

# Explanatory Distance

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## Abstract

When a train operator tells us that our train will be late ‘because of delays’, their attempt at explanation fails because there is insufficient distance between the explanans and the explanandum. In this paper, I motivate and defend an account of ‘explanatory distance’, based on the idea that explanations give information about dependence. I show that this account offers useful resources for addressing problem cases, including recent debates about grounding explanation, and the historical case of Molière’s dormitive virtue.

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## 1. Distance in Explanation

It is frustrating to be offered purported explanations that are mere descriptions of what we want to have explained. When a train operator tells us that our train will be late ‘because of delays’, we face this kind of explanatory failure. In such cases the attempt at explanation fails because the explanans

(which does the explaining) is too close to the explanandum (the thing explained).<sup>1</sup> The idea that explanation is irreflexive, and hence that there should be some distance between the explanans and explanandum of a legitimate explanation, is widely endorsed, but the precise nature of explanatory distance has not been thoroughly explored.

To illustrate the idea that explanations must display some distance, consider an apparent failure of explanatory distance from a clinical context, in which a diagnosis based purely on symptoms is offered as an explanation of those symptoms. Patients with Intermittent Explosive Disorder, a psychiatric condition, suffer from regular, poorly-controlled aggressive outbursts that have a significant impact on their lives.<sup>2</sup> Imagine that a patient asks for an explanation of the fact that they have been having regular aggressive outbursts, and the clinician replies that they have Intermittent Explosive Disorder, the condition of having regular aggressive outbursts. The explanans is too close to the explanandum for explanation, whereas a genuine explanation of the outbursts could, for example, include a description of the physical mechanism that gives rise to the behavior.

The structure of such cases is that a patient presents with symptoms a, b, and c, and asks for an explanation of their symptoms. The clinician offers the ‘explanation’ that the patient has Syndrome X, which is defined as having symptoms a, b, and c. Any diagnosis based purely on symptoms can be used to construct similar failed attempts at explanation. Attempts at explanation that appear similar to this may be useful in some way, or may offer the beginnings of an explanation. For example, if someone has symptom a and then finds out that they have Syndrome X, then this tells them that Syndrome X is part of the causal history of their having symptom a, which on some views

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<sup>1</sup> Some hold that explanation obtains between facts, while others hold that it obtains between propositions or sentences. In what follows I will move between these to engage with a wide range of views about explanation.

<sup>2</sup> American Psychiatric Association (2013) p. 466ff. 312.34 (F63.81)

is sufficient for partial explanation of their having symptom a.<sup>3</sup> However, merely offering a label for a group of symptoms does not explain those symptoms, and it is in such cases that attempts to explain symptoms by invoking symptom-based diagnostic categories can fail, because the explanans is too close to the explanandum. This kind of failure, and the corresponding requirement that there be some distance between the explanans and explanandum, is the target of an account of explanatory distance.

The view that explanation must display explanatory distance is reflected in the common commitment that explanation is irreflexive, and that full self-explanation, where the explanandum is identical to the explanans, is prohibited. The irreflexivity of explanation is a standard feature of accounts of scientific explanation, and the prohibition on self-explanation has also been discussed in the literature on identities in philosophy of mind, where many have argued that identities cannot explain.<sup>4</sup> Concerns about self-explanation also come up in discussion of Humean accounts of laws of nature, where some argue that Humean laws cannot explain events because according to the Humean the laws are merely generalizations about the events, rendering the attempt at explanation circular.<sup>5</sup> An important exception is Baruch Spinoza, who held that substances are self-causing and

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<sup>3</sup> Such as the accounts of causal explanation held by David Lewis and Bradford Skow. See Lewis, D. (1986) and Skow, B. (2014). One might suspect that the original case could be given a similar treatment, such that finding out that you have Syndrome X at least tells you that Syndrome X is in the causal history of your having symptoms a, b and c. However, this is blocked by the lack of explanatory distance in this case, because since Syndrome X is simply defined as having a, b and c, these are too close for one to be in the causal history of the other. This is equivalent to saying that the patient's having Syndrome X is in the causal history of their having Syndrome X.

<sup>4</sup> For example, the Deductive-Nomological model includes a clause that rules out complete self-explanation:

*An ordered couple of sentences, (T, C), constitutes a potential explanans for a singular sentence E only if*

(1) *T is essentially generalized and C is singular*

(2) *E is derivable in (model language) L from T and C jointly, but not from C alone.* Hempel, C. & Oppenheim, P. (1948) p.

160. (This is from a summary of their model, not the full model.) Clause 2 prohibits complete self-explanation. For example, the laws of gravitation and "Mary is blonde and blue-eyed" entail "Mary is blonde", but according to the second clause do not explain the fact that "Mary is blonde" because "Mary is blonde" is derivable from the singular fact "Mary is blonde and blue-eyed" alone. For discussion of identities in philosophy of mind, see Block, N. & Stalnaker, R. (1999), Kim, J. (2005)

<sup>5</sup> See discussion in Lange, M. (2013), Loewer, B. (2012), Miller, E. (2015), Shumener, E. (2017)

thereby also self-explained, but overall the prohibition on self-explanation is widely endorsed.<sup>6</sup> This might appear to settle the issue of explanatory distance, but as I will show, this issue is more complicated, not least because diagnosing self-explanation can be difficult, and certain cases of partial self-explanation may be permissible even if full self-explanation is not.

An account of explanatory distance will offer useful problem-solving resources because there are many philosophical problems with this issue at their heart. For example, some purported grounding explanations appear to lack an appropriate level of distance, despite the fact that all accounts of grounding portray it as explanatory. Cases such as the grounding and hence explanation of Socrates' singleton set by Socrates, or of the fact that A and B are a married couple in the fact that A and B are married to each other, are highly counterintuitive as explanations, in part because they appear to lack explanatory distance.<sup>7</sup> Alternatively, consider the historical case of Molière's dormitive virtue explanation. In Molière's comedy *The Imaginary Invalid* a doctor 'explains' that opium reliably induces sleeps because it has a 'dormitive virtue'.<sup>8</sup> At first pass, this may seem like an obvious case of insufficient explanatory distance. If 'opium has a dormitive virtue' is just a re-statement of 'opium reliably induces sleep', then this attempt at explanation fails because it is circular.<sup>9</sup> Many early modern philosophers held this view, arguing that explanation in terms of virtue or faculty was an explanatorily pointless hangover from the Scholastic period.<sup>10</sup> However, there are other

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<sup>6</sup> Spinoza, B. (1677) Ip7. Though Spinoza is not an isolated example, as a broader group of historical authors took God to be self-explanatory.

<sup>7</sup> See Fine, K. (2015); Hofweber, T. (2009)

<sup>8</sup> Molière (1732) p. 204.

<sup>9</sup> As before, note the careful construction of this case, as other apparently similar cases may involve successful explanation, or at least partial explanation. The explanandum is the pattern in opium's effects, not the event of an individual person being made to fall asleep by taking opium, which could be explained by being subsumed under that general pattern in opium's effects. Barbara Vetter discusses some cases in which single events can partially explained by subsumption under a disposition, or in which a comparison between two individuals can be explained through appeal to their respective dispositions. See discussion in Vetter, B. (2015) Chapter 3.

<sup>10</sup> Joseph Glanvill discussed the claim that fire burns in virtue of its heat and described it as 'an empty dry return to the Question' and, 'no better account than we might expect of a Rustick', in Glanvill, J. (1665) p. 143. See discussion in Ott, W. (2009). John Locke voiced a similar worry about the explanatory pointlessness of faculties in Locke, J. (1689) 2.21.20.

interpretations of this case. Some argue that such explanations fail not because of a lack of explanatory distance, but because dispositions have causal bases, and are causally and explanatorily excluded by those bases.<sup>11</sup> Alternatively, perhaps the explanation succeeds because opium has a disposition, its dormitive virtue, which grounds and therefore explains this pattern in opium's behavior. Overall, the dormitive virtue case is puzzling, as it seems that the explanans and explanandum might be too close for explanation, but that is not obvious. Furthermore, some contemporary accounts of grounding permit explanations very similar to the dormitive virtue case.<sup>12</sup> An account of explanatory distance should provide resources to diagnose and make sense of these cases, and in Section 4 I show that my account does offer these resources.

I begin in Section 2 by examining some apparently appealing but ultimately unsuccessful accounts of explanatory distance. In Section 3 I articulate and defend an account of explanatory distance based on a connection between explanation and dependence. In Section 4 I discuss some implications and applications of this dependence-based account of explanatory distance.

## **2. Failed Accounts**

I will begin by ruling out options that fail, because this will provide helpful pointers towards what is needed from an account of explanatory distance. But before beginning, I will address two concerns. The first is that the issue of explanatory distance is straightforward, and is captured by the irreflexivity of explanation. On this line of thought, there is no need for an account of explanatory distance because all it amounts to is the denial of self-explanation. However, this issue is more complicated. For example, there is logical space for the following combination of views: that

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<sup>11</sup> See e.g. Prior, E., Pargeter, R. and Jackson, F. (1982) See also discussion and critique in McKittrick, J. (2003)

<sup>12</sup> Such as grounding explanations in which dispositions ground and therefore explain patterns in events. See Audi, P. (2012) and Rosen, G. (2010) for discussion of cases of grounding that involve dispositions.

explanation obtains between sentences, and that, intuitively, there is insufficient explanatory distance in the dormitive virtue case, which involves distinct sentences. Furthermore, certain cases of partial self-explanation may be permissible with respect to distance, even if full self-explanation is not. Consider the case of priority monism. Roughly speaking, the priority monist holds that parts of the cosmos are explained by the whole.<sup>13</sup> This appears to be a case in which the explanans, the cosmos, contains the explanandum, the parts. Regardless of whether we endorse priority monism, an account of explanatory distance should make logical space for it. Simply prohibiting full self-explanation does not help us to make sense of this view, which indicates that the issue of explanatory distance is not exhausted by the issue of self-explanation. I will discuss this case in more detail at the end of Section 3.

The second concern is that accommodating explanatory distance is the work of an account of explanation, rather than an account of explanatory distance. On this line of thought, for a causal theory of explanation explanatory distance is the distance between cause and effect, and for a theory of grounding explanatory distance is the distance between grounded and ground, and so there is no work for an independence treatment of distance. However, it is not clear that an account of explanatory distance will straightforwardly fall out of a given account of explanation. For instance, as I will discuss in Section 4, certain cases of purported grounding explanation appear to violate the distance requirement.<sup>14</sup> Given that problems about explanatory distance arise for many different kinds of explanation, this indicates that this issue deserves some focused attention, independent of specific accounts of explanation. Furthermore, the view I will defend is compatible with a wide

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<sup>13</sup> As discussed in Schaffer, J. (2010)

<sup>14</sup> Similarly, the ongoing controversy about what it is to give information about causes, and hence what counts as a causal explanation, indicates that this issue will be complicated even for the comparatively simple case of causal explanation. See discussion in Dellsén, F. (2016); Lange, M. (2016); Reutlinger, A. (2017); Reutlinger, A. & Saatsi, J. eds. (2018); Skow, B. (2014); Skow, B. (2016)

range of approaches to explanation, which is preferable to tying the account of explanatory distance to one account of explanation.

## 2.1 MODAL

One way for facts or sentences to have some distance between them is for them to come apart modally. This motivates a modal account of explanatory distance, as follows:

MODAL There must be at least one metaphysically possible world in which the explanandum and the explanans differ in truth-value.

MODAL does not specify that there must be a metaphysically possible world in which the explanans is true while the explanandum is false, because that would exclude *any* deductive explanation, including, for instance, deductive-nomological explanations in which the explanandum is derived from an empirical claim and a law of nature. These are permitted by MODAL because there may be possible worlds in which the explanandum is true while the explanans is false, such as possible worlds with different laws of nature.

MODAL nicely accommodates the cases of the dormitive virtue and the patient's psychiatric symptoms. If a dormitive virtue is the pattern in events of a substance reliably inducing sleep, then there is no metaphysically possible world in which the explanandum 'opium reliably induces sleep' is true while the explanans 'opium has a dormitive virtue' is false, or vice-versa. However, if the fact that opium has a dormitive virtue is different from the fact that opium reliably induces sleep, such as if the dormitive virtue is a power, rather than a pattern in events, then there may be enough distance for explanation. Either way, MODAL clarifies the ambiguity. MODAL also vindicates the intuition that there is insufficient distance for explanation in the psychiatric case, because if it is true that 'Syndrome X' simply means 'having symptoms a, b and c', then there is no metaphysically possible

world in which ‘the patient has symptoms a, b and c’ is true while the explanans ‘the patient has syndrome X’ is false, or vice-versa.

However, despite its apparent plausibility, MODAL fails to accommodate an important class of cases in which explanation obtains between facts that are necessary. Call such facts *modal equivalents*. One example is based on Peter Lipton’s case of the non-causal explanation of the position of some falling sticks.<sup>15</sup> Imagine throwing a bunch of sticks into the air, freezing the scene as the sticks are falling, and finding that more of the sticks are oriented towards horizontal than vertical. In general, sticks thrown up in the air are more likely to end up oriented towards horizontal than vertical, and the explanation for this is that there are more ways for a stick to be positioned horizontally than vertically. If we adopt a definition of ‘stick’ as a three-dimensional cylindrical object, longer than it is wide, then there is no metaphysically possible world in which this explanandum is true while the explanans is false, or vice-versa.<sup>16</sup>

Many other successful explanations fail to meet MODAL, because a modal account of explanatory distance cannot accommodate the fine-grainedness and hyperintensionality of explanation.<sup>17</sup> A hyperintensional context is a context in which the substitution of necessarily equivalent sentences does not always preserve truth-value, and contexts such as belief, desire and importantly for us,

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<sup>15</sup> Lipton, P. (2001) p. 9.

<sup>16</sup> Worlds in which the unlikely happens and the result of some particular throw is that the sticks do end up oriented towards vertical are still worlds in which it is unlikely *in general* that in such cases the sticks will end up oriented towards vertical.

<sup>17</sup> For another example, consider Marc Lange’s case of a mother cutting up strawberries to distribute among her children: *The fact that twenty-three cannot be divided evenly by three explains why it is that Mother fails every time she tries to distribute exactly twenty-three strawberries evenly among her three children without cutting any (strawberries!)*. Lange, M. (2013) p. 488. Following Braine, in Braine, D. (1972) The explanandum is the fact that one cannot evenly distribute twenty-three strawberries among three children without cutting any of the strawberries, and the explanans is the fact that twenty-three cannot be divided evenly by three. Because there is no possible world in which twenty-three can be evenly divided by three, there is no world in which the explanans is true while the explanandum is false, and vice versa. Mathematical and logical explanations are central examples of explanations that obtain between modal equivalents.

explanation, are hyperintensional.<sup>18</sup> Accordingly, we need an approach to explanatory distance that permits explanation to obtain between modal equivalents.

## 2.2 HYPERINTENSIONAL

The failure of MODAL motivates placing hyperintensionality at the heart of the next attempt:

HYPERINTENSIONAL The explanans and explanandum must be at least hyperintensionally distinct, such that substituting either for the other in a hyperintensional context does not guarantee preservation of truth-value.

This proposal might seem promising simply because it is based on the feature that undermined MODAL, but it fails because there are cases where an attempt at explanation meets HYPERINTENSIONAL's criteria but lacks explanatory distance. For example, consider the dormitive virtue case. The explanandum is 'opium reliably induces sleep', and the explanans 'opium has a dormitive virtue', and earlier I noted that if 'dormitive virtue' simply means 'reliably induces sleep', then this lacks explanatory distance. Despite the fact that under this interpretation the attempt at explanation lacks distance, the explanans and explanandum are hyperintensionally distinct. For instance, it might be true that 'John believes that opium reliably sends people to sleep' while false that 'John believes that opium has a dormitive virtue', simply because John is unfamiliar with the concept of a virtue, or with the term 'dormitive'.<sup>19</sup>

Overall, MODAL is too strong because it rules out good explanations with appropriate distance,

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<sup>18</sup> For discussion see Nolan, D. (2014), Duncan, M., Miller, K. & Norton, J. (2017)

<sup>19</sup> One could argue that even if John is unfamiliar with the concept of a dormitive virtue, he does believe that opium has a dormitive virtue in so far as he believes that opium reliably sends people to sleep. In response, we can use the example of assertion in place of the example of belief. John may assert that 'opium reliably induces sleep' without asserting that 'opium has a dormitive virtue'.

while HYPERINTENSIONAL is too weak because it does not rule out some attempts at explanation with insufficient distance. We need an account of explanatory distance that accommodates the hyperintensionality of explanation, but is more stringent than HYPERINTENSIONAL.

### 2.3 Just is, generalized identities and identifications

An intuitive way of thinking about explanatory distance is that it is the requirement that the explanans and explanandum not be the same, and so identity seems like a promising place to look next. In this section I will survey some attempts to use work on identity, from Agustín Rayo, Fabrice Correia & Alexander Skiles, and Cian Dorr, as the basis of an account of explanatory distance.<sup>20</sup> Even though these approaches appear more promising than MODAL or HYPERINTENSIONAL, they turn out to be unsuccessful bases for an account of explanatory distance.

Rayo introduces the ‘just is’ sentence.<sup>21</sup> For example:

For Susan to be a sibling just is for her to share a parent with someone else.

For the glass to be filled with water just is for it to be filled with H<sub>2</sub>O.

Rayo argues that when a ‘just is’ sentence is true, both parts of it fully and accurately describe the same feature of reality.<sup>22</sup> Rayo suggests that we understand ‘just is’ as an operator,  $\Xi$ , that applies to sentences. He takes  $[\varphi \Xi \psi]$  to express [for  $\varphi$  to be the case just is for  $\psi$  to be the case].  $[\varphi \Xi \psi]$  is true if and only if  $\varphi$  and  $\psi$  have the same truth conditions, but Rayo does not take this to mean that  $\varphi$  and  $\psi$  are the same proposition. The  $\Xi$  operator is symmetric, which might seem inappropriate for an application to explanation, but given that the target here is an account of explanatory distance rather

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<sup>20</sup> Focusing on Rayo, A. (2013), Correia, F. & Skiles, A. (2017) and Dorr, C. (2016)

<sup>21</sup> Rayo, A. (2013), p. 3

<sup>22</sup> Rayo, A. (2013), p. 5

than explanation itself, a symmetric operator can do this work. An important feature of the ‘just is’ operator is its connection to metaphysical necessity and possibility. [For  $\varphi$  to be the case just is for  $\psi$  to be the case] is true if and only if there is a corresponding modal connection,  $\Box[\varphi \leftrightarrow \psi]$ .

Here is an account of explanatory distance based on Rayo’s ‘just is’ operator:

JUST IS: For any explanandum sentence  $\varphi$  and explanans sentence  $\psi$ ,  $\neg[\varphi \equiv \psi]$  (or, it is not the case that for  $\varphi$  to be the case just is for  $\psi$  to be the case).

We do not need to turn to case studies to see that JUST IS fails because of the connection between ‘just-is’ sentences and metaphysical necessity. Because  $[[\text{For } \varphi \text{ to be the case just is for } \psi \text{ to be the case}] \leftrightarrow \Box[\varphi \leftrightarrow \psi]]$ , if we adopt JUST IS as a criterion for explanatory distance, explanation cannot obtain between modal equivalents.<sup>23</sup> However, explanation does obtain between modal equivalents, so although the ‘just-is’ operator may be useful for other purposes, it is a non-starter as the basis of an account of explanatory distance.

A related approach to identity has been developed by Correia and Skiles.<sup>24</sup> They target a group of identity claims that they call ‘generalized identities’, including,

- 1) For a thing to be a bachelor is for it to be an unmarried adult male.
- 2) For a thing to know a proposition is for it to truly, justifiably believe that proposition.
- 3) For the Atlantic Ocean to be filled with water is for it to be filled with H<sub>2</sub>O molecules.<sup>25</sup>

Correia & Skiles follow Rayo in expressing generalized identity using the ‘just-is’ operator.<sup>26</sup> On their view, where  $p$  and  $q$  are open or closed sentences,

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<sup>23</sup> This feature of Rayo’s view has also been discussed in Linnebo, O. (2014)

<sup>24</sup> Correia, F. & Skiles, A. (2017)

<sup>25</sup> Correia, F. & Skiles, A. (2017) p. 642

<sup>26</sup> Correia, F. & Skiles, A. (2017) p. 644

$$(4) p \equiv q$$

reads 'For it to be the case that p is for it to be the case that q'; and where F and G are monadic predicates

$$(5) Fx \equiv_x Gx$$

reads 'For a thing to be F is for it to be G'. Generalized identity is reflexive, symmetric and transitive, and it permits representational differences between p and q.

Generalized identity is linked to metaphysical necessity, such that the principles 6 and 7 are true:

$$(6) \text{ If } Fx \equiv_x Gx, \text{ then } \Box \forall x \Box (Fx \leftrightarrow Gx)$$

$$(7) \text{ If } p \equiv q, \text{ then } \Box (p \leftrightarrow q)$$

However, their converses, 8 and 9, are not:

$$(8) \text{ If } \Box \forall x \Box (Fx \leftrightarrow Gx), \text{ then } Fx \equiv_x Gx$$

$$(9) \text{ If } \Box (p \leftrightarrow q), \text{ then } p \equiv q^{27}$$

This last feature makes generalized identity a more promising basis for an account of explanatory distance than Rayo's 'just is'. All generalized identities obtain between necessary equivalents, but some necessary equivalents are not generalizably identical, which leaves open the prospect of explanation obtaining between modal equivalents.

Despite this promising feature, however, generalized identity cannot serve as the basis of an account of explanatory distance. An account of explanatory distance based on generalized identity would require that in an explanation with adequate distance the explanans and explanandum are not generalizably identical. If any generalized identities are explanatory then the approach will fail, and

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<sup>27</sup> Correia, F. & Skiles, A. (2017) p. 646

some generalized identities do seem to be explanatory. For example, consider sentences 1-3 above. Some accounts of grounding explanation take 1 to be explanatory, such that the fact that a particular man is a bachelor is grounded in and therefore explained by the fact that he is an unmarried man.<sup>28</sup> Even if we reject this case as too close for explanation (and I will discuss these cases in Section 4), it is at least plausible that we get some kind of explanation out of 3. In finding out that some liquid is H<sub>2</sub>O that we can situate the liquid in the causal and nomological order, and so understand and explain some of its features. There is more to say here, but these cases indicate that at least some generalized identities are explanatory. Furthermore, the authors themselves note this, and state that grasping certain generalized identities brings ‘at least some degree of explanatory understanding’.<sup>29</sup>

Dorr has developed an account of the logic of a class of sentences that he calls ‘identifications’.<sup>30</sup> Dorr argues that because he is exploring the logic of identifications for metaphysical purposes, any operator he introduces must be transparent, in order to be metaphysically useful.<sup>31</sup> The identifications Dorr wants to capture are claims about the world, he argues, and as such their truth-value cannot be sensitive to distinctions in modes of presentation.

An account of explanatory distance based on Dorr’s notion of identification would rule out explanation between any sentences that are identical in Dorr’s sense. Whether sentences are identical in this sense is a transparent matter, and as such not subject to changes in mode of presentation. However, there is good reason to think that whether one sentence explains another is not a transparent matter, and can be influenced by changes in mode of presentation. For a

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<sup>28</sup> See discussion in Rosen, G. (2010) and McSweeney, M. (forthcoming)

<sup>29</sup> Correia, F. & Skiles, A. (2017) p. 667

<sup>30</sup> Dorr, C. (2016)

<sup>31</sup> Dorr, C. (2016) pp. 44-5

motivating example, consider a Quinean gloss on Lange's strawberry case, discussed in footnote 17. There the explanandum was, '23 strawberries cannot be evenly divided among three people without cutting any strawberries' and the explanans, '23 is not evenly divisible by 3'. Consider an alternative presentation of the explanans, 'David Beckham and Michael Jordan's favored jersey number is not evenly divisible by 3'. It is not obvious that the explanation is preserved under this presentation, given the lack of explanatory salience of Beckham and Jordan's preferences to the explanandum, even though the same number is picked out by both sentences. Such considerations indicate that explanation in general, much like belief, is not transparent, even if there is a specifically metaphysical category of explanation that is transparent. Given that an account of explanatory distance should apply to explanation in general, and not just a particular kind of explanation, Dorr's work on identification cannot provide the basis of an account of explanatory distance.

There is room here to reply. For instance, one could argue that an account of explanatory distance need not be general. However, even if we can use Dorr's work on identifications as the basis of an account of distance for metaphysical explanation (and it is not obvious that even metaphysical explanation need be transparent), this is a small subset of explanation, and so more work would be needed for a general account of distance that can be used for problem-solving purposes. My view is general, and so avoids this problem. Alternatively, one could argue that there are coherent views of explanation as not sensitive to modes of presentation, and so that the issue about transparency does not undermine this approach to explanatory distance. I agree that there are coherent views of explanation as not sensitive to modes of presentation, but basing an approach to distance on such a view would be to hold the account of distance hostage to a highly specific view of explanation. My account can accommodate views of explanation as not sensitive to modes of presentation, but is not restricted to such views.

### 3. Distance and Dependence

Each of these attempts to formulate an account of explanatory distance has faced problems and counterexamples. It would take more to show that no version of each of these could work, but in this section I will take a different approach. I will sketch an account of explanatory distance based on a connection between explanation and dependence, and argue that this view is more promising than the alternatives already considered.

The idea that there is a connection between explanation and dependence is most clearly articulated in ‘backing models’ of explanation. On this prevalent way of thinking about explanation, explanations are backed, or supported by, underlying dependence relations that are not themselves explanations.<sup>32</sup> A traditional example of a backing relation is causation. According to backing views of causal explanation, causation is not itself explanation but causal explanations nevertheless explain by giving information about causation. ‘Separatists’ about grounding hold a similar view about grounding explanation, on which grounding is a form of metaphysical dependence that is distinct from but supportive of explanation.<sup>33</sup> Some have argued that mereological relations such as parthood can also back explanations, while others extend this view to include non-metaphysical forms of dependence, such as conceptual dependence, in this role.<sup>34</sup> There is a lively literature on the precise nature of backing relations, with some arguing that they must be asymmetric, irreflexive and non-monotonic, reflecting these features of explanation, while others argue that backing relations need not have the same formal features as explanation, or disagree about those features.<sup>35</sup> The

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<sup>32</sup> For discussion of backing models see Kovacs, D. (2017), Taylor, E. (2018) and Taylor, E. (2020). Proponents of backing models include Paul Audi in Audi, P. (2015), Jaegwon Kim in a range of venues including Kim, J. (2005) and Kim, J. (1988), David-Hillel Ruben in Ruben, D. (1990) and Jonathan Schaffer in Schaffer, J. (2010), Schaffer, J. (2012) and Schaffer, J. (2015)

<sup>33</sup> See Maurin, A. (2019), Raven, M. (2015) and Schaffer, J. (2012) for discussion.

<sup>34</sup> For example, see discussion in Schnieder, B. (2006) and Taylor, E. (2020)

<sup>35</sup> See discussion in Rosen, G. (2010), Audi, P. (2012). For critique of the idea that explanation (and specifically metaphysical explanation) inherits such features from its backing relations, see Maurin, A. (2019) For discussion of

proper characterization of backing depends on substantial issues about the nature of explanation, and rather than attempt to settle any of these broader issues here, I will simply take backing models as offering a sketch of the motivating idea that explanation is supported by dependence relations.

My proposed account of the relationship between distance and dependence makes use of this backing view of explanation, as follows:

DEPENDENCE What is described in the explanandum must depend upon what is described in the explanans.<sup>36</sup>

There is much left open here about the precise nature of dependence and the correct taxonomy of dependence relations, and different accounts of explanation will fill out these details in different ways. Accordingly, DEPENDENCE is compatible with a wide range of different approaches to explanation. For instance, consider debates about whether the explanans of a successful explanation must give information about a cause of what is described in the explanandum.<sup>37</sup> DEPENDENCE can be endorsed by all participants in such debates, as proponents of noncausal explanation hold that the explanans of some explanations give information about whatever described in the explanandum noncausally depends upon, while defenders of purely causal accounts of explanation restrict this to causal dependence.<sup>38</sup> Alternatively, explanatory realists can endorse DEPENDENCE while admitting only metaphysical forms of dependence, while explanatory non-realists and anti-realists can endorse DEPENDENCE while permitting explanations to be backed by non-

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specific features see Naomi Thompson on asymmetry in Thompson, N. (2016), Ricki Bliss on irreflexivity in Bliss, R. (2014) and Alexander Skiles on necessitation in Skiles, A. (2015)

<sup>36</sup> Unlike some other views discussed here, this view requires that the relata of explanation are sentences or propositions, rather than facts.

<sup>37</sup> For a survey of recent debates on this topic, see Reutlinger, A. (2017) and in Reutlinger, A. & Saatsi, J. eds. (2018)

<sup>38</sup> See discussion in Skow, B. (2014) Dellsén, F. (2016)

metaphysical forms of dependence.<sup>39</sup>

DEPENDENCE accommodates widely-held intuitions about cases. Consider the psychiatric explanation, which intuitively fails because there is insufficient distance between the explanans ‘the patient has syndrome X’ and the explanandum ‘the patient has symptoms a, b and c’.

DEPENDENCE returns the correct verdict on this case, vindicating the intuition that this attempt at explanation lacks explanatory distance because the explanans does not give information about what the explanandum depends upon.<sup>40</sup> Similarly, consider Lipton’s case of the falling sticks. The explanandum is ‘sticks thrown in the air are more likely to end up oriented towards horizontal than vertical’, and the explanans is ‘there are more ways for a stick to be positioned horizontally than for it to be positioned vertically’. Even though these are modal equivalents, this is intuitively explanatory, and DEPENDENCE once again returns the correct verdict: because the facts about the likelihood of the positions of the sticks depend on the geometric facts about the possible positions of the sticks, there is sufficient distance for explanation.

I have argued that DEPENDENCE handles cases well and that this is a benefit of the view compared to the alternatives considered here, each of which faced serious counterexamples.

However, the extent to which DEPENDENCE handles cases well, and the range of cases it must

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<sup>39</sup> Precisely how DEPENDENCE fits into a non-realist or anti-realist account of explanation is up to the proponent of the view, but for illustration, I take conceptual dependence to be a good example of non-realist dependence. See discussion in Schnieder, B. (2006) and Taylor, E. (2020)

<sup>40</sup> One could argue that in this case there is a kind of conceptual dependence of ‘having symptoms a, b and c’ on ‘having Syndrome X’. If so, and if we permit explanations that give information about conceptual dependence, then this might meet the distance standard. But even if that is so, and so this explanation is legitimate with respect to distance, this is not the kind of causal information that we are typically interested in when we want to find out about a psychiatric condition, particularly if we are the patient. In that situation we would want to know about the causal mechanism that led to the condition developing, and particularly how to prevent and treat the condition. Accordingly, even if there is a conceptual explanation available, in clinical contexts it may be inappropriate to offer that conceptual explanation. This point will be taken up in more detail in Section 4.

handle, depends in part on the other commitments about explanation with which DEPENDENCE is combined. For instance, on a causal view of explanation the case of the falling sticks would not count as an explanation, and so there would be no issue of explanatory distance to accommodate here. I will return to this point in Section 4. I favor a pluralist view of explanation on which explanations are backed by many different kinds of dependence relation, and context determines which kind of explanation is salient, but none of this is required to endorse DEPENDENCE.

DEPENDENCE is independently motivated because, as we have seen, backing models of explanation explicitly build this connection between dependence and explanation into the nature of explanation. But the idea that it is at least part of the job of explanation to report on relations that are not themselves explanation can be found in a variety of views of that are not explicitly framed in terms of backing. For instance, interventionist accounts of explanation, which are not framed in terms of backing or dependence, portray explanations as giving information about relations of modal dependence.<sup>41</sup> The claim that there is a connection between dependence and explanation has also been explored in the literature on understanding and explanation, with some arguing that information about dependence relations is an important component of the understanding that explanation can provide.<sup>42</sup>

DEPENDENCE avoids the specific problems faced by the alternatives considered earlier. Because dependence relations, such as grounding, can obtain between modal equivalents, DEPENDENCE permits explanation to obtain between relata too fine-grained for MODAL or JUST-IS to accommodate. For two sentences to be hyperintensionally distinct is not sufficient for them to meet

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<sup>41</sup> Such as Woodward, J. (2003)

<sup>42</sup> See discussion in Dellsén, F. (2018)

DEPENDENCE, and so DEPENDENCE is more stringent than HYPERINTENSIONAL. DEPENDENCE does not require that explanation is transparent, and so this view avoids the problems faced by an account of distance based on Dorr's notion of identification. Overall, DEPENDENCE is compatible with a wide range of approaches to explanation, handles cases well, is independently motivated, and avoids the problems that undermined the alternatives considered here. In the next section, I will also show that DEPENDENCE offers useful diagnostic and clarificatory tools for addressing problem cases.

An interesting implication of DEPENDENCE is that, depending on the background metaphysics, it may permit partial self-explanation. As mentioned earlier, a prohibition on full self-explanation is widely accepted. However, it seems at least plausible that there are cases of partial self-dependence, and that these may back explanations. For example, the view that some parts may depend on their whole, as in priority monism, is an instance of such partial self-dependence, because the part is a part of the whole on which it depends.<sup>43</sup> If there genuinely is a dependence relation here, then there may be explanations of features of the part that give information about the whole, and these would be cases of partial self-explanation. If there is genuine dependence in such cases, then those explanations will be fine with respect to explanatory distance. The idea that explanation may proceed from whole to part might also help us to make sense of cases such as explanations that involve Humean laws. If there is a genuine dependence relationship between a generalization and an instance, then facts about the generalization might well explain facts about the instance, even if the instance is strictly speaking a part of the generalization. Whether these are genuine cases of dependence is up to the background metaphysics, but if it turns out that they are, then DEPENDENCE can accommodate them, and the explanations that report upon them.

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<sup>43</sup> As discussed in Schaffer, J. (2010)

#### 4. Applying DEPENDENCE

One of the promised payoffs of an account of explanatory distance is that it will help us to make sense of apparent problem cases. Here I will consider two: grounding explanations and the dormitive virtue explanation.

There are many different accounts of and approaches to grounding, but the rough idea is that grounding is a form of non-causal metaphysical determination that is either explanatory itself or stands in a close relationship to explanation.<sup>44</sup> Opinions differ about the relation of grounding, and those differences have implications for the explanatory role attributed to grounding, but on *all* views grounding is explanatory, either as explanation itself, or as a backer of explanations. Indeed, given the many differences among grounding theories, this close connection between grounding and non-causal explanation is one of its defining characteristics, and the claim that grounding is explanatory is central to the work attributed to grounding.<sup>45</sup> However, many cases of grounding are highly unintuitive as explanations. For example: the fact that A and B are a married couple is grounded in the fact that A and B are married to each other; Socrates' singleton set is grounded in Socrates; and the fact that the paint is red is grounded in the fact that the paint is scarlet.<sup>46</sup> In each of these the explanans and explanandum seem too close for explanation. A grounding theorist can reject the claim that these are instances of grounding, and these are merely intuitive worries. However, it is clear that in many purported cases of grounding explanation the explanans and explanandum are

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<sup>44</sup> For a collection of work on grounding, see Correia, F. & Schnieder, B. eds. (2012). Other key papers include Audi, P. (2012), Fine, K. (2001), Rosen, G. (2010), Schaffer, J. (2010)

<sup>45</sup> For example, Alyssa Ney uses grounding to precisify a range of debates in metaphysics of mind in Ney, A. (2016). Shamik Dasgupta uses grounding in his articulation of the Principle of Sufficient Reason in Dasgupta, S. (2016). Jonathan Schaffer uses grounding in his version of monism, in Schaffer, J. (2010). Other applications of grounding that rely on its explanatory aspect include formulations of ethical and mathematical anti-realism, as in Dreier, J. (2004), Fine, K. (2001), and formulations of physicalism, as in Dasgupta, S. (2014). See Wilson, J. (2014) for critique of the claim that grounding does perform useful work.

<sup>46</sup> Hofweber, T. (2009) and discussion of similar cases in McSweeney, M. (forthcoming); Fine, K. (2015); Audi, P. (2012)

very close indeed, and so an account of explanatory distance should have something to say about these cases.

Fortunately, DEPENDENCE does have something to say about these cases. So long as the explanans gives information about whatever is described in the explanandum depends upon, then there is sufficient distance for explanation. This puts the onus back onto the grounding theorist to clarify and defend the claim that the fact that the paint is red depends upon the fact that the paint is scarlet, or the fact that A and B are a married couple depends upon the fact that they are married to each other. If the case cannot be made for dependence, then the case cannot be made for explanation. And so this issue is about the underlying metaphysics - the grounding theorist has to make the case not only for the position that there is a specifically non-causal form of metaphysical dependence, but also that it is operative in these cases.

Furthermore, if there is sufficient distance for explanation in these cases, we can make sense of the apparently unintuitive nature of these explanations by combining DEPENDENCE with other plausible commitments. For instance, it is fairly plausible to think that context plays at least some role in determining whether a particular explanation is useful or salient.<sup>47</sup> We can combine DEPENDENCE with this contextual approach to explanation, in the view that explanations give information about a variety of different kinds of dependence, and that different kinds of explanation are salient in different contexts. Doing so opens up a range of useful resources for making sense of apparently counterintuitive explanations. For instance, even if the fact that some paint is red is

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<sup>47</sup> Pragmatists about explanation, such as Peter Achinstein and Bas Van Fraassen, take this contextual aspect very seriously. See Achinstein, P. (1983) and Van Fraassen, B. (1980). However, we do not need to endorse full-blown pragmatism about explanation in order to recognize that context can have some impact on the extent to which an explanation is appropriate or salient.

grounded in and therefore explained by the fact that the paint is scarlet, it might be that I am almost never in a context in which that particular form of dependence, and hence of explanation, is explanatorily salient. Typically, when I ask for an explanation of the fact that some paint is red, I am asking for a causal explanation, or an explanation that gives information about the motivations of the designer of that range of shades. Accordingly, the metaphysical, grounding-based explanation might be inappropriate in contrast with the causal or motivational explanation that I expect, and so it may seem jarring or counterintuitive despite meeting the distance criterion. Even if there is sufficient distance here for explanation, the explanation may be odd or unintuitive for reasons to do with context, and DEPENDENCE can diagnose and accommodate this feature.

Let's now turn to the dormitive virtue case, which is puzzling because on some plausible readings it appears to involve an obvious failure of explanatory distance, but on others it does not. If 'opium has a dormitive virtue' simply means 'opium reliably induces sleep', then this is a clear failure of explanatory distance because the explanans is a mere re-description of the explanandum. If a dormitive virtue is a metaphysical entity, such as a power, on the other hand, then the fact that opium has a dormitive virtue might metaphysically explain the fact that opium reliably causes sleep. DEPENDENCE makes sense of these options, and makes clear that the resolution of this puzzle depends not just on considerations about explanation itself, but also on the background metaphysics. On the latter option the explanans metaphysically explains the explanandum because the explanandum is metaphysically dependent upon the explanans, and the fact that opium reliably induces sleep is metaphysically explained by information about the entity responsible for that pattern in its behavior, the power or virtue. This interpretation rests on a view of explanation that includes specifically metaphysical explanation, and an ontology that includes powers, virtues or dispositions. If, on the other hand, there is no such distinct entity as the dormitive virtue, and the explanans is a

mere re-description of the explanandum, then there is no dependence and the attempt at explanation displays insufficient explanatory distance.

DEPENDENCE can also accommodate alternative interpretations of this case. For example, if the dormitive virtue explains the pattern in events through causal explanation, the relevant form of dependence is causal dependence, and DEPENDENCE returns the correct verdict that this is an adequate explanation, at least with respect to distance. Alternatively, if the dormitive virtue offers no explanation because the virtue is explanatorily excluded by its causal base, then we get no information about dependence from information about the dormitive virtue, and DEPENDENCE returns the correct verdict that there is no explanation. Overall, DEPENDENCE offers useful tools to make sense of the ambiguity around this case, and to clarify what is at stake.

The cases of grounding explanation and the dormitive virtue explanation offer a sample of the useful diagnostic applications of DEPENDENCE. Many debates in philosophy hang on whether the relata of purported explanations are too close for legitimacy, and DEPENDENCE offers useful tools wherever this issue arises.

## **5. Conclusion**

This discussion focused on attempts at explanation that fail because the explanans and explanandum are too close together. However, sometimes attempts at explanation fail because the explanans and explanandum are too far apart, and DEPENDENCE can clarify and diagnose such failures too. For example, if I attempt to explain why my tea is cold by pointing to the density of a distant planet, then the attempt at explanation fails because the explanandum in no way depends upon the explanans. This diagnosis does depend on the background metaphysics, however. If everything

depends on everything else, then everything can at least potentially explain everything else, and the density of a distant planet could explain the coldness of my tea. But this is an illustration of the counterintuitive implications of such widespread interdependence, rather than a count against DEPENDENCE as a view of explanatory distance.

Overall, DEPENDENCE is a promising account of explanatory distance. It combines with a range of different approaches to explanation and handles cases well, reflecting commonly-shared intuitions about explanation. It is independently motivated, avoids the problems and counterexamples faced by its rivals, and can be usefully applied to problem cases. From the idea that explanation must give information about dependence in order to meet the distance requirement, it is a short step to the view that giving information about dependence is central to the nature of explanation. The full development and defense of that view goes beyond the remit of this discussion, but the success of an account of explanatory distance based on this idea tells in its favor.

### **Acknowledgments**

Many thanks to Peter Achinstein, Justin Bledin, Patrick Connolly, Michael Della Rocca, Finnur Dellsén, David Kovacs, Marc Lange, Anna-Sofia Maurin, Elizabeth Miller, Alex Skiles, and two immensely helpful and generous anonymous referees. Particular thanks to the Desert Collective for workshopping the paper: Kristen Bell, Katie Elliott, Emily Given, Emily Kelahan and Clair Morrissey. Thanks also to audiences at the Open Session of the Aristotelian Society, Scripps College, the Midwest Annual Workshop in Metaphysics, the Society for Women in Philosophy Analytic, the University of Gothenburg, the University of Oxford, and the University of Glasgow.

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## References

- Achinstein, Peter (1983) *The Nature of Explanation*. Oxford University Press.
- American Psychiatric Association (2013) *Diagnostic and Statistical Manual of Mental Disorders*. (5th ed.)
- Audi, Paul (2015) “Explanation and Explication.” In Daly, C. ed. (2015) *The Palgrave Handbook on Philosophical Methods*. Palgrave Macmillan.
- Audi, Paul (2012) “Grounding: Toward a Theory of the In-Virtue-of Relation.” *Journal of Philosophy* **109**(12) pp. 685-711
- Bliss, Ricki (2014) “Viciousness and Circles of Ground.” *Metaphilosophy* **45**(2) pp. 245-56
- Block, Ned & Stalnaker, Robert (1999) “Conceptual Analysis, Dualism and the Explanatory Gap.” *Philosophical Review* **108** pp. 1-46
- Braine, David (1972) ‘Varieties of Necessity’, Supplementary *Proceedings of the Aristotelian Society* **46** pp. 139–70
- Correia, Fabrice & Schneider, Benjamin eds. (2012) *Metaphysical Grounding: Understanding the Structure of Reality*. Cambridge University Press.
- Correia, Fabrice & Skiles, Alexander (2017) “Grounding, Essence and Identity.” *Philosophy and*

*Phenomenological Research* **98**(3) pp. 642-70

Dasgupta, Shamik (2016) “Metaphysical Rationalism.” *Noûs* **50**(2) pp. 379-418

Dasgupta, Shamik (2014) “The Possibility of Physicalism.” *Journal of Philosophy* **111**(9/10) pp. 557-92

Dellsén, Finnur (2018) “Understanding as Dependency Modelling.” *British Journal for the Philosophy of Science* <https://doi.org/10.1093/bjps/axy058>

Dellsén, Finnur (2016) “There May Yet be Non-Causal Explanations.” *Journal for General Philosophy of Science* **47**(2) pp. 377-84.

Dorr, Cian (2016) “To Be F is to Be G.” *Philosophical Perspectives* **30**(1) pp. 39-134

Dreier, Jamie (2004) “Meta-ethics and the Problem of Creeping Minimalism.” *Philosophical Perspectives* **18** pp. 23-44

Duncan, Michael, Miller, Kristie & Norton, James (2017) “Is Grounding a Hyperintensional Phenomenon?” *Analytic Philosophy* **58**(4) pp. 297-329

Fine, Kit (2015) “Unified Foundations for Essence and Ground.” *Journal of the American Philosophical Association* **1**(2) pp. 296-311

Fine, Kit (2001) “The Question of Realism.” *Philosophers’ Imprint* **1** pp. 1-30

Glanvill, Joseph (1665) *Scepsis Scientifica, or, Confest Ignorance, the Way to Science; In An Essay of the Vanity of Dogmatizing, And Confident Opinion*. E. Coates.

Hempel, Carl & Oppenheim, Paul (1948) "Studies in the Logic of Explanation." *Philosophy of Science* **15**(2) pp. 135-75

Hofweber, Thomas (2009) "Ambitious Yet Modest Metaphysics" in Chalmers, David, Manley, David, Wasserman, Ryan (eds) (2009) *Metametaphysics*. Oxford University Press.

Kim, Jaegwon (2005) *Physicalism, or Something Near Enough*. Princeton University Press.

Kim, Jaegwon (1988) "Explanatory Realism, Causal Realism, and Explanatory Exclusion." *Midwest Studies in Philosophy* **12** (1) pp. 225-39

Koslicki, Kathrin (2012) "Varieties of Ontological Dependence." In Correia, Fabrice & Schneider, Benjamin eds. (2012) *Metaphysical Grounding: Understanding the Structure of Reality*. Cambridge University Press.

Kovacs, David (2017) "Grounding and the Argument from Explanatoriness." *Philosophical Studies*. **174**(12) pp. 2927-52

Lange, Marc (2016) *Because Without Cause*. Oxford University Press.

- Lange, Marc (2013a) "Grounding, Scientific Explanation, and Humean Laws." *Philosophical Studies* **164** (1) pp. 255-61
- Lange, Marc (2013b) "What Makes a Scientific Explanation Distinctively Mathematical?" *British Journal for the Philosophy of Science* **64** pp. 485-511
- Lewis, David (1986) "Causal Explanation." In *Philosophical Papers Volume II*. Oxford University Press.
- Lewis, David (1979) "Counterfactual Dependence and Time's Arrow." *Nous* 13 (4) Special Issue on Counterfactuals and Laws, pp. 455-76
- Lipton, Peter (2001) "What Good is an Explanation?" reprinted in Cornwell, J. (ed) (2004) *Explanations: Styles of Explanation in Science*. Oxford University Press.
- Locke, John (1689) *Essay Concerning Human Understanding*. Clarendon.
- Loewer, Barry (2012) "Two Accounts of Laws and Time." *Philosophical Studies* **160**(1) pp. 115-37
- Maurin, Anna-Sofia (2019) "Grounding and Metaphysical Explanation: It's Complicated." *Philosophical Studies* **176**(6) pp. 1573-94
- McKittrick, Jennifer (2003) "The Bare Metaphysical Possibility of Bare Dispositions." *Philosophy & Phenomenological Research* **66**(2) pp. 349-69

McSweeney, Michaela (forthcoming) “Debunking Logical Ground: Distinguishing Metaphysics from Semantics.” *Journal of the American Philosophical Association*

Miller, Elizabeth (2015) “Humean Scientific Explanation.” *Philosophical Studies* **172**(5) pp. 1311-32

Molière (1732) *Le malade imaginaire, comedie. Par Monsieur De Molière. The hypochondriack, a comedy. From the French of Molière.* London: printed for John Watts at the Printing-Office in Wild-Court near Lincoln's-Inn Fields.

Ney, Alyssa (2016) “Grounding in the Philosophy of Mind: A Defense.” In Aizawa, K. & Gillett, C. (ed.) *Scientific Composition and Metaphysical Ground.* Palgrave-Macmillan

Nolan, Daniel (2014) “Hyperintensional metaphysics.” *Philosophical Studies* **171**(1) pp. 149-60

Ott, Walter (2009) *Causation and Laws of Nature in Early Modern Philosophy.* Oxford University Press.

Prior, Elizabeth, Pargeter, Robert and Jackson, Frank (1982) “Three Theses about Dispositions.” *American Philosophical Quarterly* **19** pp. 251-7

Raven, Michael (2015) “Ground.” *Philosophy Compass.* **10**(5) pp. 322-33

Rayo, Agustín (2013) *The Construction of Logical Space.* Oxford University Press.

Reutlinger, Alexander (2017) “Explanation Beyond Causation? New Directions in the Philosophy of

Scientific Explanation.” *Philosophy Compass* <https://doi.org/10.1111/phc3.12395>

Reutlinger, Alexander & Saatsi, Juha (eds.) (2018) *Explanation Beyond Causation: Philosophical Perspectives on Non-Causal Explanations*. Oxford University Press.

Rosen, Gideon (2010) “Metaphysical Dependence: Grounding and Reduction.” In Hale, Bob & Hoffmann, Aviv (eds.) (2010) *Modality: Metaphysics, Logic, and Epistemology*. Oxford University Press.

Ruben, David-Hillel (1990) *Explaining Explanation*. Routledge.

Schaffer, Jonathan (2010) “Monism: The Priority of the Whole.” *Philosophical Review* **119**(1) pp. 31-76

Schaffer, Jonathan (2012) “Grounding, Transitivity and Contrastivity.” In Correia, Fabrice & Schneider, Benjamin eds. (2012) *Metaphysical Grounding: Understanding the Structure of Reality*. Cambridge University Press.

Schaffer, Jonathan (2015) “Grounding in the Image of Causation.” *Philosophical Studies* **173** pp. 49-100

Schneider, Benjamin (2006) “A Certain Kind of Trinity: Dependence, Substance, Explanation.” *Philosophical Studies* **129** pp. 393-419

Shumener, Erica (2017) “Laws of Nature, Explanation, and Semantic Circularity.” *British Journal for the Philosophy of Science* **70**(3) pp. 787-815

Skiles, Alexander (2015) "Against Grounding Necessitarianism." *Erkenntnis* **80**(4) pp. 717-51

Skow, Bradford (2014) "Are There Non-Causal Explanations (of Particular Events)?" *British Journal for the Philosophy of Science* **65**(3) pp. 445-67

Skow, Bradford (2016) *Reasons Why*. Oxford University Press.

Spinoza, Baruch (1677) *Ethics*. Translated by Curley, E. (1996) Penguin.

Taylor, Elanor (2018) "Against Explanatory Realism." *Philosophical Studies* **175**(1) pp. 197-219

Taylor, Elanor (2020) "Backing Without Realism." *Erkenntnis* <https://doi.org/10.1007/s10670-020-00249-w>

Thompson, Naomi (2016) "Grounding and Metaphysical Explanation." *Proceedings of the Aristotelian Society* **116**(3) pp. 395-402

Van Fraassen, Bas (1980) *The Scientific Image*. Oxford University Press.

Vetter, Barbara (2015) *Potentiality: From Dispositions to Modality*. Oxford University Press.

Wilson, Jessica (2014) "No Work for a Theory of Grounding." *Inquiry* **57**(5-6) pp. 535-79

Woodward, James (2003) *Making Things Happen: A Theory of Causal Explanation*. Oxford University Press.