A Novel Argument For The Principle Of Sufficient Reason

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1 Formulating 'the' Principle

> 31. Our reasonings are based on two great principles, that of contradiction (...); 32. And that of sufficient reason, by virtue of which we consider that we can find no true or existent fact [fait], no true assertion [énonciation véritable], without there being a sufficient reason why it is thus and not otherwise, although most of the time these reasons cannot be known to us. [Leibniz, *Monadologie*, 1714.]
>
> Nothing exists of which it cannot be asked, what is the cause (or reason) [causa (sive ratio)], why it exists.
> [Spinoza, *The Principles of Descartes' Philosophy*, 1663, I, Axiom 11.][1]
>
> Nothing is without a sufficient reason why it is rather than is not; that is, if something is posited, something must also be posited from which it can be understood/ it becomes intelligible (intelligitur) why it is rather than is not. [Wolff, *Philosophia Prima Sive Ontologia*, 1736, §70.]
>
> (...) we cannot compel our mind to admit anything without a sufficient reason—that is, without a reason that makes us understand why this thing is thus rather than altogether otherwise. (...) there must be in everything that exists something through which one can understand why what is has been able to exist; and this is what is called a sufficient reason.
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> [Du Châtelet, *Institutions de physique*, 1740, §§ 8-9.]

[1] Since this is an early and largely expository presentation of Descartes' views, we should not attribute the PSR in this formulation to Spinoza. So far as I can tell, Spinoza nowhere explicitly states which version of the PSR he would endorse, if indeed he endorses one at all. Nor does Descartes explicitly do so.

> Nothing is true without a determining reason. (...) No contingent existent can be without an antecedent reason that determines its existence.
> [Kant, *Nova Dilucidatio*. 1755, Prop. V; VIII.]

Three main questions: 1. **Relata**? 2. **Scope**? 3. Relation to **cognate notions** (explanation, causation, understanding, modality)?

1. Facts/truths; regimentation by means of 'because'
2. Contingent truths
3. Explanation:

   - EVIDENTIAL: It is cold outside *because* the thermometer shows $-20°C$.
   - OBJECTIVE: It is cold outside *because* the Earth is positioned a certain way wrt the sun.
   - CAUSAL: Judit won *because* she trained and studied a lot.
   - NON-CAUSAL: Judit won *because* she checkmated her opponent.
   - PARTIAL: The sentence 'Schnee ist weiß' is true *because* snow is white;
   - FULL: The sentence 'Schnee ist weiß' is true *because* the sentence means that snow is white *and* snow is white.

Our focus:[2,3]

PSR$_\Box$: *Necessarily, every contingent truth has a sufficient reason.*
Necessarily, for every p ($\mathcal{C}p \rightarrow$ for some q (p *because* q))

'because': expresses *objective*, *non-causal*, *full* (*sufficient*) explanations.

[2] Where:
$\mathcal{C}p \leftrightarrow_{df} p \wedge \Diamond\neg p$

[3] Quantification into sentence position serves simplicity. For present purposes, one might translate this in first-order terms (assuming there are propositions): '$\forall p\ \varphi p$' would then read '$\forall x(x$ is a proposition $\rightarrow\ \varphi' x)$', and '$\exists p\ \varphi p$' would read '$\exists x(x$ is a proposition $\wedge\ \varphi' x)$'; where 'φ'' is a formula corresponding to 'φ' in a suitable way. (I set aside the details of this correspondence here; the rough idea is that the two should be materially equivalent, given a comprehension principle for propositions.)

2 The Premisses

First premiss. *Every fundamental contingent truth has a possible explanation.*

P_1. $\Box\forall p(\mathcal{C}p \to (\mathcal{F}p \to \Diamond(p \wedge \neg\mathcal{F}p)))$[4]
Support: Conceivability; '*Tractarian*' Argument.

Second premiss. *Whenever there is an explanatory connection, it holds whenever the relata obtain.*

P_2. $\Box\forall p\forall q(q \text{ because } p \to \Box((p \wedge q) \to q \text{ because } p))$
Support: Essentialist Argument.

Third premiss. *Fundamental truths are singly-grounded; i.e.:*
a fundamental truth necessitates its possible (immediate) ground, if it has one.

P_3. $\Box\forall p(\mathcal{F}p \to \Box\forall q((p \text{ because}_I\ q) \to \Box(p \to q)))$[5]
Support: Considerations on determinacy and fundamentality.

SINGLY-GROUNDED TRUTHS:	Do *not* allow for further possible determination (e.g. set-existence, truth-ascriptions, conjunctions)
MULTI-GROUNDED TRUTHS:	Allow for further possible determination (e.g. determinables, existential generalisations, disjunctions)

3 The Argument

(A) $\Diamond\exists p(\mathcal{C}p \wedge \mathcal{F}p)$ (Assumption for Reductio)
(P_1) $\Box\forall p(\mathcal{C}p \to \Diamond(p \wedge \neg\mathcal{F}p))$
(P_2) $\Box\forall p\forall q(p \text{ because } q \to \Box((p \wedge q) \to p \text{ because } q))$
(P_3) $\Box\forall p(\mathcal{F}p \to \Box\forall q((q \text{ because}_I\ p) \to \Box(p \to q)))$

[4] Where:
$\mathcal{F}p \leftrightarrow_{df} \neg\exists q(p \text{ because } q)$.

[5] Where: $p \text{ because}_I q \leftrightarrow_{df} p \text{ because } q \wedge \neg\exists r(p \text{ because } r \wedge r \text{ because } q)$. We suppose, as standard, that any case of mediate ground entails a case of immediate ground.

(C_1)	$\Diamond\exists p(\mathcal{C}p \wedge \mathcal{F}p \wedge \Diamond\exists q(p \text{ because } q))$	(A, P_1)
(C_2)	$\Diamond(\mathcal{C}\mathbf{p} \wedge \mathcal{F}\mathbf{p} \wedge \Diamond(\mathbf{p} \text{ because } \mathbf{q}))$	$(C_1, \exists$-Instantiation$)$[6]
(C_3)	$\Box(\mathbf{p} \rightarrow \mathbf{q})$	(C_2, P_3)
(C_4)	$\Diamond(\mathcal{C}\mathbf{p} \wedge \mathcal{F}\mathbf{p} \wedge \mathbf{q})$	(C_2, C_3)
(C_5)	$\Diamond(\mathcal{C}\mathbf{p} \wedge \mathcal{F}\mathbf{p} \wedge \mathbf{p} \text{ because } \mathbf{q})$	(C_4, P_2)
(C_6)	Contradiction.	$(C_5$, definition of $\mathcal{F})$
(C_7)	PSR$_\Box$: $\Box\forall p(\mathcal{C}p \rightarrow \neg\mathcal{F}p)$	$(C_6, A$, Reductio$)$

4 The logic of 'because': Now and then

Contemporary Logics of Ground	**Leibnizian/Wolffian Logics of Ground**
Factivity: $\forall p\forall q\,(p \text{ because } q \rightarrow (p \wedge q))$	
Irreflexivity $\forall p\,\neg(p \text{ because } p)$	Non-Irreflexivity $\exists p\,(p \text{ because } p)$
Asymmetry $\forall p\forall q\,(p \text{ because } q \rightarrow \neg(q \text{ because } p))$	Anti-symmetry $\forall p\forall q\,((p \not\equiv q \wedge p \text{ because } q) \rightarrow \neg(q \text{ because } p))$
Transitivity: $\forall p\forall q\forall r\,((p \text{ because } q \wedge q \text{ because } r) \rightarrow p \text{ because } r)$	
Necessitarianism: $\forall p\forall q\,(p \text{ because } q \rightarrow \Box(q \rightarrow p))$ Internality: $\forall p\forall q\,(p \text{ because } q \rightarrow \Box((p \wedge q) \rightarrow p \text{ because } q))$	
	Back-Necessitarianism $\forall p\forall q\,(p \text{ because } q \rightarrow \Box(p \rightarrow q))$

5 *'Rationalism' strikes back*?

- Divergences in the logics do *not* affect our argument; we indeed get 'the' PSR;
- Valid; Sound? May we ever *know*?
- Plea for a more critical epistemology of metaphysics.

[6] Bold letters indicate specific instances; in C_2, $\mathbf{p}$ and $\mathbf{q}$ instantiate p and q in the consequent of P_3, respectively.