A Contingency Argument without the PSR

Abstract: Traditional cosmological arguments are often thought to rely fatally on the Principle of Sufficient Reason. This paper develops a contingency argument that does not. Building on Armstrong's metaphysics, I propose that no non-empty world is accessible from an empty world. From this it follows that, if only contingent entities exist, the accessibility structure of possible worlds forms either a circularity or an infinite regress. Both are ruled out by a well-foundedness principle weaker than Schaffer's Inheritance of Being. Two possible kinds of non-contingent entities are then distinguished—necessary and isolated entities—and the latter are ruled out by a modest accessibility principle. The conclusion is that at least one necessary entity must exist.

Keywords: Cosmological Argument, Principle of Sufficient Reason, Metaphysical Nihilism, Grounding, Inheritance of Being

1. The Principle of Sufficient Reason and Cosmological Arguments

Among the classical arguments for the existence of God, the cosmological argument has long been the most appreciated. Consider, for instance, Leibniz's version (Pruss 2009):

P1. Every contingent fact has an explanation.

P2. There is a contingent fact that includes all other contingent facts.

P3. Therefore, there is an explanation of this fact.

C. This explanation must involve a necessary being — namely, God.

P1 expresses the *Principle of Sufficient Reason* (PSR). This principle exists in many different versions:

Strong PSR (S-PSR). Every fact has a reason.

Limited PSR (L-PSR). Every fact with property x has a reason.

Weak L-PSR (WL-PSR). For every fact with property x, it is possible that it has a reason.

In particular, let WL-PSR* denote an especially weak version:

$$\forall a((C(a) \land In(a,w)) \to \exists b \exists v(R(b,a) \land In(b,v))) \qquad \text{(WL-PSR*)}$$

Here C predicates contingency; In expresses the belonging of an entity to the domain of a world; and R is an irreflexive, asymmetric, transitive *reason* relation. Accordingly, WL-PSR* reads "for every actual contingent entity, there exists, in some actual or non-actual world, a reason". Here, *reason* broadly covers causes, grounds, or explanations in general.

Virtually all major contemporary cosmological arguments assume some version of the PSR[1]. Yet few philosophers still endorse the PSR. According to Bourget & Chalmers (2023), 57.26% of metaphysicians reject it, while only 32.66% affirm it. Objections to its logical coherence are raised by Van Inwagen (1983: 202), McDaniel (2019) and Briceño (2023: §5). These extend even to weaker forms: Oppy (2000: §2) argues that Pruss's WL-PSR entails S-PSR if "has an explanation" is a dissective operator — a point Pruss concedes.

Such challenges do not refute the PSR conclusively, but they expose a pressing need for a cosmological argument that dispenses with it. In what follows, I aim to show that the existence of a necessary being can be demonstrated even under the radical assumption that contingent entities may exist—or fail to exist—without any reason, cause, ground, or explanation whatsoever.

2. Adoption of a two-sorted FOL mimicking QKB

We want to express a modal argument with quantifications and symmetric accessibility adopting the weakest possible system. QKB satisfies the requirements. However, we also need to manage metalinguistic statements such as: "if a exists in a world w, then it also exists in a world v that is not accessible from w." QKB cannot express such propositions: it can refer to other worlds only through the operators $\Box$ and $\Diamond$, which range over accessible worlds only.

[1] For instance, L-PSR is adopted by Koons (1997), Craig & Sinclair (2009: 101, 192), Sandsmark & Megill (2010), Wahlberg (2017), Dumsday (2018), Loke (2018: ch.5), and Byerly (2019); Flynn & Gel (forthcoming) derive it from the distinction between a contingent entity and its existence. WL-PSR appears in Kremer (1997), Gale & Pruss (1999: 463), Pruss (2010), Rasmussen (2009), and Weaver (2016).

While there are several possible solutions, the most economical one is to adopt a two-sorted FOL with additional predicates and axioms that mimic QKB:

Category	**Variables/Symbols**	**Description**
Sort E	$a, b, c,\ \dots$	Entities
Sort W	$w, v, u, t,\ \dots$	Possible worlds
Predicates	$In(a, w)$, $A(w, v)$	Membership (In) and accessibility (A)
Quantifiers	$\forall a, \forall w, \exists a, \exists w$	Necessity and possibility for each sort
Connectives	$=\ a, =\ w, \wedge, \vee, \rightarrow, \neg$	The standard symbols of FOL
B axiom	$\forall w \forall v(A(w, v) \rightarrow A(v, w))$	Symmetry of accessibility

Unless stated otherwise, standard FOL syntax, semantics, and inference rules apply.

Most derivations that follow are straightforward applications of standard inference rules, so only proof sketches are given.

3. Axioms of the theory

Our argument is based on the following axioms:

(α) $\forall w \forall v(\forall a \neg In(a, w)\ \wedge\ \exists b In(b, v)) \rightarrow \neg A(w, v)$

(β) $\exists a \forall b \forall w \forall v(\neg In(a, v)\ \vee\ \neg A(w, v)\ \vee\ \neg In(b, w)\ \vee\ In(a, w))$

(ɣ) $\forall a \exists w In(a, w)$

(δ) $\forall a(\exists w \exists v(In(a, w)\ \wedge\ \neg In(a, v)) \rightarrow \exists u \exists t(In(a, u)\ \wedge\ \neg In(a, t)\ \wedge\ A(u, t)))$

To evaluate their independence and consistency, consider the following models:

	$M_{(\omega)}$	$M_{(\alpha)}$	$M_{(\beta)}$	$M_{(\gamma)}$	$M_{(\delta)}$
Individual domain	$\{a, b\}$	$\{a\}$	$\{a, b\}$	$\{a, b, c\}$	$\{a, b\}$
World domain	$\{w, v\}$	$\{w, v\}$	$\{w, v\}$	$\{w, v\}$	$\{w, v\}$
Valuations	$M_{(\omega)} \vDash$ $In(a, w)$ $In(b, w)$ $In(b, v)$ $A(w, v)$	$M_{(\alpha)} \vDash$ $In(a, v)$ $A(w, v)$	$M_{(\beta)} \vDash$ $In(a, w)$ $In(b, v)$ $A(w, v)$	$M_{(\gamma)} \vDash$ $In(a, w)$ $In(b, w)$ $In(b, v)$ $A(w, v)$	$M_{(\delta)} \vDash$ $In(a, w)$ $In(b, w)$ $In(b, v)$
Axioms satisfied	All	All except (α)	All except (β)	All except (ɣ)	All except (δ)

Each axiom is therefore independent and jointly consistent.

In $M_{(\omega)}$, no entity is such that $R(b, a)$. Hence, WL-PSR* is violated: these axioms do not entail any version of PSR as strong as WL-PSR* or stronger.

4. Philosophical grounds for (α)

(α) states that no non-empty world is accessible from an empty world[2] — or, as Billy Preston puts it, that "nothin' from nothin' leaves nothin'":

$$\forall w \forall v (\forall a \neg In(a, w) \ \wedge \ \exists b In(b, v)) \rightarrow \neg A(w, v) \qquad (\alpha)$$

This principle is explicitly stated by Armstrong (1989: 64). He takes it as a consequence of combinatorialism — the view that possible worlds are recombinations of actual entities and properties. Among the three major theories of possible worlds, combinatorialism enjoys a clear advantage: unlike concretism and abstractionism, it avoids ontological inflation while preserving a realist account of possibility and necessity,

[2] (α) does not entail metaphysical nihilism: if the empty world is impossible, it is vacuously true. For discussion, see Baldwin (1996); Efird & Stoneham (2006); Coggins (2010); Thompson (2010: ch. 2); Goldschmidt (2012); Hansen (2012); and De Clerque (2023).

immanently realised in actual entities. But in the empty world, by definition, there are no entities or properties, and thus no recombinations. If nothing can be recombined, no world can be constructed from it; hence, no world is accessible from the empty one.

A second line of support derives from the nature of time. On the two dominant views, time is either an entity (substantivalism) or emerges from relations among entities (relationism). As Shoemaker (1969) observed, time seems irreducible to change, yet change presupposes time. The emergence of something from nothing would constitute a change. But in the empty world there are neither entities nor relations from which time could arise. Without time, nothing can change; hence again, no non-empty world can be accessible from the empty one.

Finally, (α) articulates a principle as old as metaphysics itself: *ex nihilo nihil fit*. No philosophical principle is beyond dispute, but every argument must begin from what is most intuitive and widely accepted. Given its proximity to the PSR, this principle has likely enjoyed similar historical acceptance —often tacit, yet near universal. Thinkers who diverge on nearly everything else can still converge on (α) as a credible starting point.

5. Philosophical grounds for (β)

Keeping (α) in mind, assume $\neg In(a,w)\ \wedge\ In(a,v)\ \wedge\ A(w,v)$. If $\forall b \neg In(b,w)$. By (α) we, would have $\neg A(w,v)$, contradicting the assumption. Hence, $\exists b In(b,w)$. So, from (α) we can derive directly

$$\forall a \forall w \forall v((\neg In(a,w)\ \wedge\ In(a,v)\ \wedge\ A(w,v)) \rightarrow \exists b In(b,w))) \qquad (1)$$

Now assume that every entity is such that it exists in some worlds and not in others (i.e., that it is contingent), and that at least some of these worlds are interaccessible:

$$\forall a \exists w \exists v(\neg In(a,w)\ \wedge\ In(a,v)\ \wedge\ A(w,v)) \qquad (2)$$

Take any world v in which a is actual. From (2), there exists a world w in which a is not actual but, given (1), another entity b is. Likewise, there exists a world u in which b is not actual, but some c is. So (α) implies that, if every entity is as such, each is in an F-relation with something else:

$$F(b,a) \leftrightarrow \exists w \exists v(\neg In(a,w) \wedge In(b,w) \wedge In(a,v) \wedge A(w,v)) \qquad \text{(F)}$$

which reads: "b exists in a world w where a does not exist, and w accesses a world v where a exists". We can represent F-relations between entities using graph theory.

Let G be the graph whose vertices represent entities and whose edges represent the relation F. Each vertex e_n is such that there exists another vertex e_{n+1} with a edge (e_{n+1}, e_n). Since every contingent entity is in a F-relation with another, every e_n lies on a trail (…, (e_{n+3}, e_{n+2}), (e_{n+1}, e_n)).

Either some vertex e_m with $m < n$ coincides with e_n—yielding a circularity—or no vertex ever repeats in the trail — yielding an infinite regress.

Infinite dependency chains (whether circular or not) are often considered problematic. Consider the following *pedagogical example*: *first* there is an *already* existing entity, and only *then* can a contingent entity *begin* to exist. In an infinite regress or circularity, no entity is *already* existing — each requires some *prior* existence elsewhere. Hence, none can ever begin to exist.

This captures a familiar intuition. Aquinas (2017: Iª q. 2 a. 3 co.) writes: "if everything is possible not to be, then at one time there could have been nothing in existence [and] if this were true, even now there would be nothing in existence". Similarly, Leibniz (1989: 85) states that "every being derives its reality only from the reality of those beings of which it is composed, so that it will not have any reality at all if each being of which it is composed is itself a being by aggregation". Schaffer (2010: 62) expresses the same idea: if everything were grounded in something else, "being would be infinitely deferred, never achieved".

The pedagogical example is expressed in temporal terms.[3] The relation F is transmundane and therefore atemporal, but it still represents a dependency relation: given (1), the existence of a in w implies the existence of b in v, but the converse does not hold. Therefore, the existence of b is a necessary condition for the existence of a. There is thus an intuitive ontological—not temporal—precedence of b over a. Since this applies to every entity, the intuition underlying the pedagogical example remains valid even in an atemporal context.

Yet justifying this intuition has proven difficult. Although metaphysical foundationalism is often treated as the standard view, no argument against the possibility of actual downwardly non-terminating dependency chains commands general assent. Foundationalism thus appears axiomatic. However, precisely for this reason, establishing the well-foundedness of F is no more arbitrary than any other foundationalism:

$$\exists a \forall b \neg F(b, a) \tag{3}$$

If we write $F(b, a)$ in extensive form and then apply De Morgan's law, we obtain (β). The (β) axiom is therefore nothing other than the affirmation of the well-foundedness of the relation F by virtue of which contingent entities can begin and cease to exist:

$$\exists a \forall b \forall w \forall v (\neg In(a, v) \ \vee \ \neg A(w, v) \ \vee \ \neg In(b, w) \ \vee \ In(a, w)) \tag{β}$$

Although (β) is the most daring of the four axioms, this reveals it to be relatively modest, especially when compared to the well-foundedness of Schaffer's grounding. Schaffer appeals to the concept of *inheritance of being*: a non-fundamental entity must have received being from another entity. Accordingly, if an entity a is possible but not actual in the world w (hence, there exists a v, accessible from w, in which a exists), then in w there must exist some other b capable of transmitting being to a. This is identical to (1). Yet specific relation between a and b is added — namely grounding. (1) instead describes a mere material condition, without specific ontological or explanatory relations between a and b.

[3] Bohn (2018: 170) rightly objects that the pedagogical example treats certain relations as “a diachronic, dynamic physical relation”, whereas they are instead “synchronic, static mathematical relation[s]”.

6. Philosophical grounds for (ɣ)

(ɣ) assumes that every entity exists in some world:

$$\forall a \exists w In(a, w) \qquad (\text{ɣ})$$

This principle requires no particular defense. It is nothing other than the denial of Meinongism. As Quine said, “to be is to be the values of a bound variable”. There is no Meinong’s jungle: we cannot existentially quantify over entities outside the domain of any world because there is no sense in which such entities *are*.

Stock arguments against meinongism includes: that it leads to an inflated ontology; that nonexistent entities have no identity criterion and thus it is impossible to say how many there are and how one can gain knowledge of them; that they require a different semantics for the existential quantifier and a nonclassical logic to tolerate self-contradictory properties.

7. Philosophical grounds for (δ)

In metaphysics, most arguments are framed within S5. Although S5 accepts the existence of multiple independent equivalence classes, most metaphysicians assume that accessibility forms a single equivalence class — that of the actual world. This entails universal accessibility.

One reason for accepting universal accessibility is that, if a world is inaccessible, it is not a possible world in the first place, since possibility requires accessibility. Possible worlds are not parallel universes: they are abstractions useful for evaluating the truth value of modal propositions in the actual world. Worlds inaccessible from the actual world do not change the evaluation of any proposition and are therefore to be considered useless theoretical constructs.

Another reason is combinatorialism. On combinatorialism, a world v is accessible from w iff v is a recombination of the entities and properties of w. Since the domain of possible worlds is that of the recombinations of actual entities and properties, every world is accessible from the actual world. Thus, if accessibility is an equivalence relation, every world is accessible from every other.

The axiom (δ) is significantly weaker than universal accessibility:

$$\forall a(\exists w \exists v(In(a,w) \wedge \neg In(a,v)) \rightarrow \exists u \exists t(In(a,u) \wedge \neg In(a,t) \wedge A(u,t))) \qquad (\delta)$$

It states that if an entity exists in some worlds and not in others, then at least one pair of worlds—one in which it exists and one in which it does not—is interaccessible. If most metaphysicians accept universal accessibility, they will have no difficulty accepting this principle as well.

8. Exposition of the argument

Let us consider again the (β) axiom:

$$\exists a \forall b \forall w \forall v(\neg In(a,v) \vee \neg A(w,v) \vee \neg In(b,w) \vee In(a,w)) \qquad (\beta)$$

It asserts the existence of an entity for which at least one of the following disjuncts is true:

$\exists a \forall v(\neg In(a,v))$	It exists in no possible world
$\forall w \forall v(\neg A(w,v))$	The worlds where it does or does not exist are not interaccessible
$\forall b \forall w(\neg In(b,w))$	The worlds where it does not exists are empty
$\exists a \forall w(In(a,w))$	It exists in every possible world

The (γ), (δ), and (α) axioms eliminate the first three disjuncts, leaving only the last one. First, the (ɣ) axiom:

$$\forall a \exists w In(a,w) \qquad (ɣ)$$

(ɣ) is the direct negation of the first disjunct. Hence, from (β) and (ɣ) follows:

$$\exists a \forall b \forall w \forall v(\neg A(w,v) \vee \neg In(b,w) \vee In(a,w)) \qquad (4)$$

Then, the (δ) axiom:

$$\forall a(\exists w \exists v(In(a,w) \wedge \neg In(a,v)) \rightarrow \exists u \exists t(In(a,u) \wedge \neg In(a,t) \wedge A(u,t))) \qquad (\delta)$$

Since an entity either exists or does not exist in a certain world, for every entity there exist two classes of worlds:

$$W_+ := \{w \mid In(a, w)\} \tag{W_+}$$

$$W_- := \{w \mid \neg In(a, w)\} \tag{W_-}$$

W_+ is the class of worlds where a exists, W_- that of those where it does not. If W_+ comprises all worlds, a is necessary; if W_- comprises all worlds, a is impossible; if neither W_+ nor W_- comprise all worlds, a is contingent. Now, we have excluded that a could be an impossible entity. That it is a necessary entity is represented by the last disjunct. Hence, given (δ), if it is contingent, there must be some interaccessible w and v. Therefore, from (1) and (δ) follows:

$$\exists a \forall b \forall w(\neg In(b, w) \lor In(a, w)) \tag{5}$$

Finally, the (α) axiom:

$$\forall w \forall v(\forall a \neg In(a, w) \land \exists b In(b, v)) \rightarrow \neg A(w, v) \tag{α}$$

Assume that $\neg In(b, w)$ is the only true disjunct in (β). Then, $In(a, v) \land A(w, v) \land \neg In(a, w)$. But from this, given (1), we derive that $\exists b In(b, w)$, contradicting the assumption. Hence, $\neg In(b, w)$ cannot be the only true disjunct. Hence, we can rewrite (5) directly as

$$\exists a \forall w(In(a, w)) \tag{6}$$

We therefore conclude the existence of a necessary entity.

9. No second stage under mysterianism

Following Rowe's (1975:6) distinction, the foregoing constitutes the *first stage* of the cosmological argument. It is generally followed by a *second stage*, that aims to identify a necessary being with God. How might this be accomplished?

As Theron (1987) notes, God possesses entitative and operational properties. Entitative properties follow from necessity and thus belong to every necessary entity. Hence, what distinguishes God are the operational properties such as thought and will. To identify a necessary entity with God, one must therefore show that it possesses a conscious mind.

Yet consider the following thesis:

Mysterianism Beliefs about other minds cannot be justified.

Reasons for adopting mysterianism include: the belief that indirect evidence is insufficient for justification; that philosophical zombies are metaphysically possible; that the human cognitive architecture does not have access to such facts; that empirio-criticism or phenomenalism—according to which only *sense data* are knowable—is true.

Given mysterianism, the second stage becomes impossible. Alternatively, one might jointly adopt:

Entitlement An unjustified belief can nevertheless be warranted.

Burge (2020) distinguishes justification (warrant with reasons) from entitlement (warrant without reasons). Following Wright (2004: §3), one is entitled to a belief when (i) they possess no evidence against it—a condition automatically satisfied under mysterianism—and (ii) acting as if it were true is essential to pursuing valued goals, regardless of its actual truth-value.

This renders the second stage *subjectively* possible. One might, for instance, desire a personal relationship with an entity culminating in participation in its necessity. If such a conscious necessary entity exists, the dominant strategy is to attempt to relate to it. If it does not, the goal becomes unattainable, and all strategies become equal. Hence, one may be entitled to believe in a necessary conscious entity. Yet since entitlement depends on the subjective evaluation of goals, no objective second stage can be constructed.

Famously, after establishing the existence of a necessary entity, Aquinas concludes: "this all men speak of as God". The mysterianist, by contrast, might say: "this some are entitled to believe is God."

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