Doubt as the Control Operator of Reality-Transition: Collective Coherence as the Manipulated Variable of the Self-Observation Fixed Point

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Abstract

A believed reality (the "Stone") is modelled as a Banach-stable fixed point $\Psi^* = \Phi_{B,S}(\Psi^*)$ of the self-observation operator $\Phi = \iota_S \circ \hat{O}$, with stability governed by a single contraction modulus $q(B,S) = B\,S + (1-B)\sqrt{1-S^2}$. Doubt enters through the factor $(1-\sigma)$ of each observer's anchor B and, collectively, through the coherence deficit $(1-S)$. We derive, and verify to 50 decimal places, the structural result that disciplines the whole article: $\partial q/\partial B = S - \sqrt{1-S^2}$ changes sign at $S = 1/\sqrt{2} \approx 0.70710678$. For a tightly held high-coherence Stone, raising an individual's doubt therefore tightens the contraction (at $S = 0.9$ the modulus q falls from 0.90000 to 0.44053 as B falls from 1.0 to 0.01); only below $1/\sqrt{2}$ does individual doubt loosen it. Isolated individual doubt thus fails to destabilise a strongly held reality. The operative lever is collective coherence S, driven down by the variance of doubt across observers, $\mathrm{Var}(\sigma_i)$, until S crosses an overlap threshold S_{thr} and the old basin dissolves. We present this as a falsifiable control model: the manipulated input is $\mathrm{Var}(\sigma_i)$, the controlled state is S, the plant guard is $q(B,S)$, and viability during the crossing is held by the guard $\beta > 1$ together with the continuity axiom (no rupture). Nine falsifiable predictions are stated, with every claim stratified into structural invariant, prediction, and hypothesis.

Keywords: self-observation operator, Banach contraction, collective coherence, reality-transition, doubt, bifurcation, control model, ODTOE.

1 Introduction

The "Stone" names a reality so firmly believed that it behaves as a fixed object: it reproduces itself across acts of observation and resists revision. The question this article addresses is operational. Is a rise in doubt, by itself, sufficient to open a passage to a

different reality, and can such a transition be managed by regulating the level of doubt σ?

We answer within the One-Distinction Theory of the Emergence of Everything (ODTOE), whose central postulate is that reality is observer-belief-dependent, $R = \hat{O}(\Psi)$, and that a self-consistent, self-reproducing reality is the fixed point of the self-observation strange loop [1]. On this apparatus the Stone is the collective fixed point $\Psi^* = \Phi_{B,S}(\Psi^*)$ of the cluster of observers that co-constitute it.

The analysis is presented as a falsifiable control model built on existing ODTOE machinery, and as a descriptive control theory. Its honesty signature is that the central derivation actively refutes the naive form of the thesis. The intuitive claim — "any rise in individual doubt breaks reality" — is false above $S = 1/\sqrt{2}$. What survives is a sharper, collective statement: the variance of doubt across observers is the upstream control input of reality-transition. This article unfolds within the ODTOE programme, in which all of mathematics, physics, and the phenomenology of consciousness are read as projections of a single primordial act of distinction.

Throughout, every claim is marked by epistemic level. **L2-INVARIANT** denotes a structural, observer-independent result that is derived and, where numerical, verified to 50 decimal places. **PREDICTION** denotes an empirically testable consequence of the model. **HYPOTHESIS** denotes a claim that is open in the corpus or imported as a theorem from an adjacent field.

2 The ODTOE apparatus reused

No new primitive is introduced. The article works inside the one-anchor programme: the single quantitative anchor is the contraction modulus q, and all other quantities are dimensionless ceilings or selection ratios.

A reality is a fixed point of self-observation,

$$\Psi^* = \Phi_{B,S}(\Psi^*) = \iota_S(\hat{O}_\Psi(\Psi)), \qquad \Phi : \mathcal{H} \to \mathcal{H}. \tag{1}$$

The existence and uniqueness of this fixed point, and the algebraic properties of the observation operator $\hat{O}$ and the integration map ι_S, are open tasks in the corpus [1]; the strange-loop apparatus is therefore carried at **HYPOTHESIS** (L3) grade (Axiom A).

Each observer's belief anchor is multiplicative in four factors: focus F, emotional charge E, the certainty factor $(1-\sigma)$, and integration Λ,

$$B = F^{w_1}\, E^{w_2}\, (1-\sigma)^{w_3}\, \Lambda^{w_4}, \qquad \sum_i w_i = 1. \tag{2}$$

For the research modality we adopt the weights $w_3 = 0.35$ (certainty), $w_1 = 0.30$ (focus), $w_2 = 0.20$ (emotion), $w_4 = 0.15$ (integration). The multiplicative form yields the *weak-link* property: $\sigma \to 1$ forces $B \to 0$ irrespective of F, E, Λ. This is a corpus theorem (**L2-INVARIANT**) [1].

Collective coherence over a cluster of n observers is the complement of the mean pairwise anchor disagreement [2],

$$S = 1 - \frac{2}{n(n-1)} \sum_{i<j} |B_i - B_j|. \tag{3}$$

Stability of the collective fixed point is a Banach contraction governed by one modulus,

$$q(B, S) = B\,S + (1 - B)\sqrt{1 - S^2}, \tag{4}$$

the operator Φ contracting (the Stone stable and unique) if and only if $q < 1$ [3]. The lifetime of a configuration, the collective belief probability, and the count of co-existing realities follow as

$$T(\mathcal{C}) = \frac{T_0}{(1-S)^n}, \qquad P_{\text{coll}} = 1 - \prod_i (1 - B_i^k), \qquad N_{\text{th}} = N_0(1-S)^m + 1. \tag{5}$$

Three quantities in this apparatus are explicitly open in the corpus and are carried as **HYPOTHESIS**: the numerical value of the overlap threshold S_{thr} [1], the correlated generalisation of P_{coll} [1], and the Banach/Schauder applicability conditions on $\hat{O}$ [1].

3 Doubt as anti-coherence

Doubt acts twice. Individually it enters through the factor $(1 - \sigma)$ in equation (2); collectively it enters through the deficit $(1 - S)$ in equations (3) and (5).

At the individual scale the weak-link property is decisive: by equation (2), $\sigma \to 1 \Rightarrow B \to 0$, so a single observer's doubt is sufficient to zero that observer's own anchor (**L2-INVARIANT**) [1]. This sufficiency is local; it concerns one B_i, and the next section shows it does not transfer to the collective contraction.

At the collective scale doubt lowers S through two channels. The level channel: raising σ in every observer drops every B_i in equation (2). The divergence channel: heterogeneous, unequal doubt inflates the spread $\sum_{i<j} |B_i - B_j|$ in equation (3). The second channel identifies the manipulated input as the *variance* of doubt, $\text{Var}(\sigma_i)$. A $50/50$ polarisation into two opposed belief groups pins S at the structural frustration floor $S \to 0.5$ [4]; polarisation alone can therefore drive S across any threshold below 0.5.

Operationally, σ is measurable through implicit-association divergence and Stroop interference, and is the least test-retest-reliable component of the anchor (implicit measures typically report $r \approx 0.5$–0.7). This bounds the accuracy of any open-loop control built on σ (**PREDICTION**).

4 The honest pivot: the sign-flip of the q-channel

The rigour centrepiece is the sign of the individual-doubt channel. Differentiating the modulus (4) with respect to the anchor,

$$\frac{\partial q}{\partial B} = S - \sqrt{1 - S^2}, \qquad \frac{\partial q}{\partial B} = 0 \text{ at } S = \frac{1}{\sqrt{2}} \approx 0.70710678. \tag{6}$$

Since rising doubt lowers B, the induced change in the modulus is $\Delta q = -(\partial q/\partial B)\,\Delta B$ with $\Delta B < 0$. For $S > 1/\sqrt{2}$ the derivative is positive, so lowering B *lowers* q — the contraction tightens. For $S < 1/\sqrt{2}$ the derivative is negative, so doubt loosens the contraction. The crossover sits exactly at $1/\sqrt{2}$ (**L2-INVARIANT**, derived and verified to 50 decimal places, with no fitting).

Table 1 reads the high-coherence case directly. At $S = 0.9$ the modulus falls monotonically as the anchor collapses under doubt: a single observer's doubt does not break a high-coherence Stone, it can tighten it.

Table 1: The modulus $q(B, 0.9)$ as one observer's anchor collapses under doubt ($S = 0.9 > 1/\sqrt{2}$). All values recomputed to 50 decimal places; rounded to 11 here.

B	doubt level	$q(B, 0.9)$
1.00	none	0.90000000000
0.50	moderate	0.66794494718
0.10	high	0.48230090492
0.01	near-total	0.44053099541

Two consequences discipline the rest of the article. First, the naive thesis is false for isolated σ above $1/\sqrt{2}$, so the operative lever must be the collective coherence S, driven by $\mathrm{Var}(\sigma_i)$. Second, the modulus satisfies $q < 1$ for all $B > 0$, $S > 0$; degeneracy occurs only at the corner $B, S \to 0$, where, for instance,

$$q(0.01, 0.01) = 0.99005049876, \qquad q(0.05, 0.05) = 0.95131175688. \tag{7}$$

There is no interior point at which q crosses 1. The corner-only structure of equation (7) is a feature: the real bifurcation trigger is the loss of the basin at $S < S_{\text{thr}}$, with q serving as a diagnostic of weakening and the corner as a limiting collapse.

5 Bifurcation and the threshold

The collective fixed point is unique only while coherence stays above the overlap threshold. Define the effective critical doubt σ^*_{eff} implicitly by

$$S(\sigma^*_{\text{eff}}) = S_{\text{thr}}. \tag{8}$$

For $S > S_{\text{thr}}$ Banach uniqueness holds and the fixed point (1) is locked. For $S < S_{\text{thr}}$ the cluster overlap $O_n = \bigcap_i C_i$ empties, uniqueness fails, and Schauder multiplicity admits several admissible successor configurations [3]. The successor is captured when a candidate attractor A surviving above threshold aligns with the belief gradient,

$$\Psi_0 \xrightarrow{\Phi} \Psi^* \iff \big[\exists A:\ S(A) > S_{\text{thr}} \ \wedge\ \langle \nabla_\Psi B(\Psi_0),\, A - \Psi_0 \rangle > 0\big]. \tag{9}$$

The reachability statement (9) is a candidate-lemma in the corpus and is carried as **HYPOTHESIS** [5]; the numerical value of S_{thr} is likewise open and carried as **HYPOTHESIS** [1]. The threshold σ^*_{eff} is a dimensionless structural locus on $[0, 1]$ defined implicitly by (8); it is not fitted from any combination of fundamental constants. The bifurcation is the loss of the old basin, a continuous second-order crossing with order parameter $\Delta_S = S - S_{\text{thr}} \to 0$, consistent with the no-rupture axiom of Section 9.

6 Three transition signatures from one knob

Below the threshold the single coherence knob produces three independent destabilising outputs, all functions of $S(\sigma)$ alone:

$$T(\mathcal{C}) = \frac{T_0}{(1-S)^n}, \qquad N_{\text{th}} = N_0(1-S)^m + 1, \qquad D(\eta) = D_0(1-S). \tag{10}$$

First, lifetime collapses super-linearly: at the frustration floor $S = 0.5$ the factor $1/(1-S) = 2$, so $T = 2^n T_0$. Second, the count of reachable competing realities inflates from 1. Third, stochastic dispersion un-freezes the configuration so it can migrate [2]. Sufficiency is over-determined: one input, three independent destabilising outputs. The functional forms of T and D are **L2-INVARIANT**; the multiplicity law N_{th} and any correlated use of P_{coll} are carried as **HYPOTHESIS** and are quantitatively restricted to the low-coherence transition regime [1].

7 Sufficiency and gain

The destructive mirror shares the algebra of the collective probability but is driven directly by doubt,

$$P_{\text{destr}} = 1 - \prod_i (1 - \sigma_i^k). \tag{11}$$

The corpus critical-mass asymmetry sets the cost of the two operations: $n_{\text{cr}}^{\text{anti}} = 2$ committed doubt-injectors suffice to dissolve a small consensus, against $n_{\text{cr}}^{\text{coh}} = 5$ to establish a new stable one, so destabilisation is roughly 2.5 times cheaper than reconstruction [6]. This is the quantitative meaning of "enough to regulate doubt". The marginal gain of the lever is closed-form,

$$\left|\frac{\partial B}{\partial \sigma}\right| = w_3\,(1-\sigma)^{w_3 - 1}, \qquad w_3 = 0.35, \tag{12}$$

which grows without bound as $\sigma \to 1$: a wavering, high-doubt Stone is the cheapest to push. The gain is stated on the channel $\mathrm{Var}(\sigma_i) \to S$ established in Section 4, and it stays clear of isolated σ. Two rate knobs complete the picture: the deactivation time of the old reality $\tau_{\text{deact}} \sim 1/\sigma^2$, and the convergence rate of the successor $v_{\text{conv}} = \alpha/[\tau_{\text{cycle}}(I(\mathcal{C}) + \varepsilon)]$. A physical realisation of the doubt input is the meta-observer (egregore) doubt σ_{meta} entering B_{meta} through equation (2) [6]. The gain (12) is **L2-INVARIANT**; the values n_{cr} and the mirror (11) are imported at postulate grade and carried as **HYPOTHESIS**.

8 The control law

The model assembles into a control law. The manipulated input is the doubt-variance $u = \mathrm{Var}(\sigma_i)$; the controlled state is the coherence $S(u)$, monotone-decreasing in u; the plant guard is the modulus $q(B, S)$. The regime selector is the threshold:

$$\text{reality} = \begin{cases} \text{LOCKED}, & S > S_{\text{thr}} \quad (\text{Banach uniqueness}), \\ \text{RELEASED}, & S < S_{\text{thr}} \quad (\text{Schauder multiplicity}). \end{cases} \tag{13}$$

Mode A (transition) injects heterogeneous doubt so the B_i diverge, S collapses past S_{thr}, and the old basin dissolves; the number of successor branches at the crossing is

$$N_{\text{paths}} = K\,(1 - S_n)^m + 1, \tag{14}$$

so a high residual coherence S_n at the crossing yields one clean successor and a low residual yields many incompatible ones. Mode B (lock) suppresses the doubt-variance, driving the σ_i to a common low value, S toward its ceiling and T large.

Among the broken-symmetry successors, only the worst-Diophantine torus survives perturbation, so the new Stone is φ-resonant: the KAM survivor is $\omega^* = \varphi^{-1} = 0.61803398875$ with robustness $\gamma_\varphi = 1/\sqrt{5} = 0.44721359550$ [7]. We frame φ strictly as a selection invariant, hereditary across the transition. It is not the extremum of q: on the diagonal φ^{-1} gives $q(\varphi^{-1}, \varphi^{-1}) = 0.68224911725$, whereas the true diagonal minimiser is $v^* \approx 0.56229$ with $q^* = 0.67813000236$. The KAM selection is carried as **HYPOTHESIS** [7].

Two ceilings bound the law. Coherence cannot reach 1:

$$S \le S_{\text{max}} = 1 - (\pi - 3)^2 \approx 0.97995152045, \tag{15}$$

so perfect lock is unreachable and a residual two percent of irreducible doubt is an unactuatable mode; every reality keeps a latent transition (**PREDICTION**) [8]. And because the lifetime law uses the true coherence S_{true}, suppressing only declared doubt produces a phantom coherence $S_{\text{phantom}} \gg S_{\text{true}}$ that merely delays an inevitable collapse: the lever must move S_{true} (**PREDICTION**). The dimensionless ceiling (15) is **L2-INVARIANT**.

9 Viability and continuity guards

A doubt-control law could read as a manipulation manual. Two guards prevent that reading and keep the model descriptive. Within the RELEASED regime of the selector (13), the viability guard holds the system in the rebirth regime during the crossing,

$$\beta = \frac{B_{\text{avg}}\, S\, \ln N}{\theta_{\text{crit}}} > 1 \;\wedge\; \varepsilon < 1 \implies \text{regime D (synthesis: a viable new } \Psi^*), \qquad (16)$$

as opposed to regime E, collapse to $B = 0$ — a dead reality [4]. The continuity axiom states that the transition is a continuous barrier-crossing in the complete metric configuration space $\mathcal{C}$, with order parameter $\Delta_S = S - S_{\text{thr}} \to 0$; a reality cannot be torn [4]. Managing the transition therefore means steering S across S_{thr} while holding $\beta > 1$: controlled rebirth. This is the anti-nihilism inoculation of the model. The continuity axiom is **L2-INVARIANT**; the β-viability gate is imported and carried as **HYPOTHESIS** [4].

10 Predictions, status, and discussion

The model yields nine falsifiable predictions.

P1 (sign of the derivative). Raising uniform individual doubt σ while holding inter-observer agreement S fixed must not destabilise a shared reality, and at $S > 1/\sqrt{2}$ must measurably tighten convergence; below $1/\sqrt{2}$ it loosens. The crossover sits at $1/\sqrt{2} = 0.70710678$. A measured crossover away from this value, or destabilisation from uniform high-S doubt, falsifies the modulus mechanism (**PREDICTION**, sharpest).

P2 (variance channel). Transition is triggered by rising $\text{Var}(\sigma_i)$ through S-collapse; falsified if mean doubt predicts transitions while doubt-variance fails to (**PREDICTION**).

P3 (single-knob sharpness). The three signatures of equation (10) activate at the same critical S_{thr}; thresholds diverging beyond measurement error falsify the single-input model (**PREDICTION**).

P4 (critical-mass asymmetry). Dissolving a small consensus needs fewer committed doubt-injectors ($n_{\text{cr}}^{\text{anti}} \approx 2$) than building one ($n_{\text{cr}}^{\text{coh}} \approx 5$); equal or reversed critical masses falsify the cheap-lever claim (**PREDICTION**).

P5 (lifetime scaling). Persistence follows $T = T_0/(1-S)^n$ with fixed $n \geq 1$; a linear or exponential law falsifies (**PREDICTION**).

P6 (deactivation kinetics). Time to abandonment scales as $\tau_{\text{deact}} \sim 1/\sigma^2$; a $1/\sigma$, $\exp(-\sigma)$, or σ-independent law falsifies (**PREDICTION**).

P7 (phantom-coherence collapse). Cohorts with suppressed declared doubt but high implicit doubt collapse suddenly, with timing governed by S_{true}; if such cohorts are more stable long-term, falsified (**PREDICTION**).

P8 (irreducible-doubt ceiling). No corrected collective coherence exceeds $S_{\max} = 0.97995$; a stable measured $S > 0.98$, or a ceiling unrelated to $(\pi - 3)^2$, falsifies the controllability ceiling (**PREDICTION**).

P9 (φ-resonant successor). The long-term successor's key invariant ratios cluster near φ/φ^{-1}; should the survivor instead track the highest-initial-adoption candidate, or distribute uncorrelated with φ-robustness, the selection claim is falsified (**HYPOTHESIS**, boldest).

Epistemic stratification. The structural invariants (**L2-INVARIANT**) are the modulus form (4) with its $q < 1$-for-all-interior property, the sign-flip (6) at $1/\sqrt{2}$, the weak-link property, the coherence formula (3) with the frustration floor, the marginal gain (12), the continuity axiom, and the dimensionless ceiling (15). The predictions P1–P8 are model consequences awaiting test. The open hypotheses are the numerical value of S_{thr}, the reachability candidate-lemma (9), the correlated form of P_{coll}, the KAM φ-selection, the locus σ^*_{eff}, and the existence-uniqueness of the $\Phi/\hat{O}/\iota$ fixed-point apparatus.

Open problems and limits. The φ-as-KAM-survivor through-line is imported as theorem and remains conjectural for Φ. The manipulated input $\text{Var}(\sigma_i)$ is operationalisable only through low-reliability implicit measures, so the control is noisy and open-loop. The bifurcation gate rests on the corpus-open S_{thr}, so near-threshold predictions stay at the level of shape-claims (exponents, monotonicity) and avoid point predictions. The model opens the transition and biases its selection through the residual-coherence branch count of equation (14); it does not author the successor. Managing the transition means steering and biasing the selection, with the outcome left open.

Ethical frame. The control law is a descriptive instrument bounded by the viability guard (16) (rebirth toward a viable successor) and the continuity axiom (no rupture). The phantom-coherence bound states that any real lever must move S_{true}; acting on measured doubt alone removes the claim to a clean manipulation handle.

This work develops the One-Distinction Theory of the Emergence of Everything: all of mathematics, physics, and the phenomenology of consciousness are projections of a single primordial act of distinction.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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