Canadian Journal of Philosophy (2024), 1–12
doi:10.1017/can.2024.38

ARTICLE

The PSR and the Nature of Explanation: An Underrated Response to Modal Fatalism

Joseph Emmanuel Elevado Blado

Department of Philosophy, University of Notre Dame, Notre Dame, IN, USA
Email: jblado@nd.edu

Abstract
The principle of sufficient reason (PSR) says every fact has an explanation. But van Inwagen argues the PSR is false—otherwise all facts are necessary facts. Consider the conjunction of all contingent facts, which we can call the Big Contingent Conjunction. If every fact has an explanation, then presumably the Big Contingent Conjunction had better have an explanation too. But what fact could explain its truth—is the Big Contingent Conjunction explained by a necessary fact or a contingent one? Trouble ensues either way. If the Big Contingent Conjunction is explained by a necessary fact, then it is hard to see why it should be contingent. (After all, if something follows from what is necessary, it too would seem to be necessary.) On the other hand, if the Big Contingent Conjunction is explained by a contingent fact, then the explanation appears circular since the explanans itself is among the facts it explains in the Big Contingent Conjunction. This paper explores an assumption of this argument rarely subjected to scrutiny—namely, the distribution principle, which asserts that if a fact explains a conjunction, then it explains each of its conjuncts. Though superficially plausible, close consideration of this principle reveals some reasons to reject it, potentially saving the PSR from van Inwagen's challenge.

Keywords: Logic of Explanation; Metaphysics of Explanation; Explanatory Distribution; Varieties of Explanation; Principle of Sufficient Reason (PSR)

The principle of sufficient reason (PSR) says every fact has an explanation. But van Inwagen argues the PSR is false—otherwise all facts are necessary facts. Consider the conjunction of all contingent facts, which we can call the Big Contingent Conjunction. If every fact has an explanation, then presumably the Big Contingent Conjunction had better have an explanation too. But what fact could explain its truth—is the Big Contingent Conjunction explained by a necessary fact or a contingent one? Trouble ensues either way.

If the Big Contingent Conjunction is explained by a necessary fact, then it is hard to see why it should be contingent. (After all, if something follows from what is necessary, it too would seem to be necessary.) On the other hand, if the Big Contingent Conjunction is explained by a contingent fact, then the explanation appears circular since the explanans itself is among the facts it explains in the Big Contingent Conjunction.

This article explores an assumption of this argument rarely subjected to scrutiny—namely, the distribution principle, which asserts that if a fact explains a conjunction, then it explains each of its conjuncts. Though superficially plausible, close consideration of this principle reveals some reasons to reject it, potentially saving the PSR from van Inwagen's challenge.

I. The PSR and Modal Fatalism

The PSR goes as follows:

> Principle of Sufficient Reason (PSR): Everything has an explanation (i.e. ∀x∃y(yRx) where R is the binary relation "… explains …").[1]

The PSR is perhaps one of the most influential principles in the history of philosophy—most especially in the early modern era.[2] Despite its previous prominence, Peter van Inwagen famously argued the PSR collapses all modal distinctions. His argument may be put more precisely as follows:

(1) No necessary proposition explains a contingent proposition.
(2) No contingent proposition explains itself.
(3) If a proposition explains a conjunction, it explains every conjunct.
(4) A proposition *q* only explains a proposition *p* if *q* is true.
(5) There is a Big Conjunctive Contingent Fact (BCCF), which is the conjunction of all true contingent propositions, perhaps with logical redundancies removed, and the BCCF is contingent.
(6) Suppose the PSR holds. (for *reductio*)
(7) Then, the BCCF has an explanation, *q*. (by (5) and (6))
(8) The proposition *q* is not necessary. (by (1) and (5) and as the conjunction of true contingent propositions is contingent)
(9) Therefore, *q* is a contingent true proposition. (by (4) and (8))
(10) Thus, *q* is a conjunct in the BCCF. (by (5) and (9))
(11) Thus, *q* explains itself. (by (3), (5), (7), and (9))
(12) But *q* does not explain itself. (by (2) and (9))
(13) Thus, *q* does and does not explain itself, which is absurd.
(14) Hence, the PSR is false.[3]

Since Van Inwagen's criticism,[4] much of the work defending the PSR (and restricted versions of it) has centered around rejecting either (1) or (5) or abandoning the PSR for some version which avoids the fatalist problem. Against (1), it has been argued that (1) is unmotivated,[5] and that it is perfectly coherent for a necessary fact to explain a contingent one.[6] Against (5), some have argued the collection of all contingent truths is not even a set,[7] and one can show there is no BCCF on varying grounds.[8] Despite the focus on (1) and (5), virtually no analysis has been done on whether the distribution principle in (3) is true. It is often taken for granted—described by some as an "unimpeachable premise"[9] which is most "surely"[10] true. Whether (3) is true has wide-sweeping ramifications since it stakes a claim on the very nature of explanatory relations. Let us take a closer look at the main reason people reject it and precisely the formulation of the distribution principle.

[1] Melamed and Lin, 2016.
[2] Ibid.
[3] Van Inwagen 1983, 202–204. Formalized interpretation of the argument comes from Pruss 2012, 50.
[4] Van Inwagen's formulation is the most influential, so I engage his formulation here. At least some of the other variantions of the argument employ the distribution principle, or an event version thereof, and so my criticism will also be applicable. See Rowe 1984, 362–363. Oppy 2009, 37 and 39–40.
[5] Pruss and Rasmussen 2018, 60–63. Pruss 2006, 103–122.
[6] Amijee 2020, 1163–1181. Pruss 2006, 98–125.
[7] Ibid., 100.
[8] Levey 2016, 397–430. Tomaszewzki 2016, 267–274.
[9] Pruss 2006, 98.
[10] Ibid., 69.

https://doi.org/10.1017/can.2024.38 Published online by Cambridge University Press

II. The Distribution Principle and the Main Source of Pushback

Very few people have questioned the distribution principle. For those who have, most have found it is dubious when we understand the operative notion of explanation as *grounding*. Let the binary grounding relation be abbreviated by R_g "… explanatorily grounds …", and let the domain be the set of all facts. Suppose *per reductio* grounding explanatory relations distribute over conjunction such that:

Grounding Distribution: $\forall p \forall q \forall r \ldots \forall n\ (pR_g(q \wedge r \wedge \ldots n)) \rightarrow (pR_g q \wedge pR_g r \wedge \ldots pR_g n)$.[11]

According to grounding orthodoxy though, the partial grounding relation is irreflexive, and conjunctions are explanatorily grounded by their conjuncts. So suppose the facts [p],[q] explanatorily ground the conjunction [$p \wedge q$]. By the grounding distribution principle, [p],[q] explanatorily grounds [p]. So [p] partly grounds itself. But nothing partly grounds itself (irreflexivity)—contradiction. Therefore, *Grounding Distribution* is false—rendering the more general distribution principle dubious.[12]

Now for sympathizers of grounding such as myself, this is a forceful takedown of (one) distribution principle. But there are a couple of issues lingering. For one thing, plenty of realists about explanation are also antigroundhogs. So these individuals will take issue that since there are no grounding relations at all, this argument does not accomplish much. Another issue that should be obvious is that we might precisify two versions of the distribution principle that could have been originally at play—what I call "intra-type explanatory distribution" and "inter-type explanatory distribution". The former says that *every type* of explanatory relation distributes over conjunction, whereas intertype explanatory distribution says *the disjunction of every type* of explanatory relation distributes over conjunction. More precisely, let the generic explanatory relation R_G be the disjunction of any type of explanatory relation ($R_1, R_2, \ldots R_{.n}$) such that $\forall x \forall y\ (xR_G y \leftrightarrow (xR_1 y \vee xR_2 y \vee \ldots xR_n y))$. So, for any explanatory relations ($R_1, R_2, \ldots R_{.n}$) on the domain of all facts, we may define the different distribution principles as follows:

Intratype Explanatory Distribution: $\forall p \forall q \forall r \ldots \forall n\ [[(pR_1(q \wedge r \wedge \ldots n) \rightarrow (pR_1 q \wedge pR_1 r \wedge \ldots pR_1 n)] \wedge [(pR_2(q \wedge r \wedge \ldots n) \rightarrow (pR_2 q \wedge pR_2 r \wedge \ldots pR_2 n)] \wedge \ldots [(pR_n(q \wedge r \wedge \ldots n) \rightarrow (pR_n q \wedge pR_n r \wedge \ldots pR_n n)]$. Rough approximation in words: For any fact p and any explanatory relation R, if p R-explains a conjunction, then p R-explains each of its conjuncts.

Inter-type Explanatory Distribution: $\forall p \forall q \forall r \ldots \forall n\ [(pR_G(q \wedge r \wedge \ldots n)) \rightarrow (pR_G q \wedge pR_G r \wedge \ldots pR_G n)]$. Rough approximation in words: For any fact p, if p (in some way or other) explains a conjunction, then p (in some way or other) explains each conjunct.

Assuming grounding realism, it becomes clear the grounding argument would only rule out *Intratype Explanatory Distribution* but not *Intertype Explanatory Distribution*. Moreover, arguably the notion of explanation operative in the PSR says every fact has some explanation or other—where the operative sense of explanation is equivalent to the generic explanatory relation R_G. So, it seems that the few arguments available against the distribution principle, the main one does not succeed. There are, however, a couple other arguments against the distribution principle. For instance, Geoffrey Hall suggests that (given certain assumptions) the distribution principle allows for instances of reflexive explanations. Since surely explanation is irreflexive, the distribution

[11]Notably, this formulation and formulations of other principles in the rest of the paper apply only to finitely large conjunctions. However, I do not think much hangs on this and we could just as easily reformulate the principles to apply for infinitely large conjunctions. Thank you to one of the editors of *Canadian Journal of Philosophy* for noting this.

[12]Dasgupta 2016, 392–393. McDaniel 2019, 231–232. There is more on what precisely the original distribution principle amounts to in this section.

principle may be to blame.[13] I think this is plausible. But others in the explanation literature have argued there are (or at least could be) plausible instances of reflexive explanations,[14] and so I do not wish to stake a claim on this view here. Others such as Guigon have pointed out the distribution principle is incompatible with Leibniz's notion of explanation.[15] However, irrespective of the Leibnizian notion of explanation, are there other possible reasons to reject the distribution principle? As we'll discover, it appears so. Not only are there currently no good arguments to accept this principle, but there are further positive reasons to doubt it.

III. Arguments for the Distribution Principle

I have identified two arguments which could be raised in favor of (3)—the first being an argument from explanatory transitivity and the second being an argument from sufficient information by Alexander Pruss. Consider each in turn.

A. The Argument from Transitivity

The following theses seem *prima facie* plausible:

(15) All causal relations are explanatory relations.
(16) All logical entailment relations are explanatory relations.
(17) Explanatory relations are transitive.

It seems to follow that:

(18) Therefore, if *p* causally explains a conjunction (*q* & *r* & … *n*), and (*q* & *r* & … *n*) explains each of its conjuncts by logically entailing them, then *p* explains each conjunct.

There are a few remarks needed to precisify this argument. First, by "explanatory relations" in (15)–(16), I just mean these are disjuncts of a generic explanatory relation R_G.

Second, the thesis of explanatory transitivity in (17) has two relevant formulations: intratype explanatory transitivity and intertype explanatory transitivity. The former says the above claim is that *all types* of explanatory relations are transitive. So for every type of explanatory relation (R_1, R_2, … $R_{.n}$), it is the case that:

Intratype Explanatory Transitivity: $\forall x \forall y \forall z\ (((xR_1y \wedge yR_1z) \rightarrow xR_1z) \wedge ((xR_2y \wedge yR_2z) \rightarrow xR_2z)$ … $((xR_ny \wedge yR_nz) \rightarrow xR_nz))$.

To illustrate this, suppose the causal relation R_c and the grounding relation R_g are the only types of explanatory relations on the domain of everything. To claim intratype explanatory transitivity, then would be to claim that $\forall x \forall y \forall z\ (((xR_cy \wedge yR_cz) \rightarrow xR_cz) \wedge ((xR_gy \wedge yR_gz) \rightarrow xR_gz))$. Thus, intratype explanatory transitivity is to affirm that every individual type of explanatory relation is transitive.

In contrast to this, intertype explanatory transitivity is the claim that the disjunction of every type of explanatory relation is transitive. In other words, for every type of explanatory relation (R_1, R_2, … $R_{.n}$), it is the case that:

Intertype Explanatory Transitivity: $\forall x \forall y \forall z\ (((xR_1y \vee xR_2y \vee \ldots xR_ny) \wedge (yR_1z \vee yR_2z \vee \ldots yR_nz)) \rightarrow (xR_1z \vee xR_2z \vee \ldots xR_nz))$.

[13] Hall 2021, 490–491.
[14] Krämer 2013, 85–89, Nozick 1981, 128–137. Pruss 2006, 86–90 and 122–125.
[15] Guigon 2008, 364–366.

https://doi.org/10.1017/can.2024.38 Published online by Cambridge University Press

For example, suppose the set $\{R_c, R_g\}$ is the set of all types of explanatory relations on the domain of everything. To claim intertype explanatory transitivity obtains would be to claim $\forall x \forall y \forall z\ (((xR_c y \vee xR_g y) \wedge (yR_c z \vee yR_g z)) \rightarrow (xR_c z \vee xR_g z))$.

However, notice the argument above needs intertype explanatory transitivity in (17) to work. For the antecedent in (18) is *an intertype* explanatory chain. Thus, for the conditional of (18) to come out true, the consequent of (18) should be implied by an intertype explanatory chain. Since intratype transitivity does not entail this (along with (16)–(17)), intertype transitivity is needed to guarantee (18). So, we should understand the argument as:

Explanatory Transitivity Argument (ETA):

(15) All causal relations are explanatory relations.
(16) All logical entailment relations are explanatory relations.
(17) **Intertype Explanatory Transitivity* is true.
(18) Therefore, if *p* causally explains a conjunction (*q* & *r* & … *n*), and (*q* & *r* & … *n*) logically entails each of its conjuncts, then *p* explains each conjunct.

Since (18) establishes (3) of the fatalist argument, the question becomes whether *ETA* is any good. Upon examination, it is not, for (16) appears highly implausible. Consider how trivially, for any proposition *p, p* logically entails *p*. Yet surely not every *p explains p*, or else every proposition would be self-explanatory.[16] Since this is absurd, (16) should be rejected. Perhaps the better version of *ETA* is something like:

Modified Explanatory Transitivity Argument (META):

(19) All causal relations are explanatory relations.
(20) All nontrivial logical entailment relations are explanatory relations.
(21) Conjunction elimination is a nontrivial logical entailment.
(22) Interexplanatory transitivity is true.
(23) Therefore, if *p* causally explains a conjunction (*q* & *r* & … *n*), and (*q* & *r* & … *n*) logically entails each of its conjuncts, then *p* explains each conjunct.

This avoids the error above while seemingly preserving the original argument's merits.

Nevertheless, there are two problems with *META* (in fact, there are three, but I'll reserve the last one for the last section). First, contra (21), conjunction elimination seems to be a trivial logical entailment. Indeed, just assert to anyone on the street that some *p* is true. Then, give as your explanation for why *p* is true that both (*p* and *q*) are true, and so *p* is true. I suspect they will respond with a look of confusion, saying something like, "*of course* assuming *p* and *q* are both true, then *p* is true. But that hardly *explains why p* is true." Indeed, this seems like a perfectly natural reaction. The reason why is because it seems conjunction elimination is highly trivial—it does not provide us with genuinely explanatory information. Since conjunction elimination is a trivial logical entailment, (21) is false.

Perhaps though there are counterexamples where conjunction elimination is indeed nontrivial. For instance, one might try to explain the fact that [Fred died] via the conjunction ([Fred was shot] & [Fred died]). Perhaps such a conjunction elimination does not seem trivial at all and so explains the explanandum. However, it is not obvious we would explain Fred's death in this way. For by saying this, one is essentially just saying [Fred died because he died of being shot]. Admittedly, this is rather odd. It seems much more natural to explain Fred's death by way of merely one of the conjuncts—namely, [Fred was shot].[17] Furthermore, even if this instance of conjunction

[16] Thank you Samuel Newlands for pointing this out in private conversation.
[17] This example and response come up in a different dialectical context discussed in Pruss 2006, 113.

https://doi.org/10.1017/can.2024.38 Published online by Cambridge University Press

elimination were nontrivial, (21) asserts all conjunction eliminations are non-trivial. Yet surely there are instances of conjunction eliminations which are trivial and non-explanatory. For instance, ([Clinton exists] & [I ate Japchae for lunch]) yields [Clinton exists]. But if you were to try and explain Clinton's existence on the street using this conjunction, I suspect many would find this explanation to be trivial and non-explanatory. Thus, (21) still comes out false.

Moreover, (22) is dubious insofar as it is vague which explanatory relation (22) implies between the initial and final members of an interexplanatory chain. To see this, consider how it seems plausible that interexplanatory chains obtain. For example, the fact that [a glass manufacturer created that piece of glass *g*] causally explains why [*g* exists and actually has a certain physio-chemical makeup]. The fact that [*g* exists and actually has a certain physio-chemical makeup] at least partially grounds the fact that [*g* is fragile]. I take it that there are genuine glass manufacturers and pieces of glass which make these statements true. So, there are at least some interexplanatory chains obtaining in the world such that (for example) some *A* caused *B*, and *B* grounds *C*. Interexplanatory transitivity, nonetheless, implies there is some explanatory relation between *A* and *C*. But what sort of explanatory relation could this even be? It is not obviously causal or grounding. After all, it seems strange to say if *A* caused *B* and *B* grounds *C*, then *A* caused *C* (likewise with a grounding relation in the consequent).

Perhaps one might respond there are at least some instances in which A really does causally explains C in intertype explanatory chains. Suppose Anna lives in Scotland and is about to give birth. However, Anna moves to the U.S. Consequently, Anna's moving to the U.S. causally explains why her baby is born in the U.S., and her baby's being born in the U.S. grounds (together with U.S. law) the fact that her baby's a U.S. citizen. Here, it is not strange to say Anna's immigrating *causally explains* why her baby is a U.S. citizen.[18] I admit this seems right. But surely there are at least *some instances* in which it is inappropriate to say A explains C in an intertype explanatory chain, and so the generalization (in intertype explanatory transitivity) comes out false. Suppose I have some clay, and I shape it into a sphere. My actions causally explain the clay's being spherical, and the clay's being spherical then grounds the clay's being shaped. But my actions surely *do not cause* the clay's being shaped—for it was already shaped to begin with. Rather, it seems *in spite of* my actions, the clay is shaped (likewise my actions do not themselves seem to ground the clay's being shaped since it was already shaped).[19] Or suppose I have a ruby-red mug. I then paint it scarlet. My actions causally explain its being scarlet, and its being scarlet grounds its being red. But my actions do not *cause* (nor do they themselves ground) the mug's being red—since it was already red to begin with. These seem to be plausible counterexamples. Thus, since it is at least dubious the intertype explanatory transitivity generalization holds in *all* instances of intertype explanatory chains, (22) remains dubious.

Perhaps one might argue it is the counterfactual relation which is the explanatory relation between *A* and *C* in the alleged false instances of (22). This is a natural move to make if one already accepts counterfactual theoretic analyses of both causation and grounding. But as the causation literature has taught us, not all counterfactual relations are explanatory relations. Take the following standard example: suppose Johnny and Dominic are hired by Christine. However, Johnny is Christine's least favorite employee whereas Dominic is her favorite. Here, it seems the following counterfactual is true: had Dominic been fired, then Johnny would have been fired. But even though there is counterfactual dependence of Johnny's being fired on Dominic's being fired, it may very well be the case that Johnny's being fired is explanatorily irrelevant to Dominic's being fired. Perhaps Johnny was fired since he messed up for the nth time. So, it seems there are counterfactual relations which are not explanatory relations.[20]

[18]Thank you to an anonymous reviewer for this comment.

[19]Thanks to Brian Cutter for this counterexample.

[20]Similar to Jansson 2015, 588–589.

https://doi.org/10.1017/can.2024.38 Published online by Cambridge University Press

Alternatively, perhaps one might postulate some sort of "gappy" explanatory relation ($R_{\#}$) which is not itself identical to any of the standard explanatory relations (R_1, R_2, … R_n) that we know of and is implied by their obtaining. Thus, $\forall x \forall y\ ((xR_1y \vee xR_2y \vee \ldots xR_ny) \rightarrow (xR_{\#}y))$. I must admit this relation seems very mysterious to me. Putting aside such mystery though, one might avoid accepting this relation since postulating such an explanatory relation for the sake of saving the above argument appears *ad hoc* and needlessly bloats one's ontology of explanatory relations.

Overall then, we considered three responses against the transitivity argument and its modified version. First, we saw (16) of *ETA* appears to be false since it implies the false conclusion that all propositions are self-explanatory. Second, even adjusting *ETA* to *META*, (21) of *META* seems false because conjunction elimination is a trivial logical entailment. Third, (22) of *META* (and (17)* of *ETA*) seems dubious since it implies there is an explanatory relation between the initial and final members of interexplanatory chains. Insofar as there do not seem to be any plausible candidate explanatory relations, (22) is dubious. On these grounds, the argument(s) from transitivity does not have force.

B. The Prussian Argument from Sufficient Information

The second argument that can be raised for (3) comes from Alexander Pruss. Pruss is the only person I'm aware of who has an argument for (3). It is worth noting, however, that Pruss comes off as treating this argument as an interesting side-thought and therefore does not put much stock in defending it. The argument goes roughly as follows:

(24) If *p* explains a conjunction (*q* & *r* & … *n*), then *p* has enough information to explain each conjunct.
(25) If *p* has enough information to explain each conjunct, then *p* explains each conjunct.
(26) Therefore, if *p* explains a conjunction (*q* & *r* & … *n*), then *p* explains each conjunct (i.e. (3)).[21]

Unfortunately, there are a few problems with this argument. For one thing, Pruss himself does not provide us any reason to believe (24) or (25). He simply states them quickly and moves on to address some brief objections (which are irrelevant for our purposes).[22] It is notable however that Pruss's focus was primarily on another topic—with this argument given merely as an afterthought.

Another issue with the argument is (24) seems to be false. Consider just one counterexample. Suppose the fact that [Bob smokes] causally explains the conjunctive event that [[Bob has cancer] & [Bob is in pain]]. Nonetheless, the mere fact that [Bob smokes] *itself* does not have enough information to explain why the conjunct [Bob is in pain] obtains. Maybe Bob is in pain for other reasons (e.g. jumping off a trampoline, or working out). Thus, it seems false that if *p* explains a conjunction, then *p* has enough information [itself] to explain each conjunct (that is 24).

Furthermore, (25) seems dubious. Even though *p* has enough information to explain each conjunct, it does not follow that *p de facto* explains each conjunct. This seems similar to (but not exactly the same as) saying if *p* possibly explains *q*, then *p* actually explains *q*.[23] Consider a case from before reworked as a plausible counterexample: suppose the facts that [Fred fell off a 10 story building] and [Fred died] obtain. It seems [Fred fell off a 10-story building] has enough information to explain why [Fred died]. However, suppose that in fact [Fred got shot on the way down]. Here, it seems although [Fred fell off a 10 story building] has enough information to explain why [Fed died],

[21] Pruss 2012, 50.
[22] Ibid.
[23] Notably, Pruss elsewhere admits that *p*'s possibly explaining *q* does not mean *p* actually explains *q*—since otherwise his and Gale's weak PSR would be just as strong as the strong PSR. Gale and Pruss 1999, 461–476. But even if the analogy does not hold here, I give a counterexample to (24) in this paragraph.

https://doi.org/10.1017/can.2024.38 Published online by Cambridge University Press

it does not in fact explain why [Fred died]. Rather, the fact that [Fred got shot on the way down] does.[24] Therefore, not only do we have no reason to believe (24)–(25), we also have two positive reasons to reject them. Consequently, as it stands now, this argument for (3) is unconvincing.

IV. Isn't the Distribution Principle Self-Evident?

We have now seen how there seem to be no good arguments to date for the distribution principle. But one might press that it just seems self-evident—or perhaps *properly basic*—that if *p* explains a conjunction, then *p* explains each conjunct. Of course, one might push back that (as we have seen earlier) there are at least a few arguments against the distribution principle. Perhaps this strips this status from the distribution principle. But I suspect the more die-hard Moorean distributionist will not be convinced. In this last section, I want to consider three further reasons to doubt the distribution principle—putting more pressure on the Moorean distributionist to strip the principle of its Moorean status.

First, suppose one accepts *Booleanism* regarding identifications. A consequence of this theory is that if a fact *F* and a fact *G* are logically equivalent, then they are identical.[25] Now, take the fact [Clinton exists]. There is plausibly some contingent fact *p* which explains this—perhaps, that [Clinton's parents decided to have a child] or some such fact (it does not really matter which fact it is for our purposes). Consider then the following argument:

(28) [Clinton's parents decided to have a child] explains [Clinton exists] (premise).
(29) [Clinton exist] = [Clinton exists & ($\forall q$ ($q \vee \sim q$))] – where the *q*s are just all the propositions (premise, by Booleanism).
(30) So, [Clinton's parents decided to have a child] explains [Clinton exists & ($\forall q$ ($q \vee \sim q$)] (28 & 29).
(31) Assume (per reductio) the distribution principle is true such that if proposition *r* explains a conjunction (*s* & *t*), then *r* explains *s* and *r* explains *t.*
(32) So, [Clinton's parents decided to have a child] explains [$\forall q$ ($q \vee \sim q$)] (by 30–31).
(33) But it's not the case that [Clinton's parents decided to have a child] explains ($\forall q$ ($q \vee \sim q$)) – contradiction. Therefore, the distribution principle is false.

Here, I take it it's rather obvious that the fact that [Clinton's parents decided to have a child] does not explain the logical truism that [$\forall q$ ($q \vee \sim q$)].[26] One might push back that given the PSR, Booleanism seems less plausible than the distribution principle. For suppose the PSR is true. Then, there is an explanation of [$\forall q$ ($q \vee \sim q$)]—perhaps because [It is in the nature of propositions such that $\forall q$ ($q \vee \sim q$)], or some such fact.[27] Now we also know [Clinton's parents decided to have a child] explains why [Clinton exists], but does not explain why [$\forall q$ ($q \vee \sim q$)]. Surely then, the conjunction [It is in the nature of propositions such that $\forall q$ ($q \vee \sim q$) & Clinton's parents decided to have a child] explains the conjunction [$\forall q$ ($q \vee \sim q$) & Clinton exists]. By Booleanism, it follows [It is in the nature of propositions such that $\forall q$ ($q \vee \sim q$) & Clinton's parents decided to have a child] explains [Clinton exists]. This is bizarre. How could an essence fact about propositions, in any way, explain Clinton's existence? Since, given the PSR, Booleanism has this dubious consequence, we should be more dubious of Booleanism than the distribution principle.[28]

[24]Similar example used for other purposes in Pruss 2006, 113–114.
[25]Dorr 2016, 67–70.
[26]Thank you to Johnny Waldrop for generating a sketch of this argument in private discussion, and helping me precisify the argument.
[27]It does not matter what the explanation is for our purposes since the issue can be run with any given explanation E of the truism.
[28]Thank you to an anonymous reviewer for raising this worry.

https://doi.org/10.1017/can.2024.38 Published online by Cambridge University Press

For simplicity's sake, let us make the fact that [It is in the nature of propositions such that $\forall q\ (q \vee \sim q)$] be [$p_1$], make [$\forall q\ (q \vee \sim q)$] be [$p_2$], make [Clinton's parents decided to have a child] be [p_3], and make [Clinton exists] be [p_4]. One thing to say is the above argument makes use of the following inference: if [p_1]R_G[p_2] and [p_3]R_G[p_4], then [p_1 & p_3]R_G[p_2 & p_4]. However, it is not immediately obvious such an inference is justified—perhaps because of irrelevance worries when combining both explanantia and explananda. So maybe it is not Booleanism at fault here, but rather, this inference. Another option for a PSR advocate is to just accept a restricted PSR where every *contingent* fact has an explanation (rather than every fact has an explanation). Accepting the (restricted) PSR avoids committing one to there being an explanation of the necessary fact [$\forall q\ (q \vee \sim q)$]—thereby avoiding this premise in the issue above.[29]

Moving forward, a second reason to be dubious of the distribution principle is there seem to be tempting counterexamples to it. Consider:

> *Dog Bite:* Suppose a terrorist plans on bombing an area using a detonator at noon. Since he's right-handed, he plans to use his right hand to denotate the bomb. However, before noon, a dog bites his right hand. The terrorist then proceeds to detonate the bomb with his left hand, and the bomb goes off.[30]

Here, the dog's actions can be said to causally explain the conjunction of the chain of events where both: [[the terrorist used his left hand to detonate the bomb] & [the bomb went off]]. However, it does not seem like the dog's actions causally explain the conjunct that [the bomb went off]. For the bomb would have gone off regardless of the dog's actions. Thus, although the dog's actions explain the overall conjunctive event, the explanatory relation does not distribute over both conjuncts. Consider another example:

> *Assassination:* Suppose an assassin intends to kill me, and plants a bomb underneath my desk. I fortunately discover the bomb in time and have a team of bomb specialists remove the bomb. Consequently, I continue to live.[31]

Now, the assassin's actions can be said to cause the "survival event" which is the conjunction of facts that: [[I discover the bomb] & [the bomb squad removes the bomb] & [I continue to live]]. But even though the assassin's actions result in this conjunctive event, it would be odd to say the assassin's action causally explain the conjunct that [I continue to live]. For I would have continued to live even if the assassin did not try to kill me.

Consider one last counterexample:

> *Siberia:* Suppose everyone in Siberia is both cold and alert unless they take a certain pill. For most people, the pill makes them warm and alert. However for very few, it has a different effect – namely making them cold and tired. No one ever has this combination of features of being both cold and tired unless they take the pill. Suppose Johnny must go outside for some reason (maybe he needs to gather wood or something like this). He decides to take the pill, and it makes him cold and tired.[32]

Here, we can say the fact [Johnny took the pill] explains why [[Johnny is cold] and [Johnny is tired]]. But it is false that [Johnny took the pill] explains why [Johnny is cold]. For he would've been cold

[29]Notably, Van Inwagen's fatalist argument can still be run against this restricted PSR. So by accepting the restricted PSR, the PSR advocate can still respond to fatalism by running the Booleanism argument against the distribution principle while simultaneously avoiding this issue.

[30]Paraphrased counter-example against causal transitivity. Hitchock 2001, 277.

[31]Paraphrased counter-example against causal transitivity. Hall 2000, 201.

[32]Thank you to Brian Cutter for this example.

https://doi.org/10.1017/can.2024.38 Published online by Cambridge University Press

anyway, and taking the pill was his only chance at *not* being cold. Therefore, the intuitions elicited by *Dog Bite, Assassination*, and *Siberia* support the position that it is not the case explanatory relations distribute over conjunction.

It is also worth noting that if one takes seriously these counterexamples against the distribution principle, these cases also give us reason to doubt *META*. For suppose I grant (19)–(21), and so conjunction elimination is a nontrivial logical entailment. (22) still has counterexamples in *Dog Bite, Assassination*, and *Siberia*. For in all these cases, some initial action(s) @ causally explains an event, which is the conjunction of some facts ($F_1 \wedge F_2 \wedge \dots F_n$). Nonetheless, although ($F_1 \wedge F_2 \wedge \dots F_n$) explains each conjunct by a nontrivial logical entailment (conjunction elimination), @ does not explain each conjunct. Since these causal and logical entailment relations would be explanatory relations according to (19)–(21), (22) requires there to be an explanatory relation between @ and the conjuncts of ($F_1 \wedge F_2 \wedge \dots F_n$). Since there does not seem to be one, (22) seems false.

Moving forward, here is one final reason to doubt (3). Consider two PSR formulations:

Strong PSR: For any x, if x is a fact, then there is some fact y such that y explains x.

Weak PSR: For any x, if x is a fact, then possibly, there is some fact y such that y explains x.[33]

Ask yourself this: are these formulations modally equivalent? One might think, surely they are not. Indeed, to claim there is *possibly* an explanation for *p* (perhaps) seems very different from saying there *is* an explanation for *p*. Nonetheless, Graham Oppy has a modal proof which demonstrates that assuming the distribution principle is true, the Weak PSR is indeed modally equivalent to Strong PSR. The rough idea is this: suppose *per reductio* there is a contingent fact *p* that has no explanation. Then there is a contingent fact *p** then that reports [p obtains and p has no explanation]. Suppose explanation distributes over conjunction such that if q explains a conjunction, it explains each conjunct. So there is a possible world where *p* has no explanation. Suppose W-PSR is true. By the W-PSR, there is a world where *p** has an explanation *q*. Go to that world. By the distribution principle, since *q* explains the conjunction *p**, then *q* explains *p* and *q* explains why *p* has no explanation. So there is and is no explanation of *p*—contradiction. So there is no contingent fact *p* such that *p* has no explanation. So every contingent fact *p* has an explanation—Strong PSR. Since of course Strong PSR also entails weak PSR, the two are modally equivalent.[34] However, one might have strong seemings that Weak PSR is not modally equivalent to Strong PSR. If one has such strong modal intuitions, then this gives reason to doubt the distribution principle. Consider a comparison with Fitch's paradox: if one thinks the claim that (all truths are known) is modally different from the claim that (all truths are knowable) despite a proof to the contrary which utilizes distribution for knowledge, then analogously they should let go of distribution.[35] The intuition in both cases, of course, is defeasible. Nonetheless, it seems there is at least some epistemic force here.

Overall then, we have considered three further reasons that puts pressure on the Moorean distributionist to strip the distribution principle of its Moorean status: first, an argument from Booleanism about identity claims would; second, it is plausible the intuitions regarding *Dog Bite, Assassination*, and *Siberia* are best captured by a denial of the distribution principle; third, insofar as

[33]Oppy 2000, 348.

[34]Ibid., 347–348. It should be more accurately noted though that Oppy's proof relies on a premise which is entailed by the distribution principle—namely, that explanation is dissective such that if a conjunction has an explanation, then each conjunct has an explanation. The distribution principle entails explanation is dissective since if (*p* explains a conjunction (*q* & *r* & … *n*) implies *p* explains each conjunct), then there is an explanation for each conjunct – namely *p*. So assuming explanation is distributive over conjunction, it's also dissective and therefore the proof that Strong PSR is modally equivalent to Weak PSR goes through.

[35]Fitch 1963, 135–142.

https://doi.org/10.1017/can.2024.38 Published online by Cambridge University Press

one has strong modal intuitions that Weak PSR is not modally equivalent to Strong PSR, this is reason to deny the distribution principle. Notably, the hard-core Mooreans about the distribution principle can always resist the arguments above by asserting the operating assumptions are less plausible than the distribution principle. For example, they might say Booleanism is intuitively less plausible than the distribution principle, or they may say the intuition in each counterexample that the putative initial fact [p] explains the target conjunction [q & r & … n] is less plausible than distribution, or yet again they might say the intuition that the Strong PSR is not modally equivalent to the Weak PSR is less plausible than distribution. Let us not forget though there are other arguments from Guigon and Hall against the distribution principle. Surely, the odds of *at least one* of these arguments being right is plausibly more likely than the distribution principle being right. To say otherwise seems rather strong. At the very least, the more arguments against the distribution principle there are, the greater the pressure for the Moorean about the distribution principle to at least strip it of its Moorean status. I take it this section has added to such pressure.

V. Conclusion

Overall, we have considered whether there is good reason to believe the distribution principle, and seen that not only are there no good arguments for it but it also there seems to be mounting evidence against it. This puts further pressure on the distributionist to deny the principle—or at least, strip it of any preexisting Moorean status. One interesting ramification this has is that it provides a clean way out of the fatalist argument (and the various relevant versions of it)—for this premise is (at the very least) dubious.[36]

References

Amijee, F. (2020). Explaining contingent facts. *Philosophical Studies*, 178 (4), 1163–1181.

Dasgupta, S. (2016). Metaphysical rationalism. *Noûs*, 50(2), 379–418.

Dorr, C. (2016). To be F is to be G. *Philosophical Perspectives*, 30(1), 39–134. https://doi.org/10.1111/phpe.12079.

Fitch, F. B. (1963). A logical analysis of some value concepts. *The Journal of Symbolic Logic*, 28(2), 135–142.

Gale, R., & Pruss, A. (1999). A new cosmological argument. *Religious Studies*, 35(4), 461–476.

Guigon, G. (2008). A universe of explanations. In *Oxford studies in metaphysics*, D. W. Zimmerman (Ed.), Oxford University Press.

Hitchock, C. (2001). The intransitivity of causation revealed in equations and graphs. *The Journal of Philosophy*, 98(6), 273–299.

Hall, G. (2021). Indefinite extensibility and the principle of sufficient reason. *Philosophical Studies*, 178(2), 471–492.

Hall, N. (2000). Causation and the price of transitivity. *The Journal of Philosophy*, 97(4), 198–222.

Inwagen, P. V. (1983). *An essay on free will*. Oxford University Press.

Jansson, L. (2015). Explanatory asymmetries: laws of nature rehabilitated. *The Journal of Philosophy*, 112(11), 577–599.

Krämer, S. (2013). A simpler puzzle of ground. *Thought: A Journal of Philosophy*, 2(2), 85–89.

Levey, S. (2016). The paradox of sufficient reason. *The Philosophical Review*, 125(3), 397–430.

McDaniel, K. (2019). The principle of sufficient reason and necessitarianism. *Analysis*, 79(2), 230–236.

Melamed, Y., & Lin, M. (2016). Principle of sufficient reason. *Stanford Encyclopedia of Philosophy*. https://plato.stanford.edu/entries/sufficient-reason/.

McDonnell, N. (2018). Transitivity and proportionality in causation. *Synthese*, 195(3), 1211–1229.

Nozick, R. (1981). *Philosophical explanations*. Harvard University Press.

Oppy, G. (2009). Cosmological arguments. *Nôus*, 43(1), 31–48.

Oppy, G. (2000). On 'A new cosmological argument'. *Religious Studies*, 36(3), 345–353.

[36]I would like to first thank the editors and anonymous reviewers at the *Canadian Journal of Philosophy* for their very helpful feedback. I would also like to thank Zach Barnett for helping me phrase the intro and abstract. A special thanks to Samuel Newlands and Dominic LaMantia for their thoughts on some of the content in the very early stages of the paper. Lastly, I would like to extend my sincerest gratitude to Johnny Waldrop and especially Brian Cutter for their extensive feedback throughout the process of publishing this paper.

Pruss, A. (2012). The Leibnizian cosmological argument. In *The Blackwell companion to natural theology*, W. L. Craig, & J. P. Moreland. (Eds.), Blackwell Publishing Ltd.

Pruss, A. (2006). *The principle of sufficient reason*. Cambridge University Press.

Pruss, A., & Rasmussen, J. (2018). *Necessary existence*. Oxford University Press.

Rowe, W. (1984). Rationalistic theology and some principles of explanation. *Faith and Philosophy*, 1(4), 357–369.

Tomaszewski, C. M. P. (2016). The principle of sufficient reason defended: there is no conjunction of all contingently true propositions. *Philosophia* 44(1), 267–74. https://doi.org/10.1007/s11406-016-9686-y.

Cite this article: Blado, J. E. E. 2024. The PSR and the Nature of Explanation: An Underrated Response to Modal Fatalism. *Canadian Journal of Philosophy*: 1–12, doi:10.1017/can.2024.38