From Catharsis to Geometric Bayesianism: RSVP and the Demise of the Hydraulic Model

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Abstract

We critique the catharsis model of emotion—derived from Freudian hydraulics and still culturally pervasive—as theoretically incoherent. Rather than "releasing" pressure, indulging sadness or anger re-excites the same dynamical attractors, prolonging emotional dwell time. We propose a replacement grounded in Relativistic Scalar Vector Plenum (RSVP) field dynamics and Geometric Bayesianism with Sparse Heuristics (GBSH). Emotions are attractor basins in constrained inference geometry, shaped by metabolic sparsity and comparative reference frames. This framework explains why catharsis amplifies affect, why reframing alters valence without arousal escalation, and why personality "traits" are environmental averages rather than fixed quantities.

1 Introduction

The notion of catharsis, rooted in Freudian psychology, posits that expressing or "venting" emotions serves as a release mechanism for pent-up psychic energy, akin to a hydraulic valve discharging pressure. This model persists in popular culture and some therapeutic practices, encapsulated in advice to "let it out" to alleviate sadness or anger. However, empirical evidence suggests that such indulgence often exacerbates negative affect rather than resolving it [Douglas, 1966]. This tension highlights the need for a dynamic, biologically grounded alternative that eschews hydraulic metaphors in favor of field-theoretic and Bayesian principles.

In this paper, we advance the Relativistic Scalar Vector Plenum (RSVP) model integrated with Geometric Bayesianism with Sparse Heuristics (GBSH) as a rigorous framework for emotion. We demonstrate the incoherence of catharsis through mathematical analysis of feedback loops and propose testable predictions. Later sections extend this to linguistic gender evolution and the emergence of Boolean logic, illustrating broader applications of the framework.

2 Critique of Catharsis

The hydraulic metaphor conceptualizes emotions as fluids accumulating pressure within a closed system, necessitating release to restore equilibrium. Originating in Freud's "psychic hydraulics," this view internalized culturally as a mechanism where expressing affect dissipates it. However, in a dynamic systems perspective, emotions are not static quantities but emergent attractors in a field landscape.

Under RSVP, "venting" does not drain a reservoir but injects energy into the system, deepening attractor basins and extending dwell times. This positive feedback entrainment mislabels a control loop as a valve, rendering catharsis not merely ineffective but potentially harmful. Comparative

analysis further reveals that affective valence is reference-dependent: any event can be construed as positive or negative based on counterfactual baselines, undermining the notion of absolute emotional "quantities."

3   RSVP Field-Theoretic Framework

The RSVP model describes cognition through three coupled fields on domain $\Omega \subset \mathbb{R}^3$:
- Scalar capacity $\Phi(\mathbf{x}, t)$, - Vector flow $\mathbf{v}(\mathbf{x}, t)$, - Entropy density $S(\mathbf{x}, t)$.
Dynamics:

$$\partial_t \Phi + \mathbf{v} \cdot \nabla \Phi = D_\Phi \Delta \Phi - \lambda_\Phi (\Phi - \Phi^\star), \tag{1}$$

$$\partial_t \mathbf{v} + (\mathbf{v} \cdot \nabla)\mathbf{v} = -\nabla(\Phi + \psi) + \nu \Delta \mathbf{v} - \gamma \mathbf{v} + \mathbf{u}, \tag{2}$$

$$\partial_t S = D_S \Delta S + \eta \|\nabla \mathbf{v}\|^2 + \chi \|\nabla \Phi\|^2 - \rho(S - S^\star). \tag{3}$$

Free-energy functional F ensures dissipativity ($\dot{F} \leq 0$) [Kretzmann et al., 1982].
Order parameters on Ω_a:
- Arousal $A = \langle \eta \|\nabla \mathbf{v}\|^2 + \chi \|\nabla \Phi\|^2 \rangle$, - Valence $V = \frac{\langle \mathbf{v} \cdot \nabla \Phi \rangle}{\sqrt{\langle \|\mathbf{v}\|^2 \rangle \langle \|\nabla \Phi\|^2 \rangle}}$, - Dominance $D = \frac{1}{|\Gamma_a|} \int_{\Gamma_a} \mathbf{v} \cdot \mathbf{n}\, dS$.
Emotions are metastable basins in (A, V, D).

Proposition 1 (Dissipativity). *Differentiation and integration by parts yield $\dot{F} \leq 0$.*

4   Geometric Bayesianism with Sparse Heuristics (GBSH)

RSVP fields embed in manifold M with metric $G(\xi)$; inference as $\dot{\xi} = -\nabla_G F$.
Sparsity from budget $E_u \leq B$; KKT yields mode selection favoring high gain-to-curvature ratios.

Corollary 1 (KKT Sparsity). *Solutions suppress low-$|g_i|$ modes under constraints.*

Emotions emerge from sparse navigation in entropic manifolds.

5   Comparative Relativity of Affect

Valence $V \propto E[U|\theta] - U^\star$; tilt $F_{\text{ref}} = F - \langle \theta, C \rangle$.

Lemma 1 (Reference-Tilt). *Shifting θ alters V at constant A.*

Catharsis forcing $k\mathbf{e}_A$ induces Hopf bifurcation, increasing high-A dwell.

Corollary 2 (Hopf Feedback). *Venting entrains oscillations, prolonging affect.*

6   Predictions

1. Anti-catharsis: Venting increases dwell; reframing reduces.

2. Reference dependence: Baseline shifts flip V.

3. Budget sparsity: Load yields sparser policies.

4. Hopf signature: Build-up as limit cycles in A.

7 Extensions: Linguistic Gender and Boolean Logic

[Here insert condensed version of previous sections 3 and 4, focusing on parallels to emotional attractors: compression as deepening basins under cultural ψ_{bin}, with timeline and hysteresis.]

8 Conclusion

Catharsis is an incoherent relic; RSVP–GBSH unifies dynamics with constraints. Symmetry: catharsis/gender/Boolean as attractor deepening, not release or choice. Future: empirical tests on reframing and sparsity.

References

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