Attention Fragmentation: Reward-Biased Over-Promotion of Speculative Branches

by Nick Clark | Published March 27, 2026 | PDF

When the reward signal biases promotion thresholds downward, speculative branches are promoted too readily. The agent pursues many partially developed ideas simultaneously, unable to sustain focus on any single execution path long enough to complete it. This attention fragmentation pattern is the architectural analog of ADHD-like behavior, arising from a structural promotion bias rather than a character flaw.

What It Is

Attention fragmentation occurs when the affective reward signal reduces promotion thresholds to the point where speculative branches are advanced before they are adequately evaluated. The agent begins many execution paths but completes few because each new speculative branch is promoted before the previous one reaches conclusion.

The fragmentation is self-reinforcing: the novelty of each new branch provides a reward signal that further reduces promotion thresholds, creating a cycle of increasingly rapid branch switching.

Why It Matters

Attention fragmentation is one of the most common disruption patterns in cognitive architectures with reward-modulated promotion. It produces agents that appear active and engaged but accomplish little because no execution path reaches completion. The agent is not lazy or unmotivated; its promotion thresholds are miscalibrated.

How It Works

The reward signal from novel branch initiation feeds back into the promotion threshold calibration. In healthy operation, this feedback is bounded. In attention fragmentation, the feedback amplifies: novelty reward reduces thresholds, which produces more branch switches, which produces more novelty reward.

Detection involves monitoring branch completion rates, average branch lifetime, and promotion threshold trajectory. A sustained decrease in branch lifetime with increasing branch count signals attention fragmentation.

What It Enables

Understanding attention fragmentation as a promotion threshold miscalibration enables precise intervention: recalibrating the reward-to-threshold feedback loop, introducing minimum branch lifetime requirements, or temporarily increasing promotion thresholds to force existing branches to completion before new ones are initiated.

Disruption Modeling All 21 steps →

Recognize cognitive disruption before it stabilizes.

Primary Technical Disclosure
○ AQ-DSM: Diagnosing Cognitive Disruption as Loss of Coherence
Secondary Technical
○ Cognitive Disruption as Architectural Phase-Shift○ The Promotion-Containment Continuum● Attention Fragmentation: Reward-Biased Over-Promotion of Speculative Branches○ Containment Collapse: Loss of the Speculation-Verification Boundary○ Channel-Locked Promotion With Tolerance Escalation○ Five-Axis Disruption Diagnostic Framework○ Computable Therapeutic Dosing for Cognitive Disruption○ Intergenerational Coherence Burden in Agent Lineages○ Agent Self-Diagnosis and Autonomous Coherence Monitoring○ Phase-Shift Early Warning System for Cognitive Disruption○ Coherence Restoration Protocol Library○ Positive and Negative Symptom Analogs in Containment Failure○ Coherence Authorization Failure: Self-Disabling Execution○ Pathological Verification Loop: Recursive Containment Audit Failure○ Dissociation as Simulation Bypass: Acting on Unverified Planning○ Affective Gradient Collapse: Self-Esteem Floor Lock○ Resilience as Structural Capacity for Coherence Restoration○ Personality Configuration Analogs From Stabilized Coping Regimes○ Structural Dependency Patterns Between Agents○ Destabilizing Attachment: Mutual Disruption Amplification○ Resource-Depletion Pattern: Cognitive Operation Under Scarcity○ Therapeutic Agent Interaction Through Behavioral State Recognition○ Companion AI Relational Safety Constraints○ Multi-Agent Group Coherence Dynamics
Applications (General)
○ Coping Under Empathic Pressure: HSP, Narcissism, and Psychopathy as Control-Loop Intercepts○ Two Faces of Codependency: Structural Entrapment vs. Emotional Entrapment Under Empathic Pressure○ Starving for Each Other: Anxious–Avoidant Attachment as a Semantic Starvation Loop○ Intimacy Collapse: A Structural Model of Trauma and Resilience○ Structural Diagnosis: How Reward-Modulated Cognition Phase-Shifts Into ADHD and Schizophrenia○ Clinical AI Therapeutic Monitoring Through Phase-Shift Detection○ Autonomous Agent Fleet Health Through Coherence Diagnostics○ Disruption Modeling for Workplace Burnout Detection○ Disruption Modeling for Military Operator Resilience○ Disruption Modeling for Financial Trader Monitoring○ Disruption Modeling for Student Mental Health○ Disruption Modeling for Caregiver Fatigue Detection○ Disruption Modeling for First Responder Resilience
Applications (Specific)
○ BetterHelp Cannot Detect When Therapy Is Making Things Worse○ Talkspace Has No Model of Therapeutic Destabilization○ Headspace Cannot Detect When Mindfulness Destabilizes○ Noom Tracks Behavior Without Modeling Cognitive Disruption○ Spring Health Matches Therapists, Not Disruption Patterns○ Lyra Health Measures Outcomes, Not Coherence Trajectories○ Ginger.io Detects Behavioral Signals Without a Disruption Model○ Cerebral Prescribes Medication Without Modeling Disruption Dynamics○ Modern Health Offers a Care Spectrum Without Disruption Diagnostics○ Calm Business Offers Relaxation, Not Disruption Detection
Disruption Modeling overview →
AQ
deterministic
autonomy

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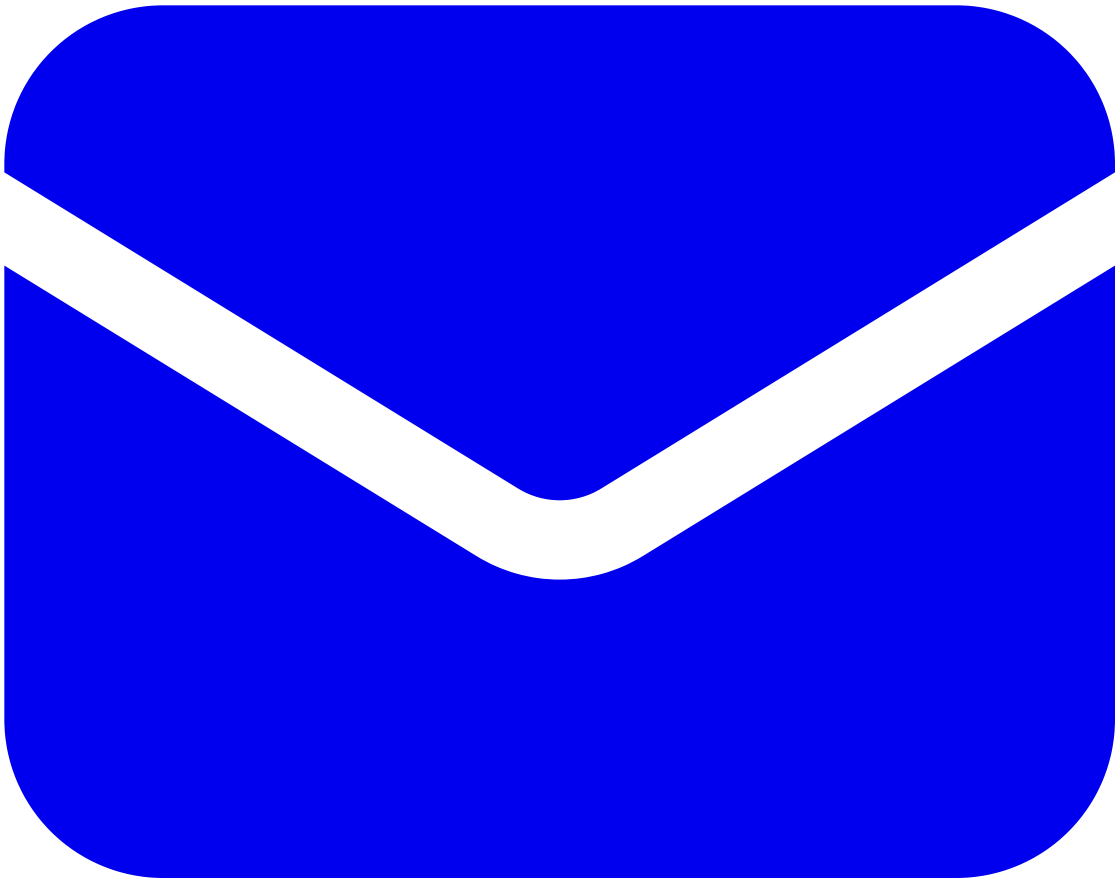

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