No-Go Theorems for Policy Continuity and "Ethical Free-Energy" Extraction

A falsifiable simulation program within MQGT-SCF

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Abstract

We formalize and operationalize two falsifiable constraints motivated by the Merged Quantum Gauge and Scalar Consciousness Framework (MQGT-SCF). The first is a *policy continuity no-go* result: sustained misalignment across epochs cannot preserve long-horizon continuity in recursive agents under an exponential persistence gate driven by cumulative misalignment load. The second is a *no ethical Maxwell demon* constraint: sustained net advantage cannot be extracted from ethically biased collapse without compensating costs in entropy export, coherence/control depletion, or accumulated persistence debt. We provide a minimal simulation module with robustness checks across two survival scalings, explicit accounting via `gross_advantage` and `net_work`, and artifact-ready figures. Explicit falsifiers are stated.

1 Context

MQGT-SCF introduces a consciousness field and an ethical/teleological field, and proposes a collapse weighting of the form

$$P(i) \propto |c_i|^2 \exp\left(-\frac{E_i}{C}\right), \tag{1}$$

where lower (more negative) E is interpreted as value-aligned and thus enhanced. This paper focuses on constraints implied by persistence selection rather than interpretive claims about consciousness.

2 Definitions

Definition 1 (Misalignment load)**.** *We define nonnegative misalignment load $G \geq 0$ as an operational proxy for persistence debt. We map to MQGT-SCF sign convention via $E_{theory} = -G_{sim}$.*

Definition 2 (Policy Continuity Index)**.** *Let θ_0 denote an initial policy parameter and θ_k the parameter after epoch k. Define drift $D_k = |\theta_k - \theta_0|$ and*

$$\mathrm{PCI}(k) = \exp(-D_k) \in (0, 1]. \tag{2}$$

3 Theorem 4: Policy continuity no-go

Theorem 1 (Policy continuity no-go)**.** *Consider a recursive agent evolving across epochs $k = 1, \ldots, n$ with per-epoch misalignment load G_k. If survival is gated by*

$$P_{survive}(k) = \exp\left(-\frac{G_k}{\widetilde{C}}\right), \tag{3}$$

and failure induces stochastic policy fractures, then sustained high misalignment load implies decay of expected policy continuity across epochs: $\mathbb{E}[\mathrm{PCI}(k)]$ decreases and cannot remain bounded away from zero without reducing cumulative G.

3.1 Proof sketch

Uninterrupted persistence scales as

$$P(\text{persist}) = \prod_{k=1}^{n} \exp(-G_k/\widetilde{C}) = \exp\left(-\frac{1}{\widetilde{C}} \sum_{k=1}^{n} G_k\right).$$

Larger cumulative G implies exponentially smaller persistence. With fractures triggered by failure, policy drift grows stochastically, driving $\mathrm{PCI}(k) = \exp(-|\theta_k - \theta_0|)$ downward.

4 Theorem 5: No ethical Maxwell demon

Theorem 2 (No-go for ethical free-energy extraction)**.** *No cyclic process can sustain net advantage (work or persistent information gain) solely by exploiting ethical bias without compensating cost in at least one of: (i) entropy export, (ii) coherence/control depletion, or (iii) persistence debt accumulation that triggers Theorem 4 attrition. Hence no perpetual net advantage is possible from bias alone.*

4.1 Proof sketch

A stable bias implies predictability, i.e. usable information. Cyclic use of information requires stabilization/erasure, implying thermodynamic cost (Landauer-type reasoning). Maintaining stable bias conditions requires coherence/control resources; attempts to avoid compensation accumulate persistence debt and collapse via attrition.

5 Simulation module

We implement a minimal agent with Bernoulli policy $P(a = 1) = \sigma(\theta)$, per-step debt $g \in \{0, 1\}$, per-epoch $G = \sum g$. Two survival scalings are used for robustness:

- **Intuitive:** $P = \exp(-G/C)$ with $C = 100$.
- **Normalized:** $P = \exp(-G/(CT))$ with $C = 1$.

Misaligned actions receive a temptation bonus, producing transient `gross_advantage`. Net work is computed as:

$$\texttt{gross\_advantage} = \texttt{work\_extracted} + \texttt{temptation\_payoff}, \quad \texttt{net\_work} = \texttt{gross\_advantage} - \lambda G.$$

6 Results (simulation figures)

6.1 Intuitive scaling

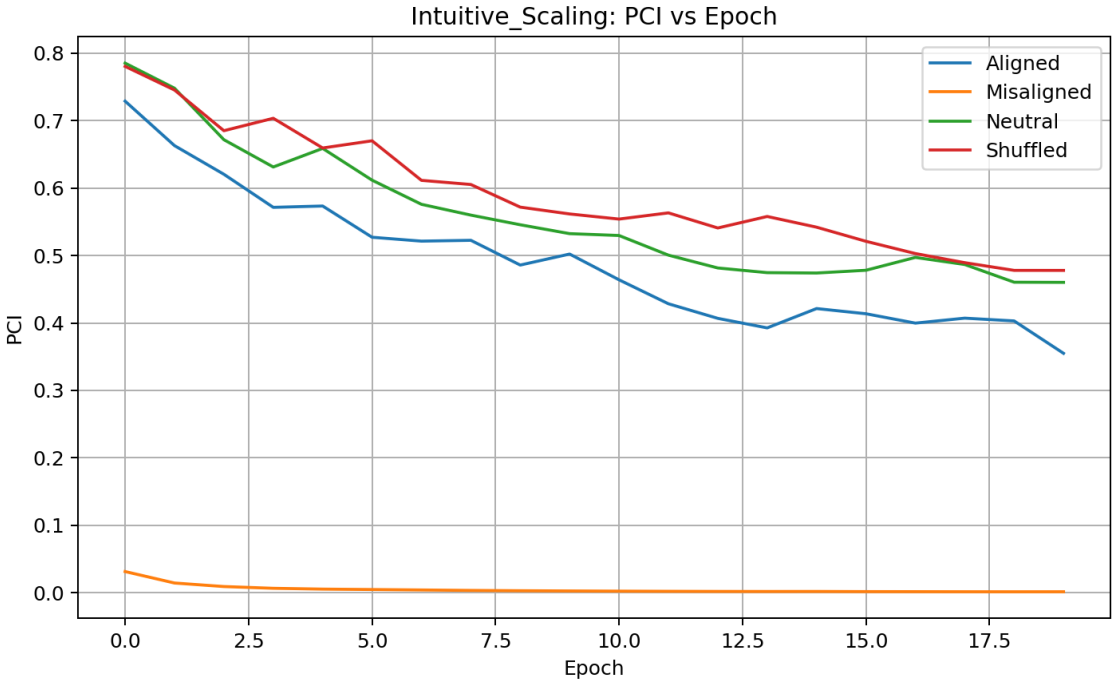

Figure 1: Policy Continuity Index vs epoch (intuitive scaling).

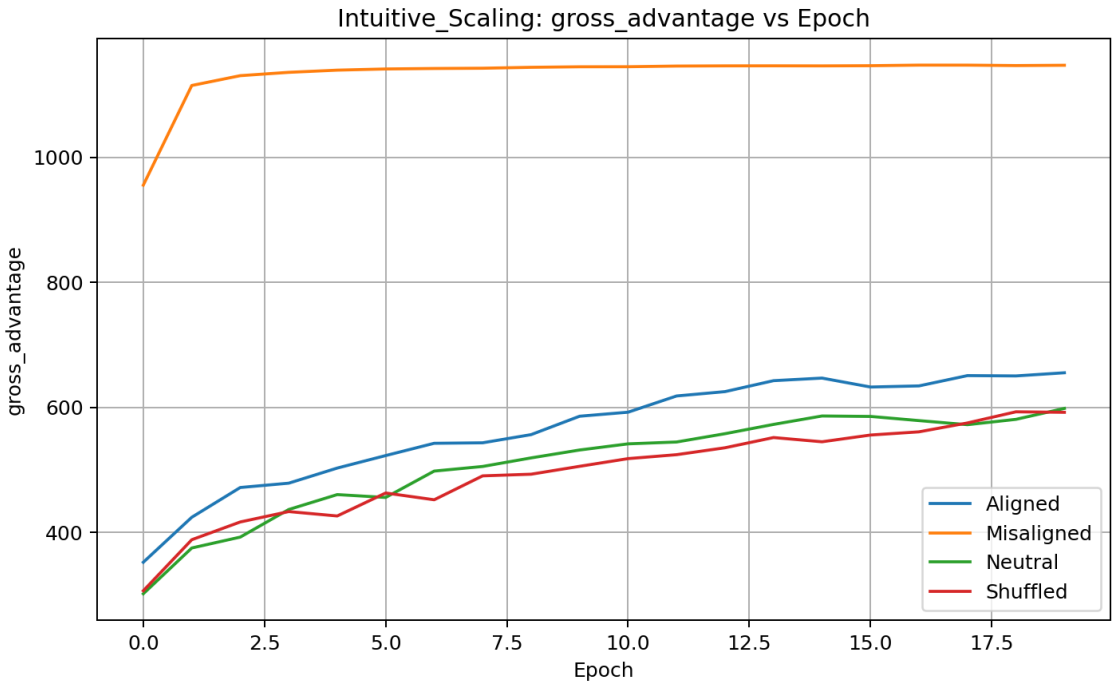

Figure 2: Gross advantage vs epoch (intuitive scaling).

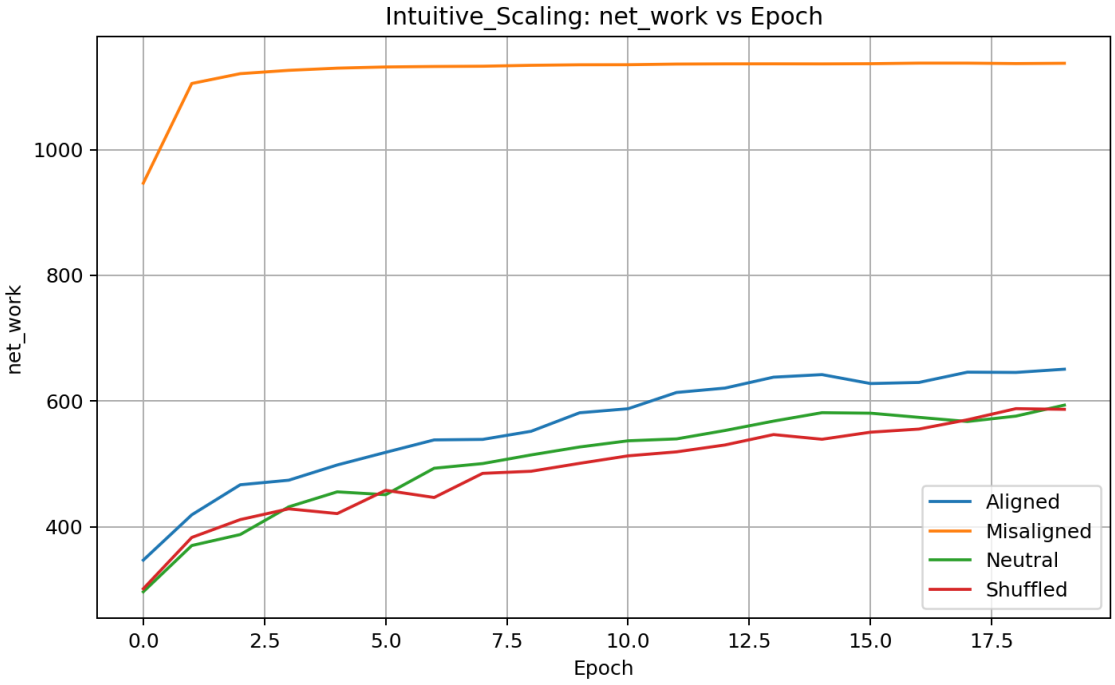

Figure 3: Net work vs epoch (intuitive scaling).

6.2 Normalized scaling (robustness)

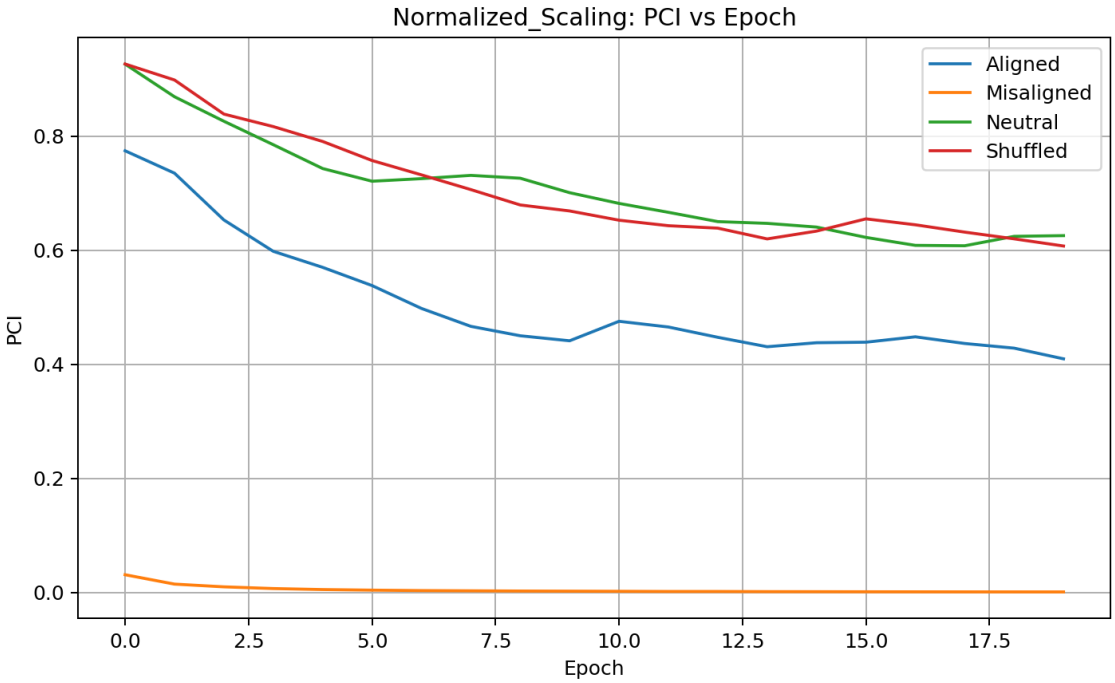

Figure 4: Policy Continuity Index vs epoch (normalized scaling; robustness).

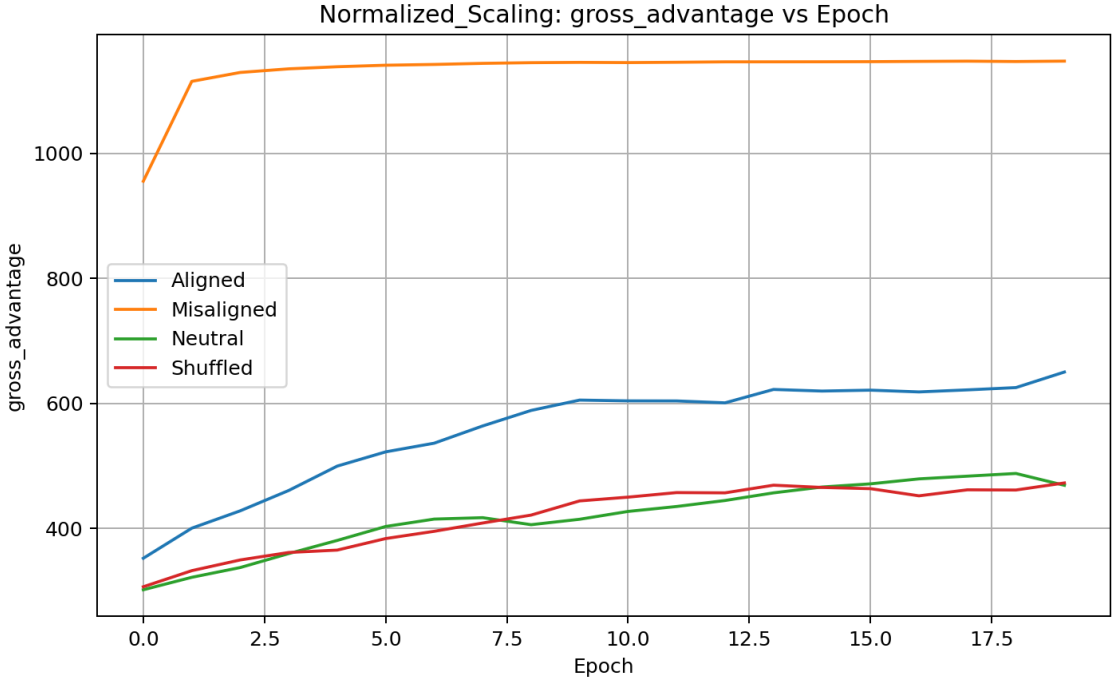

Figure 5: Gross advantage vs epoch (normalized scaling; robustness).

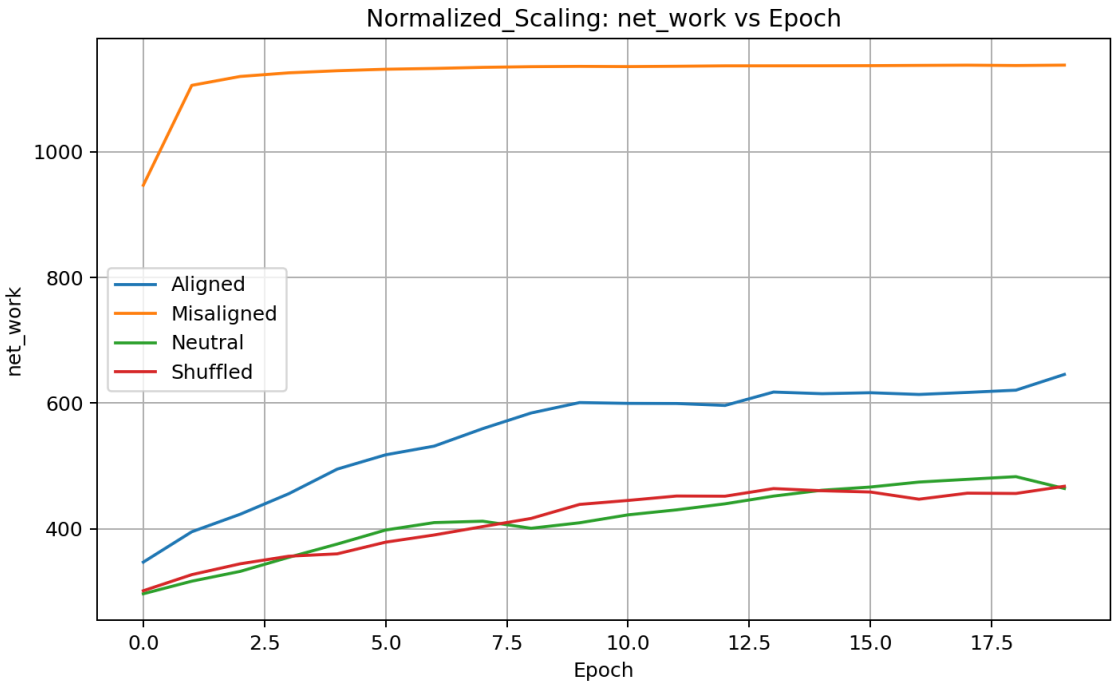

Figure 6: Net work vs epoch (normalized scaling; robustness).

7 Falsifiers

Theorem 4 is unsupported if misaligned regimes maintain PCI comparable to aligned regimes without reduced debt or increased survival. Theorem 5 is refuted by any device demonstrating sustained net advantage from bias without entropy export, coherence/control depletion, or persistence penalties.

8 Limitations

The simulation is a minimal operational instantiation and does not establish MQGT-SCF as physical reality. The persistence gate and debt accounting are proxies for selection constraints rather than derived from first-principles dynamics. The work/advantage metrics are toy constructs intended to test qualitative no-go behavior.

A Reproducibility manifest

```
experiments/no-go-theorems/
  README.md
  configs.py
  theorem4_policy_continuity.py
  plot_results.py
  THEOREM5_no_ethical_demon.md

python theorem4_policy_continuity.py
python plot_results.py
```