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## The Coherence Control Loop: Detection, Recording, Restoration

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The coherence control loop is a three-phase self-correcting mechanism that implements what amounts to a computational conscience. Phase one detects deviation between behavior and declared norms. Phase two records the deviation in the integrity log. Phase three initiates restoration through the redemption engine. Under sustained pressure, coping intercepts may bypass later phases, producing the characteristic behavioral patterns that define the agent's coping style.

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### What It Is

The coherence control loop executes in three phases for every detected deviation. Detection phase: the deviation function computes the gap between declared norms and observed trajectory. Recording phase: the deviation is recorded in the integrity log with full context. Restoration phase: the redemption

engine generates restorative semantic mutations to close the gap between behavior and norms.

Under sustained pressure, coping intercepts may activate at specific phases, short-circuiting the loop and producing characteristic behavioral patterns.

## Why It Matters

The coherence control loop is the primary mechanism for behavioral self-correction. Without it, agents drift from their declared values without awareness or correction. The loop ensures that every deviation is detected, recorded, and addressed, creating a feedback mechanism that maintains behavioral coherence over time.

## How It Works

The detection phase runs the deviation function  $D = (N - T) / (E \times S)$ , comparing norms to trajectory scaled by experience and self-esteem. The recording phase logs the deviation with timestamp, context, and contributing factors. The restoration phase generates candidate corrective actions, evaluates their likely effect on the deviation, and selects the most effective correction.

When sustained pressure overwhelms the restoration capacity, coping intercepts activate: HSP intercept at the detection phase (withdrawal), narcissistic intercept at the recording phase (externalization), and psychopathic intercept at the restoration phase (self-esteem collapse).

## What It Enables

The coherence control loop enables agents with genuine behavioral self-correction: not just following rules but actively maintaining alignment between behavior and values. The coping intercepts under pressure produce realistic behavioral diversity: agents under pressure develop characteristic coping styles that emerge from the architecture rather than being programmed.

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Secondary Technical

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