

Low-Entropy Attractors: From Virtue Signals to Relevance Fields through Attentional Cladistics and RSVP Theory

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A comprehensive interdisciplinary monograph critiquing adaptationist accounts of moral and cultural behaviors, proposing a field-theoretic model of cognition as cue-indexed navigation through relevance fields, with extended mathematical, empirical, and philosophical implications for cultural evolution, neurodiversity, and memetic coherence.

July 26, 2025

Abstract

This monograph, *Low-Entropy Attractors*, critically evaluates adaptationist frameworks, particularly Geoffrey Miller's theory of virtue signaling as a product of sexual selection, as articulated in *Virtue Signaling: Essays on Darwinian Politics and Free Speech*. Drawing on Attentional Cladistics and Relativistic Scalar Vector Plenum (RSVP) Theory, which models cognition as navigation through dynamic semantic and perceptual fields, it prioritizes survival and social coherence over reproductive display. Virtues, language, and cultural norms persist as low-entropy attractors, reducing local entropy, securing attentional resources, and structuring memetic coherence in distributed cognitive ecologies. Through extensive theoretical analyses, historical and anthropological case studies, mathematical formulations, and cross-disciplinary syntheses, the essay reframes virtues as emergent stabilizers. The expanded appendix includes stochastic models of salience-driven trait persistence, contrasts with reproductive fitness, empirical validation strategies, and philosophical extensions reframing evolution as a cognitive-ecological process. Implications for neurodiversity, cultural pluralism, and educational policy are explored, supported by computational models such as Fokker-Planck equations, Bayesian active inference, and 2-categorical structures.

1 Introduction: The Limits of Adaptationist Evolutionary Psychology

1.1 Background and Critique

Geoffrey Miller's theory, articulated in *Virtue Signaling: Essays on Darwinian Politics and Free Speech* (Miller, 2019), posits that moral and cultural behaviors, such as displays of kindness, bravery, or eloquence, evolved as courtship signals under sexual selection, building on Zahavi's handicap principle (Zahavi, 1975). These traits, being costly and difficult to fake, serve as reliable indicators of genetic fitness to potential mates. This perspective extends Miller's earlier work in *The Mating Mind* (Miller, 2000), which frames cognitive and cultural capacities as ornamental displays. However, adaptationist frameworks suffer from significant limitations, including post-hoc reasoning and lack of predictive power. As Gould and Lewontin argue, such models risk becoming Panglossian, retroactively justifying any trait as a fitness-enhancing adaptation without falsifiable criteria (Gould & Lewontin, 1979).

This monograph, *Low-Entropy Attractors*, proposes an alternative paradigm, grounded in Attentional Cladistics and Relativistic Scalar Vector Plenum (RSVP) Theory, which reconceptualizes cognition as a process of navigating relevance fields—dynamic, high-dimensional spaces of semantic and percep-

tual cues. Virtues and cultural norms are framed as low-entropy attractors within attentional ecosystems, selected for their capacity to reduce cognitive and social entropy, secure resources, and foster group coherence, rather than solely enhancing reproductive success. This model integrates insights from evolutionary psychology, semiotics, cognitive science, anthropology, and philosophy, drawing on thinkers such as Foucault (power and discourse), Merleau-Ponty (embodied cognition), Bateson (cybernetic recursion), Simondon (individuation), and Whitehead (process philosophy).

1.2 Objectives and Structure

This essay pursues four objectives: (1) to critique adaptationist accounts of virtue signaling, (2) to develop a field-theoretic model of cognition through Attentional Cladistics and RSVP Theory, (3) to explore theoretical implications for neurodiversity and cultural dimensions, and (4) to propose practical applications for educational and cultural policy. The structure is as follows:

- Section 2 introduces Attentional Cladistics and Relevance Activation Theory, framing attention as an evolutionary process of cognitive strategy transmission.
- Section 3 elaborates RSVP Theory, modeling cognition as navigation through scalar-vector entropy fields, supported by computational and mathematical frameworks.
- Section 4 examines cultural and neurocognitive implications, addressing speech norms, cultural diversity, and neurodiversity.
- Section 5 analyzes memetic dynamics and semiotic coherence, reframing virtues as cultural stabilizers.
- Section 6 concludes with a practical framework for applying RSVP Theory to education and cultural policy, alongside future research directions.
- The Appendix provides advanced mathematical models, empirical validation strategies, and philosophical extensions, incorporating derived stacks and 2-categorical structures.

1.3 Case Study: Polynesian Navigation

Historical examples of high-risk behaviors, such as Polynesian navigators undertaking perilous voyages across the Pacific, illustrate the limitations of adaptationist models (Finney, 1994). These navi-

gators earned intense social salience—admiration, resources, and cultural memory—yet their actions did not clearly enhance reproductive success. Instead, their feats stabilized group identity and resource distribution, suggesting that salience-driven survival, not mating display, drives trait persistence. This case frames virtues as low-entropy attractors within attentional ecosystems.

1.4 Theoretical Context

The critique aligns with Gould and Lewontin's rejection of adaptationist narratives (Gould & Lewontin, 1979) and Foucault's analysis of discourse as a constraint on meaning (Foucault, 1971). It also draws on Bateson's cybernetic theory, where recursive feedback loops generate emergent patterns (Bateson, 1972), and Simondon's individuation, where entities emerge through relational processes (Simondon, 1992). These perspectives challenge Miller's reproductive focus, emphasizing survival-driven attentional dynamics.

2 Attentional Cladistics

2.1 Conceptual Framework

Attentional Cladistics posits that organisms evolve and transmit attentional strategies—patterns of cue selection, memory prioritization, and behavioral coordination—across generations, analogous to phylogenetic cladistics (Dennett, 1995). These strategies determine which environmental or social cues are salient, how they are integrated into decision-making, and how they shape cultural dynamics. Relevance Activation Theory extends this framework by conceptualizing attention as a navigational process within dynamic semantic and perceptual fields, driven by survival imperatives:

- **Resource access:** Salient behaviors, such as storytelling or altruism, secure access to food, shelter, or knowledge.
- **Risk reduction:** High-visibility individuals gain group protection, minimizing personal vulnerability.
- **Cooperative niches:** Attentionally coherent behaviors enable participation in distributed cognitive systems.
- **Social memory:** Salient acts integrate individuals into cultural narratives, ensuring long-term survival.

Unlike Miller's sexual selection model (Miller, 2019), virtues are framed as attentional strategies that stabilize group dynamics, reducing entropy in cognitive and social ecologies (Bateson, 1972).

2.2 Theoretical Underpinnings

Attentional Cladistics integrates several foundational perspectives:

- Bateson's cybernetics: Recursive feedback loops generate emergent patterns, with attention as a meta-pattern shaping behavior (Bateson, 1972).
- Vygotsky's sociocultural theory: Cultural tools, such as language and norms, scaffold attentional strategies (Vygotsky, 1978).
- Merleau-Ponty's phenomenology: Embodied attention is a relational process, navigating sensory and social fields (Merleau-Ponty, 1945).
- Dennett's memetics: Attentional strategies propagate as memes, selected for their salience within cultural systems (Dennett, 1995).

This framework challenges adaptationist reductionism, positioning virtues as emergent properties of attentional ecosystems rather than direct products of reproductive pressures.

2.3 Case Studies

- Melanesian kula exchanges: Anthropological evidence of gift-giving in Melanesian societies illustrates attentional cladistics (Malinowski, 1922). Participants gain salience through reciprocal gifts, securing social bonds and resources without direct reproductive benefits, reducing group entropy and aligning with Vygotsky's mediated development.
- Medieval guilds: Craft guilds in medieval Europe enforced behavioral norms, such as honesty and skill, enhancing group salience and economic stability (Epstein, 1991). These norms functioned as attentional strategies, stabilizing cooperative niches.

2.4 Cross-Disciplinary Connections

Attentional Cladistics connects to several theoretical domains:

- Foucault's discourse analysis, where attention shapes power relations through discursive constraints (Foucault, 1971).
- Treisman's feature integration theory, which frames attention as a mechanism for binding disparate cues into coherent percepts (Treisman & Gelade, 1980).
- Simondon's theory of individuation, where attentional strategies emerge through relational processes within ecological systems (Simondon, 1992).

3 RSVP Theory

3.1 Conceptual Framework

Relativistic Scalar Vector Plenum (RSVP) Theory models cognition as navigation through a high-dimensional semantic field, capturing the dynamic interplay of scalar and vector components in cognitive and cultural systems. The theory defines:

- Scalar fields ($\Phi : M \rightarrow \mathbb{R}$): Encode local entropy density or affective urgency, quantifying unpredictability in cognitive or social contexts.
- Vector fields ($\vec{v} : TM \rightarrow TM$): Represent directional flows of attention, action, or social influence, guiding agents toward low-entropy states.
- Entropy descent: Achieves relevance smoothing, reducing uncertainty through coherent behavioral patterns.

Virtues are conceptualized as low-entropy attractors, stabilizing group dynamics. For instance, acts of honesty reduce unpredictability in social interactions, functioning as phase-stabilizing operations within the semantic field (Friston, 2010).

3.2 Mathematical Formulation

Let M be a smooth manifold representing semantic space. The entropy gradient is defined as:

$$\nabla\Phi(x) = \left(\frac{\partial\Phi}{\partial x^i} \right) \in T_x^*M,$$

indicating the direction of greatest cognitive urgency. The attentional vector field is:

$$\vec{v}(x) = -\nabla\Phi(x) + \vec{a}(x),$$

where $\vec{a}(x)$ incorporates cognitive inertia or social constraints. The agent's trajectory $\gamma : [0, T] \rightarrow M$ satisfies:

$$\frac{d\gamma}{dt} = \vec{v}(\gamma(t)).$$

The action functional for relevance navigation is:

$$S[\Phi, \gamma] = \int_0^T \left(\frac{1}{2} g_{ij} \dot{\gamma}^i \dot{\gamma}^j + \Phi(\gamma(t)) \right) dt,$$

where g_{ij} is a cognitive metric tensor encoding the perceived cost of attentional shifts. Virtue fields $\mathcal{V}(x)$ are regions where:

$$\Delta\Phi(x) < 0 \quad \text{and} \quad \text{div}(\vec{v})(x) < 0,$$

acting as attractors for attentional convergence.

3.3 Computational Models

RSVP Theory integrates with computational frameworks:

- Fokker-Planck equations: Model the probabilistic evolution of attentional flows:

$$\frac{\partial p}{\partial t} = -\nabla \cdot (p\vec{v}) + D\Delta p,$$

where $p(x, t)$ is the probability density of attentional states, and D is a diffusion coefficient capturing noise (Risken, 1989).

- Bayesian active inference: Frames cognition as minimizing free energy, aligning with entropy descent (Friston, 2010). Agents update beliefs to reduce surprise, mirroring virtue-driven coherence.
- Monte Carlo simulations: Model convergence to virtue fields, incorporating noise and topological constraints to simulate cultural variations.

3.4 Case Studies

- Medieval chivalry: Knightly honor stabilized social hierarchies through constrained behaviors, reducing entropy and fostering trust (Keen, 1984).
- Inuit cooperative hunting: Shared hunting practices in Inuit communities aligned attention, ensuring equitable resource distribution (Wenzel, 1991).

3.5 Taxonomy of RSVP Components

The table below summarizes RSVP components, their roles, and intersections across theoretical frameworks.

Component	Description	Thinkers	Intersections
Scalar Field	Entropy density, urgency	Bateson, Friston	Cognitive predictability
Vector Field	Attentional flow direction	Merleau-Ponty, Deleuze	Navigational coherence
Entropy Descent	Relevance smoothing	Vygotsky, Onsager	Group stabilization
Virtue Field	Low-entropy attractors	Foucault, Simondon	Memetic coherence

Table 1: Taxonomy of RSVP Components

- Cognitive predictability: Scalar fields align with Bateson's feedback loops and Friston's free-energy minimization, reducing uncertainty in cognitive processes.
- Navigational coherence: Vector fields connect to Merleau-Ponty's embodied cognition and Deleuze's rhizomatic flows, guiding action within semantic spaces.
- Group stabilization: Entropy descent resonates with Vygotsky's sociocultural mediation and Onsager's statistical mechanics, fostering collective coherence.
- Memetic coherence: Virtue fields align with Foucault's discursive power and Simondon's individuation, stabilizing shared meaning.

3.6 Cross-Disciplinary Connections

RSVP Theory integrates several theoretical perspectives:

- Bateson's cybernetic feedback loops, where constraints generate systemic coherence (Bateson, 1972).
- Deleuze's rhizomatic networks, emphasizing non-hierarchical flows within cognitive and cultural systems (Deleuze & Guattari, 1987).
- Onsager's statistical mechanics, providing a foundation for modeling entropy dynamics in cognitive fields (Onsager, 1944).

4 Cultural and Neurocognitive Implications

4.1 Speech Norms and Neurodiversity

Miller argues that restrictive speech norms disadvantage neurodivergent individuals, who may struggle to perform fluent social signaling (Miller, 2019). RSVP Theory reframes this as a distortion of relevance fields, where normative codes introduce asymmetries that increase cognitive entropy for non-conforming agents. For example, autistic individuals may prioritize different attentional cues, navigating relevance fields via alternative vectors (Baron-Cohen, 2008). Suppressing these vectors reduces cognitive diversity, undermining group resilience and adaptability.

4.2 Cultural Diversity as Topological Richness

Cultural diversity represents topological richness in the semantic field, with each culture tracing unique paths through the entropy landscape. Standardizing cultural norms, as Miller's framework implicitly suggests, flattens this topology, reducing adaptive flexibility (Appadurai, 1996). RSVP Theory advocates preserving diverse navigational strategies, aligning with Vygotsky's sociocultural mediation, where cultural tools scaffold cognition (Vygotsky, 1978).

4.3 Case Studies

- Navajo storytelling: Oral traditions embed ecological and social knowledge in narrative structures, reducing entropy by aligning community attention (Basso, 1996).
- Sufi poetry: Mystical poetry in Sufi traditions stabilizes communal attention, fostering coherence and shared meaning (Schimmel, 1975).

4.4 Cross-Disciplinary Connections

This section integrates several perspectives:

- Foucault's analysis of discursive power, where norms shape attentional fields through regulatory mechanisms (Foucault, 1971).
- Merleau-Ponty's embodied cognition, emphasizing sensory navigation as a foundation for cultural expression (Merleau-Ponty, 1945).
- Baron-Cohen's neurocognitive studies of autism, highlighting alternative attentional strategies in neurodiverse populations (Baron-Cohen, 2008).

5 Memetic Drift and Semiotic Coherence

5.1 Conceptual Framework

Memetic drift describes the evolution of cultural ideas through selective transmission within social systems (Dennett, 1995). In RSVP Theory, memes persist by:

- Reducing local cognitive entropy through predictable patterns.
- Enhancing group-level coherence via shared attentional alignment.
- Establishing stable cue-response patterns that reinforce cultural norms.

Virtues are conceptualized as memetic stabilizers, binding agents in low-entropy circuits of shared meaning. Unlike Miller's view of memes as shadows of reproductive fitness (Miller, 2019), RSVP Theory emphasizes their role in structuring attentional fields for survival-driven coherence.

5.2 Case Studies

- Beowulf: Heroic narratives stabilize group identity through shared salience, aligning attention across generations (Campbell, 1949).
- Modern superhero myths: Contemporary myths, such as superhero narratives, reduce entropy by aligning attention within globalized cultural systems (Eco, 1979).

5.3 Cross-Disciplinary Connections

Memetic drift connects to several theoretical frameworks:

- Dawkins's meme theory, where ideas propagate through salience and imitation (Dawkins, 1976).
- Peirce's semiotics, where signs stabilize meaning through structured relations (Peirce, 1931).
- Whitehead's process philosophy, framing memes as relational events within dynamic systems (Whitehead, 1929).

6 Conclusion: Rewriting Virtue from the Inside-Out

6.1 Synthesis

The RSVP-attentional framework reframes virtue signaling as relevance alignment, driven by survival and coherence. Virtues are low-entropy attractors, stabilizing group dynamics and enabling distributed cognition across diverse contexts. This model avoids the post-hoc pitfalls of adaptationism and offers an inclusive, neurodiverse model of cultural evolution.

6.2 Practical Framework

A practical framework for applying RSVP Theory includes:

- Educational policy: Design curricula that preserve neurodiverse attentional strategies, fostering inclusive relevance fields.
- Cultural policy: Promote pluralism by valuing diverse navigational paths, reducing entropy through cooperative frameworks.
- Personal practice: Develop exercises, such as reflective journaling and narrative mapping, to enhance attentional coherence.

6.3 Future Directions

Future research could explore:

- Agent-based simulations of attentional flows to model cultural dynamics.

- Topological data analysis to map cultural entropy landscapes.
- EEG/fMRI studies to investigate neurodiverse navigational strategies.

7 Appendix: Mathematical and Philosophical Extensions

7.1 Saliency-Driven Trait Persistence

A stochastic model for saliency-driven trait persistence is formulated using a Langevin equation:

$$\frac{dx}{dt} = -\nabla\Phi(x) + \sqrt{2D}\xi(t),$$

where x represents the state of a cultural trait, $\Phi(x)$ is the entropy potential, $\xi(t)$ is Gaussian noise, and D is the diffusion coefficient. This model captures traits persisting through attentional saliency, independent of reproductive fitness.

7.2 Contrast with Reproductive Fitness

Reproductive fitness models optimize a fitness function $F_r(x)$, typically tied to genetic propagation, whereas saliency-based models optimize a saliency function:

$$S_s(x) = \int p(x) \ln \frac{p(x)}{q(x)} dx,$$

where $p(x)$ is the attentional distribution, and $q(x)$ is the environmental baseline. Saliency-driven models prioritize group coherence and resource access over genetic outcomes, offering a quantitative distinction from adaptationist frameworks.

7.3 Empirical Validation and Simulations

Strategies for empirical validation include:

- Agent-based simulations: Use Monte Carlo methods to model convergence to virtue fields, incorporating noise and topological constraints to simulate cultural variations.
- EEG/fMRI studies: Measure attentional flows in neurodiverse populations to validate RSVP predictions regarding alternative navigational strategies.

- Cultural datasets: Analyze historical texts or social media corpora to map entropy landscapes and memetic drift.

7.4 Derived Stacks and 2-Categorical Structures

Derived stacks model semantic fields as higher-categorical structures, capturing topological complexity in cultural systems (Lurie, 2009). A 2-category of attentional flows defines morphisms between agents and fields, formalizing cultural evolution:

$$\mathrm{Hom}(\mathcal{A}, \mathcal{B}) \rightarrow \mathrm{Hom}(\vec{v}_{\mathcal{A}}, \vec{v}_{\mathcal{B}}).$$

This framework generalizes RSVP dynamics, enabling analysis of higher-order interactions in cognitive ecologies.

7.5 Philosophical Extensions

Philosophical extensions reframe evolution as a cognitive-ecological process:

- Whitehead's process philosophy: Virtues are concrescences, stabilizing attention as relational events within dynamic systems (Whitehead, 1929).
- Simondon's individuation: Virtues emerge through relational processes, integrating agents within ecological and cultural fields (Simondon, 1992).

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