the fact that e is less massive than q and vice versa. But FMRF is not uncontroversial amongst postmodal metaphysicians. Jennifer Wang (2016) provides an extensive critique of it. She offers a number of potential counterexamples to it. She notes, for example, that an ontology that includes both objects on the one hand and properties and relations on the other is incompatible with it, since objects can't exist without instantiating at least one property or relation. She also notes that, for views that countenance fundamental states of affairs, that

[34]There's actually more to the claim than this. In full, it ensures that the fundamental objects (properties and relations) are such that "for any ways that any [of them] can be (instantiated), they may respectively be (instantiated in) those ways" (Wang 2016: 401). But the stated component of the thesis will be sufficient for the purposes of the discussion that follows.

"fundamental states of affairs that share constituents arguably are not modally free of each other" (ibid.: 403).

Wang also critiques a number of ways one might try to motivate FMRF. In the interest of space, I will consider only the two most powerful reasons she considers, and her critiques of them. First, she considers Hume's Dictum (ibid.: sec. 5.1), arguing, roughly, that the considerations underpinning it are the same as those underpinning FMRF; hence the latter cannot be motivated by appeal to the former. Wang next considers Humean supervenience (ibid.: 5.2), as found, for example, in Lewis 1986: ix–x, as another potential way to motivate FMRF. The dictate of Humean supervenience relevant to Wang's discussion (modified to replace Lewis's notion of perfect naturalness with fundamentality) is that "any pattern of instantiation of fundamental properties over point-sized objects, along with their spatiotemporal relations, is possible" (ibid.: 408). Here Wang (ibid.: 409), in part, relies on a point made by Wilson (2010). On Lewis's view, every perfectly natural (read: fundamental) property is intrinsic (see, e.g., Lewis 1983: 357). But, Wilson notes, this does not prevent there being necessary connections between distinct entities, since some intrinsic properties can be "modally loaded", i.e., "necessarily such that when instanced *in certain circumstances*, it (its instance) brings about certain effects" (Wilson 2010: 141, ital. orig.). Hence, Humean supervenience does not imply FMRF.

A fifth reason one might find UVD dissatisfying, and the last one I will consider, is that one might think that it runs afoul of Jonathan Schaffer's laser.

> **Schaffer's Laser**
> Do not multiply fundamental entities without necessity! (Quoted from Schaffer 2015: 647.)

Saying that the fact that q is more massive than $e \neq$ the fact that e is less massive than q, as the UVD-ist does, commits one to two fundamental facts, while saying that they are identical commits one to only one. (I am assuming that q and e are fundamental and that *more massive than* facts concerning fundamental entities are fundamental.) Unlike Hume's Dictum and FMRF, Schaffer's Laser indeed pulls just as hard on the postmodal metaphysician as it might on others. Granted, the typical postmodal metaphysician will be committed to more entities than the typical modal metaphysician, as there will be at least some intensionally equivalent/coexistent concepts/entities that the former will distinguish, while the latter will not. But the postmodal metaphysician believes they are posited out of necessity. Whether it be because they are needed to reflect the meanings of fine-grained natural language expressions, or to provide explanations for some phenomena, etc., the postmodal metaphysician thinks they have a purpose that can't be filled in any other way. Accordingly, the postmodal directionalist can distinguish between facts like [q is more massive than e] and [e is less massive than q] only if it is necessary. And of course, whether it is necessary to do so depends on whether IVD is a viable alternative for the postmodal directionalist.

As a result, Schaffer's Laser compels the postmodal directionalist to investigate whether denying Uniqueness instead of Identity is workable. As we saw in section 6, some might find IVD to be workable, while others might not due to potential points of worry I discussed in connection with both the essence-based approach and the converse-based approach. I leave it to the reader to determine for themselves whether IVD is workable or not. But even if a postmodal directionalist finds IVD to be unworkable in the end, they can take heart in the fact that, in this very circumstance, UVD thereby becomes a necessity for them, and so they would not be running afoul of Schaffer's Laser by adopting UVD.

8 Concluding Remarks

So there are ways the postmodal directionalist can respond to Fine's argument. The directionalist who endorses Identity and rejects Uniqueness might appeal to the essential reciprocal connectedness of the application conditions of converse relations to explain converse completion identities. Or they might appeal to the fact that the relations are (weak) converses of one another to do so. Granted, some might reject the essence-based approach on the basis of its apparent identification of completions that should be distinguished, viz., completions of non-converse relations whose application conditions are nonetheless essentially reciprocally connected. They might reject the converse-based approach on the basis of the fact that it appears to require two different types of explanations for explaining completion identities, in some cases in terms of the fact that the two underlying relations are converses of one another, in others in terms of the identity of those relations. And they might find the weak converse-based approach *ad hoc*. Fortunately, the postmodal directionalist who thinks that these considerations make Identity-verifying directionalism unworkable will be justified, given the strictures of Schaffer's laser, in adopting Uniqueness and rejecting Identity instead. This yields a greater number of completions (e.g., Dante's loving Bice and Bice's loving Dante are now distinct rather than identical). But the directionalist can adopt the identity-based approach to explaining completion identities — the same approach the neutral theorist of relations adopts. Moreover, a number of other concerns one might have concerning Uniqueness-verifying directionalism and its proliferation of completions should not concern a postmodal directionalist, *qua* postmodal metaphysician.

Supplementary information. Not applicable

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