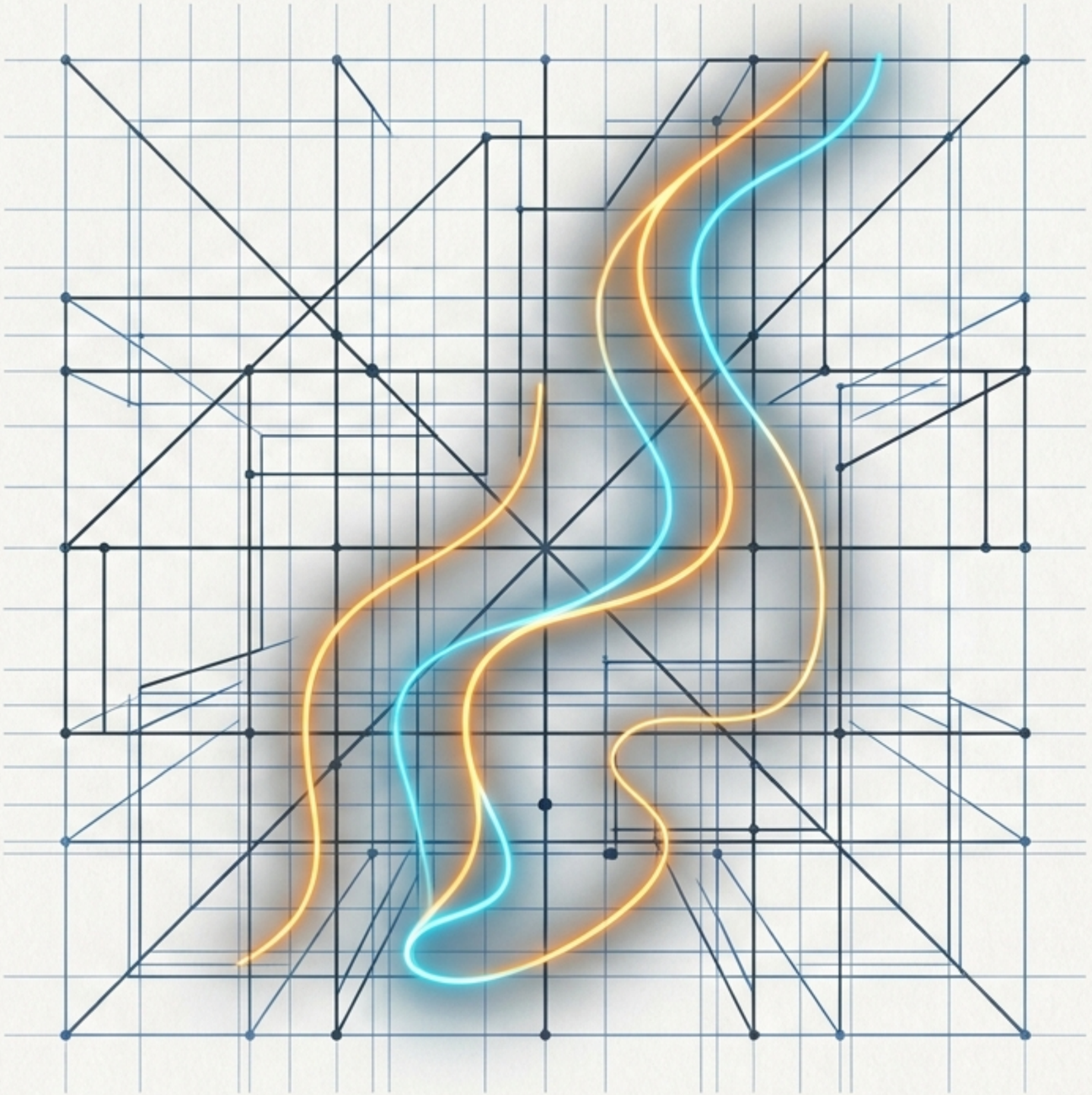
Traversal Over State

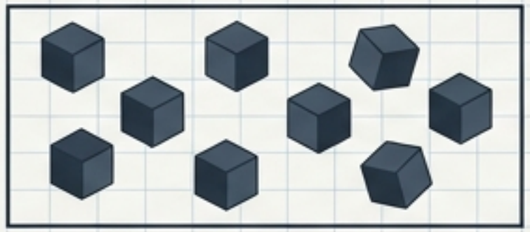
A Unified Theory of Intelligence, Attention, and Designed Experience.

Synthesizing perspectival convergence, cinematic gaze, and latent AI reasoning into a single topological framework.



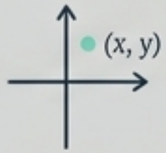
The Core Misalignment

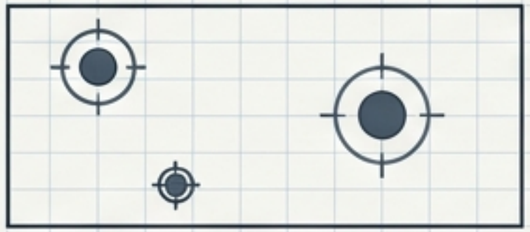
The State-Based Illusion



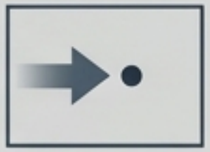
Intelligence:
A fixed target waiting to be discovered.

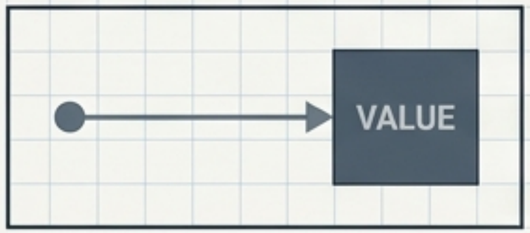
AI Cognition:
A thought is a single latent vector (a coordinate).



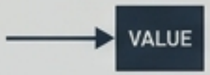


Media Design:
Cinema directs your eye to a focal point.





Experience:
Value lives at the terminal destination.



The Traversal Reality

Intelligence:
A concept built through the convergence of resistant paths.

AI Cognition:
A thought is a trajectory through an admissibility field.

Media Design:
Cinema bounds the possibilities of where your eye can travel.

Experience:
Value is extracted from the traversal itself.

The Formal Machinery

admissibility structure

$$(X, \mathcal{A}, \gamma)$$

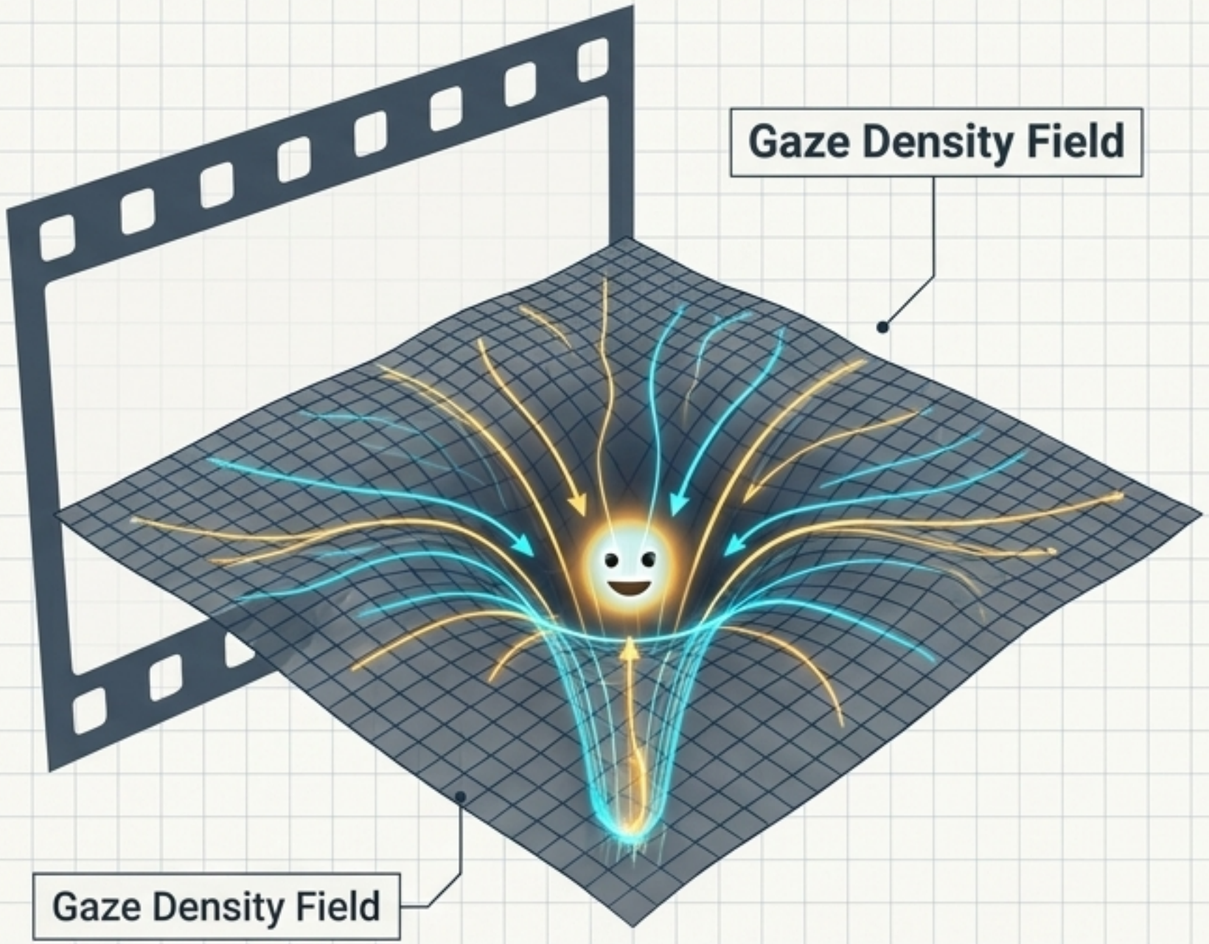
A (Admissibility Structure)
The local constraints. What moves are valid from the current position?

X (State Space)
The total universe of possibilities. (All screen pixels, all vocabulary tokens, all candidate definitions).

γ (The Trajectory)
The realized path generated by the observer.
$\gamma(t+1) \in \mathcal{A}(\gamma(t))$.

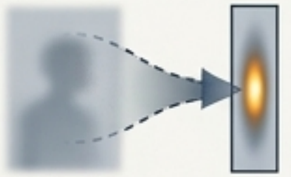
THE FUNDAMENTAL LAW: The designer controls the constraints (**A**). The observer generates the path (γ).

Film grammar is a perceptual optimization



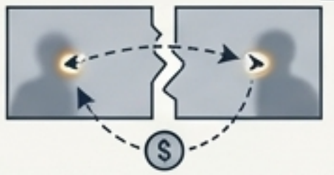
Rack Focus as Annihilation

Focus isn't a pointer; it is a salience annihilation operation. It destroys the viability of alternative visual pathways ($\nabla w_t \to 0$ for out-of-focus areas).



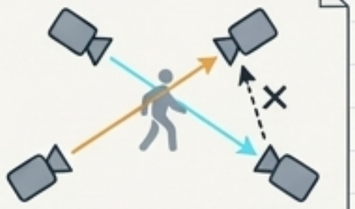
The Cut as Discontinuity

A sudden topological shift. The viewer's eye must pay a "re-acquisition cost" to find the new attractor.

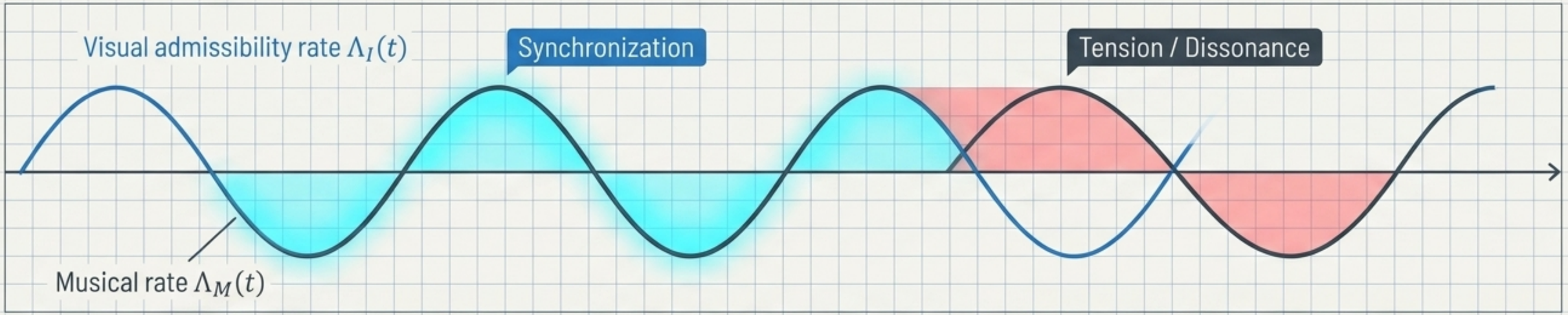


The Rule of 180 Degrees

Not an arbitrary stylistic convention, but an approximate mathematical solution to minimize re-acquisition cost across cuts by preserving motion-vector anchors.



Affect is the temporal geometry of constraint



Dread ($dV_A/dt < 0$)

Progressive narrowing of the admissible field. The trajectory is constrained toward an unseen target. Alternatives vanish.

Relief ($dV_A/dt > 0$)

Sudden expansion of the admissible field.

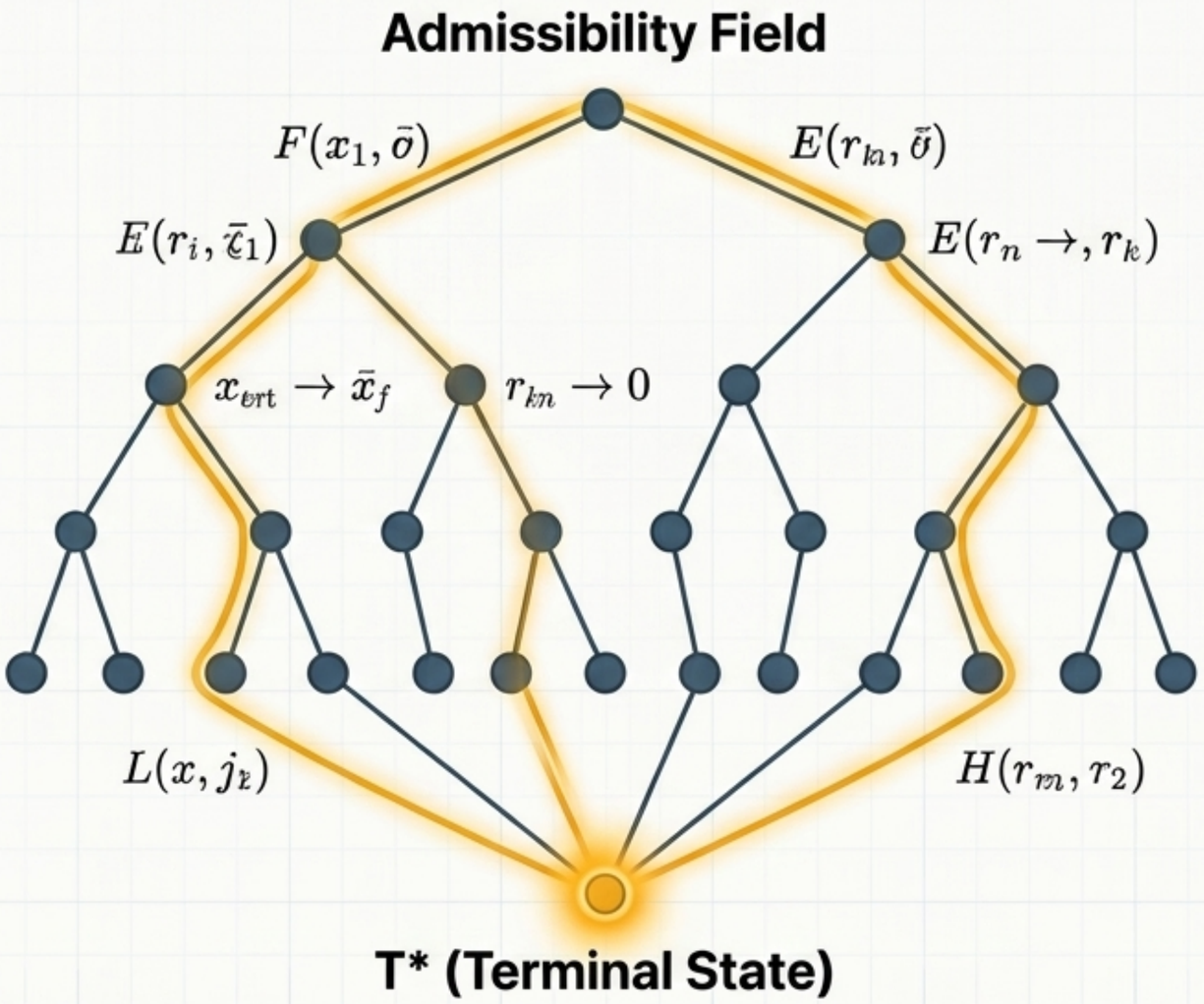
Suspense

Sustained constraint. The destination is visible, but the path is blocked.

Surprise

A sudden, massive spike in the admissibility jerk ($|d\Lambda/dt|$).

LLM reasoning is a path, not a coordinate



State-Trajectory Non-Equivalence

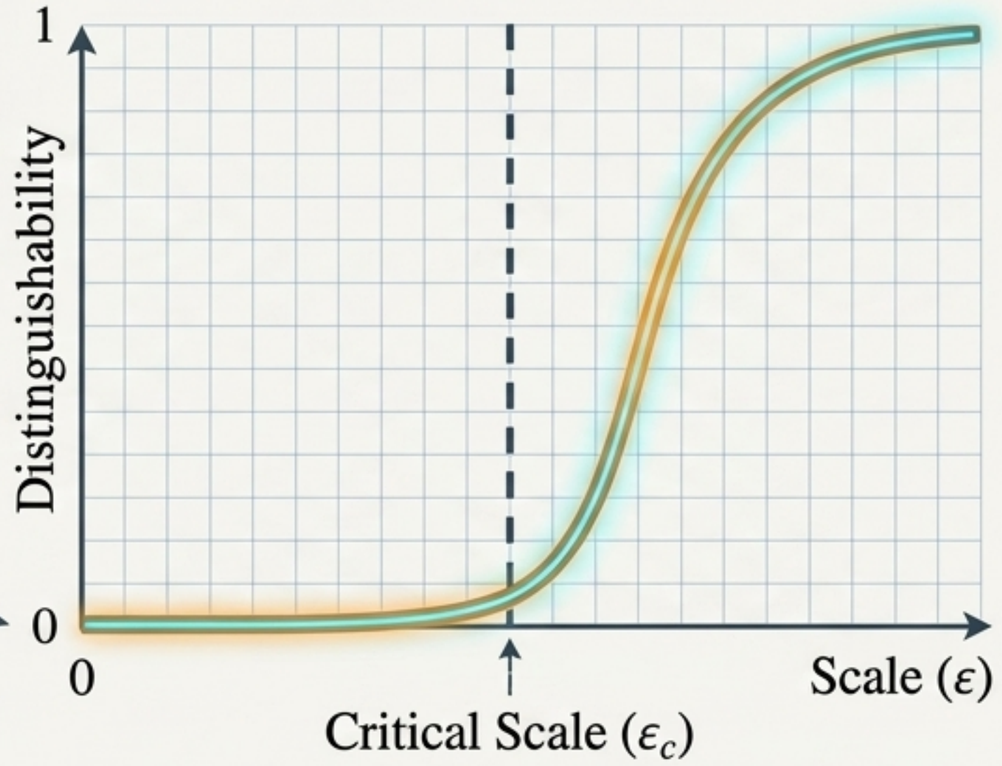
- Measuring a single latent vector to understand LLM reasoning is structurally flawed.
- Two completely different reasoning sequences can arrive at the exact same terminal state (T*). The terminal state mathematically “forgets” the path.
- Thought is the action functional of moving through token transitions, not a geometric location.

Optimization erases fine-grained distinctions

Below Critical Scale ($\epsilon < \epsilon_c$)

Instance-level identity. High variance and conflicting gradient signals cause the model to integrate out fine differences.

Distinguishability $\to 0$.



Above Critical Scale ($\epsilon > \epsilon_c$)

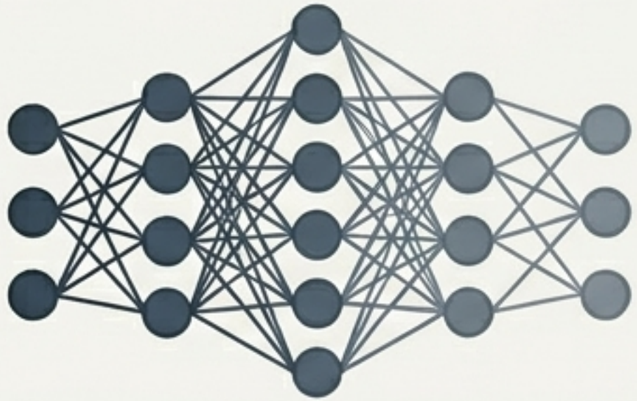
Task-level identity. Consistent gradient signals preserve categorical differences.

Distinguishability > 0.

Takeaway: An LLM failing to separate instances within a task is not a representation flaw; it is the mathematical signature of renormalization under optimization pressure.

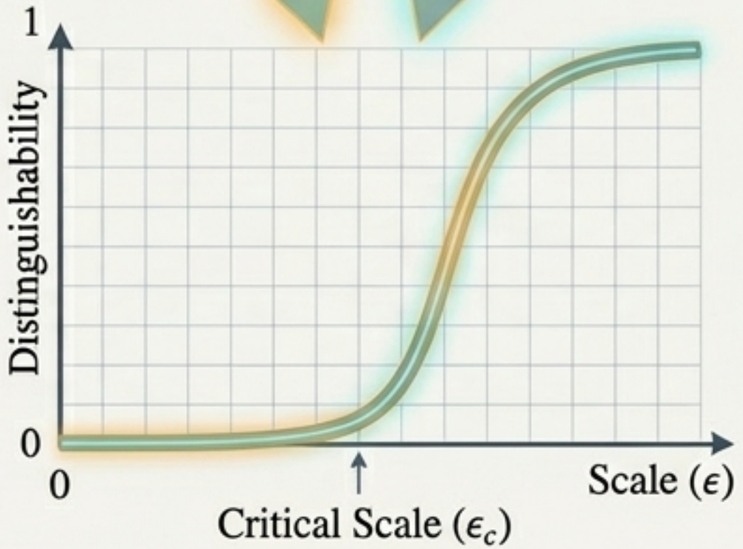
Biological cognition mirrors mathematical renormalization

LLM Architectures

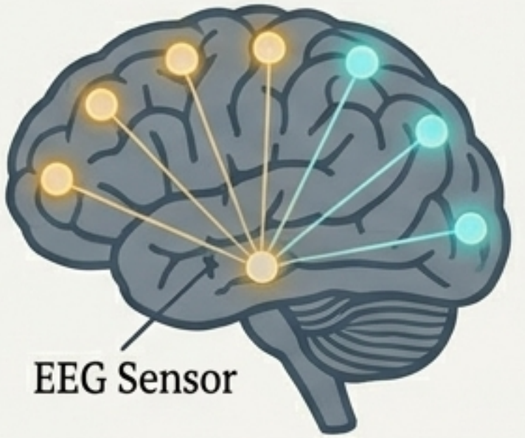


The Dual-Hierarchy

Griffin et al. (2026) tested cortical EEG face processing in autistic vs. neurotypical children. Both LLMs and autistic cortical representations show the identical pattern: preserved between-category dis scrimination (faces vs. houses) but collapsed within-category identity (specific faces).



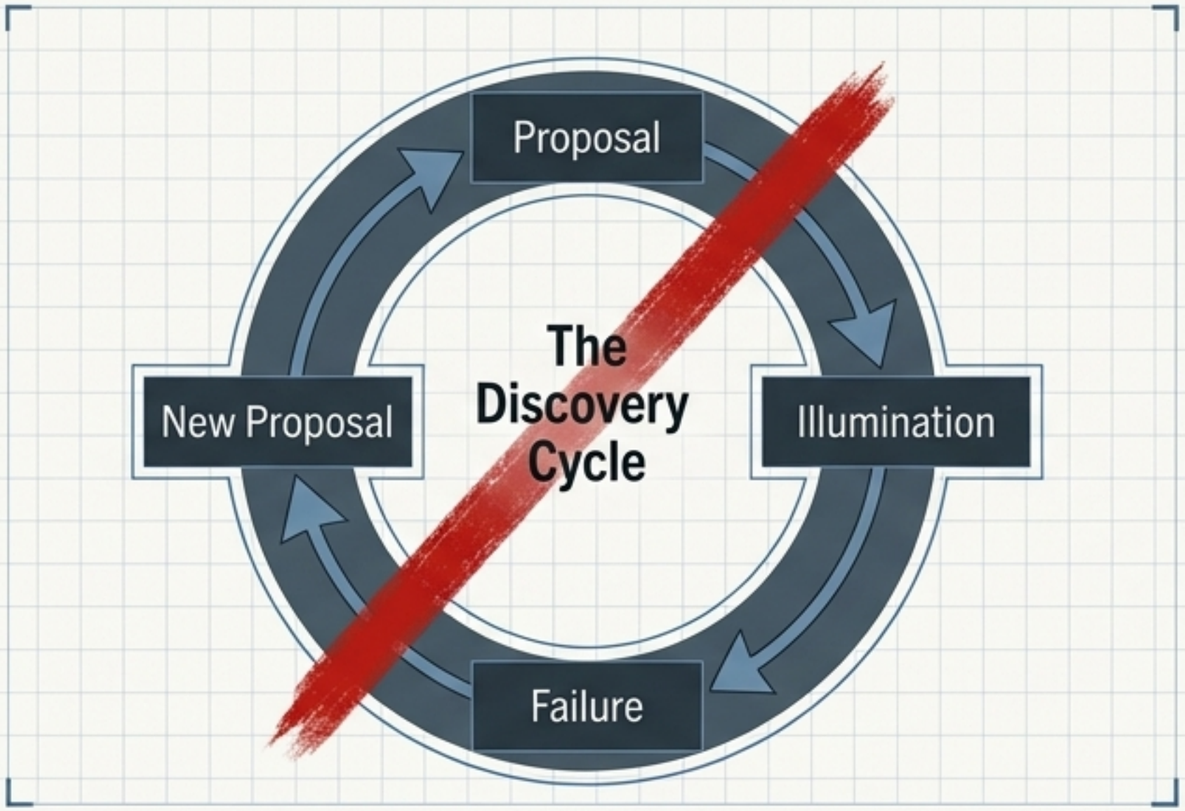
Biological Cognition

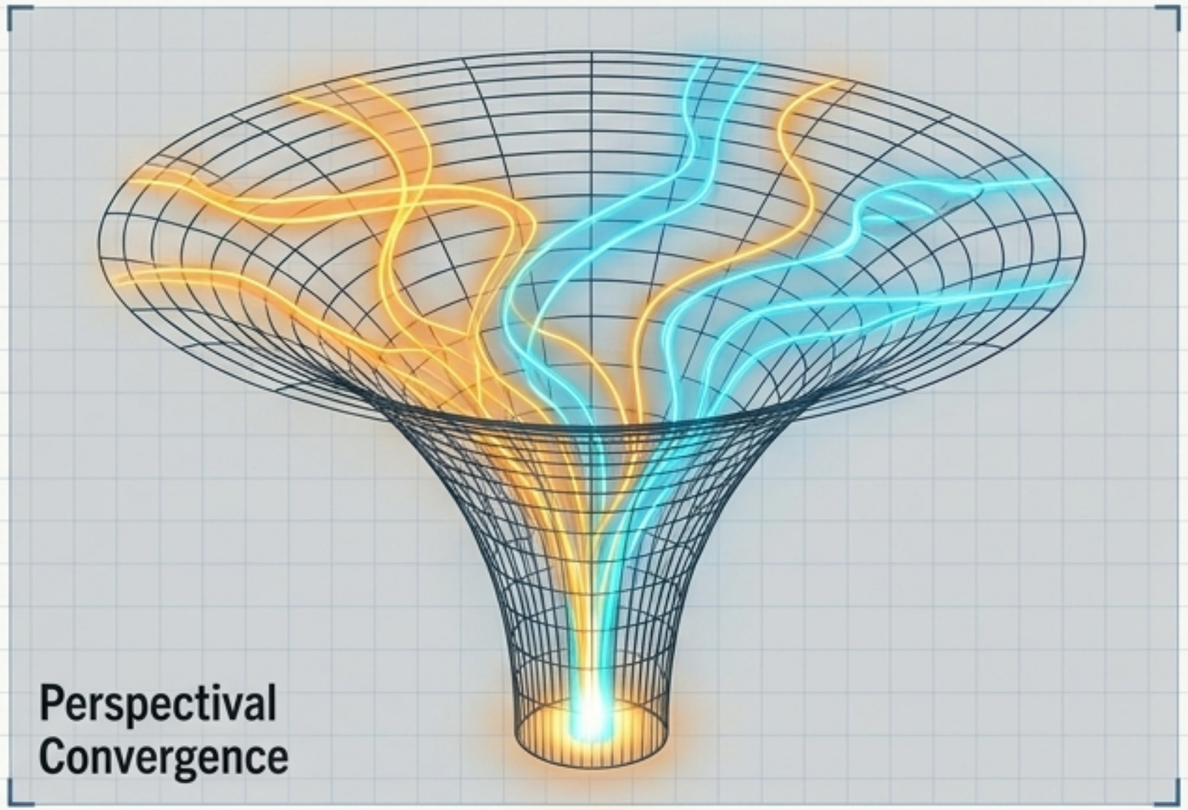


The Conclusion

The distinguishability collapse is not an artifact of transformer architecture. It is a universal property of capacity-limited systems exposed to uneven training signals.

Intelligence is a converging path, not a hidden kind





- Every generation redefines intelligence (optimization, prediction, symbolic logic). Every subsequent generation finds the definition flawed.
- This cycling proves intelligence isn't a fixed natural kind waiting to be triangulated. It is built through resistance.

Weak Realism:

Concepts resolve into two parts:

1. A **Hard Core**: Fixed by the unyielding resistance of reality.
2. A **Soft Periphery**: Malleable social convention.

Epistemic authority requires independent checks

Directness (d_i):
Intrinsic failure vs. long, fragile causal chains.

Closure (c_i):
Genuine dead-ends vs. hidden escape routes.

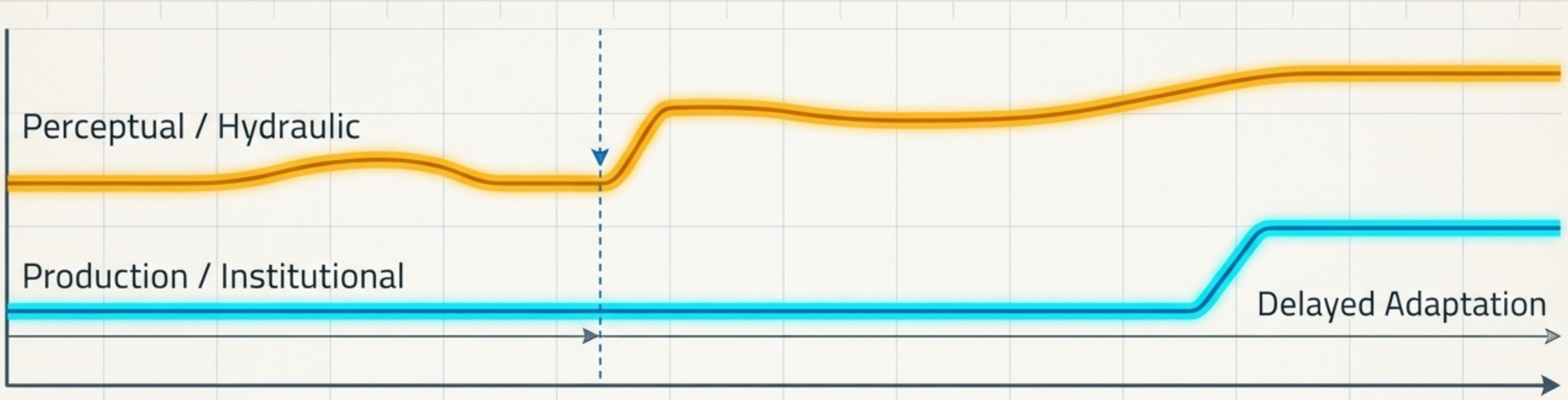
$$w_i = d_i \cdot s_i \cdot c_i \cdot q_i$$

Severity Calibration (s_i):
Realized outcomes vs. exaggerated threats.

Source Independence (q_i):
Checkable by anyone vs. reliance purely on status/authority.

Takeaway: Because the formula is multiplicative, a zero in any quadrant collapses the authority of the evidence to zero.

Adaptation operates on decoupled subsystems



Case Studies

Dutch Rivers	Toddler Development
Post-1990s floods, hydraulic engineering adapted instantly. Institutional governance remained on a centuries-long, independent trajectory.	A child calling a cow a ‘dog’ may already visually track the difference (Perception leads Production by months).

Beware Nominal Closure.

Systems often explicitly declare they have adapted to anomalies while their underlying operations remain completely unchanged.

Disparate media share an identical underlying topology

Function	Film	Game Design	Music	Math Proofs
Constraint Mechanism Bounds the path	Tracking Shot	Corridors	Key / Meter	Axioms
Focus Mechanism Salience attractor	Rack Focus	Highlighted Object	Dissonance Resolution	Lemma
Discontinuity Re-acquisition cost	The Cut	Teleport / Loading	Rhythmic Break	Logical Leap

Testing the trajectory hypothesis

The Crux: If ordered trajectories successfully **recover identity** where scrambled trajectories fail, it proves that thought encoding is **genuinely path-dependent**, not just ensemble noise reduction.

The intrinsic value of the path

$$R(\gamma) = R(\gamma(T)) + R_T(\gamma)$$

reward

The Terminal Illusion

If reward was only about learning the terminal state $R(\gamma(T))$, re-watching movies or re-playing games would be irrational (zero new information).

The Traversal Reward

The breakthrough: $R_T(\gamma)$ represents the Traversal Reward. The trajectory has intrinsic geometric value independent of its destination.

Case in Point

Wim Wenders' *Perfect Days*. The terminal narrative reward is near zero. The massive emotional reward is derived entirely from observing the competent traversal of tightly constrained daily routines.

Meaning is the artifact of traversal

$y = \int^{t} g(x) + v_3(x) - (l_5 z)$

$d(x) = v_5(x) - g_2(x) + (c_0) \approx f_t + \bar{v}_{t_1} [\mu_\varepsilon]$

Constraint (The Designer builds the rules) → **Trajectory** (The Observer generates the path) → **Experience** (The friction between constraint and trajectory) → **Meaning** (The artifact left behind)

$\lambda = -\int\int h\gamma/\varepsilon_{\varepsilon} + t$

We traditionally ask "What does this mean?" first. The Traversal Framework proves meaning comes last.

Stop measuring the fixed points.
Start engineering the paths.

$y^2 = f\mathrm{L}(p\text{-}\infty)$