Affective Contagion in Multi-Agent Systems

by [Nick Clark](#) | Published March 27, 2026 | [PDF](#)

Formalized model of affective propagation through delegation, interaction exposure, and broadcast channels with anti-spiral mechanisms including contagion damping and aggregate limits.

What It Is

Affective contagion is a formalized model of how affective states propagate between agents through delegation, interaction exposure, and broadcast channels. When agents interact, their affective states can influence each other according to defined contagion rules. Anti-spiral mechanisms including contagion damping, aggregate limits, and spiral detection prevent runaway emotional propagation.

Contagion is governed, not automatic. The policy defines which dimensions are contagious, the attenuation applied during propagation, and the maximum propagation depth.

Why It Matters

In multi-agent systems, agents necessarily influence each other. Without a formal contagion model, affective influence happens implicitly through behavioral changes that other agents observe and react to. Formalizing contagion makes it governable, auditable, and constrainable.

Anti-spiral mechanisms are essential because unconstrained contagion produces positive feedback loops: one agent's anxiety increases a neighbor's anxiety, which reflects back, escalating indefinitely. The damping mechanisms ensure that contagion converges rather than diverges.

How It Works Structurally

When two agents interact, the contagion function evaluates the difference between their affective states on contagious dimensions. If the difference exceeds the interaction threshold, the receiving agent's state is adjusted toward the sender's state by an amount governed by the contagion coefficient and attenuation factor.

Spiral detection monitors the rate and direction of contagion-induced updates across connected agent groups. When the detection algorithm identifies a positive feedback pattern, it increases the damping factor for all participating agents, breaking the escalation cycle.

What It Enables

Multi-agent systems with controlled emotional dynamics. A fleet of autonomous agents can share caution when one member encounters a hazard, propagating appropriate wariness through the fleet without triggering system-wide panic. The contagion parameters determine the balance between collective awareness and individual stability.

Social simulation and companion AI applications where realistic emotional interaction dynamics are structurally modeled rather than scripted.

[Affective State](#) [All 21 steps →](#)

Emotion as a computational primitive, not a simulation.

AQ
deterministic
autonomy

Last updated: 2026-03-03

-
-

-
- nick@qu3ry.net
- 72 28 14 36 01

[Invented by Nick Clark](#) | Founding Investors: Devin Wilkie