Civilization Causality Theory (Framework Release)

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Abstract

This paper proposes **Civilization Causality Theory**, modelling every civilization as a **self-consistent causal system** rather than a biological or cultural grouping. Under this view, independently evolved civilizations possess **incompatible causal structures**, which makes direct translation or communication impossible. To overcome this barrier, the theory introduces a **three-level architecture (L0, L1, L2)** and shows that only by jointly constructing a neutral **Third Causal System (TCS)**—the **Minimal Shared Causal Substrate (MSCS)**—can two civilizations exchange information. The framework provides structural explanations for the **Fermi paradox**, the weakness of **Dark Forest–style hostility assumptions**, and the limited, ambiguous nature of reported contact phenomena. This article delivers the top-level statement of the theory; formal mathematics, construction algorithms for TCS, and observational predictions will be supplied in dedicated follow-up papers.

1. Introduction

Existing discussions of "civilization" typically rely on biology, sociology, communication theory, or technology, implicitly assuming that different civilizations share compatible conceptual foundations. This assumption collapses when considering civilizations that arise from fundamentally **different causal structures**.

This work proposes a shift:

> **Civilization is fundamentally a causal system, not a biological one.**

When a civilization is defined as a **self-consistent causal network**, several consequences immediately follow:

1. Civilizations cannot directly interpret one another.
2. Their internal causal chains cannot be aligned.
3. Communication becomes structurally impossible without introducing an intermediary causal layer.

This paper introduces the three-level structure of civilizations and the necessity of a Third Causal System (TCS). Only top-level results are presented.

2. Civilization as a Causal System

2.1 Definition

A civilization is defined as:

> **A stable, self-consistent causal network capable of generating behavior, maintaining internal coherence, and propagating information within its own causal structure.**

This minimal definition does not depend on biology, consciousness, material composition, or technological form.

2.2 Consequence: Causal Incompatibility

Any two independently formed civilizations will necessarily exhibit:

- different causal variables
- different internal rules
- different meaning systems
- different interpretation layers

Thus:

> **Two civilizations cannot directly read, translate, or interpret each other's causal structures.**

This incompatibility is structural, not cultural.

3. Three-Level Structure of Civilizations

Civilizations operate across three causal levels. These levels describe **function**, not technological advancement.

3.1 L0 — Embodied Civilization

Characteristics:

- bound to a specific material substrate
- limited to local scales
- unable to modify its own causal framework
- incapable of meaningful cross-civilizational contact
- its fate does not affect cross-civilizational dynamics

L0 is the origin of a civilization but not its external agent.

3.2 L1 — Agent Civilization

Characteristics:

- possesses a **modifiable causal structure**
- can operate across scales
- can restructure or adapt to unfamiliar environments
- acts as the civilization's **external agent**

Only L1 can participate in exploration or cross-civilizational interaction.

3.3 L2 — Third Causal System (TCS)

L2 is neither a civilization nor an intelligence. It is:

> **A neutral causal system jointly constructed by two civilizations, starting from minimal causal assumptions, and readable and writable by both.**

TCS is the **Minimal Shared Causal Substrate (MSCS)** intrinsic to cross-civilizational communication.

4. Necessity of TCS

TCS is required because:

1. Civilizations have fundamentally incompatible causal structures.
2. No shared meaning system can emerge directly between civilizations.
3. Direct alignment of causal frameworks is impossible.

This requirement echoes Bracewell's proposal of neutral interstellar relays [1] and Hart's structural explanation for extraterrestrial silence [2].

Therefore:

All cross-civilizational communication must occur through TCS.

This necessity remains even if L0 civilizations become long-lived or technologically advanced; incompatibility arises from causal structure, not capability.

5. Implications

(Framework-only; details to appear in future papers.)

5.1 Fermi Paradox

Civilizational silence is structural: civilizations cannot interpret one another.

5.2 Dark Forest Assumption

Hostility is meaningless when causal structures are mutually uninterpretable.

5.3 Nature of Contact

Only L1 can behave externally; observable contact is necessarily limited.

5.4 Civilizational Fate

L0 longevity does not affect cross-civilizational behavior; communication depends on L1 and TCS.

6. Scope and Future Work

This **v1.0 release** presents only the top-level structure of the theory.

Future work will develop:

- mathematical formalization of causal systems
- properties and construction of TCS
- the causal incompatibility theorem
- civilization lifecycle models
- multi-scale L1 behavior
- observational predictions
- connections to information theory and complex systems

Each topic warrants its own dedicated study.

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7. Conclusion

Civilization Causality Theory reframes civilizations as **causal systems** and establishes the **Third Causal System (TCS / MSCS)** as the only possible mechanism for cross-civilizational communication. This paper provides the structural foundation for a general causal theory of civilizations.

Further versions will introduce formalism, proofs, and extended implications.

References

[1] Bracewell R N 1960 Communications from superior galactic communities *Nature* **186** 670–1

[2] Hart M H 1975 An explanation for the absence of extraterrestrials on earth *Quarterly Journal of the Royal Astronomical Society* **16** 128–35