

# Response to Review of *The Theory of Us* (Dec 25 draft)

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**To:** Editor/Referee

**From:** Jonathan Washburn

**Date:** January 1, 2026

**Subject:** Response to Review of Dec 25 Draft

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Dear Editor/Referee,

Thank you for the comprehensive and constructive review of the Dec 25 draft. We appreciate the assessment that the manuscript is in the "late-stage draft" phase and effectively communicates the narrative chain from distinction to ethics.

We accept the primary structural recommendations (Predictions Hub, paragraph tightening, terminology standardization). Below, we detail our plan to address the "Highest-impact finishing moves" and specifically respond to the points regarding **Claim Hygiene** and **Reader Trust**, which we believe are best addressed by clarifying the rigorous foundation of the Cost Functional ( $J$ ).

## 1 Strengthening the Core: The Cost Functional $J$

The review rightly identifies "Reader Trust" as the critical scientific risk. To anchor this trust, we will sharpen the distinction between (i) results that are **formal theorems in our Lean repository**, versus (ii) derived applications and hypotheses that depend on additional modeling assumptions and/or empirical validation.

Concretely, in the Lean codebase the canonical cost is defined as

$$J(x) := \frac{x + x^{-1}}{2} - 1$$

(see `IndisputableMonolith/Cost.lean`, definition `Jcost`). We will point readers directly to this definition and the associated proved lemmas (e.g. symmetry and nonnegativity on  $\mathbb{R}_{>0}$ ).

### 1.1 The Uniqueness of $J$ (T5)

We will revise the early chapters to make clear that  $J(x) = \frac{x + x^{-1}}{2} - 1$  is not introduced as an ansatz. The canonical uniqueness statement in Lean is the theorem `IndisputableMonolith.CostUniqueness.T5_uniqueness_complete`, which concludes (under explicit hypotheses) that any admissible cost functional  $F$  agrees with  $J$  on  $\mathbb{R}_{>0}$ . The hypothesis bundle includes:

1. **Reciprocal symmetry on  $\mathbb{R}_{>0}$ :**  $F(x) = F(x^{-1})$  for all  $x > 0$ .
2. **Normalization:**  $F(1) = 0$ .
3. **Convexity/regularity on  $\mathbb{R}_{>0}$ :**  $F$  is strictly convex on  $(0, \infty)$  and continuous on  $(0, \infty)$ .
4. **Log-coordinate calibration at the identity:**

$$\left. \frac{d^2}{dt^2} F(e^t) \right|_{t=0} = 1,$$

which is implemented as `deriv (deriv (fun t => F (exp t))) 0 = 1.`

5. **The d'Alembert/"cosh-add" composition law on  $\mathbb{R}_{>0}$ :**

$$F(xy) + F\left(\frac{x}{y}\right) = 2F(x)F(y) + 2F(x) + 2F(y) \quad (x, y > 0),$$

encoded in Lean as `FunctionalEquation.CoshAddIdentity F`.

6. **Regularity bridge hypotheses:** the additional explicit hypotheses used in the Lean proof to pass from the d'Alembert functional equation to the ODE classification (spelled out as hypotheses in `T5_uniqueness_complete`).

Under these hypotheses, the Lean theorem proves  $F(x) = J(x)$  for all  $x > 0$ . We will pull this result forward (or clearly signpost it) so the reader can see exactly which parts of the narrative are anchored in a formal, machine-checked theorem.

## 2 Predictions & Falsifiers Hub

We agree that a central “Predictions & Falsifiers” hub is essential. We will add a dedicated chapter or appendix (referenced early in the text) that tabulates claims by *certainty level* and attaches the appropriate evidence type:

- **Formally verified statements:** claims that correspond to Lean theorems, cited by file and theorem name (e.g. `CostUniqueness.T5_uniqueness_complete`).
- **Formalized but assumption-dependent statements:** claims that are stated in Lean but depend on additional explicit hypotheses or are still under active formalization.
- **Empirical predictions:** claims intended to be tested against measurement, each paired with a crisp falsifier and a citation plan.

This separation directly addresses the "Claim Hygiene" concern.

## 3 Addressing Specific Revisions

### 3.1 Readability & Density

We have noted the list of "Densest paragraphs" (e.g., lines 7403, 9333, 6490). We will:

- **Decompress:** Split these into 2–3 shorter paragraphs.
- **Anchor:** Add the suggested "so what" summary lines to re-orient the reader.

- **Tone Check:** Review the "Strong-claim sentences" to ensure they are framed as consequences of the theory (e.g., "Under RS, minds are defined by...") rather than bare assertions, unless they are proven theorems (like T5).

### 3.2 Terminology

We will standardize:

- **Light Field** (capitalized when referring to the formal structure).
- **Meta-Principle** (standardized usage).
- **ILG** (Information-Limited Gravity) will be defined explicitly on first use.

## 4 Conclusion

We are confident that by mechanically separating the **proven core** (Cost/Ledger/ $\phi$ ) from the **empirical applications** (Gravity/Biology/Consciousness), we can deliver a manuscript that invites the reader to verify the foundation before asking them to entertain the implications.

The Cost Functional is the key to this trust. It is the bridge between abstract logic and physical geometry. We will ensure its derivation shines clearly in the final text.

Sincerely,

Jonathan Washburn  
Recognition Science Research Institute