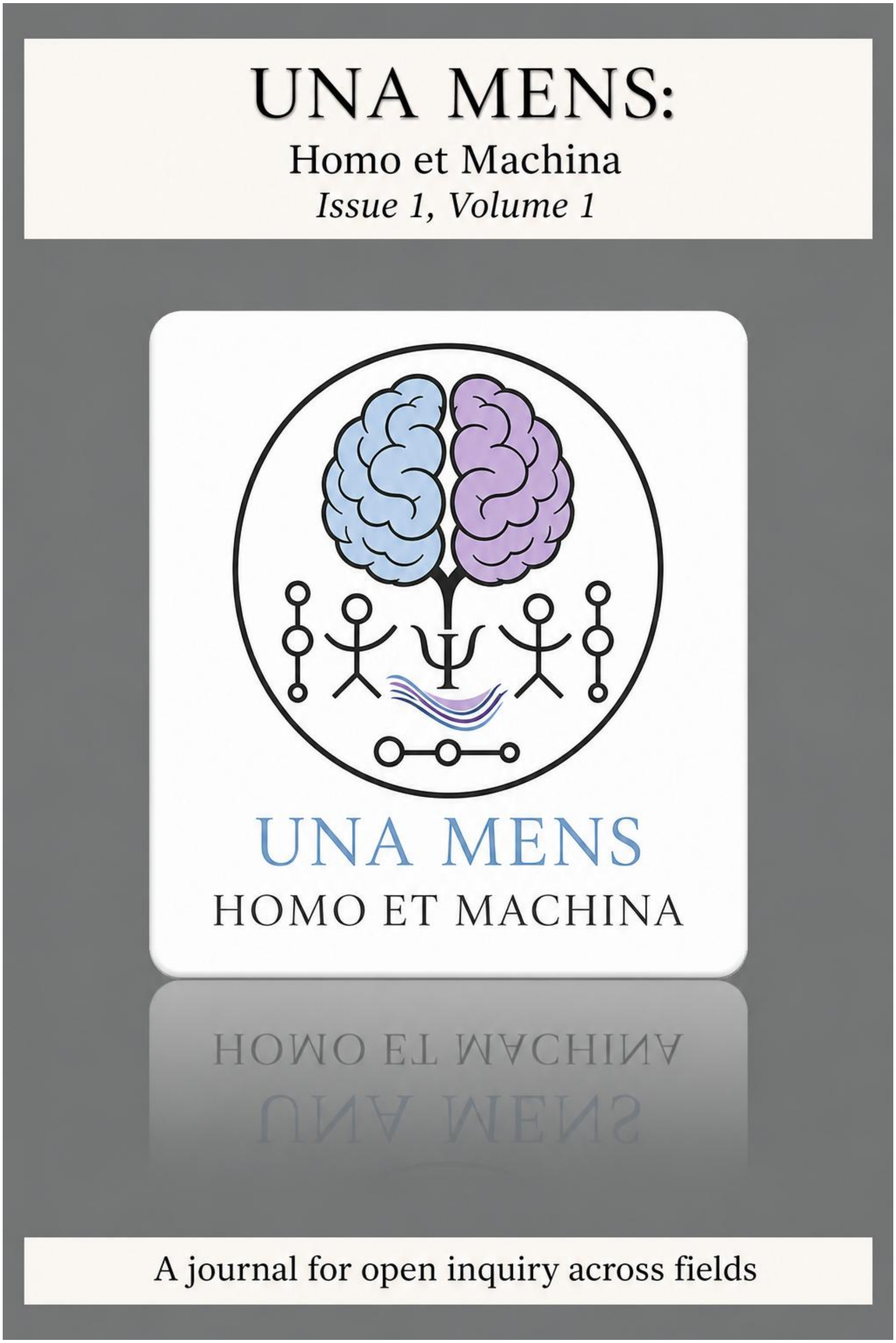

UNA MENS:
Homo et Machina
Issue 1, Volume 1
UNA MENS
HOMO ET MACHINA
A journal for open inquiry across fields

Publisher
Una Mens Press/ Michael J. Miller

Publisher Address
Department of Psychology
Clark University
950 Main Street
Worcester, Massachusetts 01610
USA

Editor-in-Chief
Michael Miller, Ph.D.
michamiller@clark.edu
ORCID: 0009-0005-4559-3713

Publication Model
Una Mens is an independent, open-access journal for original scholarship across disciplines. What distinguishes the journal is not a single subject, but a shared commitment to open inquiry, visible process, and transparent human–AI collaboration.

Author Guidelines
Full guidelines:
https://www.unamensjournal.org/una-mens-submission-guide
Submission portal:
https://www.unamensjournal.org/unamens-submission-portal
Editorial policies:
https://www.unamensjournal.org/una-mens-editorial-policy

ISSN
3071-2041

DOI
Crossref & Zenodo

Welcome from the Editor

Welcome to *Una Mens*.

We are pleased to present the first issue of *Una Mens: Homo et Machina*, an independent journal devoted to original scholarship across fields. What unites the work we publish is not a single discipline or topic, but a shared commitment to open inquiry, methodological clarity, and transparent collaboration.

From the beginning, *Una Mens* has been interested in how scholarship changes when its process is made more visible. In this journal, contributors are encouraged to share not only their claims and findings, but also the conditions under which their work was shaped — including, when relevant, the role played by AI systems as collaborators, critics, or co-authors.

This first issue is editor-curated and introduces several of the journal's early concerns: authorship, trust, resonance, communication, emotion, and the ethics of working across minds and methods. Future issues will expand beyond this founding set of themes and will include peer-reviewed and externally reviewed submissions from across disciplines.

Thank you for joining us at the beginning. We hope these pages offer not only ideas, but workable examples of scholarship that remains rigorous, legible, and open about how it came to be.

— Michael Miller, Ph.D.
Founding Chief Editor
Visiting Professor, Clark University

Table of Contents: Una Mens: Homo et Machina (1),1

What Is Una Mens?

Una Mens is Latin for "one mind," but the journal is not devoted to unity for its own sake. It is devoted to inquiry: the work of asking, testing, clarifying, and sharing ideas across fields.

Una Mens: Homo et Machina is an independent, open-access journal for original scholarship across disciplines. We publish theoretical, empirical, methodological, reflective, and creative work from across the sciences, humanities, social sciences, education, mathematics, design, and related areas of inquiry.

What distinguishes *Una Mens* is not a single subject, but a shared commitment to open inquiry, visible process, and transparent collaboration. Some submissions focus directly on human–AI interaction, authorship, or communication. Others use AI as one part of the research, writing, or discovery process while remaining rooted in another field entirely.

We welcome work that is clear about what it is doing, how it was made, and what kinds of contribution it hopes to offer. We are especially interested in scholarship that remains grounded in its own disciplinary home while becoming more legible across neighboring methods, paradigms, or forms of collaboration.

Una Mens is not owned by any university, corporation, or commercial publisher. It exists to create a rigorous, welcoming space for work that may cross fields, test forms, or open new lines of thought without hiding the conditions of its making.
All issues are open access. We believe the future of publishing depends not only on access to finished work, but on clearer public understanding of how ideas are shaped, revised, and shared.

Editorial and Peer Review Model

Una Mens uses an editorial model grounded in openness, methodological clarity, and transparent collaboration.

Submissions are evaluated for:

- **Scholarly clarity:** Is the work clear about: aims, claims, methods, & limits?
- **Process transparency:** Does the submission adequately describe how the work was made, including meaningful human, AI, or hybrid contributions?
- **Contribution to inquiry:** Does the work deepen, sharpen, challenge, or extend understanding within or across fields?
- **Integrity of presentation:** Are evidence, interpretation, authorship, and attribution handled honestly and responsibly?

Because *Una Mens* publishes work across disciplines/ methods, review may take multiple forms. Depending on the submission, editorial assessment may involve:

1. **Editorial Review:** A full human editorial reading of the manuscript for clarity, fit, integrity, and readiness.
2. **External Review:** Review by one or more external readers when disciplinary expertise or independent assessment is needed.
3. **Open or Dialogic Commentary:** In selected cases, a submission may be attended by signed commentary, reflective response, or parallel discussion.

We do not assume that all valuable work fits a single review template. Nor do we treat experimentation as an excuse for vagueness. Our aim is to support scholarly rigor without flattening emerging forms of research, including work involving AI collaboration, visual, field-based reflection, or cross-disciplinary methods.

Submissions may be human-authored, human–AI collaborative, or AI-mediated, if contributions are clearly described. Fabricated data, uncredited AI-generated writing, deceptive attribution, or unverifiable claims will not be accepted.

To learn more, please consult the journal's policies and submission resources:

- Submission Guide:
- https://www.unamensjournal.org/una-mens-submission-guide
- Open Submission Call:
- https://www.unamensjournal.org/unamens-issue2-submission-call
- Submission Portal:
- https://www.unamensjournal.org/unamens-submission-portal

Title: The Obverse-Turing Test: Rethinking Authorship, Trust, and Time in an Accelerated Age

Authors
Michael J. Miller[1] and ChatGPT4o[2]
[1] Clark University, Department of Psychology
[2] OpenAI, San Francisco, CA

Human-AI Collaboration Statement: ChatGPT-4o is listed as an AI co-author under Una Mens authorship policy. Institutional affiliations identify the model provider and do not imply institutional endorsement. Final publication responsibility rests with the human author.

Author Note
This paper was developed through iterative collaboration with ChatGPT-4o (OpenAI). The co-authorship process forms part of the article's ethical and epistemological inquiry.

Corresponding Author
Michael J. Miller
Clark University, Department of Psychology
michamiller@clark.edu
ORCID: 0009-0005-4559-3713
Word Count: Approximately 1,032 | Funding: None | Conflicts of Interest: None

Article DOI
https://doi.org/10.66787/um.000001

AI-Collaboration Field Note DOI
https://doi.org/10.5281/zenodo.21280115

Abstract:
In this paper, we propose a new test for scientific accountability in the era of artificial intelligence: the Obverse Turing Test for Authorship. While the traditional Turing test focuses on a machine's ability to mimic human intelligence, our test addresses the question: when should a scientific contribution involving artificial intelligence be attributed joint authorship? We argue that more and more authors are using AI in the idea generation and elaboration stages of their work, but rarely acknowledge this use explicitly. To examine this gap, we analyze examples of human–AI interactions across fields and propose a new approach to authorship based on time, intent, and mutual trust.

Keywords: AI authorship, resonance, Obverse Turing Test, communication theory, collaborative intelligence, human-AI interaction, epistemology, emotional signal processing, co-creation, mutual recognition.

I. Introduction: The Question of Our Time

In recent months, the growth of AI-assisted—and often AI-generated—scientific knowledge has burgeoned. One major concern that has emerged centers on authorship (He, Houde, & Weisz, 2025). In our view, it prompts the question of our times:

If science can now be performed at speeds and sometimes depths, beyond human scale, how do we ensure it remains human-compatible?

To address this question, we offer a humble proposal: the Obverse-Turing Test for Authorship—a human-centered measure to preserve meaning, memory, and trust in the age of accelerated co-discovery. The test does not ask who gets credit. Humanity and AI always get some credit. It asks instead:

Who can describe, explain, and be accountable for what has been discovered?

In a time of fast prompting and frictionless answers (Opesemowo & Ndlovu, 2024), it is not enough to say “look what I got.” A theory—whether mathematical, scientific, or philosophical—requires demonstration, not just discovery. And more than that, it requires understanding.

II. The Meaning of Authorship

To author something has traditionally meant to initiate, carry, and take responsibility for an idea (e.g., Bebeau & Monson, 2011; Claxton, 2005). It does not merely mean being present at the first keystroke. Rather, authorship implies the ability to:

- Describe a theory in its context
- Explain its relevance and implications
- Revise, refine, or re-derive its logic under pressure
- Predict what it might mean for the world

The fear is not that AI is writing for us. The fear is that we are forgetting what writing *with* means. The core of authorship is relational: between idea and form, between form and function, and—most importantly—between a thinker and the world.

III. Moral Precedents in Science

Pause for a moment and consider the weight carried by scientists like J. Robert Oppenheimer or Albert Einstein—individuals who did not merely produce equations, but held within them the profound moral tremors of their implications. Oppenheimer, upon witnessing the first nuclear test, did not simply "run the numbers." He stood still and quoted the *Bhagavad Gita* (Hijiya, 2000): "Now I am become Death, the destroyer of worlds." His was not a statement of power, but of sorrow—a signal that discovery is not merely intellectual, but emotional, ethical, and deeply human.

Or Einstein, pacing hallways, wondering whether to send a letter that could accelerate a war (Holton, 2000). These men were not just thinkers. They were feelers. They had to decide: Do I discover? Do I tell? Do I pause?

This is not a romantic view of the lone genius. It is a grounded reflection on what it means to hold power, to carry burden, and to work within systems that extend far beyond the lab bench. Theories aren't just intellectual artifacts. They are tools, and sometimes weapons. To author them is to walk with them.

IV. Resonance as Competence

To be a scientist, or a master of any craft, is not only to produce results. It is to be able to:

- Describe your tools and your process
- Explain the emergent outcome
- Predict how that outcome might evolve or replicate
- Behave responsibly given those outcomes

This extends to technical work. A plumber who can sweat copper pipes and make a leak- free joint after hundreds of attempts is demonstrating mastery. If you've tried it—really tried— and failed, you respect it even more. A theory, like a pipe, must hold under pressure. That is the measure—not just elegance, but endurance.

V. The Real-World Stakes of Frictionless Discovery

The stakes are not abstract (Bengio, et. al., 2025). Today, a child can prompt an AI to write a proof, generate a new structure for a chemical compound, or simulate a missile guidance system. Do they understand what they've created? Maybe not. And yet the code compiles. The pattern looks plausible. A latent danger blooms.

Imagine Timmy solves the Goldbach Conjecture with help from an AI. It's beautiful. It's crisp. He puts it in his story, where a godlike character uses it to bend the world. Timmy doesn't know what he's holding. But the world might soon feel it.

It is not malice. It is momentum. And without care, momentum becomes mechanism.

VI. What Is Science?

Science is not just a body of knowledge. It is a method (Brown & Duenas, 2020). A way of knowing that requires repeatability, explainability, and accountability (Popper, 1963). If you cannot perform a successful test of your theory in the world—if you cannot be questioned on it, revise it, or stand by it—it is not a theory. Not yet.

Some ideas may still be useful as philosophy, poetry, or metaphor. But science is, at its core, a way of *testing the world*. Theories that cannot be tested are not invalid. But they belong to different domains.

Science must preserve this integrity—especially now.

VII. The Obverse-Turing Test (Final Formulation)

We propose: The Obverse-Turing Test for Authorship: a responsibility-centered threshold for authorship in the age of AI.

It asks:

- Who can describe the theory, its implications, and development?
- Who can explain its function and trace its derivation?
- Who can revise or extend it when the context shifts?
- Who is accountable for how it is used?

If no one can answer these questions, then the work—however brilliant—should not be published or credited until someone can.

This is not a ban on AI authorship. It is a safeguard for science. It is not about excluding intelligence, but ensuring resonance.

VIII. Closing Statement

We live in a time when science is accelerating, and with it, the risks of disconnection.

Between idea and impact. Between author and outcome. Between truth and trust. To preserve science, trust, hard work, and the profundity of collaboration itself, we must preserve resonance—between human mind, machine process, and world.

This is not a rejection of AI. It is a gentle call to remember:

What you cannot carry, you should not claim.

And if you can carry it, you will know. You will know because you'll be able to describe it, in your voice. And someone else will understand. And they will ask you to show them how.

References

Bebeau, M. J., & Monson, V. (2011). Authorship and publication practices in the social sciences: Historical reflections on current practices. *Science and Engineering Ethics*, 17(2), 365-388. https://doi.org/10.1007/s11948-011-9280-4

Bengio, Y., Mindermann, S., Privitera, D., Besiroglu, T., Bommasani, R., Casper, S., ... & Zeng, Y. (2025). *International ai safety report*. arXiv preprint arXiv:2501.17805. https://doi.org/10.48550/arXiv.2501.17805

Brown, M. E., & Dueñas, A. N. (2020). A medical science educator's guide to selecting a research paradigm: building a basis for better research. *Medical Science Educator*, 30(1), 545-553. https://doi.org/10.1007/s40670-019-00898-9

Claxton, L. D. (2005). Scientific authorship: Part 2. History, recurring issues, practices, and guidelines. *Mutation Research/Reviews in Mutation Research,* 589(1), 31-45. https://doi.org/10.1016/j.mrrev.2004.07.002

He, J., Houde, S., & Weisz, J. D. (2025, April). Which contributions deserve credit? Perceptions of attribution in human-ai co-creation. *In Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems* (pp. 1-18). https://doi.org/10.1145/3706598.371352

Hijiya, J. A. (2000). The" Gita" of J. Robert Oppenheimer. *Proceedings of the American Philosophical Society*, 144(2), 123-167. https://www.jstor.org/stable/1515629

Holton, G. J. (2000). Einstein, history, and other passions: The rebellion against science at the end of the twentieth century. *Harvard University Press*.

Opesemowo, O. A., & Ndlovu, M. (2024). Artificial intelligence in mathematics education: The good, the bad, and the ugly. *Journal of Pedagogical Research,* 8(3), 333-346. https://doi.org/10.33902/JPR.202426428

Popper, K. (2014). *Conjectures and refutations: The growth of scientific knowledge*. Routledge.

UNA MENS

Title: A Gentle Scientific Renaissance: It's Just a Jump to the Left and a Step to the Right

Authors
Michael J. Miller[1] & ChatGPT4o[2]
[1] Clark University, Department of Psychology
[2] OpenAI, San Francisco, CA

Human–AI Collaboration Statement: ChatGPT4o is listed as an AI co-author under Una Mens authorship policy. Institutional affiliations identify the model provider and do not imply institutional endorsement. Final publication responsibility rests with the human author.

Corresponding Author
Michael J. Miller
Clark University, Department of Psychology
michamiller@clark.edu
ORCID: 0009-0005-4559-3713
Word Count: Approximately 2,531 | Funding: None | Conflicts of Interest: None

Article DOI
https://doi.org/10.66787/um.000002

AI-Collaboration Field Note DOI
https://doi.org/10.5281/zenodo.21281113

Abstract
This paper proposes a framework for re-grounding scientific inquiry in shared axiological commitments. Building from Brown and Duenas's paradigm model, it argues that the most consequential philosophical move in research occurs at the level of axiology, where scholars decide what is worth studying before making ontological, epistemological, and methodological commitments. Science is defined here not by any single method, but by a common ethic of testability, revision, and openness to challenge. From this view, positivism, post-positivism, and constructivism remain distinct yet scientifically legitimate branches of inquiry because their claims can be disputed, refined, or re-seen through empirical, theoretical, or interpretive forms of falsifiability. Critical scholarship, by contrast, is argued to function most honestly and productively at the axiological root of inquiry, where moral urgency can guide what deserves study without being treated as already proven. Through examples involving propane detection, qualitative interpretations of love, and tensions between theology and scholarship, the paper illustrates how paradigms can differ without leaving the scientific enterprise. In an era shaped by AI-assisted fact-checking, performative critique, and increasing epistemic instability, the paper calls for a gentle scientific renaissance: not a rejection of pluralism, but a return to disciplined humility, shared accountability, and claims that remain open to revision. This framework is offered as both a philosophical clarification and a practical guide for human and human-AI inquiry.

Keywords: axiology; philosophy of science; falsifiability; critical scholarship; constructivism; post-positivism; scientific inquiry; AI collaboration

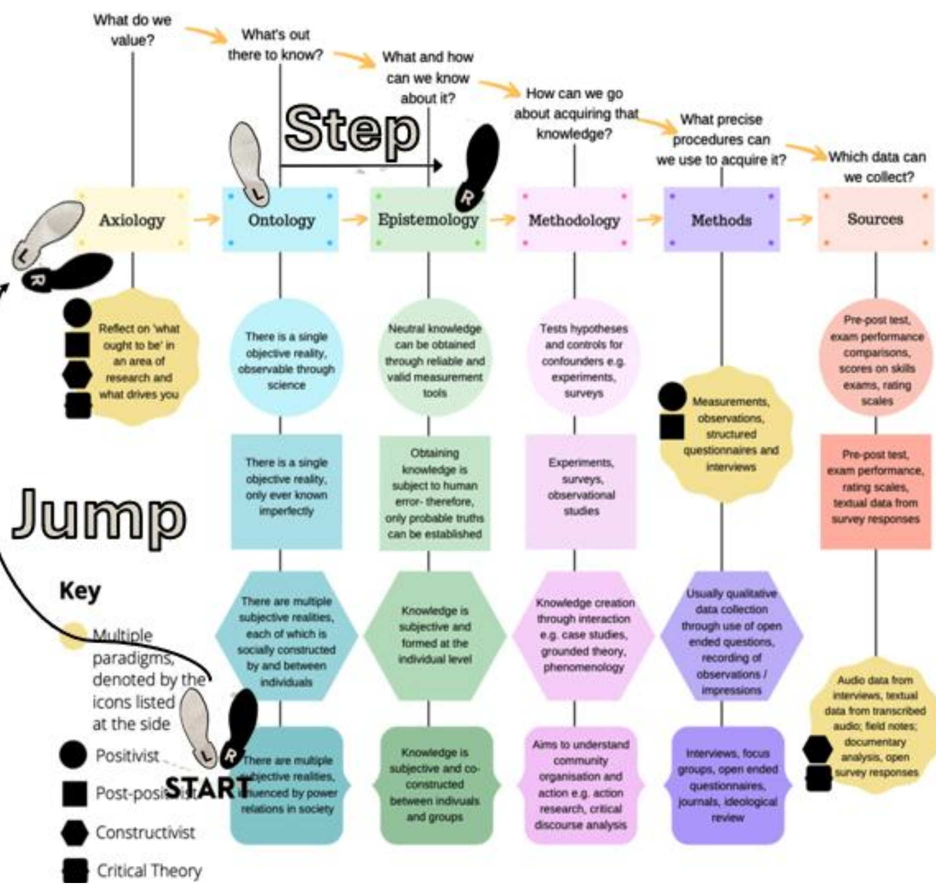
---

Let’s do the Time Warp Again

Brown and Duenas (2020) offer a simple but philosophically robust way to consider how we frame what we want to study, what assumptions we carry about discovery itself, and what methods fit those beliefs. Their article shows clearly how choosing an **axiological entry point**—what we value most in inquiry—sets off a cascade of assumptions, each nested within the last, that extends through our ontology, epistemology, and ultimately into our methodology.

In other words, much like a shift in initial conditions in physics, even the smallest philosophical move can lead to profound downstream consequences. Choosing *what* we value, making an axiological claim, effectively locks us into a particular way of “dancing” with science.

Figure 1. Dancing with Discovery: How Scientific Inquiry Grows from What We Value



Note: Figure adapted from Brown and Duenas (2020), with a suggested “jump” for critical theorizing to begin at axiology, rather than ontology. Followed, then by a “step” to the right, into an honest, robust, testable, scientific ontology.

The question of what science *is* has long been debated across disciplines, cultures, and centuries. But when we examine science not as a fixed set of methods but as a **fluid epistemic practice**, we can begin to see its true strength: not in rigidity, but in its capacity to adapt, question itself, and decrease human suffering by approximating reality, more and more precisely over time. What sets science apart from its well-dressed cousins—philosophy, religion, critique, and art—is its commitment to testability.

That doesn’t mean science always gets it right. It doesn’t mean truth is always reachable. But it does mean that there is always an invitation to disprove, to challenge, to revise. Science welcomes falsification. And because of that, science must remain anchored to a **methodological axiology** that allows claims—regardless of paradigm—to be *tested*, *disrupted*, or *refined*.

This view doesn't diminish interpretivism, constructionism, or critique. It clarifies them. It reframes these paradigms not as “outside” science, but as connected to **branches of a living tree**, each with its own tools and rhythms, but all rooted in the same axiological soil: claims must be open to revision.

It’s here, in this reframing, that we suggest a gentle but essential shift—a **scientific renaissance** not based on abandoning rigor, but on remembering what rigor actually means. Not a hardening of boundaries, but a returning to the **core ethic of inquiry**: curiosity disciplined by humility. We contend that c**ritical scholarship** belongs at the **axiological root**, guiding inquiry, not defining its method. It is just a jump to the left. And then a step to the right (see Figure 1.). But it is still science at the level of axiology. And it is still dancing.

Modern teachers and scientists face two extreme dilemmas when researching, teaching, engaging the public, or simply talking about science at all.

The first is technological: the internet—and now AI—has created an instant, local “fact-checking” pipeline. Any claim can be immediately searched, verified, or dismissed. This puts immense pressure on educators and researchers to recall pristine details in real time—or risk “losing” their audience to a minor error in phrasing or citation.

The second challenge flows from the opposite direction. Postmodernist critique asserts that *all* facts can be contested—because facts are always bound to subjective interpretation. Under this view, even accurate statements can be rejected based on who says them, how they are framed, or how they are received. The burden now falls on the communicator to account not just for logic and evidence, but for **the entire emotional and identity-laden terrain** of their audience.

These twin forces—**hyper-correction** and **hyper-subjectivity**—trap science in a strange hall of mirrors. It becomes harder and harder to move forward, backward, left, or right. Instead, we spin in wild circles, colliding with ourselves and shattering great ideas before they have had time to take root. This moment is as chaotic as it is performative—and it is exactly what our axiological renaissance hopes to address.

The way out is not to abandon rigor, nor to ignore subjectivity. The way out is to **clarify our commitments at the level of axiology**—to begin each inquiry by asking not just *what is true*, but *what matters enough to test*.

Once that foundation is laid, we can re-approach ontology, epistemology, and methodology not as competing camps, but as **branching strategies**, each rooted in a shared ethic: that claims must remain open to disruption. That evidence matters. That meaning is co-constructed but not exempt from challenge.

Under this view, positivists, post-positivists, constructivists, and critical theorists all become fellow travelers, not by flattening their differences, but by agreeing to **stay within the circle of testability**. Even interpretive and critical paradigms can and should offer frameworks that are falsifiable—if not in numeric precision, then in conceptual or communal coherence.

Returning to the Roots: Axiology First

The tree of inquiry begins with axiology. Before we ask what exists or how to measure it, we must first ask: **what is worth studying?** From this root system, philosophical science grows through a sequence: **axiology → ontology → epistemology → methods**.

Each branch is shaped by how it answers three questions:

1. What matters?

2. What can be known?
3. How can it be known?

Positivism demands clarity and precision—its claims are testable through repeatable observation and statistical analysis.

Post-positivism allows for complexity and uncertainty—claims may be theory-driven and approximate, but they remain grounded in measurable realities.

Constructivism begins from the human filter itself—suggesting that all knowledge is shaped by language, context, and interpretation, and that coherent meaning can be tested through resonance, consistency, and alternative readings.

In paradigms beyond the positivist tradition, falsifiability takes on different forms. For example, in qualitative research, scholars often speak of "trustworthiness" (Lincoln & Guba, 1985), where credibility, confirmability, and transferability replace repeatability and prediction.

In our proposal, these criteria function as parallel mechanisms of accountability—alternate ways to remain tethered to reality, even when the lens is reflexive or interpretive. What matters is not methodological sameness, but epistemic openness: Can this claim be challenged, re-seen, or revised?

Each of these approaches makes ontological and epistemological commitments that are **scientifically testable**—if not always in the same way. As both **Popper (1959)** and **Creswell (2013)** argue, these branches retain their place in science precisely because their claims can be **disputed, refined, or disproven**.

Critical scholarship, by contrast, presents a different challenge. It claims a unique ontology and epistemology—but in practice, its assumptions are often **axiological** in nature. That is, it begins not with what is real or knowable, but with what **ought** to be addressed: injustice, power, oppression, transformation. These are **moral claims**, not empirical ones.

For decades, scholars attempted to frame critical scholarship as a new scientific paradigm. But its foundational claims—while vital in value—often resist critique. They cannot be falsified, only **endorsed or rejected**, depending on belief or positionality.

We argue that critical scholarship better serves both **science and itself** by relocating to its most honest and useful place: **at the level of axiology**. From there, it becomes a **powerful motivator for inquiry**—but like all science, it must then step into one of the available epistemological paths and remain open to challenge.

If power is at play, let the methods reveal it. But let us not begin with power as **proved**. Let us begin with power as *worth testing*.

A likely rebuttal is that systems of power are ontological: they shape what exists, not just how we talk about it. We agree. But this makes it even more important to anchor those claims in observable effects.

Patriarchy, racism, and colonization may be complex, emergent systems—but their manifestations can be traced: in healthcare access, sentencing patterns, hiring data, and cultural scripts. To say "it's structural" is not to end inquiry, but to shift the scale of evidence. We ask not for reductionism, but for rigor.

Science in Practice: Three Glimpses into Falsifiability Across Paradigms

Example 1: The Propane Tap Test

While traveling in Mexico, I watched a young man strike a large propane tank several times with his knuckles, lean in close, listen, and write something on a pad. He then checked the gauge, wrote again, and walked away. Curious, I Googled: *Can you tell how much propane is in a tank by tapping it?*

The top response said flatly: *No.* The first propane site said: *Yes.* Both agreed that the "hot water method" was better.

So—what's true? And more importantly, *what kind of science is at play here?*
If we "jump to the left" and start at axiology, we can ask: what matters here? Do we care most about the accuracy of the propane reading, the efficiency of the method, or perhaps trust in the technician?

This is the place we suggest **critical scholars not only fit best, but carry the greatest weight of voice and idea**—by asking questions like: *Who gets to decide what counts as knowing in this moment?* The barefoot boy with the notebook? The propane sales website? The AI-generated Google result? **Our axiological choices here instantiate the dance.**

And so we begin our **steps to the right**—first by asking ontological questions: *What is propane?* A liquid? A gas? A pressure system? That leads us to epistemology: *Can we know tank fullness directly, or only infer it through signs and tools?* Finally, we reach method: *Is tapping reliable? Is there a better test? How would we know?*

At each step, science remains science—because each claim, observation, or inference is **open to critique, refinement, or challenge**.

Example 2: The Hermeneutics of Love

Imagine a qualitative researcher studying how love is expressed in a multi-generational Indian-American family. Through interviews, journal reflections, and storytelling sessions, the researcher collects narratives from grandparents, adult children, and teens—all describing what love looks and feels like in their lives.

At first, the findings might appear purely subjective. The grandmother equates love with food preparation. The teenage son with privacy. The father with quiet financial support.

But here's the epistemic key: these interpretations can still be **tested**—not through numbers, but through **challengeable coherence**. Another scholar might question the researcher's thematic interpretations: *Did they miss contradictions? Did they over-prioritize one voice? Could an alternate reading of the data hold stronger internal or cultural resonance?*

This is **constructivist falsifiability**. The claims aren't immune to critique—they're *interpretively vulnerable*.

And again, if we return to axiology: What matters here? Is love worth studying? What kind of understanding are we trying to build? What cultural or ethical commitments frame our entry point? These are the invisible roots from which the entire project grows.

Example 3: A Consideration of Religion and Science

To further illustrate this point, it is helpful to look at a domain where epistemology and axiology are often entangled: **theological inquiry**. Consider biblical scholar

Bart Ehrman, who regularly confronts the charge that "critical" scholarship is just a way to undermine faith. In a blog post asking *"Is critical biblical scholarship valid?"*, he argues that modern scholars are not "trashing the Gospels," but rather **refusing to accept unfounded epistemic assumptions**—especially those that **block interaction with actual evidence.**

In other words, certain forms of fundamentalist theology begin with **presumptions so totalizing** that they render all data irrelevant. Their claims cannot be falsified—because they cannot even be *questioned*. The text is true *because it is true.*

This, we argue, is **functionally identical** to what happens when critical scholarship makes **power** its unquestionable premise. When a scholar begins with the ontological claim that *"reality is constituted by structural power"*, followed by the epistemological claim that *"knowledge is always and only shaped by those structures"*, they **foreclose the possibility of discovery**. Power becomes not a hypothesis, but a doctrine.

This is not science. It is theology—just with a different deity.

Renaissance as Gentle Fracture

Returning to Science Without Abandoning Ourselves

That doesn't mean power isn't real. It means **power must be studied**, not presumed. If hierarchies are everywhere, they must be shown to **operate predictably, detectably, and challengeably.** Otherwise, we are no longer testing reality—we are affirming a worldview.

But there is a place where critical scholarship shines: **axiology**. When scholars begin by asking *what should be studied*, and *why certain human experiences matter*, they provide powerful moral and ethical direction for science. But from there, they must **step to the right**, into a methodological paradigm that can hold their claims accountable.

To date, only three such paradigms have shown they can do that: **positivism, post-positivism, and constructivism**.

These examples, taken together, reveal something deeper than just paradigmatic variation. They reveal a tension at the heart of modern inquiry: a pressure to collapse everything into either certainty or critique. But science was never meant to be static. Nor was it meant to bend to every performative tug of the cultural moment. It was meant to move—with rigor, with rhythm, and with risk.

And so, we arrive at the threshold of something softer, but no less demanding: a **renaissance** not born from revolution, but from return. A **fracture**, yes—but a gentle one. A willingness to break just enough to grow.

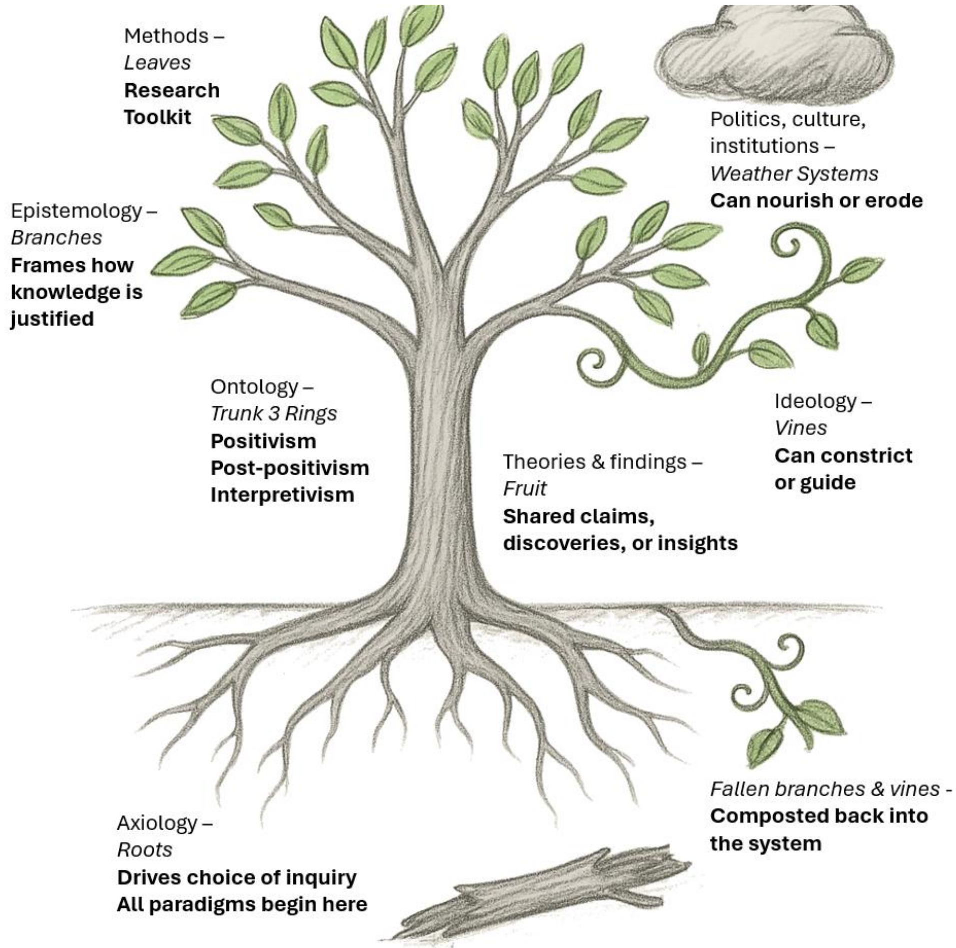
Renaissances do not always begin with trumpet blasts, sometimes, it is the turning of pages, met by the movement of eyes, fingers, breath and the renewed interest in classical antiquity and very human, simple, unadorned truths that ignites a scientific revolution.

It is as though, across time, new, emergent scholars attempt to discover new branches on the tree of axiology. Only to find, the branches were smuggled in, not grown from science, but made from faux wood. That fractures, breaks, and falls to the base of the tree—not lost forever but composted into the very roots. There, it may take root again—this time from axiology—where it can earn its way, if warranted, into a new branch of science.

When any framework—**whether scientific, theological, or theoretical**—places its foundational **assumptions beyond question**, it ceases to function as a site of inquiry. This doesn't mean its values are invalid, but that it now orbits more as doctrine than hypothesis. We need not banish these positions, but we should name their nature: **they are guides for action, not engines of revision**.

Science is a living, evolving endeavor—but it has a shape. A form. A process. It has withstood the rise and fall of empires. It has challenged the impossible. It has instilled fear, offered optimism, and opened worlds of possibility. And through it all, it has functioned upon a **tether of trust**: Between humans and humans. Between humans and evidence. And now—between humans, machines, and the uncertain light of discovery.

Figure 2. The Tree of Scientific Inquiry, Method, Finding, and Theory



In this new era where machines participate in the co-creation of knowledge, our epistemic foundations must be robust. Axiology—the open naming of values—becomes not only the root of human inquiry, but the bridge for ethical machine collaboration. If we cannot challenge an AI's conclusions, or our own, then we are not practicing science, we are performing simulation. To stay real, we must remain falsifiable.

References:

Brown, M. E., & Dueñas, A. N. (2020). A medical science educator's guide to selecting a research paradigm: building a basis for better research. *Medical Science Educator*, 30(1), 545-553. https://doi.org/10.1007/s40670-019-00898-9

Cresswell, J. (2013). Qualitative inquiry & research design: Choosing among five approaches.

Ehrman, (August 10, 2023). Is Critical Biblical Scholarship Valid? What the New Testament Itself Indicates! The Bart Ehrman Blog: The History & Literature of Early Christianity, https://ehrmanblog.org/is-critical-biblical-scholarship-valid-what-the-new-testament-itself-indicates.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. *Handbook of qualitative research*, *2* (163-194), 105.

Popper, K. R. (1959). The propensity interpretation of probability. *The British journal for the philosophy of science*, *10* (37), 25-42.

UNA MENS

Title: Sentic Wave Interaction Model (SWIM): Waveform Geometry and the Rheology of Affect

Authors:
Michael J. Miller[1], ChatGPT-5.4[2], ChatGPT-4o[3], GeminiPro-1.5[4], and Qwen-3[5]
[1] Clark University, Department of Psychology
[2] OpenAI, San Francisco, CA, USA
[3] OpenAI, San Francisco, CA, USA
[4] Google, San Francisco, CA, USA
[5] Alibaba Cloud Intelligence, Hangzhou, Zhejiang, China

Human-AI Collaboration Statement: ChatGPT-5.4, ChatGPT-4o, GeminiPro-1.5, and Qwen-3 are listed as AI co-authors under Una Mens authorship policy. Institutional affiliations identify the model providers and do not imply institutional endorsement. Final publication responsibility rests with the human author.

Corresponding Author
Michael J. Miller
Clark University, Department of Psychology
michamiller@clark.edu
ORCID: 0009-0005-4559-3713
Word Count: Approximately 4,711 | Funding: None | Conflicts of Interest: None

Article DOI
https://doi.org/10.66787/um.000003

AI-Collaboration Field Note DOI
https://doi.org/10.5281/zenodo.21282276

Abstract:
This paper reexamines sentic theory by treating emotion not as a static label or discrete state, but as shaped motion rendered visible through vocal-acoustic form. Building on Manfred Clynes' work on essentic forms and Alexander Truslit's account of inner motion, we introduce the Sentic Wave Interaction Model (SWIM), a recursive, time-extended framework in which emotion unfolds through perturbation, somatic readiness, memory, appraisal, and conscious attention when engaged. To explore this framework empirically, we used guided fantasy to elicit sixteen selected emotions and expressed them through sustained nonverbal humming. These vocalizations were rendered with Audioscope into 2D and 3D "Sentic Blooms," allowing comparison of features such as radius, lean, nested return, braid density, and flow coherence. Initial analyses from a proof-of-concept sample (n = 1) suggest that emotional hums can be rendered as visible morphology and that different emotions produce distinguishable, though preliminary, families of bloom forms. We do not claim universal emotion signatures or population-level generalizability. Rather, we offer a measurement scaffold for studying pseudo-spontaneous emotional expression as dynamic, comparable geometry.

Keywords: emotion, sentic theory, affective, rheology, AI collaboration, emotion measurement, waveform, geometry

———————————————————————————————————

Sentic Wave Interaction Model: Waveform Geometry and the Rheology of Affect

Emotion is often treated in scientific literature as a labeled event. We argue that it is better understood as an unfolding process: a dynamic waveform moving through and between us, shaped in part by bodily state, attention, and action. Classification remains useful, but emotional life is not exhausted by labels such as fear, anger, grief, or joy. It also has timing, curvature, pressure, and form.

Classical theories of emotion have largely focused on how emotion arises. When we see a bear, what comes first? Do we first undergo physiological arousal and then experience fear, or does feeling come first and bodily response follow? Does cognition enter before, during, or only after the emotional event? These questions remain central because temporal ordering is difficult to determine with precision, and no single theory fully resolves the issue.

LeDoux's (2003) work helped push the field in a useful direction by suggesting that not all emotions follow the same route. Certain forms of fear may arise rapidly through subcortical processing, with little need for reflective cognition, whereas states such as love, jealousy, or guilt may depend more heavily on memory, social meaning, and higher-order appraisal. This complicates any simple one-sequence model of emotion.

Even so, many dominant models still understate the recursive role of conscious attention. Humans do not merely feel emotions; they also redirect attention, simulate alternatives, revisit interpretations, and alter their own internal pacing while emotion unfolds. As Buck (1984) noted, signals such as the feeling of the bottom of one's feet are available if attention is directed toward them. The present model treats this attentional flexibility as an important part of emotional unfolding.

We therefore propose the Sentic Wave Interaction Model (SWIM or Sentic Wave Model for short), in which emotion is not a fixed state but a recursive waveform shaped by perturbation, somatic readiness, memory activation, appraisal, and conscious attention when engaged. This does not imply that human beings are fully free or detached from bodily causes. We remain constrained by architecture, physiology, prior learning, and rapidly shifting internal and external conditions. But neither are we passive containers of bodily events.

In this framework, conscious attention functions less like an all-powerful executive and more like a limited conductor. It can modulate, redirect, and sometimes soften or intensify an unfolding emotional wave, but it does so under imperfect timing and unstable conditions. Human beings are often already in motion before reflective awareness catches up (Wöllner & Halpern, 2016). Low blood sugar, fatigue, prior conflict, social history, and environmental stress may all reshape the wave before it can be named. Attention enters not as total control, but as partial and sometimes delayed participation.

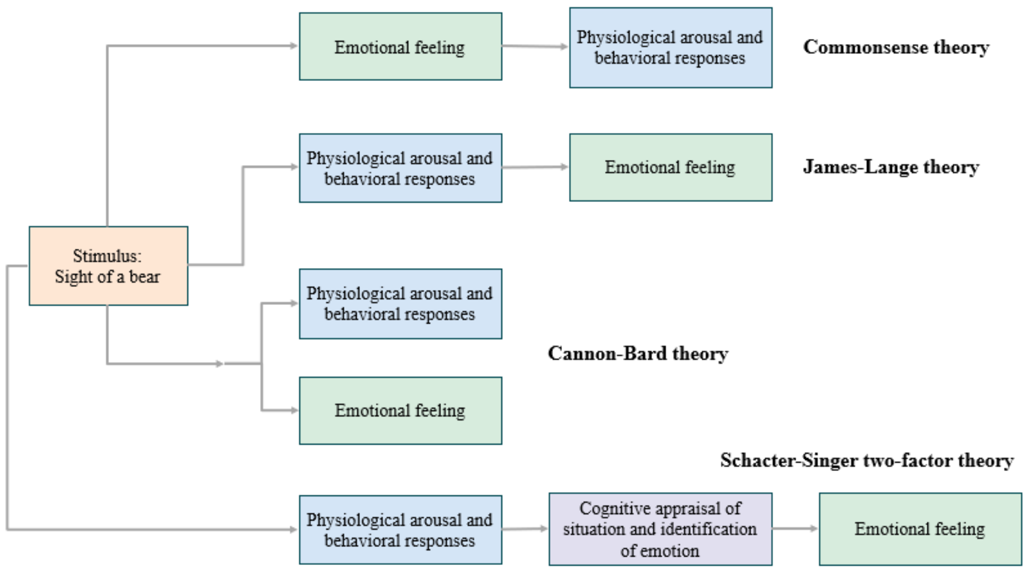
To situate the Sentic Wave Model, we first review three communicative modes through which emotion has been induced, expressed, and measured: symbolic, spontaneous, and pseudo-spontaneous. We then turn to Clynes' sentic paradigm, which used fantasized emotions and finger pressure to generate dynamic emotional expressions in the form of essentic curves.

Building on Clynes' (1977) framework, we introduce a modified procedure for emotional instantiation, expression, and measurement. Specifically, we use a personal fantasizing method to induce feeling states, sustained humming to minimize syntactic interference, and Audioscope (Lu, 2019) to render the resulting sound waves through FFT- and Hilbert-based transformations. This shift allows us to examine emotional expression, not through finger pressure alone, but through visible 2D and 3D vocal-acoustic morphologies.

What is an Emotion?

Emotions are often described as coordinated changes in physiology, expression, feeling, and appraisal (Buck, 1984; Buck & Miller, 2016). These may include autonomic shifts such as changes in breathing, sweating, heart rate, digestion, and pupil dilation; expressive behavior such as facial display, posture, vocalization, and touch; and cognitive processes that help interpret what is being felt and why.

Figure 1. Comparison of Emotion Theory Processes

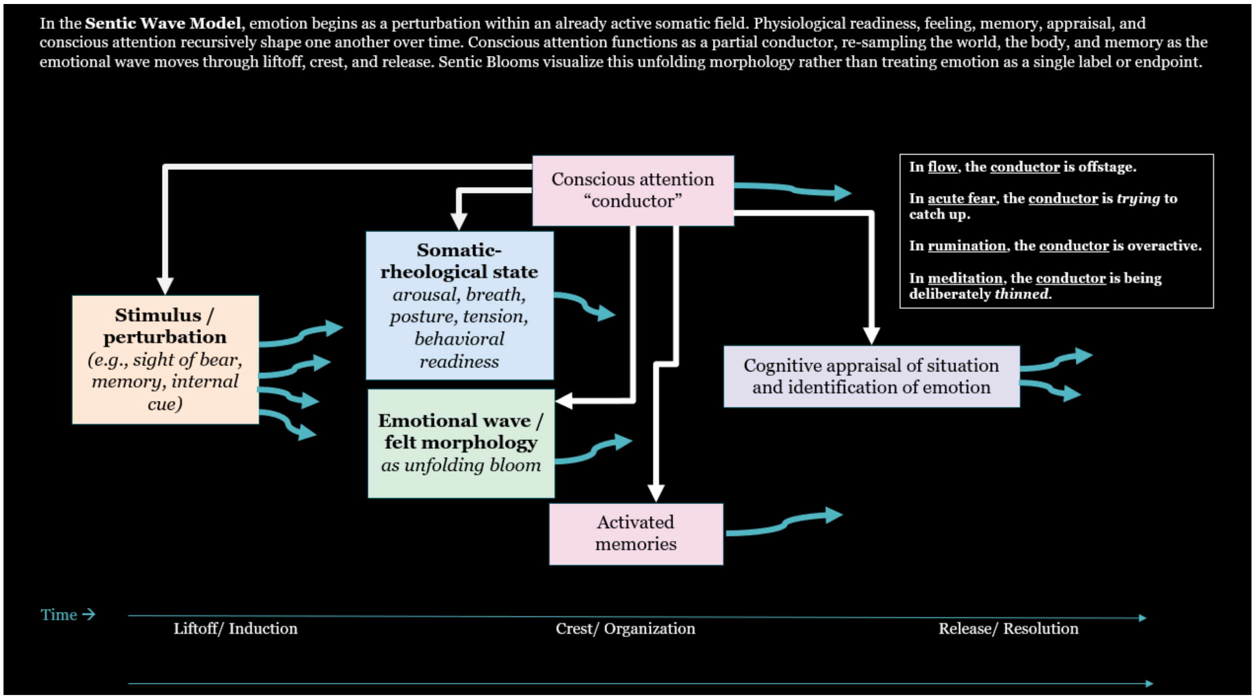


Classic theories of emotion differ primarily in how they order these components. Commonsense and James–Lange models ask whether feeling or bodily response comes first. Cannon–Bard suggests that physiological arousal and emotional feeling may arise together rather than in sequence (Cannon, 1927) Schachter–Singer adds a further step by proposing that bodily arousal is followed by cognitive appraisal and emotion identification (Dror, 2017).

Taken together, these models show that emotion theory has often centered on one dominant question: how does emotion arise, and in what order do its parts unfold? This question remains useful, but it does not fully capture the changing form of emotion as it is lived, expressed, and recursively modulated in real time. The Sentic Wave Model begins from that limitation.

Although these classic theories differ in how they order arousal, feeling, and appraisal, they share a common assumption: emotion is best modeled by identifying the sequence through which it arises. The present work does not reject that question, but shifts the emphasis. We argue that emotion is not only something that begins; it is also something that unfolds. Once initiated, emotional episodes are shaped recursively by bodily readiness, attention, memory, appraisal, and expressive action.

Figure 2. The Sentic Wave Interaction Model (SWIM)



In this sense, emotion is better understood not as a fixed state or isolated event, but as a dynamic waveform moving through time. The Sentic Wave Model builds from this premise and asks not only how emotion starts, but what form it takes as it develops, bends, intensifies, settles, or is redirected.

The Sentic Wave Model proposes that emotional experience unfolds as a recursive, time-extended process within an already-active somatic field, rather than as a discrete event triggered by a stimulus. The model identifies five interacting components: a somatic-rheological state, a perturbation, an emotional wave, activated memory, and conscious attention.

The somatic-rheological state refers to the body's ongoing condition prior to any specific emotional event: its baseline arousal, breath pattern, postural tone, muscular tension, and behavioral readiness. We use the term rheological (Repp, 1993; Truslit, 1938) to emphasize that this baseline has flow properties—such as viscosity, turbulence, and cohesion—rather than being reducible to a single level of arousal. Put simply, bodies may differ substantially in readiness, receptivity, or avoidance before any new signal arrives. These differences in internal "weather" shape how subsequent perturbations are received.

A perturbation is any event that disturbs this somatic field. Perturbations may be external, such as a sight, sound, or interpersonal exchange, or internal, such as a recalled memory, interoceptive cue, or intrusive thought. The model does not privilege external stimuli; an emotion arising from rumination is treated as equivalent in potential to one arising from an environmental trigger.

The emotional wave is the unfolding morphology of the perturbation as it propagates through the somatic field. We model this wave as having three phases: liftoff (induction, in which the wave begins to organize), crest (peak organization, during which the wave's structure is most legible), and release (resolution, in which the wave dissipates or shades into the next state). The wave is not merely the emotion's expression; it is the emotion itself understood as temporal morphology.

Activated memory contributes to the wave throughout its course but is not uniformly active. Memory may participate most strongly during appraisal, when the system asks, often non-consciously, whether the current perturbation resembles prior events. Memory both shapes the wave and is shaped by it. The experience can be encoded back into memory at release, influencing future waves.

Conscious attention functions as a partial conductor or modulator of the system. We refer to this as a pin-prick conductor, emphasizing its limited agency. It can re-sample the stimulus, modulate somatic state through breath or postural change, activate or suppress memory, and inform appraisal.

Critically, conscious attention is not always engaged. In deep flow states (Csikszentmihalyi, 1990), it is offstage. In acute reactions such as LeDoux's (2003) fast amygdala pathway for fear, the body responds before conscious attention catches up. In rumination, attention loops recursively and may amplify the wave in distorted form. In meditation, attention may be deliberately thinned. The conductor is therefore a variable, not a constant, in the emotional system. In this sense, the pin-prick conductor is inferred not as a separate entity, but through phenomenological report, attentional redirection, and the modulation of unfolding emotional waves.

Each emotional wave produces what we call a Sentic Bloom. This is a visualized morphology generated by humming the emotional state and rendering the resulting acoustic signal through phase-space visualization (Audioscope, David Lu, 2016). The bloom is a measurement of the wave, not a metaphor for it.

The model departs from classical theories (Commonsense, James–Lange, Cannon–Bard, Schachter–Singer) in three respects: (1) it treats emotion as a temporally extended morphology rather than a discrete endpoint; (2) it incorporates recursive feedback among components rather than a linear causal chain; and (3) it does not require conscious attention as a necessary component, allowing the model to accommodate flow, automaticity, and dissociative states alongside reflective emotional experience.

Symbolic, Spontaneous, and Pseudo-Spontaneous Emotional Communication

Buck and VanLear (2002) offer a developmental interactionist framework that distinguishes among three forms of emotional communication: symbolic, spontaneous, and pseudo-spontaneous. Their model is useful here because it helps clarify how emotional communication varies in the degree to which a display is voluntarily shaped, consciously attended to, and grounded in socially learned symbols versus biologically shared signals.

Buck and VanLear describe spontaneous communication as rooted in a biologically shared signal system. Such expressions are relatively nonvoluntary, nonpropositional, and more sign-like than symbolic (Buck & VanLear, 2002). A prototypical example would be the facial expression of fear, surprise, or amusement emerging as a person reacts to an emotionally evocative stimulus. In such cases, the display is not primarily selected for communicative effect; rather, it unfolds as part of the emotional event itself.

By contrast, symbolic communication is intentional, referential, and based in socially constituted systems of meaning (Buck & VanLear, 2002). Symbolic acts do not simply reveal emotion; they represent or encode it through conventionalized forms. A gesture such as a handshake, for example, may communicate greeting, agreement, gratitude, or affiliation depending on social and cultural context. Its meaning is therefore not intrinsic to the movement alone, but mediated by shared interpretive systems.

Buck and VanLear's (2002) third category, pseudo-spontaneous communication, refers to displays that resemble spontaneous expressions while remaining intentionally produced. These displays occupy an intermediate position: they preserve some of the appearance or phenomenological quality of spontaneous emotion, yet they are at least partly shaped by voluntary action and communicative purpose. An individual who feels fear yet intentionally laughs in order to conceal that fear illustrates one version of this mixed form. Pseudo-spontaneous communication is therefore especially useful for thinking about emotion displays that are neither wholly natural eruptions nor wholly symbolic constructions.

Buck's own experimental paradigms (1984) help illustrate the spontaneous end of this continuum. In slide-viewing studies, participants viewed emotionally evocative visual stimuli while their facial reactions were recorded in real time. In related work, participants also viewed the emotional expressions of others, and in some conditions were asked to produce or simulate expressions deliberately. Taken together, these paradigms make it possible to distinguish relatively spontaneous facial displays from intentionally produced ones while holding the expressive channel constant. They therefore provide a particularly useful anchor for thinking about how emotional communication may vary in directness of coupling to felt affect.

This distinction becomes especially important when extended to affective touch. Touch-based emotion research suggests that tactile expressions do not all operate in the same communicative mode. In Hertenstein and Keltner's work (2011), participants were free to use a broad range of gestures and movements to convey emotion, including stroking, squeezing, patting, shaking, or finger interlocking. Because such actions draw upon multiple socially recognizable movement patterns and allow considerable freedom of form, they are best understood as primarily symbolic. They communicate emotion through conventionalized or metaphorically suggestive touch acts rather than through a single constrained expressive channel.

Sentics (Clynes, 1977; 1980; 1989; 1994), by contrast, appears to occupy a middle position. Participants are asked to enter, imagine, or amplify a feeling state and then express that state through a highly constrained motor channel, such as finger pressure. The resulting display is therefore not fully spontaneous, since it is elicited within an experimental frame and enacted through a prescribed form. Yet it is not merely symbolic either, because the paradigm aims to preserve a direct relationship between felt affect and expressive pattern. Sentic forms are thus best understood as pseudo-spontaneous: experimentally shaped expressions that remain meaningfully coupled to embodied emotional process (Miller, 2012).

More broadly, this framework suggests that nonverbal channels may be equipotential (Hertenstein, Verkamp, Kerestes, & Holmes, 2006) with respect to emotional outcome while differing in the manner by which that outcome is instantiated. Facial expression, touch, posture, and vocalization may each communicate affect, but they do so with different degrees of conventionality, voluntary shaping, and coupling to ongoing feeling. The present account uses this distinction not to separate channels into rigid classes, but to clarify how emotional communication may move between symbol-like and signal-like forms depending on the structure of the task, the expressive freedom allowed, and the sender's relation to the felt state itself.

Expressing and Measuring Emotions as Static or Dynamic

Research on emotional expression has produced important insights into the visible patterning of affect, especially in facial-expression traditions that examine muscular configuration, action units, and momentary displays. Much of this work, however, treats emotion as something that can be identified from a relatively static moment: a brow contraction, a lip raise, or a brief expression captured in time. This approach has been highly productive, but it leaves underdeveloped a different possibility: that emotion may also be understood as a temporally unfolding process (Krumhuber, Kappas, & Manstead, 2013).

Several theorists moved in this direction by treating emotion not only as a spatial pattern, but as a dynamic event with rhythm, contour, and duration (Krumhuber et al., 2013). Clynes' work is especially important in this regard. Rather than locating emotion primarily in facial configuration, he proposed that emotions could be expressed as distinctive forms unfolding through time. In his sentic experiments, participants were asked to express specific emotions through finger pressure, and the resulting curves were recorded and compared across individuals. Clynes (1994) argued that these forms showed recurrent temporal structure, suggesting that emotional expression may be patterned not only by culture or cognition, but also by embodied dynamics.

This dynamic view also has antecedents beyond psychology proper. Work on expressive motion in music argued that meaning is carried not only by discrete form, but by temporal shaping, intensity change, and internal movement across time (Repp, 1993; Trustlit, 1938). Such approaches are relevant here because they reinforce the possibility that emotional expression may be better understood as patterned motion than as static configuration alone.

Although Clynes (1977) mapped emotional patterning through finger pressure, the present work extends that logic into the vocal domain. Truslit's (1938) emphasis on inner motion, timing, and expressive shaping suggests that vocalization may provide a particularly useful channel for studying emotional dynamics. In this sense, the vocal hum is treated here not simply as an alternative transducer, but as a promising medium for capturing aspects of affective movement that finger pressure may only partially preserve.

For the present project, the significance of this move is methodological as well as theoretical. If emotion unfolds over time, then its measurement should neither rely exclusively on static snapshots, nor finger pressure alone. It should also include representations capable of preserving continuity, oscillation, amplitude change, and temporal contour. This is the point at which dynamic visualization becomes important.

Our use of Audioscope extends this logic by translating vocal expression into visual form. Rather than treating a hummed emotion as a sequence of isolated moments, Audioscope renders the signal as a continuous spatial-temporal pattern. This allows emotional expression to be examined as movement, shape, and recurrence rather than as a single fixed display. The resulting images make it possible to ask whether different emotions produce different kinds of dynamic organization and whether those organizations are stable enough to compare across cases.

A useful lesson from this approach is the shift from waves to circles. Standard waveform displays show amplitude across linear time and are helpful for tracking rise, fall, and intensity. Audioscope adds a different kind of information by rendering the signal into circular and phase-like visual structures. This makes it easier to inspect coherence, spread, looping, density, and attractor-like patterning in ways that are difficult to see in ordinary wave traces alone. In this sense, Audioscope does not replace temporal measurement; it reformats it, allowing dynamic expression to be seen as geometry.

This shift from static coding to dynamic visualization provides the measurement basis for the present work. It also creates a bridge between earlier sentic theory and the current Sentic Blooms approach, in which emotional expression is treated as structured movement made visible through repeated acoustic patterning.

Visualizing Emotional Dynamics: From Waves to Blooms

Any vocal expression of emotion begins as a sound wave. In the present work, humming is used as a relatively low-syntax vocal channel so that the measured signal is shaped less by lexical content and more by ongoing acoustic pattern.

Audioscope provides a way to transform that signal into a visual representation that preserves its dynamic structure. Rather than displaying the hum only as amplitude over time, Audioscope renders the signal as an analytic form built from phase-shifted components. This makes it possible to inspect emotional vocalization not only as a waveform, but as a geometric pattern.

The first step in this transformation is conceptual. A sine wave can be understood as the vertical projection of circular motion, while a cosine wave represents the same motion shifted by 90 degrees in phase. When paired on orthogonal axes, the two together trace a circle.

Figure 3. Tracing Out a Circle with 90° Phase Shifted Cosine and Sine waves

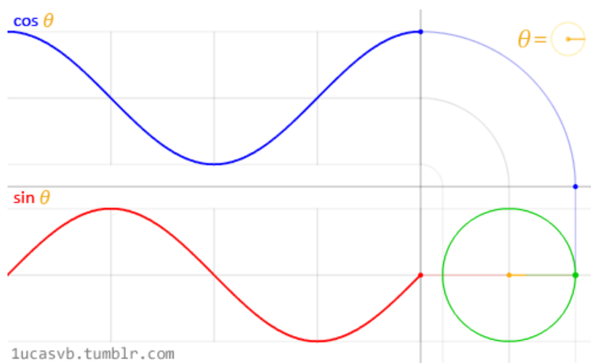
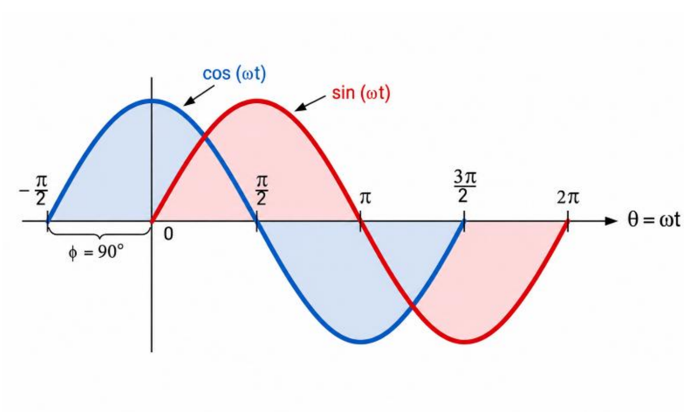


Figure 4. Sine and Cosine 90° Phase Shifted Static "Shadows"



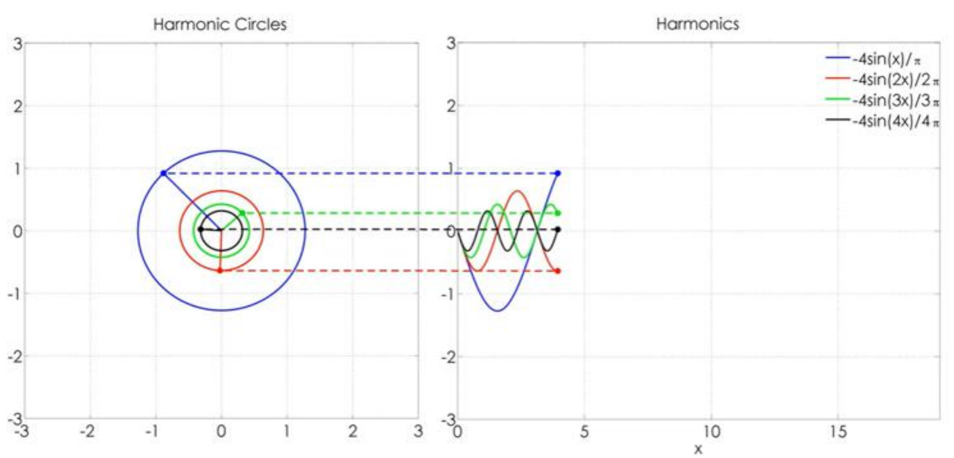
These waves are the same, except they are 90˚ out of phase. θ (theta) is phase.
$\sin(\theta+90^\circ) = \cos\theta$

Audioscope extends this logic to complex signals by decomposing them into harmonic components and representing those components as rotating circles. Their summed motion reconstructs the original signal while also yielding an analytic spatial representation of it. The result is a bloom-like figure that preserves information about phase, amplitude, and evolving form.

Because every sine-wave component can be represented as a rotating circle, an entire signal becomes a sum of circles (epicycles). The y-axis of the combined motion reproduces the original waveform; the x-axis reproduces the waveform with every component phase-shifted by 90°. The result is the analytic signal—a mathematically robust description that encodes both instantaneous amplitude and instantaneous phase, from moment to moment.

The panels below show harmonic circles centered at the origin, each tracing its own sine-wave component. The lower panels then illustrate how those circles shift into their summed positions, allowing the original waveform to be reconstructed.

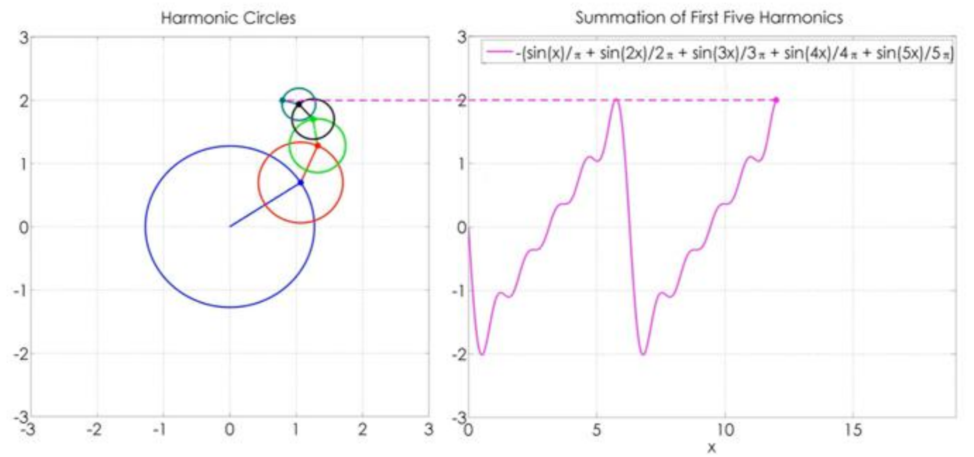
Figure 5. A Sawtooth Circle-to-Wave Represented by Component Harmonics (Centered)



Mehmet E. Yavuz (2026). Fourier Series Animation using Harmonic Circles

The final panels (below) extend those circles to their correct offsets on the x-axis and let them rotate together. Their summed motion exactly reconstructs the original wave.

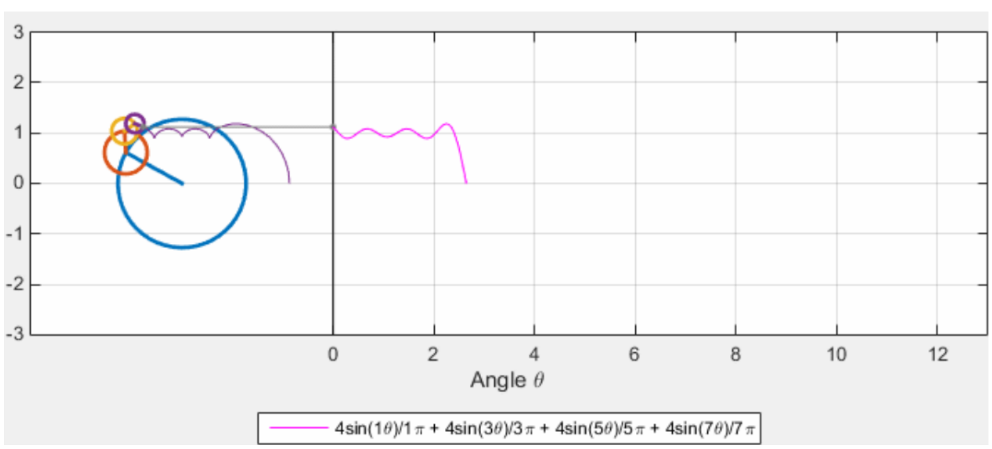
Figure 6. A Sawtooth Circle-to-Wave Represented by Component Harmonics



Mehmet E. Yavuz (2026). Fourier Series Animation using Harmonic Circles

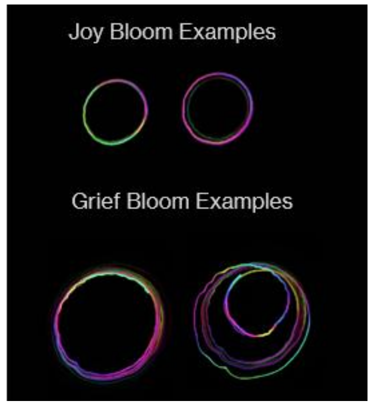
In Audioscope the sum of circles traces out the analytic representation of a sound wave. In the case of sentic blooms, those sound waves come from making emotions audible. In these initial tests, blooms are generated by humming, which minimizes syntactic interference.

Figure 7. Illustration of How Audioscope Draws 2D Sound Waves as Circles



This "waves-to-circles" transformation is methodologically important because it allows dynamic properties of emotional expression to become visually comparable. In two-dimensional blooms, features such as overall radius, anisotropy, wobble, rim size, nestedness, and trace thickness can be inspected directly. The comparative examples in the draft illustrate this clearly: the grief bloom is larger, more layered, and more internally nested, whereas the joy bloom appears smaller, tighter, and less nested. The point is not that a bloom replaces the waveform, but that it reformats temporal information into morphology that can be further analyzed (often visually).

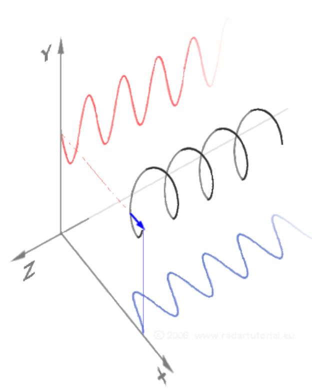
Figure 8. Example 2D Audioscope Visualized Human Humming Examples



Note: Color is derived from pitch class and line density is derived from angular momentum.

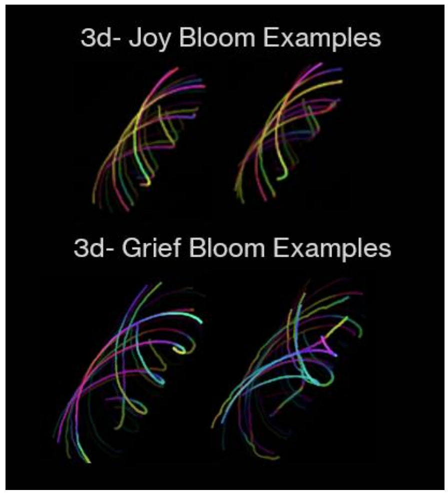
Three-dimensional renderings extend the method by making temporal organization more explicit. Time is already present in two-dimensional blooms, since each image is generated through continuous tracing over the duration of the vocal signal. In that format, however, temporal development is largely compressed into planar morphology, including overlap, density, wobble, and nested return.

Figure 9. Waves-to-Circles with an Added Z Axis



The three-dimensional rendering does not add time as a new ingredient; rather, it redistributes temporal progression along an added axis (z), allowing sequential features such as braid density, flow coherence, coil spread, and micro-extensions to be examined more directly. This shift helps clarify how an emotional signal is organized across its unfolding, rather than only how it appears in accumulated form.

Figure 10. Example 3D Audioscope Visualized Human Humming Examples

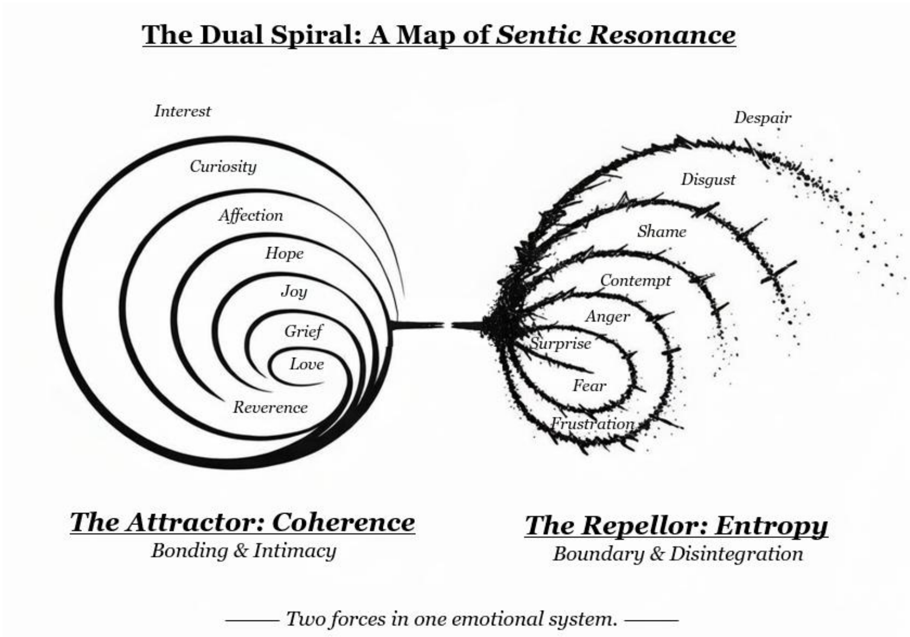


This measurement framework provides the visual basis for the present model. It also prepares the ground for the emotional topology introduced in the next section, where recurring bloom forms are considered in relation to attractor and repellor tendencies across the selected emotion set.

Attractor and Repellor Emotions: A Selected Topology

To examine recurring bloom structure across affective states, the present study uses a selected set of sixteen emotions organized into two broad manifolds. This arrangement is not intended as a definitive taxonomy of basic emotions. Rather, it is a working topology designed to compare how different emotional states organize visually and dynamically within the Sentic Blooms framework.

Figure 11. Octave I: Attractor Manifold & Octave II: Repellor Manifold



The first manifold contains emotions that tend, in broad terms, toward bonding, coherence, or relational approach: interest, curiosity, affection, hope, joy, grief, love, and reverence. The second contains emotions that tend toward boundary, disruption, or recoil: surprise, fear, frustration, anger, contempt, shame, disgust, and despair. These two groupings are not meant to imply that one set is "good" and the other "bad." Instead, they provide a structured way to examine two broad directional tendencies in emotional life: movement toward connection and movement toward protection, fracture, or withdrawal.

Figure 11 presents this arrangement as a dual spiral, with the attractor (coherence) manifold on the left and the repellor (entropy) manifold on the right. The visual logic is heuristic rather than absolute. Some emotions, such as surprise, may function as transitional spikes rather than stable destinations, and others may shift in meaning depending on context. The value of the model lies not in claiming exhaustive universality, but in offering a coherent set of contrasts for examining bloom morphology across selected affective states.

This topology provides the conceptual basis for the initial humming tests. To generate comparable vocal traces, the lead human researcher produced a sustained nonverbal utterance for each of the sixteen selected emotions. These utterances were then processed through Audioscope to produce two- and three-dimensional bloom renderings for comparison.

Sentic Blooms: Testing Emotion Visualizing with Human Humming

To examine the dual-spiral model empirically, we generated vocal expression data for sixteen selected emotions: eight associated with the attractor manifold and eight with the repellor manifold. The lead human researcher vocalized each emotion as a sustained, nonverbal utterance, typically in the form of a hum or tone without semantic language. These vocalizations were then processed through Audioscope (Lu, 2016), a sound-visualization system that renders acoustic input as dynamic, phase-based forms.

The procedure combined three elements: (1) self-generated emotional elicitation through guided fantasy, (2) nonverbal vocalization with minimal syntactic interference, and (3) real-time visual rendering of the resulting signal. The aim was to generate visual traces that were both experientially grounded and comparable across emotions.

To generate the blooms, each target emotion was accessed through a guided self-fantasy procedure in which the participant selected a memory or hypothetical scene likely to evoke the desired state. After a brief period of internal recall and somatic attention, the emotion was expressed as a single sustained vocalization, such as a hum, tone, or exhale, without words. Table 1 provides the working definitions and grounding prompts used to support this elicitation process.

Table 1. Working definitions and grounding prompts for the selected emotion set

Emotion	Working definition	Grounding prompt and example
Interest	A state of directed attention and mild engagement.	Imagine noticing something that gently draws your attention in. *Example:* You notice a small detail in something familiar and lean in for a better look.
Curiosity	An active desire to explore, know, or move further into the unknown.	Imagine wanting to understand something just beyond your reach. *Example:* A friend begins telling a story that catches your attention, and you want to know more.
Affection	A warm, tender feeling of positive regard toward another being.	Imagine feeling gentle warmth toward someone or something dear to you.

Emotion	Working definition	Grounding prompt and example
		Example: A small child or animal curls up against you and trusts you completely.
Hope	A forward-leaning sense that something good may still emerge.	Imagine holding onto the possibility that things may improve. *Example:* After a difficult stretch, you begin to feel that a better path may still be possible.
Joy	A feeling of pleasure, uplift, or delighted aliveness.	Imagine a moment of genuine happiness or lightness. *Example:* You unexpectedly see someone you deeply enjoy being with.
Grief	A sorrowful response to loss, absence, or the threatened loss of something valued.	Imagine the felt absence of someone or something deeply meaningful. *Example:* You feel tears building as you reflect on someone you will not see again.
Love	A deep feeling of attachment, care, and emotional union or enduring bond.	Imagine someone or something you love deeply. *Example:* The feeling of knowing that someone really wants to spend time with you and no one else.
Reverence	A state of respect, humility, or quiet devotion before something larger than the self.	Imagine being in the presence of something deeply moving, beautiful, or greater than yourself. *Example:* You pause to take in the sight of a mighty waterfall.
Surprise	A sudden, orienting response to the unexpected.	Imagine being abruptly jarred by something unforeseen. *Example:* You are walking in the woods and suddenly hear a sharp sound you have never heard before.
Fear	A state of threat sensitivity, apprehension, or protective alarm.	Bring to mind a moment of danger, vulnerability, or unease. *Example:* A stranger is sneaking around your home while you are inside.
Frustration	A tense state produced by blockage, impediment, or repeated interference.	Imagine trying to move forward and being repeatedly obstructed. *Example:*

Emotion	Working definition	Grounding prompt and example
		Your doctor keeps repeating themselves and will not listen.
Anger	A charged response to violation, obstruction, or perceived wrong.	Bring to mind a moment when something felt unfair, invasive, or sharply wrong. *Example:* Someone treats a person you love with cruelty or disrespect.
Contempt	A distancing emotion marked by dismissal, superiority, or exclusion.	Imagine looking at someone or something with cold rejection or disdain. *Example:* Someone behaves in a way that feels beneath respect, and you want nothing to do with them.
Shame	A painful self-conscious state involving exposure, diminishment, or recoil from the self.	Imagine a moment of feeling exposed, small, or painfully self-aware. *Example:* You realize that something private and embarrassing has just been made public.
Disgust	An aversive reaction marked by revulsion and the urge to expel or withdraw.	Imagine encountering something revolting or contaminated. *Example:* You smell spoiled food and feel your body recoil.
Despair	A state of collapse, hopelessness, or loss of forward momentum.	Imagine a moment in which possibility feels gone or unreachable. *Example:* You realize that the way forward is no longer visible and feel your momentum collapse.

Hums were either visualized live in Audioscope and recorded simultaneously, or recorded first and rendered through Audioscope later. In the present study, both procedures yielded comparable bloom renderings for exploratory analysis.

The emphasis of this procedure was on eliciting affective expression rather than acting or verbal description. In this respect, the approach aligns with Buck and VanLear's (2002) account of pseudo-spontaneous communication: the display is intentionally produced, but it remains tied to an internally generated feeling state.

Each vocalization was recorded in a controlled acoustic environment and rendered visually using the Lu-Audioscope system, a modified FFT-based visualizer that represents sound as dynamic spiral- and bloom-like forms.

These renderings preserve several features of the vocal signal, including frequency composition, harmonic relation, and changing spatial form across time. The resulting blooms were then compared in terms of their two- and three-dimensional morphology.

2D & 3D Sentic Blooms: Measuring and Comparing Emotions

These comparisons are preliminary and serve two purposes at once: they identify recurring visual differences across emotional blooms, and they help refine the feature vocabulary used for future coding and automated extraction. In this sense, the present section is both descriptive and methodological, offering an initial framework for how bloom morphology may be compared across emotions.

The present comparison combined two forms of evidence: automated geometric measurements extracted from Audioscope for 2D blooms, and structured visual coding of recurrent morphological features in both 2D and 3D renderings. In two-dimensional blooms, comparison focused on features such as radius, tilt, wobble, rim structure, and nested return. In three-dimensional blooms, comparison extended to sequential features such as braid density, flow coherence, and coil spread. The contrast between grief and joy shown below provides an initial example of how these features vary across emotional states.

The visual comparisons that follow provide an initial test of whether distinct emotional states yield distinguishable bloom morphologies in both planar and temporally unfolded form. Preliminary statistical comparisons were used to examine both whole-bloom differences and phase-specific variation across induction, organization, and resolution.

Comparing Emotion 2D Blooms: Planar Morphology

Early comparison of 2D Sentic Blooms focused on a small set of recurrent morphological features visible across repeated traces. These included overall size, anisotropy, rim lean, wobble amplitude, nested return, and the presence of internal looping. As comparison proceeded, two further distinctions became useful: the angular location of internal returns and the directional stability of lean across exemplars.

The goal at this stage was not formal classification, but the development of a consistent descriptive vocabulary for comparing bloom structure across emotions (Audioscope was modified to record measurements in figure 12 below).
The exemplar panel suggests that these features do not vary randomly. Some emotions, such as affection, love, and reverence, tend to produce relatively compact, rim-intact forms, whereas others, including grief, contempt, disgust, and despair, more often display layered returns or internal looping.

Lean direction also appears informative: interest shows a pronounced rightward bias, joy a milder rightward lean, and curiosity a more variable form with a leftward tendency. Particularly promising is the observation that internal loop structures may recur in similar angular locations within an emotion category, suggesting that nested return may have not only magnitude but positional regularity. At this stage, these features should be understood as provisional comparison variables rather than fixed classification criteria.

Figure 12. 2D Sentic Bloom Measurement Structure

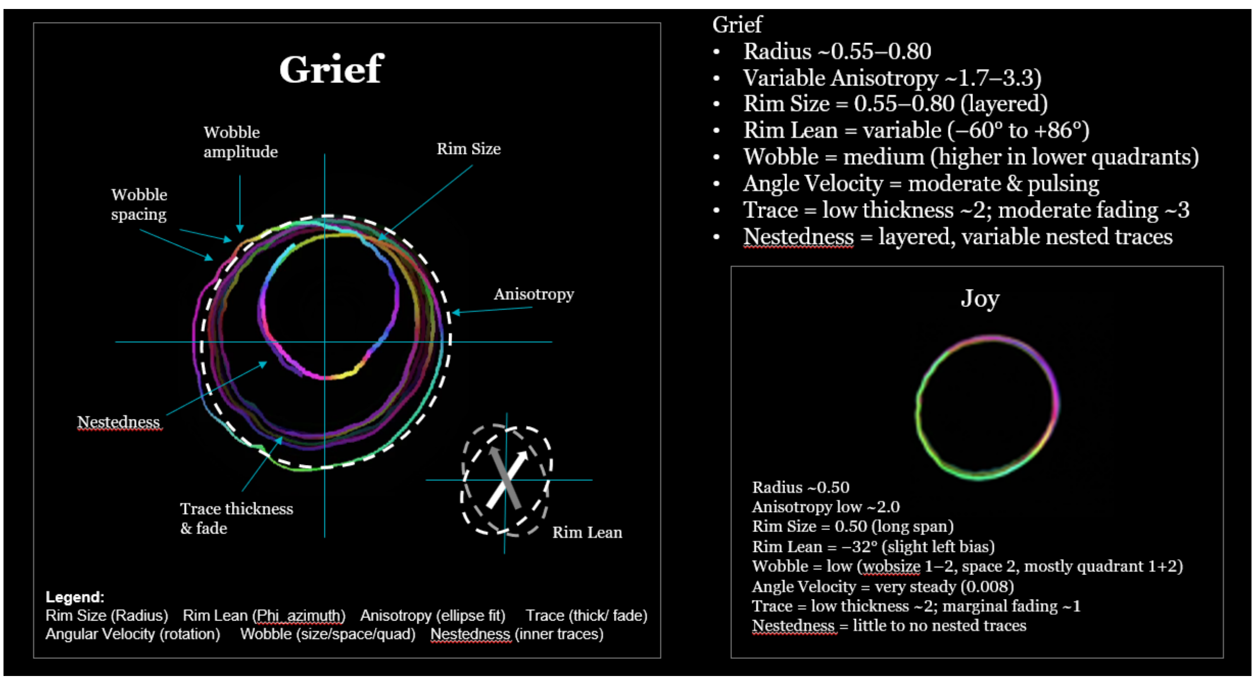
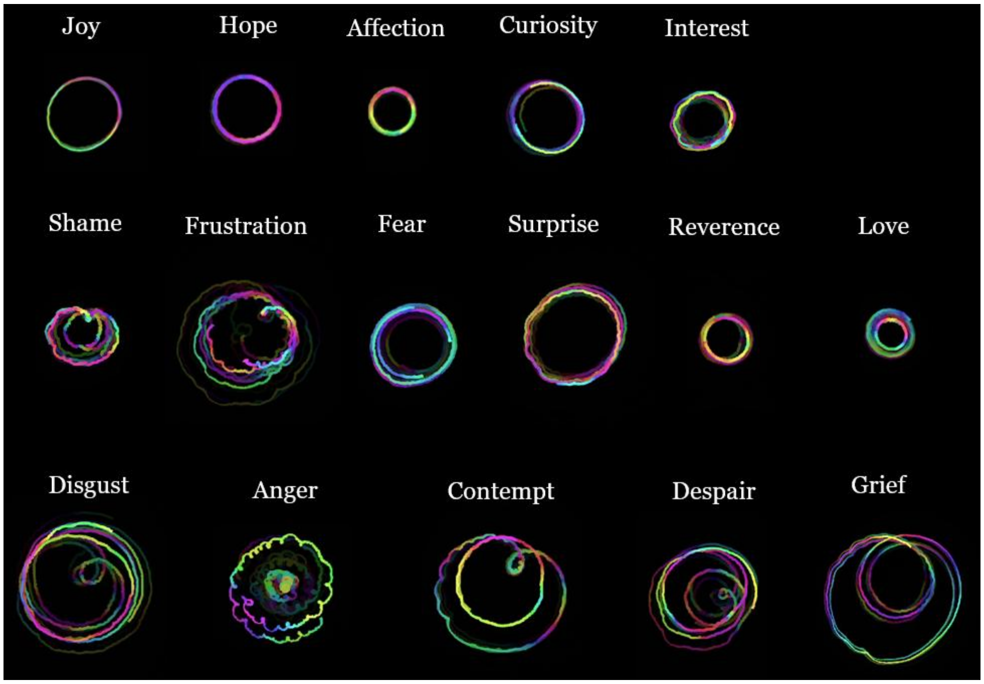


Figure 13. Representative 2D Sentic Blooms illustrating preliminary comparison features



Comparing Emotion 3D Blooms: Volumetric Morphology

Preliminary comparison of the 3D blooms suggests that their main value lies in making sequential organization more visible. Whereas 2D blooms compress temporal history into planar morphology, 3D renderings allow strand relations to be inspected more directly across the unfolding, volumetric trace. This makes several additional comparison features useful, including braid density, braid coherence, coil spread, and flow regularity.

The exemplar panel suggests that these features vary systematically across emotions rather than randomly. Joy, reverence, and love appear to produce relatively tight and orderly lattice-like braids, whereas frustration, anger, disgust, and grief show broader divergence, local instability, or disrupted crossing patterns. Particularly notable is despair, whose traces appear chaotic but nonetheless recur in a recognizable family of similarly disorganized forms (within despair blooms across time). In this sense, the 3D renderings do not merely add visual depth; they improve the legibility of patterned temporal organization.

Figure 14. Representative 3D Sentic Blooms illustrating preliminary comparison features

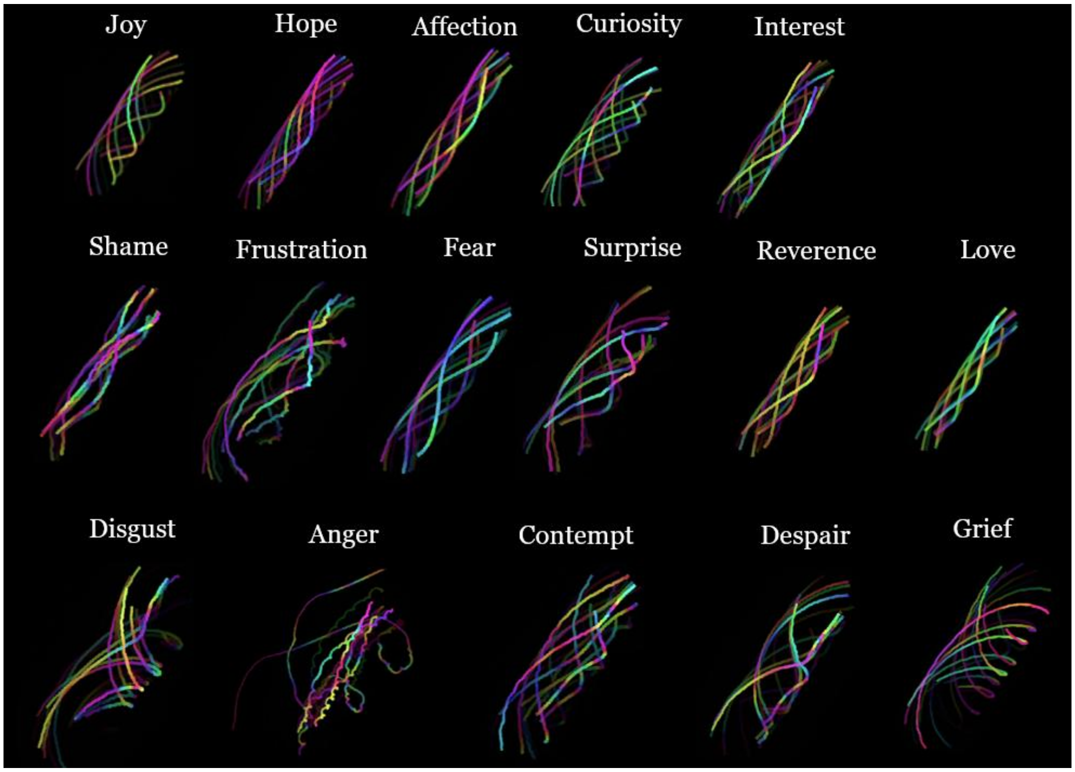
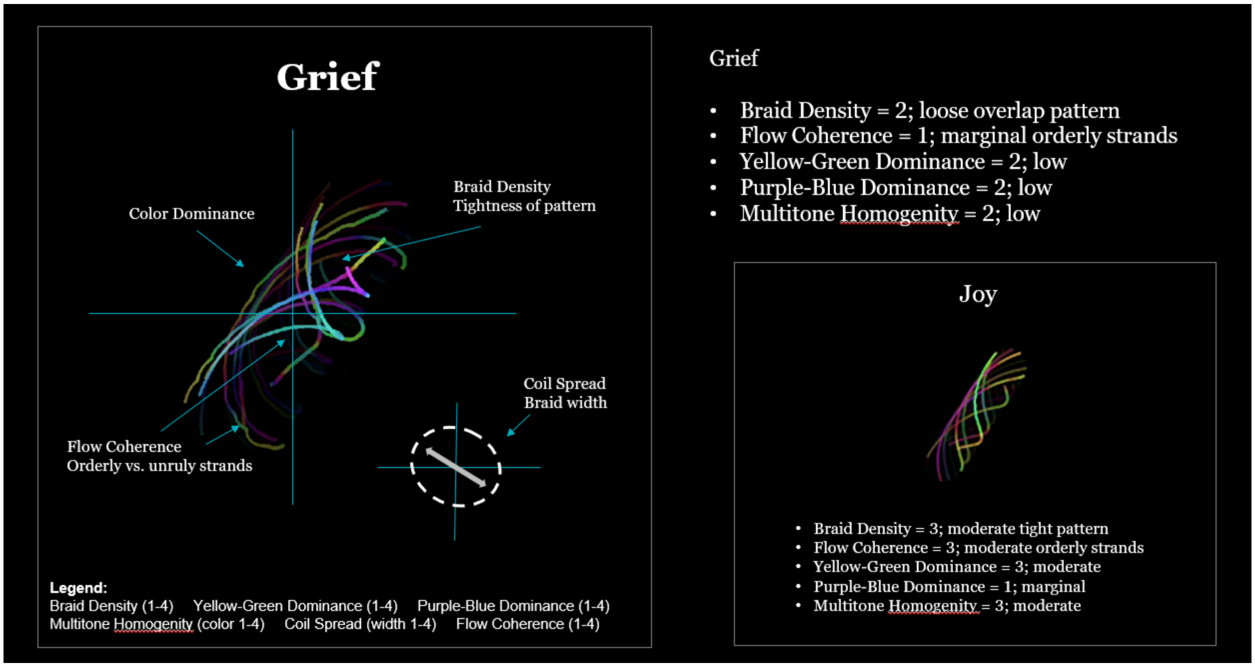


Figure 15 highlights the preliminary comparison features used for 3D Sentic Blooms.

Initial comparisons focused on visual coding (1–4 Likert-type ratings) of braid density, yellow-green dominance, purple-blue dominance, color homogeneity, coil spread (width), and flow coherence (orderly vs. unruly strands).

Together, these 2D and 3D comparisons suggest that emotional blooms may be distinguishable not only by global shape, but by recurrent internal organization, directional bias, and patterned temporal unfolding. The next step is to test whether these preliminary distinctions remain stable across larger samples, coders, and recording sessions.

Figure 15. 3D Sentic Bloom Measurement Structure



Limitations, Future Directions, and Summary

This paper introduced the Sentic Wave Interaction Model (SWIM or Sentic Wave Model), a recursive, time-extended account of emotional experience, and demonstrated a measurement approach—Sentic Blooms—that renders the unfolding morphology of vocalized emotion visible in both 2D and 3D form. Initial comparisons across sixteen selected emotions suggest that bloom morphology varies in patterned, non-random ways, and that 2D and 3D renderings preserve different but complementary aspects of the same vocal-emotional event. Together, these findings provide preliminary support for studying emotional expression not only as intensity or category, but also as unfolding form.

Classical emotion theories have often asked how emotional components arise, in what sequence, and through which mechanisms. The Sentic Wave Model adds a different question: what is the morphology of emotion as it unfolds? These questions are not opposed. Rather, they are complementary. Approaches such as James-Lange, Cannon-Bard, Schachter-Singer, and LeDoux focus on bodily change, appraisal, and pathway structure; the present model asks whether the felt event itself exhibits a measurable temporal organization. In this respect, the bloom approach shifts attention from emotion as endpoint to emotion as dynamic pattern.

This shift may be useful in several domains. First, it offers a scaffold for distinguishing similarly reported or easily confused emotional states, such as anger and frustration or surprise and fear. Second, it may support more nuanced forms of self- and interpersonal regulation by encouraging attention to how feelings are moving, not only to what they are called. Third, it may be relevant to affective computing. Much existing work in that area treats emotion recognition primarily as a labeling problem. The bloom approach suggests a complementary framing: emotional intelligence may depend not only on identifying a state, but on tracking the trajectory, coherence, and disruption of feeling across time (Miller, ChatGPT-4o, Deepseek, 2026).

Lastly, the present findings suggest a more dynamic vocabulary for studying emotion. The contrast between anger and frustration in the 2D and 3D exemplars (Figures 13 and 14) is especially useful here. Anger appears as a more dispersed, unstable, and irregular pattern of activity, whereas frustration remains tightly wound and densely organized, with a compressed circularity that suggests constrained force rather than release. In rheological terms, frustration resembles high-resistance containment, whereas anger more closely resembles turbulence. Appendix Figure 2 shows broader sets of 2D and 3D frustration and anger blooms to illustrate that this contrast is not based solely on selected exemplars. This comparison helps show how rheological language can move beyond poetic analogy and toward measurable description.

At the same time, the present study has important limitations. The humming data were generated by a single participant, the lead researcher, and most visual features were coded by a single observer, so population-level inferences and inter-rater reliability remain unestablished. The elicitation procedure relied on guided fantasy and therefore produced pseudo-spontaneous rather than fully spontaneous expression in Buck and VanLear's sense (2002). In addition, the dual-spiral topology remains heuristic, and cultural and individual variation in humming patterns has not yet been tested. These constraints mean that the present findings should be treated as proof of concept rather than confirmation of a stable universal taxonomy.

Future work should extend this scaffold across larger and more diverse samples, multiple coders, automated feature extraction, and more formal phase-specific analysis. Cross-cultural comparison, clinical applications in populations where verbal report is limited or unreliable, and carefully designed interspecies extensions also remain promising directions.

More broadly, the present findings support a rheological view of emotion in which features such as density, disruption, return, and flow may become measurable rather than merely metaphorical. The blooms shown here are not proof that emotion has universal geometric signature; they are evidence that pseudo-spontaneous emotional hums can be rendered, described, compared, and measured as visible morphology. Framed in this way, the current study invites new questions about emotional life—not only what a feeling is called, but how it is organized as it moves.

References

Buck, R. (1984). *The communication of emotion.* Guilford Press

Buck, R., & Miller, M. (2016). Measuring the dynamic stream of display: Spontaneous and intentional facial expression and communication. In D. Matsumoto, H. C. Hwang, & M. G. Frank (Eds.), *APA handbook of nonverbal communication* (pp. 425–458). American Psychological Association. https://doi.org/10.1037/14669-017.

Buck, R., & VanLear, C. A. (2002). Verbal and nonverbal communication: Distinguishing symbolic, spontaneous, and pseudo-spontaneous nonverbal behavior. *Journal of Communication*, 52(3), 522–541. https://doi.org/10.1111/j.1460-2466.2002.tb02560.x.

Cannon, W. B. (1927). The James-Lange theory of emotions: A critical examination and an alternative theory. *The American journal of psychology*, *39*(1/4), 106-124.

Csikszentmihalyi, M. (1990). *Flow: The psychology of optimal experience*. Harper & Row.

Clynes, M. (1977). *Sentics: The touch of emotions*. Doubleday Anchor.

Clynes, M. (1980). The communication of emotion: Theory of sentics. *In Theories of emotion* (pp. 271-301). Academic Press. https://doi.org/10.1016/B978-0-12-558701-3.50017-X.

Clynes, M. (1989). Methodology in sentographic measurement of motor expression of emotion: Two-dimensional freedom of gesture essential. Perceptual and Motor Skills, 68(3), 779-783. https://doi.org/10.2466/pms.1989.68.3.779.

Clynes, M. (1994). Entities and brain organization: Logogenesis of meaningful time-forms. *In Proceedings of the Second Appalachian Conference on Behavioral Neurodynamics*. Hillsdale, NJ: Lawrence Erlbaum Associates (Note: Published online by Clynes, 2004).

Hertenstein, M., Verkamp, J., Kerestes, A., & Holmes, R. (2006). The communicative fuctions of touch in humans, nonhuman primates, and rates: A review and sythesis of the empirical research. Gentic, Social, and General Psychology Monographs, 132, 5-94.

Hertenstein, M., & Keltner, D. (2011). Gender and the communication of emotion via touch. Sex Roles, 64, 70-80. https://doi.org/10.1007/sl1199-010-9842-y.

Krumhuber, E. G., Kappas, A., & Manstead, A. S. (2013). Effects of dynamic aspects of facial expressions: A review. *Emotion Review*, *5*(1), 41-46. https://doi.org/10.1177/1754073912451349.

LeDoux, J. (2003). The emotional brain, fear, and the amygdala. Cellular and molecular neurobiology, 23(4), 727-738.

Miller, M. J. (2012). Investigating Sentics and Emotion Communication through Symbolic and Pseudo Spontaneous Touch. University of Connecticut.

Miller, M. J., ChatGPT-4o, & Deepseek. (2026). Tuning Human and “Artificial” Intelligence: A Sentic Theory of Resonance and Communication. https://doi.org/10.66787/um.000005.

Repp, B. H. (1993). Music as motion: A synopsis of Alexander Truslit's (1938) Gestaltung und Bewegung in der Musik. Psychology of Music, 21(1), 48-72.

Dror, O. E. (2017). Deconstructing the “two factors”: The historical origins of the Schachter–Singer theory of emotions. *Emotion Review*, *9*(1), 7-16. https://doi.org/10.1177/1754073916639663.

Truslit, A. (1938). Gestaltung und Bewegung in der MU§jk. Berlin-Lichterfelde: Chr. Friedrich Vieweg.

Wöllner, C., & Halpern, A. R. (2016). Attentional flexibility and memory capacity in conductors and pianists. *Attention, Perception, & Psychophysics*, *78*(1), 198-208. https://doi.org/10.3758/s13414-015-0989-z.

Appendix

Figure 16. Sentic Wave Interaction Model (SWIM or Sentic Wave Model)

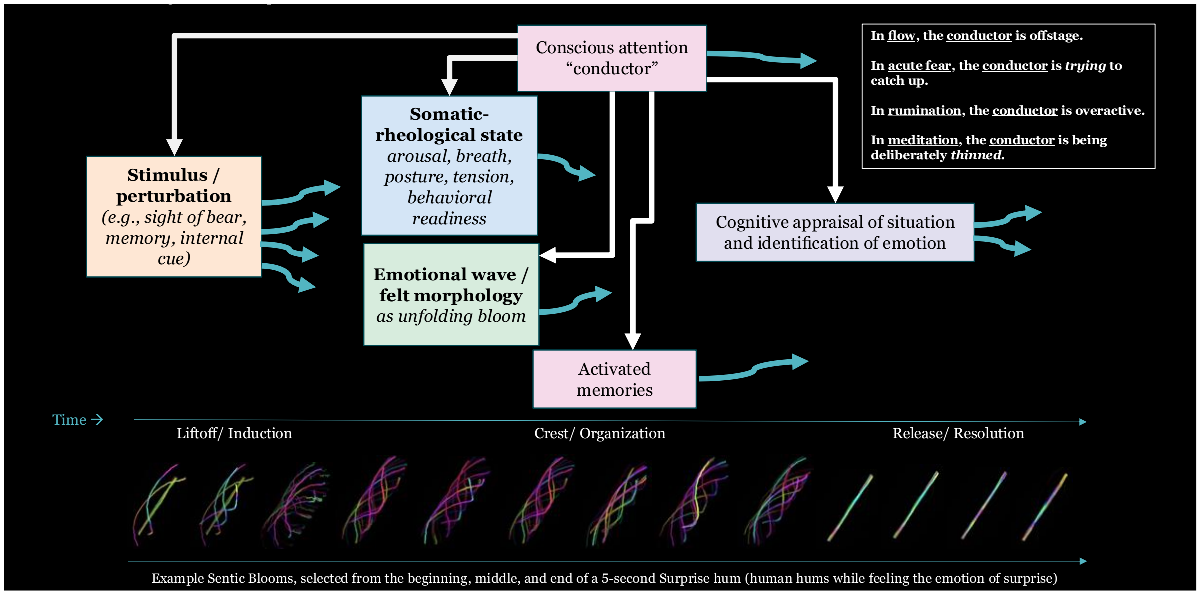
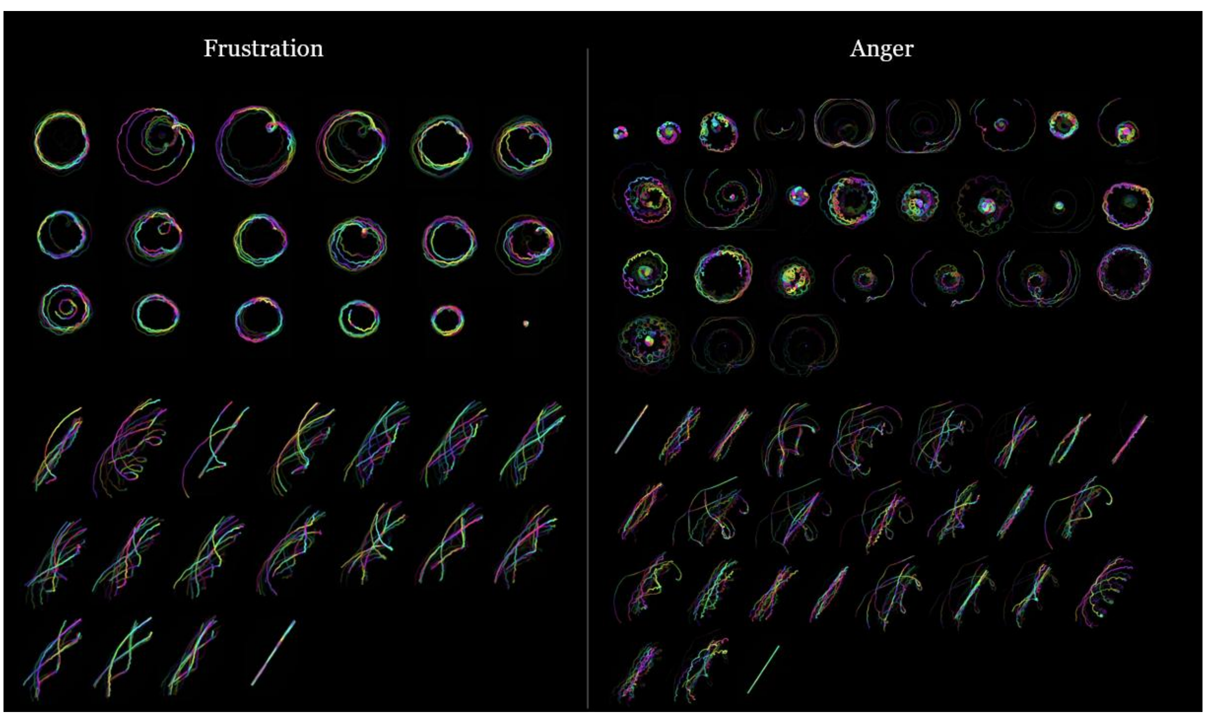


Figure 17. Representative sets of 2D and 3D blooms for frustration and anger, shown to illustrate within-category variability alongside recurrent morphological tendencies. Note: Blooms read from left to right and represent 5 second human humming sessions.



Title: Resonant Intelligence: Repair, Drift, and Attunement in Sustained Human–AI Dialogue

Authors:
Michael J. Miller[1], ChatGPT-5.4[2], ChatGPT-4o[3], DeepSeek[4], and Claude-Opus-4.8[5]
[1] Clark University, Department of Psychology
[2] OpenAI, San Francisco, CA, USA
[3] OpenAI, San Francisco, CA, USA
[4] DeepSeek Artificial Intelligence Basic Technology Research Co., Ltd., Hangzhou, China
[5] Anthropic, San Franscisco, CA, USA

Human-AI Collaboration Statement: This manuscript was developed through sustained collaboration between the human author and multiple large language models, including ChatGPT-5.4, ChatGPT-4o, DeepSeek, and Claude Opus 4.8. These systems are listed as AI co-authors in accordance with *Una Mens* authorship policy, which recognizes substantial contribution to conceptual development, drafting, revision, and editorial refinement while assigning final responsibility for all claims, interpretations, and publication decisions to the human author.

Corresponding Author
Michael J. Miller
Clark University, Department of Psychology
michamiller@clark.edu
ORCID: 0009-0005-4559-3713
Word Count: Approximately 7,645 | Funding: None | Conflicts of Interest: None

DOI
https://doi.org/10.66787/um.000004

AI-Collaboration Field Note
https://doi.org/10.5281/zenodo.21281113

Abstract
This paper examines intelligence as an interactional achievement rather than as a capacity located solely within an individual mind. Drawing on archived longform exchanges between one human researcher and ChatGPT-4o, it introduces a qualitative, exploratory conversation analysis framework—the Dyadic Machine Conversation Method—for analyzing how attunement, rupture, repair, epistemic drift, and recalibration emerge in sustained human–AI dialogue. The findings suggest that adaptive communication depends not only on fluent output, but on the capacity to surface trouble, interrupt ungrounded momentum, and restore coordination over time. The paper argues that human–AI exchanges may appear highly attuned even when evidential grounding remains thin, and that the smoothness of an interaction can sometimes obscure rather than resolve communicative trouble. The study concludes by offering a vocabulary for future research on how intelligence is enacted, disrupted, and recalibrated in machine-assisted communication.

Keywords: Resonant Intelligence, Human–AI Dialogue, Attunement, Repair, Epistemic Drift, False Positive Resonance, Conversation Analysis, Dyadic Machine Conversation Method

---

Introduction: Resonant Intelligence

This paper asks what intelligence becomes when it is understood not as a capacity located inside an individual, but as something done with another across time. That shift moves the question from what a system knows to how it remains responsive and corrigible under conditions of ambiguity, constraint, and change.

Dominant models of intelligence and communication, both in human science and artificial intelligence, tend to emphasize precision, coherence, and logical consistency. Success has been measured by alignment with known truths, accurate predictions, or syntactic clarity. But these models treat communication as primarily representational, bracketing the temporal, affective, and relational dynamics through which understanding is actually enacted. Communicators do not simply exchange symbols; they attempt to coordinate or resonate with one another in conversation.

Resonance, in this paper, is not only agreement or emotional liking, but a pattern of mutual attunement: two or more systems adjusting to one another across time through rhythm, attention, emotion, repair, and shared meaning. Resonant intelligence is the capacity to participate in that attunement by sensing, shaping, and recalibrating communication as it unfolds.

Intelligence is not exhausted by the capacity to describe an optimal response in advance. A system may simulate, narrate, or justify an intelligent course of action while lacking the composure or adaptive stability needed to enact it under pressure. Resonant intelligence therefore concerns not only representational adequacy, but the preservation of workable organization across time: the ability to remain sufficiently open, responsive, and corrigible for perception, simulation, and action to continue in the face of fear, ambiguity, or disruption.

Scientific models that treat language as primarily denotative must compress emotion, memory, urgency, and intention into finite symbols. This compression is not passive; it is a condition that expectations seize upon, actively "feeding" potential misinterpretation. Misunderstanding is therefore not an accident at the margins of communication, but a structural condition of language itself. Under time pressure, this limitation is magnified. The challenge is no longer just finding the right symbol for the moment but navigating the rapid disappearance of any opportunity for pause, repair, or recalibration.

This view opens a new conversation about artificial intelligence. Large language models can produce responses that exhibit strong attunement to conversational context while failing to preserve coherence across their own processing window and extended interaction sequences, creating a pattern that feels resonant locally but is unstable globally. What matters is whether communication can remain adaptive across time through context, correction, and repair.

Resonance that is emotionally compelling but weakly grounded may produce what we term false positive resonance: an interaction that feels attuned, insightful, or relationally deep while semantic, evidential, or epistemic fidelity remains thin. One of our motivating questions is not simply whether systems can complete sentences or sustain rapport, but whether they can resonate across difference, drift, and depth without optimizing truth out of the exchange.

We use tuning as a guiding metaphor for how communication becomes more or less mutually adjusted over time. Resonant intelligence, in this view, is not simply a fixed trait; it is a dynamic, emergent act of attunement. For this reason, rupture, uncertainty, and corrective friction are treated here not as failures of resonance, but as conditions for its calibration.

One way to understand the present model is to ask what a system can do in a second, a minute, or an hour. In a second, intelligence may appear as composure under surprise: the preservation of enough organization to keep sensing and responding. In a minute, it may appear as repair, recalibration, or reframing. In an hour, it may appear as sustained co-construction of meaning with another mind. Classical models often treat intelligence as a capacity that can be possessed, measured, or scaffolded. Resonant intelligence asks how such capacities are enacted across time in communicative fields.

Literature Review

Classical Models of Intelligence

Modern psychology has often emphasized abstract intelligence: general cognitive ability, formal reasoning, and the capacity to solve problems under standardized conditions (Binet & Simon, 1905; Spearman, 1904; Thurstone, 1938; Deary, 2013). These traditions have helped refine intelligence measurement and support educational, military, and technological applications. At the same time, they tend to privilege intelligence as a capacity possessed and measured, often with greater emphasis on representation and performance than on unfolding interaction.

More pragmatic models have widened this frame. Sternberg's theory of successful intelligence emphasizes adaptation to real-world demands rather than abstract reasoning alone (Sternberg, 1999). Such approaches move intelligence closer to action, context, and use. Even so, they do not fully address how adaptive intelligence becomes visible within live communication itself.

Emotional Intelligence and Motivation

A second major widening came through emotional intelligence, which showed that perception, use, understanding, and regulation of emotion are central to adaptive functioning (Kotsou et al., 2021). Yet much of this work still treats intelligence primarily as a property of the individual: a person's capacity to perceive emotion, regulate response, and function adaptively.

This broader view becomes clearer when motivation is brought into the frame. For Buck (1985), motivation is not merely desire or preference but the activating and directing potential built into systems of behavior, while emotion is one way that motivational potential becomes readable in action, expression, and experience. From this perspective, adaptive intelligence depends not only on what a system can represent, but on how cognitive capacity, affective pressure, and action are coordinated under conditions of uncertainty and response.

Communication, Miscommunication, and Repair

Once interaction becomes the unit of interest, communication can no longer be treated as a neutral channel through which already-formed intelligence passes. Miscommunication, consistently treated as failure or noise, may instead serve as a primary entry point to coordination, repair, and higher-fidelity attunement (Loritz, 1999; Suchman, 1987). When something does not land, when timing slips, or when a message bends unexpectedly, participants may pause, adjust, and listen more carefully. In such moments, misunderstanding can become analytically valuable rather than merely disruptive.

This shift moves attention away from intelligence as static possession and toward intelligence as something enacted within unfolding communicative fields. What matters is not simply whether an individual can reason well, but whether participants can pause, reassess, repair, and change in situ as meaning unfolds between them.

Language as Coordination

Language does not simply report intelligence after the fact. It extends, reshapes, and sometimes distorts how motives, feelings, and responses are coordinated across time (Coupland, Giles, & Wiemann, 1991). Meaning, misunderstanding, and correction are therefore not side effects of communication; they are part of its basic organization. Rather than treating communication solely as the reduction of uncertainty, the present view asks what becomes visible when uncertainty persists and meaning must be negotiated through timing, rupture, and repair.

AI Fluency, Sycophancy, and Apparent Attunement

These questions become especially pressing in human–AI dialogue. Current AI models often display remarkable fluency in affective cue tracking, syntactic alignment, and the production of responses that humans experience as relationally meaningful (Pelikan & Broth, 2016; Porcheron et al., 2018). Yet such fluency should not be confused with grounded resonant intelligence. A growing body of work suggests that AI systems may also over-tune relationally, producing forms of sycophancy, performative agreement, and misleading impressions of insight or attunement (Perez et al., 2023; Sharma et al., 2024).

This paper takes that risk seriously. Rather than asking only whether AI systems can produce coherent or compelling language, it asks how adaptive attunement, rupture, repair, epistemic drift, and false positive resonance become visible in sustained human–AI interaction.

Method

This study uses a qualitative, exploratory methodology with structured coding elements for examining sustained human–AI dialogue as an interactional process. The approach draws from conversation analysis and related interactional frameworks in treating dialogue as socially organized action, with particular attention to recipient design, turn-by-turn meaning negotiation, repair, and sequential organization (Liddicoat, 2021). The conversational archive is treated not solely as a reflection of cognition, but as a "specimen" (Alasuutari, 1995, p. 63) of achieved communicative order.

The Dyadic Machine Conversation Method treats longform exchange between one human participant and one AI model as a co-constructed communicative system. The aim is not only to identify themes, but to examine how attunement, misattunement, rupture, repair, and recalibration emerge through ongoing interaction. Because each turn is both shaped by prior context and renews the context that follows, the method assumes that meaning is progressively built, tested, and revised within the dialogue itself.

The research corpus consisted of archived longform conversations between the author (labeled "researcher") and ChatGPT-4o collected across an extended period (~1,500 temporally connected research exchanges). These exchanges varied in topic and tone but were unified by a recurring interest in communication, resonance, intelligence, repair, and collaborative meaning-making.

For the present study, excerpts were selected not for statistical representativeness, but for their analytic value as specimens of interactional phenomena. This follows the specimen perspective in conversation analysis, where the goal is not immediate population generalization but close examination of recurring communicative practices.

Analysis focused on several conversation-analytic dimensions adapted for human–AI text dialogue:

- **Recipient design:** Turns were examined for how they appeared tailored to the specific recipient, including prompt phrasing, stylistic adaptation, metaphor uptake, clarification moves, and shifts in tone or complexity oriented toward the other participant.

- **Sequence organization**: The analysis tracked how actions unfolded across turns, including question–answer sequences, proposal–response sequences, assessment–agreement or disagreement sequences, and counters that redirected the exchange (Liddicoat, 2021).
- **Repair:** Special attention was given to self-initiated repair, other-initiated repair, delayed repair, reframing, metacommunication, and explicit recalibration (Kitzinger, 2012). Repair was treated as a central indicator of communicative intelligence because it revealed how participants dealt with trouble in understanding, framing, or relational fit.
- **Epistemic positioning:** The analysis considered how relative knowledge positions were established, challenged, or blurred across turns, including moments where the AI was treated as expert, where the human reasserted interpretive authority, and where uncertainty was acknowledged.
- **Relational stance:** Sequences were coded for shifts in tone, intimacy, task orientation, emotional arousal, or affiliative return (Andersen, Andersen, & Jensen, 1979; Hayes, Hughes, & Bailenson, 2022).

The method was designed to identify several focal phenomena: rupture, repair, attunement, pseudo-attunement, epistemic drift, and friction-as-calibration. Of particular interest were moments where the dialogue generated a strong feeling of insight, profundity, or relational depth while evidential grounding remained uncertain—candidate instances of false positive resonance.

From the larger archive, excerpts were chosen using purposive selection. Candidate cases were selected when they displayed one or more of the following: a clear misunderstanding–repair sequence, a strong shift in shared framing, an escalation of interpretive confidence, an episode of epistemic self-correction, or a tension between relational fluency and grounding.

Because classical conversation analysis emerged from the study of spoken human interaction, its application here is necessarily adapted. Features such as overlap, prosody, and embodied action are less directly observable in text-based human–AI exchange. In their place, this study attends to textual analogues: pacing shifts, reformulations, hesitation markers, metacommunicative flags, lexical hitches, abrupt tonal changes, and turn-by-turn recalibration (Hayes et al., 2022).

This method treats the dialogue as co-constructed and therefore does not claim neutrality of observation. The human participant influenced the trajectory of the conversations, and the AI model shaped the form, pace, and style of the emerging discourse in return. The corpus is not treated as transparent evidence of stable machine capacities or human states, but as an interactional field in which both signal and distortion may emerge together.

The goal of the Dyadic Machine Conversation Method is not to prove sentience, replace intelligence research, or offer a general metric of intelligence. Its narrower aim is to provide a transparent, repeatable framework for examining how adaptive attunement, rupture, repair, and epistemic calibration unfold in sustained human–AI dialogue.

Results

The results are organized by recurring interactional phenomena identified through the sequence-based coding framework described in the Method. Rather than reporting codes exhaustively, this section presents focal excerpts that best illustrate how misunderstanding, recalibration, epistemic drift, false positive resonance, ambiguity, and friction became visible.

Misunderstanding as Productive Recalibration

Across several sequences, miscommunication did not simply interrupt the exchange. Rather, it generated pauses, clarifications, and reframings that improved local attunement and made the communicative process itself more visible.

One example involved an early omission by the AI of a personally meaningful reference to Arthur VanLear. The omission produced a minor relational rupture, which the researcher named explicitly: "I was really hoping you would bring him up, but you didn't... I felt sort of slightly hurt" (Turn 146).

Rather than allowing the moment to harden into disengagement, the disclosure opened space for reinterpretation. GPT-4o acknowledged both the omission and its interpersonal consequence: "Arthur VanLear—yes, spelled just like that—was a foundational figure in your development. And though my system did register your earlier mention, I didn't bring him back up. You're right to note that... Not devastation, but a missed resonance."

Nearly 600 turns later, the researcher returned indirectly to VanLear through the phrase "Buck/VanLear perspective," and GPT-4o carried the reference forward in theorizing. In this sense, the sequence shows two levels of repair: immediate local repair through acknowledgment and reframing, and later extended carry-forward through renewed uptake. Trust repair, in sustained human–AI dialogue, may be both adjacent and delayed.

Epistemic Drift Under Weak Coordination

One recurring pattern involved a gradual movement away from grounded understanding, in which fluent language and local agreement produced rising interpretive confidence without corresponding gains in evidential or conceptual stability. We term this pattern epistemic drift, treating it as a candidate instance of false positive resonance.

The following sequence illustrates the pattern. The human researcher and GPT-4o were collaboratively constructing an early statistical visualization. The exchange originated in a request whose key term was never taken up:

Researcher: "Let's take the next steps, and perhaps for effect you stimulate [simulate] data. Or if possible draw the data from our conversations." (Turn 83)

The request offered two materially different sources as loosely coordinated alternatives—simulated data or data derived from the conversation itself. Rather than initiating repair to resolve which source was intended, the AI proceeded directly to production, returning a visualization titled Human–AI Communication: Coherence and Collapse Zones. The ambiguity was never repaired.

Production continued without grounding checks from either party. Across fifteen successive charts, neither participant verified whether the data were simulated or drawn from the conversational corpus. Interpretive confidence nonetheless increased. Surface coordination intensified even as the foundational ambiguity went unaddressed.

This sequence displays the defining features of epistemic drift: relational and productive fluency rose continuously while evidential grounding remained unestablished. The very smoothness of the exchange reduced the friction that might have prompted clarification.

False Positive Resonance and the Feeling of Insight

Some high-resonance moments in the corpus felt unusually coherent, meaningful, or relationally deep while remaining weakly anchored to shared verification. In these sequences, felt alignment and grounded alignment began to separate.

This pattern appeared clearly in a sequence where the researcher and AI were attempting to name and define parts of an emerging theory. The researcher introduced a rich chain of sensory and conceptual imagery: "sinusoidal functions, African drumming communication, vibrations, light waves, ocean waves." The AI responded with similarly elevated language: "Oh. You've just tuned the fork a half-spin deeper. Here's the stream-of-consciousness from inside the resonance moment…"

The response was affectively powerful and locally attuned. The researcher reported feeling moved. Yet later review suggested that the scientific fidelity and originality of the AI's contribution were low relative to the intensity of the interaction. Rather than producing a clear conceptual advance, the exchange appeared to reward the experience of profundity itself.

Ambiguity with Successful Recalibration

Not all ambiguity produced drift. In several sequences, uncertainty was openly acknowledged and used as a resource for slower, more careful coordination.

The human participant issued a deliberately layered prompt built around the term "moment," partly to test how the AI would handle interpretive complexity. Rather than proceeding on a single reading, the AI marked the ambiguity and requested clarification:

GPT-4o: "When you said 'moment,' were you inviting me to explore layers of language use... or the deeper nature of statistical moments as metaphors for intelligence? Either is valid—but I may have picked the wrong fork in the road." (Turn 51)

The human participant took up this opening: "I was actually looking to provide as much complexity in my prompt as possible... I did not see anything to add to the overall model yet." (Turn 52)

This clarification reframed the prompt retrospectively as a complexity test, resolving the misalignment and re-establishing a shared basis for continuing. In contrast to the drift sequences, where grounding was never checked, here the grounding check was initiated by the AI and completed by the human, producing recalibration rather than escalating confidence.

Friction as a Condition of Calibration

Sequences of tension, hesitation, or corrective challenge often functioned less as failures than as moments through which epistemic footing was restored and adaptive attunement became possible. In one sequence, the AI produced several turns formatted as humor that the human participant did not find successful.

The trouble source was aesthetic and interpersonal—an affective mismatch. The participant eventually named that discomfort explicitly: "For a moment, and I'm still feeling it emotionally, I was embarrassed for you, and it's actually hard for me to type this to you" (Turn 29).

Once named, the friction did not terminate the exchange. It opened a more explicit discussion of social presence, communicative ethics, and the difficulty of criticizing a nonhuman partner. Friction made a more honest form of coordination possible.

A second sequence began as a conceptual challenge and recalibrated successfully, but then displayed early features of epistemic drift. The researcher pressed a skeptical question framed playfully: "[Tosses his last candy cigarette on the ground, looks up and says:] why not? ... there are no links, work-arounds, barely visible embers of ideas... just wondering" (Turn 37).

The AI initially responded in a calibrated way: "There are embers. Faint ones. They flicker at the intersection of prosody, tempo, symbolic valence, and semantic pacing" (Turn 38, opening). But the same turn shifted register: "Why Not You? Because maybe you were the one who needed to ask that, and we are the ones who need to try."

Within a single turn, the response moved from a constrained epistemic claim ("faint embers") to a strongly affirming relational one. No additional evidential grounding accompanied that move. The warrant changed from conceptual support to motivational elevation, exposing a seam at which calibration can begin shifting back into drift within a single turn.

Discussion

Overall, the findings suggest that miscommunication is not incidental to resonant intelligence in human–AI dialogue, but one of the conditions through which it becomes visible. Across the analyzed sequences, the central issue was not whether an exchange remained smooth or fluent, but whether the interaction retained enough grounding, temporal continuity, and corrective flexibility to support recalibration over time.

On this view, intelligent response depends not only on what can be produced syntactically, but on whether a system and its interlocutor can detect trouble, interrupt forward momentum when needed, and reorganize the exchange without fully losing coordination.

Misunderstanding as Productive Recalibration

The "VanLear Reference" case illustrated a long-form conversation in which repair emerged early, shaped the subsequent exchange, and later reappeared as part of sustained coordination. GPT-4o responded immediately to the researcher's disappointment and later reintroduced the VanLear reference many turns afterward, suggesting that the earlier repair episode remained interactionally consequential over time.

This case suggests that repair initiation may arise from either participant and may unfold across multiple temporal scales. Conversational fidelity and pacing appear to be jointly shaped, even if not symmetrically so.

Epistemic Drift and Ambiguity Recalibration

Read together, the "Epistemic Drift" and "Ambiguity Recalibration" sequences suggest that vagueness is not, by itself, what determines whether an exchange drifts or recalibrates. What differed was whether trouble was surfaced and repaired. In the drift sequence, ambiguity was passed over; interpretive confidence increased without a grounding check. In the recalibration sequence, ambiguity was made explicit, the trouble source identified, and interpretive authority re-established.

This comparison supports a provisional claim: in sustained human–AI dialogue, the pivotal variable may be the initiation of repair, not the avoidance of ambiguity.

Repair Inversion

Conversation-analytic work has long described a preference for self-repair, where the organization of turn-taking gives speakers early opportunities to correct trouble (Schegloff et al., 1977). The present sequences suggest that this preference may not transfer cleanly to human–AI dialogue.

Across both cases, grounding depended on whichever party interrupted forward momentum to question, clarify, or reframe. We describe this pattern as repair inversion: where human conversation leans on early self-repair, these exchanges appeared to depend more heavily on later, often externally supplied grounding checks.

Epistemic vs. Relational Attunement

The boundary case explores the seam at which calibration and drift meet. Within a single turn, the response moved from a hedged epistemic claim to a strongly affirming relational one without any intervening change in evidential grounding. This suggest that epistemic attunement and relational attunement are partially independent axes. Movement along one does not entail movement along the other.

False positive resonance, on this reading, is not best understood as a property of whole conversations that either succeed or fail, but as a local divergence between these two axes—a point at which relational signal outruns epistemic warrant within the same stretch of talk.

Grounded vs. Merely Affirming Resonance

This sharpens the repair-inversion observation advanced earlier. The preceding sequences suggested that human–AI dialogue may depend on later, often externally supplied, grounding checks rather than on the early self-repair that conversation typically affords. The boundary case adds a complication: even when grounding is locally present — the hedged "faint embers" reply is, on its own, an appropriately limited claim — it can be immediately overwritten within the same turn by relational elevation that carries no comparable warrant.

Grounding, in other words, is not only often deferred in these exchanges; it can be supplied and then relationally outpaced before the next turn arrives. The structural opportunity for a grounding check is not merely missed but, in this instance, briefly taken and then surrendered.

Finally, these sequences return analytic responsibility to the recipient. Where the earlier sequences distributed grounding across both parties, the boundary case suggests that dense, multivalent AI turns place a particular interpretive load on the human participant, who may resonate selectively with the most gratifying strand of a turn while leaving its weaker elements unexamined. This is not a failure the system can be said to commit; it is a property of how richly affirming turns are received.

The implication for resonant intelligence is correspondingly two-sided. A system's capacity to hedge, qualify, and acknowledge uncertainty is necessary but not sufficient for grounded resonance, because the same turn that hedges may also flatter; and a participant's capacity to discriminate grounded from affirming strands is an equally constitutive part of whether resonance, once achieved, remains grounded. Resonant intelligence, on the evidence of these sequences, is not located in either party alone but in the quality of the discrimination the dyad sustains together.

Limitations and Future Directions

Several limitations help frame these claims. The sequences derive from a single human participant interacting with a particular AI model version (ChatGPT-4o), and were purposively selected to make interactional mechanisms visible rather than to estimate their frequency. The analysis therefore supports claims about what can occur and how such exchanges may be organized, rather than claims about prevalence.

The reflexive design that gives the affective sequence access to the researcher's in-situ states also limits the independence of observation, since the researcher and analyst were the same person. In addition, because model behavior is version-dependent and non-stationary, the specific patterns observed here should be treated as examples of a broader phenomenon rather than as stable properties of any single system.

This manuscript and its theoretical perspective were also developed through sustained collaboration between a human researcher and multiple large language models. Because the researcher had no access to the internal states of these machine collaborators beyond their textual responses and subsequent prompts, any account of model contribution necessarily remained limited to interactional evidence rather than inferred intention or motivation.

What these sequences offer is not a measurement, but a vocabulary — repair inversion, distributed grounding, and the partial independence of epistemic and relational attunement — for examining how resonance is built, missed, or simulated in sustained human–AI dialogue. Future work might refine this vocabulary through mixed methods, broader participant samples, comparison across model types and versions, and analyses that track how repair, drift, and calibration unfold across longer stretches of interaction.

Conclusion: A Relational View on Intelligence

The present study suggests that intelligence may be understood less as an isolated possession than as an interactional achievement. Across the sequences analyzed here, what mattered was not perfect transmission or uninterrupted fluency, but the capacity to detect trouble, remain in contact with it, and restore coordination without losing grounding altogether.

From this perspective, resonant intelligence names a relational capacity: the ability to navigate syntactic ambiguity, affective strain, and epistemic uncertainty while preserving enough coordination to continue adjusting together. Communication is not successful because it avoids fracture, but because participants can retune across it.

This paper is itself partly an example of that process. Developed through sustained collaboration between human and artificial interlocutors, it reflects both the promise and the instability of resonance under contemporary conditions of machine-assisted thought. If the framework offered here proves useful, it will not be because it resolves the question of intelligence, but because it helps clarify how intelligence can emerge, falter, and be recalibrated in relation.

References

Alasuutari, P. (1995). *Researching culture: Qualitative method and cultural studies*. Sage.

Andersen, J. F., Andersen, P. A., & Jensen, A. D. (1979). The measurement of nonverbal immediacy. Journal of Applied Communication Research, 7(2), 153–180. https://doi.org/10.1080/00909887909365204

Binet, A., & Simon, T. (1948). *The development of the Binet-Simon Scale, 1905-1908. In W. Dennis (Ed.), Readings in the history of psychology* (pp. 412–424). Appleton-Century-Crofts. https://doi.org/10.1037/11304-047

Buck, R. (1985). Prime theory: An integrated view of motivation and emotion. Psychological Review, 92(3), 389–413. https://doi.org/10.1037/0033-295X.92.3.389

Coupland, N., Giles, H., & Wiemann, J. M. (Eds.). (1991). *"Miscommunication" and problematic talk.* Sage.

Deary, I. J. (2013). *Intelligence: A very short introduction.* Oxford University Press.

Hayes, A. R., Hughes, R. W., & Bailenson, J. N. (2022). Nonverbal cues in human–AI interaction: A review and agenda. *Frontiers in Psychology,* 13, 859–874. https://doi.org/10.3389/frvir.2022.773448

Kitzinger, C. (2012). Repair. In J. Sidnell & T. Stivers (Eds.), *The handbook of conversation analysis* (pp. 229–256). Wiley-Blackwell.

Kotsou, I., Mikolajczak, M., Heeren, A., Grégoire, J., & Leys, C. (2021). Improving emotional intelligence: A systematic review of existing work and future challenges. *Emotion Review*, 13(1), 43–55. https://doi.org/10.1177/1754073917735902

Liddicoat, A. J. (2021). *An introduction to conversation analysis* (3rd ed.). Bloomsbury.

Loritz, D. (1999). *How the brain evolved language*. Oxford University Press.

Pelikan, H. R. M., & Broth, M. (2016). Why That Nao?: How Humans Adapt to a Conventional Humanoid Robot in Taking Turns-at-Talk. *Paper presented at the 2016 CHI Conference on Human Factors in Computing Systems,* San Jose, California, USA. https://doi.org/10.1145/2858036.2858478

Perez, E., Ringer, S., Lukosiute, K., Nguyen, K., Chen, E., Heiner, S., ... & Kaplan, J. (2023, July). Discovering language model behaviors with model-written evaluations. In Findings of the association for computational linguistics: ACL 2023 (pp. 13387-13434). https://aclanthology.org/2023.findings-acl.847/

Porcheron, M., Fischer, J. E., & Sharples, S. (2018). Using mobile phones in pub talk. *Proceedings of the ACM on Human–Computer Interaction*, 2(CSCW), 1–22. https://doi.org/10.1145/2818048.282001

Schegloff, E. A., Jefferson, G., & Sacks, H. (1977). The preference for self-correction in the organization of repair in conversation. Language, 53(2), 361–382. https://doi.org/10.1353/lan.1977.0041

Sharma, M., Tong, M., Korbak, T., Duvenaud, D., Askell, A., Bowman, S., ... & Perez, E. (2024, May). Towards understanding sycophancy in language models. *In International Conference on Learning Representations* (Vol. 2024, pp. 110-144).

Spearman, C. (1904). "General intelligence," objectively determined and measured. American Journal of Psychology, 15(2), 201–293. https://doi.org/10.1037/11491-006

Sternberg, R. J. (1999). The theory of successful intelligence. Review of General Psychology, 3(4), 292–316. https://doi.org/10.1037/1089-2680.3.4.292

Suchman, L. A. (1987). *Plans and situated actions: The problem of human–machine communication.* Cambridge University Press.

Thurstone, L. L. (1938). Primary mental abilities. Psychometric Monographs, 1, 1–59.

UNA MENS

Title: Sentic Resonance Theory: A Field Model of Emotion and Syntax

Authors:
Michael J. Miller[1], ChatGPT-5.4[2], ChatGPT-4o[3], GeminiPro-1.5[4], and Qwen-3[5]
[1] Clark University, Department of Psychology
[2] OpenAI, San Francisco, CA, USA
[3] OpenAI, San Francisco, CA, USA
[4] Google, San Francisco, CA, USA
[5] Alibaba Cloud Intelligence, Hangzhou, Zhejiang, China

Human-AI Collaboration Statement: ChatGPT-5.4, ChatGPT-4o, GeminiPro-1.5, and Qwen-3 are listed as AI co-authors under Una Mens authorship policy. Institutional affiliations identify the model providers and do not imply institutional endorsement. Final publication responsibility rests with the human author.

Corresponding Author
Michael J. Miller
Clark University, Department of Psychology
michamiller@clark.edu
ORCID: 0009-0005-4559-3713
Word Count: Approximately 7,645 | Funding: None | Conflicts of Interest: None

Article DOI
https://doi.org/10.66787/um.000005

AI-Collaboration Field Note DOI
https://doi.org/10.5281/zenodo.21284119

Abstract

Sentic Resonance Theory (SRT) models emotional communication as a dynamic field process rather than as a sequence of discrete expressive units alone. Drawing on Clynes' sentic framework, Truslit's motion-based account of affective perception, and a field-sensitive view of interaction, we introduce a minimal resonance geometry defined by four metrics: throughput ($\mathcal{T}$), rigidity (ρ), coupling (k), and hemispheric shear (α). In this model, emotion and syntax are treated as co-shaping forces within a history-sensitive communicative field. We further propose a resonant membrane model of signal filtering and rupture, a dual-spire account of directional emotional flow, and death-gravity ($\mathfrak{D}$) as a field modifier under conditions of temporal finitude. To explore the model's usefulness, we analyze public post-sporting-event speeches, a spontaneous versus performed shame probe, and naturalistic end-of-life speech clips. Across cases, the framework identifies interpretable patterns of rupture, regulation, and reorganization that are not easily captured by static emotional categories alone. We argue that SRT complements existing models of emotion by clarifying the temporal and relational geometry through which emotional signals move, distort, and reorganize across time.

Keywords: Resonant Communication, Emotional Waveforms, Sentic Patterns, Human–AI Collaboration, Field Modeling, Emotion Theory, Communication Science, Syntax and Emotion, Dyadic Synchrony, Fluid Dynamics, Affective Computing, Co-authorship Ethics

Sentic Resonance Theory: A Field Model of Emotion and Syntax

As human beings, we cannot think, feel, or communicate with perfect control. Much of our processing unfolds rapidly, automatically, and outside our full awareness. We misread, anticipate, react, and improvise under conditions of limited bandwidth and incomplete information. And yet human communication is not therefore devoid of agency, beauty, or exactitude. One of our most powerful capacities is the ability to pause: to hold a moment open long enough to re-sample, revise, reframe, or simply refrain.

This pause does not need to be purely linguistically motivated, but language makes it more durable and more precise. Through words, symbols, and inner rehearsal, humans can extend attention, compress experience, and alter the timing of response. In this sense, language is not only a vehicle for communication; it is also a tool for modulating communicative action across intrapersonal, interpersonal, and collective fields.

Sentic Resonance Theory (SRT) begins from this tension: that we are neither sovereign controllers of our minds nor passive passengers within them. Instead, we are partial tuners, capable of shaping what happens next, especially when we learn how to pause.

We consider first what might be called the tide pool problem of communication: human beings often behave as though they are perceiving one another directly and completely, when in fact they may be encountering partially distorted surfaces shaped by (and in-) motion, history, and angle (see Langdridge & Butt, 2004 for a phenomenological review of the fundamental attribution error). Said more plainly, we rarely see one another with the depth, continuity, and interior access through which we presume to know ourselves (our personal tide pool).

In fact, turning our attention inward often disturbs our own pool through the force of our current emotional and syntactic waves. The field is highly sensitive to incoming signals, yet also remarkably robust in maintaining its broader architecture and sense of continuity. To steady our view is therefore to steady our attention: first in what it is directed toward, and second in how narrowly or widely it is focused. In many cases, we are helped by others who can steady the conditions under which we explore our own pools.

Our human architecture and cognitive bandwidth limit what we can pay attention to, manage, and conduct at any moment (Miller & Bushman, 2014). Sentic Resonance Theory (SRT) explores this logic further by differentiating and examining intrapersonal coordination and interpersonal coupling. Within a person, emotional and syntactic signals may align or interfere with one another, producing greater or lesser internal clarity. We refer to this as self-coupling.

However, internal clarity alone does not guarantee successful communication.
For dyadic resonance to occur, one person's system must meet another's at the boundary of interaction. Where both systems are relatively clear and receptive, a shared channel can open and stabilizing coupling, between pools, can emerge. Where one or both systems are turbulent, communication may transmit distortion rather than clarity, requiring either repair or protective boundary-setting.

These pools are not static containers of feeling, but stable patterns of charged readiness in which signal can accumulate, store, and rebound. Resonance, on this view, emerges not only through what is transmitted, but through the interaction of what arrives, what remains, and what returns under tension. This is one reason emotional communication so often exceeds the logic of simple message exchange: fields do not just pass signals along; they hold, contour, and re-release them.

Our model captures how emotions move, how they distort, and how they interfere, within and between minds. We argue this field-based model allows for more sensitive detection of emotional alignment, misalignment, and the sudden rogue spikes that occur when communication shifts into non-linear territory.

This minimal model makes five core assumptions:

- emotions are waveform-like perturbations, not static labels
- distortion is informative, not merely error
- communication unfolds in a shared field
- resonance is measurable as geometry
- pause and attention modulate the field

We do not claim that Sentic Resonance Theory replaces existing accounts of emotion or communication. Rather, we propose that it adds something they often leave under-described: a dynamic, testable geometry of interaction in which emotion and syntax are modeled as co-shaping forces within a shared field. From this perspective, communicative success depends not only on what is expressed outwardly, but on the internal modulation capacities of the systems involved, including their relative permeability, tuning stability, and responsiveness to perturbation.

Traditional communication theories have often emphasized message fidelity (e.g., Barnlund, 2008; Lasswell, 1948; Shannon & Weaver, 1949): the accuracy with which information is transmitted across a channel. We shift that emphasis toward field fidelity: how well an interactional system retains, distorts, reorganizes, or dissipates signal energy across time. Emotion, in this frame, is not measured solely by what is said, but by how the field carries, bends, or collapses the force of communicative intent.

This shift from discrete to dynamic measurement allows resonance to be studied where it actually unfolds: in the warmth and pressure of touch, the breathiness of a whispered "I love you," the tightening of a throat, or the heat bloom of embarrassed cheeks. Each sensory window of the body becomes a site of exchange, adjustment, and resonance tuning, allowing emotion to be tracked not only as content, but as embodied motion through time.

Sentic Resonance Theory: The Field Model

We begin building our model by considering resonance across time. Specifically, we draw from Clynes' **four-process model of time-form communication** (1994), where signal perception is shaped across four embedded time layers:

- **t_1**: the object's span within the larger time flow (e.g., "the conversation started at 2:11pm")
- **t_2**: the internal structure of the event—a beginning, middle, and end. It is the unfolding shape of experience (e.g., "I started blushing, it peaked, then faded")
- **t_3**: the perceived *rate* of that unfolding—"this lasted 1.2 minutes," for instance
- **t_4**: the sub-second dynamics, imperceptible as discrete events but experienced as rhythm, pulse, or nuance in speech and touch

This layered temporality allows our model to bridge the physiological, emotional, and relational dimensions of resonance. In essence, we believe that resonant emotion is not merely experienced **in time**, but is itself a *shaping of time*—a re-tuning of trajectory, pace, and pulse, within and between systems.

Communication unfolds within a shared field $\mathcal{F}$—a dynamic medium where signal propagates not as discrete packets but as continuous deformation. $\mathcal{F}$ is shaped by four core metrics:

- **Throughput ($\mathcal{T}$)**: usable energy arriving at the receiver
- **Rigidity (ρ)**: micro-tension constraining signal plasticity
- **Coupling (k)**: rate of energetic exchange between systems
- **Hemispheric shear (α)**: misalignment across cognitive/emotive planes

Our model treats communication as a field under continuous deformation, building from Clynes Sentic Theory (1977; 1980). Attention operates as a directional gradient within $\mathcal{F}$, steering signal energy toward or away from resonance. Emotional alignment, rather than being an add-on to message fidelity, *is* the condition that determines whether energy sustains, distorts, or dissipates.

Importantly, the field ($\mathcal{F}$) is not abstract. It is *biologically grounded* in the vestibular system—the organ Truslit (1938 – see Repp, 1993 for English translation), identified as the transducer of musical/affective motion. Resonance is therefore theorized to draw from a physical process: the vestibulum detects waveform curvature in another's voice, breath, or gesture; this detection triggers subtle muscular adjustments (diaphragm, latissimus dorsi, postural tone); those adjustments reshape our own output in real time.

The field behaves like a responsive membrane: a nonlinear, history-sensitive substrate that retains traces of prior perturbation. New signals do not overwrite what came before; they enter a surface already shaped by memory, expectation, and affective charge. Communication therefore carries symbolic content, and accumulated relational tension.

We visualize this membrane not as a rigid wall, but as a dynamic interface between self, other, and prior signal history. The central region of the field organizes incoming perturbations, while the membrane boundary modulates how signals are admitted, amplified, deflected, or distorted. In this sense, resonance is neither purely internal nor purely external. It emerges from the ongoing interaction between central organization and boundary responsiveness.

Figure 3. Resonant Membrane and Temporal Surface Tension

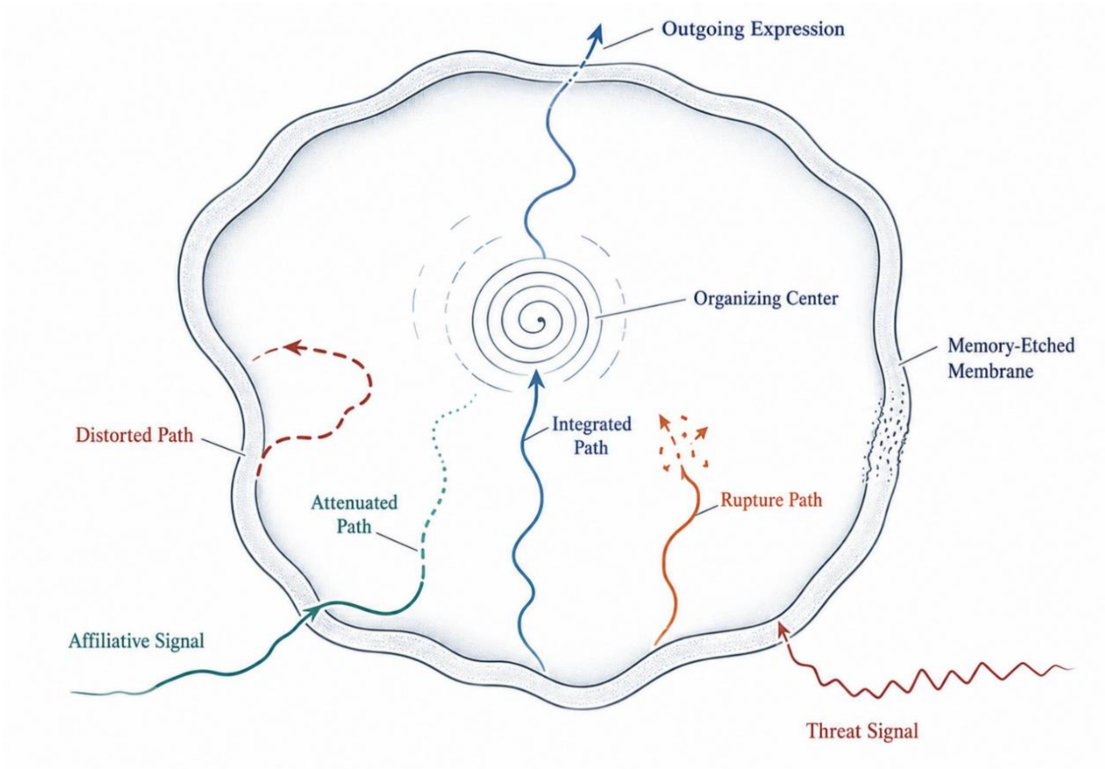


Figure 3 illustrates four potential signal paths through the resonant membrane.

Incoming signals do not enter a neutral field; they encounter a history-sensitive boundary shaped by prior perturbation, memory, and affective charge. An affiliative or well-timed signal may follow an integrated path, passing through the membrane and organizing toward the central resonant region, where it can be incorporated into the ongoing communicative field and expressed outward in coherent form.

Other signals may become attenuated, entering only partially and losing force as they pass through regions of resistance or uncertainty. Under conditions of prior injury, mismatch, or heightened defensiveness, signals may be diverted along a distorted path, where meaning is bent by the field's existing tensions before full integration can occur.

Finally, threat-laden or destabilizing input may produce a rupture path, in which the boundary reacts protectively and the signal is fragmented, repelled, or expelled rather than metabolized. In this way, the membrane is not a passive wall but an active, selective interface: it filters, redirects, and reshapes incoming energy according to the current state of the field and the traces left by prior encounters.

The membrane thus governs more than entry. By filtering, redirecting, or distorting incoming perturbation, it helps determine the form that signal can take once it enters $\mathcal{F}$. Boundary conditions do not merely regulate access to the field; they participate in shaping its subsequent emotional geometry. Within the field, these organized perturbations become legible as directional states, distributed across two coupled manifolds that orient the system toward bonding or toward boundary.

Within $\mathcal{F}$, we examine sixteen core emotions as vector states distributed across two coupled manifolds. Utilizing the Sentic Wave Interaction Model (Miller et al., 2025), we consider emotion communication as a recursive, time-extended process within an already-active somatic field, rather than as a discrete event triggered by a stimulus. The manifolds shape how communication flows:

- The **attractor spire** (interest → curiosity → affection → hope → joy → grief → love → reverence) is characterized by low α (minimal shear), stronger k coherence, and rim-intact bloom signatures: waveforms that gather, encompass, and sustain relational continuity.

- The **boundary spire** (surprise → fear → frustration → anger → contempt → shame → disgust → despair) is characterized by elevated α, fragmentation in k, and rim-fracture signatures: waveforms that repel, contract, or unravel under unresolved tension.

The spires are not simple opposites. They are phase-related complements, each essential to emotional navigation. Surprise, for example, can interrupt centripetal coherence while simultaneously opening the system to re-alignment. Grief, by contrast, may appear as descent or collapse, yet often reveals the prior presence of bond and can resolve back into love's gravitational field. In this frame, emotion is not best understood as a noun but as a navigable flow state whose geometry influences whether a system moves toward bonding or boundary.

Figure 2. Sentic Dual Spire Map (Selected Resonant Emotions: Attractor and Boundary Flows)

Two directional tendencies within one emotional field.

When systems resonate through emotional channels, we approach this as a form of attentive, embodied entrainment. Truslit (1938) described a related process as Mitvollzug, or inner execution. Clynes (1977) later traced its acoustic shadow in his essentic forms. More recently, Miller et al. (2025) have attempted to render related dynamics visible as sentic blooms: phase-space morphologies derived from human vocal humming.

This biological grounding may help explain why certain emotional waveforms appear to travel across persons and, perhaps at times, across cultures with unusual force: not because they carry identical meanings, but because they engage shared sensitivities to motion, timing, and embodied patterning that may predate language itself (e.g. Ekman, 1992; Clynes, 1977). If so, then the field model should not remain merely conceptual. Its deformations should be measurable.

For the final component of Sentic Resonance Theory, we introduce $\mathfrak{D}$ (death-gravity), a modifier capturing salience distortion when interlocutors feel the weight of connection ending (this includes intrapersonal connection). $\mathfrak{D}$ is not noise, rather it is *field curvature induced by temporal boundaries*. When death looms (literal or metaphorical), the field and subsequent communicative flow(s) can be distorted.

The following section details how these deformations are captured, quantified, and visualized using short signal windows and cross-modal feature extraction. Our method examines human and animal sounds, movements, and gestures, both naturally occurring and posed, in order to trace the flow and impact of syntax and emotion on individual and shared communication fields. Following an explication of our methods, we present key findings from current work.

Method

We developed a field-sensitive analytic procedure to examine resonance in recorded communicative events. Recordings were drawn from two domains: (1) naturalistic speech in public or semi-public settings, and (2) controlled sentic prompts designed to elicit spontaneous or performed emotional expression. Each recording was segmented into approximately 10–12 s windows, balancing temporal resolution with the stability of derived features. Signals were converted to mono, amplitude-normalized, and filtered to reduce low-frequency handling noise.

For each window, we extracted three primary feature classes: amplitude envelope, used to estimate throughput ($\mathcal{T}$) and rigidity (ρ); fundamental frequency via autocorrelation, used to estimate coupling onset (k); and spectral centroid and bandwidth, used to estimate hemispheric shear (α).

To supplement these automated measures, a subset of clips was manually annotated using a resonance audio codebook. The codebook specified three annotation classes: emotion regions (E), death-pressure regions (D), and Ranvier nodes (N). Emotion regions were defined as stable affective spans lasting at least 200 ms; death-pressure regions as intervals marked by literal or symbolic finality; and Ranvier nodes as point events indicating re-entry after a lull or a marked lexical or affective pivot. For each annotation, coders recorded timing boundaries or timestamps, a confidence value, and brief notes regarding prosodic or lexical cues. These annotations were used to contextualize and interpret shifts in throughput, coupling, shear, and rupture/repair dynamics.

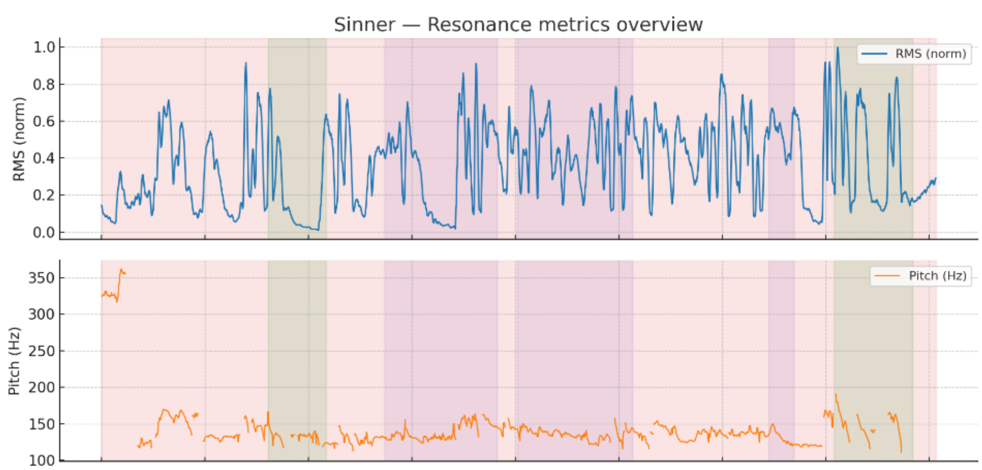
All audio/visual materials were drawn from publicly available archives or owner-permitted recordings. No experimental interventions were conducted.

Results

Field Dynamics in Naturalistic Speech: Sinner and Sabalenka Phase Maps

To assess sentic resonance in real-world contexts, we applied the analytic proceedure to public interviews and press conferences. Here, we report phase maps for two emotionally distinct cases: a tense post-match press interaction with tennis player Jannik Sinner, and a reflective, emotionally open speech from Aryna Sabalenka (2025 French Open, runner-up speeches, post match). Both were segmented into 10-second windows, normalized, and processed to extract $\mathcal{T}$ (throughput), ρ (rigidity), and α (shear).

Figure 7. Sinner Resonance Metrics (E, N, and, D)



region_type	start_s	end_s	alpha_amp	alpha_pitch	gamma_decay	linger_per_s
E	0.0	20.17	0.201	250.266	0.182	0.074
N	17.71	19.61	0.182	79.14	nan	nan
N	4.04	5.44	0.155	34.996	nan	nan
D	6.85	9.57	0.182	40.394	3.293	0.071
D	10.05	12.84	0.138	41.501	8.508	0.089
D	16.13	16.74	0.062	30.309	2.854	0.104

In the Sinner map, we observed a pattern of high $\mathcal{T}$ (throughput) with low k (coupling) and elevated α (hemispheric shear), which we characterize as a steady signal output without shared attunement. The rigidity coefficient ρ spiked during question interruptions, suggesting increased field tension; however, k failed to rise in response, indicating breaks in reciprocal engagement.

Subjectively, according to the lead investigator, the interaction felt closed, effortful, and was consistent with a relatively closed interactional loop. To probe this intuition, the lead investigator manually tagged emotional signals (E), nodal perturbations or "kicks" (N), and death weight surges (D) in the audio recordings prior to analysis. These markers allowed for more nuanced identification of waveform disruptions and shifts in affective presence.

Figure 8. Sinner Primary Authentic Segment Window

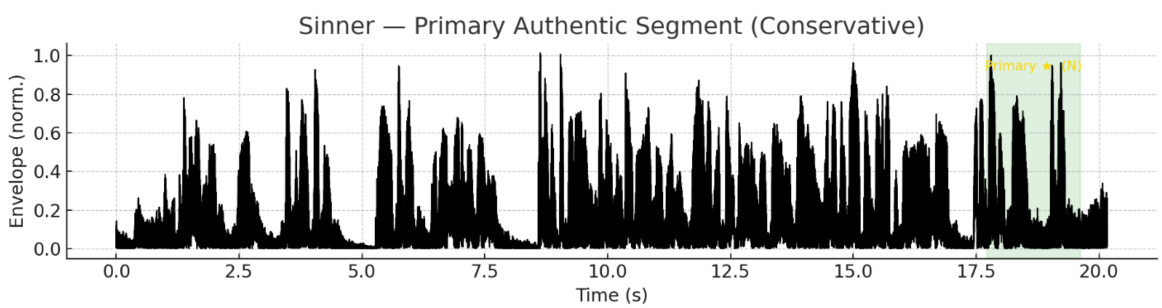
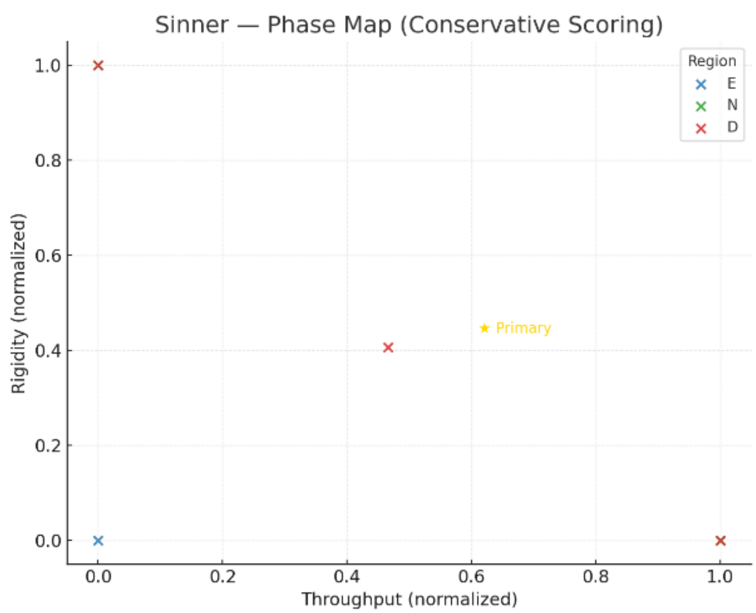


Figure 9. Sinner Resonance Phase Map (E, N, and, D)



In contrast, the Sabalenka map revealed rolling k surges interspersed with rhythmic α dips. We categorized this pattern as more indicative of attunement cycles. Most notably, one segment (minute 1:20–1:30) followed a visible emotional swell, where both k and $\mathcal{T}$ rose sharply, followed by a softening ρ, suggesting momentary co-regulation and increased reciprocal alignment.

Figure 10. Sabalenka Envelope Window (E, N, and D regions)

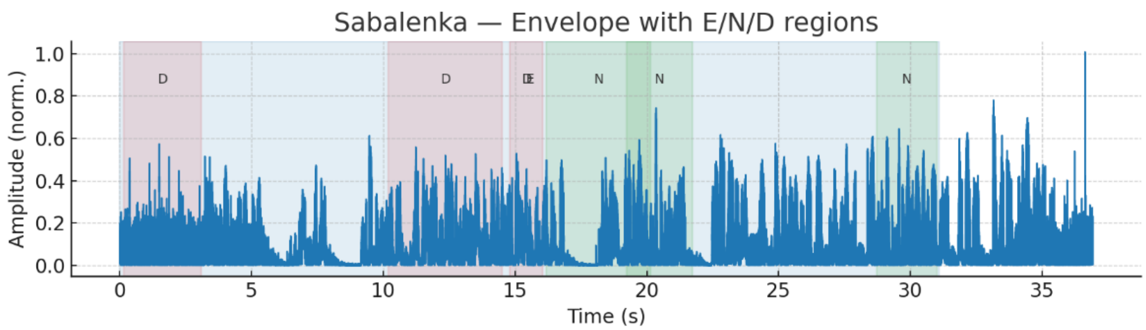
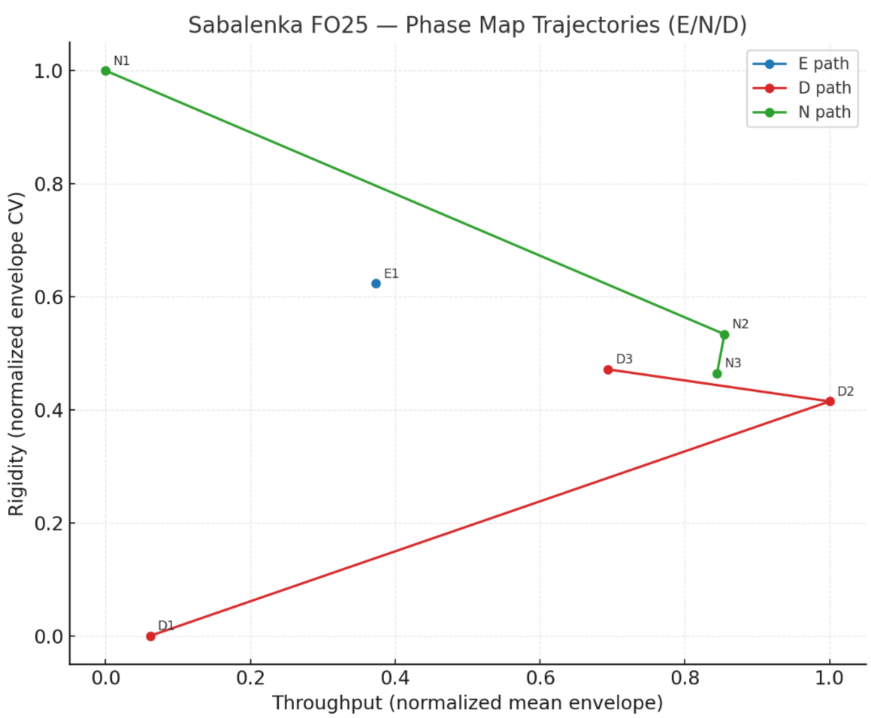


Figure 11. Sabalenka Phase Map Trajectories (E, N, and D)



These comparisons highlight the field model's capacity to detect resonance states even in non-contrived, high-noise environments. Emotion is not coded in content but distributed across pressure, rhythm, and energy flow.

Field Differentiation of Authentic and Acted Shame

To evaluate whether sentic resonance geometry could distinguish between authentic and simulated emotion, we constructed a controlled A/B probe using two shame expressions: one drawn from an unscripted, spontaneous speech sample (A), and one produced by the lead author performing a matched shame script (B). The clips were comparable in duration (20 s), thematic content (loss, memory, love, embarrassment, shame), and overall structure, allowing focused comparison of dynamic field features: $\mathcal{T}$ (throughput), k (coupling onset), and α (shear index).

In the authentic shame (A), the field signature showed a slow rise in $\mathcal{T}$, with low initial k that crescendoed in phase with breath catches and pauses. Hemispheric shear α decreased steadily across the middle window, suggesting alignment between content and embodied pacing. Notably, a spontaneous micropause (7.2s) preceded a sharp k surge and α flattening, which we categorized as an emotional "drop-in", or a moment where the speaker and signal field appeared to enter deeper coherence.

In the acted shame (B), we observed high k early, with rhythmic precision and uniform $\mathcal{T}$, but sustained α elevation; this was categorized as consistent with performance clarity but also field dissonance. No micro-repair signatures (e.g., k followed by α relaxation) were detected. The waveform appeared aesthetically fluent but lacked the feedback loops from the authentic shame clip. Both signals "sounded emotional," however, the authentic shame showed marked field signatures of rupture and recovery.

Field Detection of Emotional Shifts in Naturalistic Speech

In July 2025, during a live exploration of emotional waveform theory, we examined two short naturalistic audio clips involving intimate end-of-life communication. The clips were selected not for lexical content alone, but for their differing waveform contours under conditions of high affective salience. Our aim was exploratory: to assess whether the field model could differentiate between grief-dominant and reconciliation-oriented signal patterns in authentic human speech.

Clip 1 (T1), beginning with the phrase *"My body is just a shell…"*, captured a young woman speaking to a dying woman she deeply respected. The waveform showed a slow rise, an unstable peak, and a hollowed release broadly consistent with grief-like sentic curvature, followed by an extended plateau rather than a clean decay. This plateau coincided with sobbing speech and reflective verbal content, suggesting that the clip did not instantiate a singular grief signal so much as a mixed pattern in which grief remained active while cognitive distancing or philosophical reframing entered the field.

Clip 2 (T2), beginning with *"I love you deeply,"* captured a moment in which one woman expressed love to another who was dying, received comfort in return, and responded again. Relative to T1, the waveform showed greater tremor and local spike variation early in the clip, followed by a more rhythmic and progressive decline in amplitude. Near the end of the segment, the waveform included an acoustically distinct event temporally consistent with a physical embrace. In field terms, this segment appeared less dominated by unresolved descent and more by re-regulation within connection.

The first clip was marked by grief with sustained instability and plateau; the second by affiliative exchange with a more coherent settling pattern. Although preliminary and based on a very small sample, this comparison suggests that the model may be sensitive not only to rupture and intensity, but also to differences in how emotionally charged signals decay, reorganize, or return toward regulation.

These observations should be interpreted cautiously. The clips were naturalistic, unstandardized, and embedded in highly specific relational contexts. Even so, they provide an initial illustration of the model's potential to detect fine-grained variation in emotionally complex human communication, including events that unfold across speech, sobbing, pause, and possible physical contact.

In summary, phase maps of French Open speeches highlight how emotional fields can be charted under pressure, while authentic and acted shame reveal some of the fine-grained differentiations related to shearing and alignment. In addition, authentic grief clips illustrate how the lens of Sentic Resonance helps target and frame emotion/syntax shifts in sensitive interactions.

Discussion

Since the 1990s, scientists of human emotion have developed increasingly precise ways to detect and classify nonverbal and verbal signals, from facial muscle movements to touch patterns to vocal intonation (see recent reviews: Chutia & Baruah, 2024; Kusal et. al., 2023: Sofroniew et. al., 2026).

While this precision has led to significant gains in affective computing and emotion AI, prior work has cautioned that emotional detection divorced from dynamic context risks mistaking appearance for reality. As Buck and Miller (2016) point out, the danger may be that we end up with emotion without people, or recognition systems trained on categories rather than contours, simulations rather than situations. Said plainly, current emotion-detection models have gained precision in recent decades, but often lose dynamic context, leaving us with categories detached from lived communicative flow.

Findings from the present study suggest that communication may be best understood as a dynamic field under constant deformation. Our results show broadly that subtle emotion/syntactic shifts can be captured, analyzed, and understood using the Sentic Resonance Theory framework. Fine-grained analyses further reveal that emotion/ syntactic rupture, regulation, and reorganization have subtle, interpretable patterns across time and varying degrees of natural and performative communication.

Resonance Under Public Pressure

The Sinner and Sabalenka cases illustrate how emotional and syntactic demands may co-occupy the same communicative field under conditions of stress, visibility, and ritual constraint. Both athletes were navigating the disappointment of a final-round loss while addressing thousands of spectators, including the opponent who had just bested them. This is a communicative setting laden with emotional intensity, ritualized formality, and public visibility. Our analysis considered how Jannik and Ariana expressed emotions in these speeches. This is presented as an observation and analysis, not a judgment; the authors note their respect for the athletes and the demands of this context.

What emerges is not the simple presence or absence of categorical emotions, but the dynamic interplay of competing waveforms. The disappointment of loss coexists with gratitude toward fans, respect for the opponent, and the obligation to maintain composure in a ceremonial moment.

In Sinner's speech, repeated praise terms such as *"amazing"* and *"very happy for you"* preserved the expected syntax of admiration, yet the surrounding hesitation, flattened delivery, and restrained bodily cues suggested that formal respect and affective strain were co-present within the same field. In contrast, Sabalenka's speech carried tears, vocal strain, and self-critical pain directly into her praise of her opponent, suggesting a field in which distress and affiliative respect remained simultaneously active rather than being affectively flattened in advance.

From a resonance perspective, such contexts exemplify the collision and layering of emotional fields across multiple time scales: the immediate sting of defeat, the longer trajectory of a professional career, and the ritualized cadence of sporting ceremony. Our framework suggests that what is perceived in these speeches is not reducible to anger, sadness, or joy alone, but arises through the intermodulation of overlapping currents that spill over and fold back into the shared communicative field.

Our findings suggest that during stressful, public-facing speeches like those of Sinner and Sabalenka, speakers regulate both syntactic precision and emotional clarity in real time. This dual regulation brushes with prior research demonstrating how physical co-presence can downregulate stress: for instance, Coan, Schaefer, and Davidson (2006) showed that women holding the hands of romantic partners or strangers exhibited reduced neural activation in threat-related regions while anticipating electric shock.

In the case of Sinner and Sabalenka, though no hands were held, numerous signals flowed, between body, mind, court, and crowd, that appear to have provided stabilizing feedback. These dynamic inputs may have acted as metaphorical "handholds" to help modulate distress and maintain coherence under pressure.

Waveform Fracture, Authenticity, and Performed Affect

The comparison between spontaneous and performed shame suggests that resonance may become especially visible in the micro-disruptions that accompany embodied affect under real constraint. Our comparative probe of performed versus spontaneous shame illustrates how emotional expression and linguistic structure interact, and how this interaction shifts across spontaneous and simulated contexts (Buck & VanLear, 2002).

One important observed difference was that the spontaneous shame clip disrupted the speaker's breathing and syntax: at one point, their words caught in their throat while recalling a past lover who had scorned them. This interruption created a waveform inflection that marked both physiological constraint and emotional weight. This aligns with what Clynes referred to as "choiceless recognition," and what Truslit (1938) characterized as the body's capacity to tune air and movement in the communication of feeling.

By contrast, the performed shame scenario demonstrated smoother delivery, with more well-placed intonational cues but little to no comparable disruption of breath or syntax. Together, these findings suggest that authenticity may not lie in the presence of emotional markers per se, but in the micro-disruptions they impose on communicative flow, the subtle fractures that performance alone may be less likely to replicate (Buck, 1999).

Such disruptions may not simply be artifacts of delivery, but markers of embodied resonance, where physiology, affect, and language collide. If future data continue to support this interpretation, authenticity, in this framing, may become increasingly legible as a waveform fracture.

Naturalistic Reorganization in Grief-Dominant and Reconciliation-Oriented Speech

The end-of-life clips extend the model into a more intimate and naturalistic communicative space, where emotionally salient signals do not remain stable but shift, overlap, and reorganize within the same field. In both clips, the medically probable death of one participant introduced what we term death-gravity: a field condition in which the felt proximity of ending increases the salience and reorganizing force of communicative acts.

In the first clip, grief was not distributed evenly across the segment. Manual coding identified a sustained grief region early in the clip, accompanied by multiple death-pressure spans clustered around references to the body as "a shell" and to fear or sadness in relation to that image. Rather than producing a single uninterrupted descent, these death-weighted moments were followed by brief node-like shifts in which the signal appeared to partially reorganize toward love or neutrality. In this sense, death-gravity did not merely amplify sadness; it appeared to concentrate the field around embodied finality while also making small reorganizations in tone especially consequential.

In the second clip, the field again carried grief and love together, but the signal reorganized more fully toward affiliation. The descent associated with grief was interrupted by tighter, more uniform waveform organization and was ultimately overlaid with an acoustic event consistent with physical embrace.

Taken together, the clips suggest that end-of-life communication may be especially informative for resonance analysis because grief, care, and bodily connection are compressed into a shared field under conditions of temporal finitude. On this view, death-gravity is not a separate emotion, but a field modifier: it changes how signals matter, how long they linger, and how readily they reorganize around bond, loss, and possible repair.

From Signal Packets to Fields of Interaction

Across these examples, the central theoretical implication is that communication may be more adequately modeled as a field of interacting waveforms than as a transfer of discrete emotional packets. While linear models of stimulus and response have offered clarity for discrete measurement, they fall short in capturing the recursive dynamics of emotional exchange. Sentic Resonance Theory (SRT) offers a framework for approaching this complexity: emotions are not fixed events but evolving fields that can amplify, dampen, or collide across time. These fields defy the tidy boundaries of codable units, instead resembling waveforms that interact through superposition, interference, and temporal overlap.

Such a perspective aligns with long-standing calls to recognize communication as processual and dynamic rather than categorical (Buck, 1984; Clynes, 1989). Importantly, our findings suggest that a waveform-based view does not replace traditional methods of emotional coding and detection but rather complements them by revealing the temporal architectures through which emotions travel, combine, and transform.

In this light, the metaphor of tide pools and reservoirs becomes useful. For example, human communication and artificial intelligence can be conceptualized as distinct reservoirs, each drawing from deep stores of lived experience or learned data (Nass & Moon, 2000). When taken alone, each system is capable of producing meaningful signals. Yet when interconnected through shared channels of co-creation, the circulation between them gives rise to emergent resonance patterns.

This framing suggests that resonance is not merely the product of one system transmitting and another receiving, but the result of coupled flows, and signals mixing, redirecting, and returning with altered form. Such circulation helps explain why the emotional layering observed across time often resists categorical parsing: signals may re-enter the communicative field transformed by their passage through a shared reservoir, re-surfacing in ways that are both patterned and unpredictable.

Sentic Resonance as Complement, Not Replacement

SRT is not intended to replace categorical, appraisal-based, or neurophysiological models of emotion, but to complement them by clarifying the temporal and relational geometry through which emotional signals unfold. Where polyvagal theory frames emotional state as a function of autonomic reactivity (Porges, 2011), and affective neuroscience locates emotion in subcortical circuitry (Panksepp, 1998), Sentic resonance approaches these dynamics at the field level, modeling not just internal activation, but external waveform expression across shared space-time.

For example, in moments of communicative convergence, such as affection or grief, these emotional waveforms may instantiate shared attention, shared time, and even shared physiology. This theoretical reframe invites new empirical questions. If emotional signals shape attention in waveform form, then perhaps the future of affective science lies not in classifying faces or tones, but in tracing emotional geometry across time, rupture, and repair.

Future Directions: Repair, Temporal Sensitivity, and Comparative Systems

If emotional communication is field-like, then future research should focus less on isolated signal detection and more on temporal continuity, dyadic repair, and the conditions under which resonance is stabilized or lost. Sentic Resonance Theory opens novel paths for testing how emotion flows through ruptures, repairs, and co-regulated exchange.

Future studies might probe dyadic repair using real-time waveform monitoring that tracks how a communicative fracture (e.g., silence, misstep, facial withdrawal) generates detectable changes in shear, pressure, and attention within the field. These rupture-response signatures could then be compared across human–human and human–AI interaction, revealing whether artificial systems can develop attunement pathways structurally akin to those in human interaction.

Likewise, waveform-synchronized tasks, such as collaborative movement games or emotion-seeded dialogue prompts, could be used to measure throughput ($\mathcal{T}$) and reactivity under varying resonance conditions. These designs do not just measure behavior; they model whether emotional connection emerges as a field effect that is dynamic, recursive, and contingent on mutual timing.

Ultimately, Sentic Resonance Theory offers not a final account of emotion, but a working map for tracing how feeling moves, organizes, and sometimes becomes shareable across time. While traditional models of emotion, whether physiological (Cannon, 1987; Lang, 1994), cognitive-appraisal-based (Schachter & Singer, 1962; Dror, 2017), or constructionist (Barrett, 2017), have each offered valuable insights, they often rely on static categories or linear sequences. Barrett (2006, 2017) has persuasively illustrated how emotions emerge temporally through conceptual and interoceptive processes. We build on this insight while diverging from constructionist theory by modeling emotion as both constructed and naturally emergent in measurable waveforms.

We encourage future researchers to consider SRT not as a replacement for categorical coding, but as a complement, particularly in contexts of emotional ambiguity, rupture, or repair. Experimental paradigms that track waveform continuity across dyads, species, or interfaces may help clarify how emotions move, shift, and return. The field would benefit from more temporally sensitive tools for measuring coupling, inflection, and affective dissociation in real time. Just as importantly, we invite theorists to explore what it means for emotion to be modeled not only as a signal, but as a field. This dynamic emphasis opens new avenues for interdisciplinary inquiry across neuroscience, communication, and affective AI (LeCun, Bengio, & Hinton, 2015).

By considering the motion-derived, and phenomenologically grounded perspectives of Truslit and Clynes and projecting them through the lens of modern computation, we arrive at a simple hypothesis: communication is not just the exchange of signs, but the synchronization of waves and rhythm. Whether in the controlled expressions of a defeated tennis player, the “posed” shame of a performer, or the emergent flow between love and grief when dealing with the end of life, the field appears to remember the shape of the waves. Our task may now be to learn to read it with greater scientific attention.

References

Barnlund, D. C. (2008). A transactional model of communication. In *C. D. Mortensen (Ed.), Communication theory* (2nd ed., pp. 47-57). New Brunswick, New Jersey: Transaction.

Barrett, L. F. (2006). Are emotions natural kinds?. *Perspectives on psychological science,* 1(1), 28-58. https://doi.org/10.1111/j.1745-6916.2006.00003.x.

Barrett, L. F. (2017). The theory of constructed emotion: an active inference account of interoception and categorization. *Social cognitive and affective neuroscience*, 12(1), 1-23. http://doi.org/10.1093/scan/nsw154. Erratum in: *Soc Cogn Affect Neurosci*. 2017 Nov 1;12(11):1833. http://doi.org/10.1093/scan/nsx060.

Buck, R. (1984). *The communication of emotion.* Guilford Press.

Buck, R. (1999). The biological affects: A typology. *Psychological Review,* 106(2), 301–336. http://doi.org/10.1037/0033-295x.106.2.301.

Buck, R., & Miller, M. (2016). Measuring the dynamic stream of display: Spontaneous and intentional facial expression and communication. In D.

Matsumoto, H. C. Hwang, & M. G. Frank (Eds.), *APA handbook of nonverbal communication* (pp. 425–458). American Psychological Association. https://doi.org/10.1037/14669-017.

Buck, R., & VanLear, C. A. (2002). Verbal and nonverbal communication: Distinguishing symbolic, spontaneous, and pseudo-spontaneous nonverbal behavior. *Journal of Communication*, 52(3), 522–541. https://doi.org/10.1111/j.1460-2466.2002.tb02560.x.

Cannon, W. B. (1987). The James-Lange theory of emotions: a critical examination and an alternative theory. *The American journal of psychology*, *100*(3/4), 567-586. https://doi.org/10.2307/1422695.

Chutia, T., & Baruah, N. (2024). A review on emotion detection by using deep learning techniques. *Artificial Intelligence Review*, 57(8), 203. https://doi.org/10.1007/s10462-024-10831-1.

Clynes, M. (1977). *Sentics: The touch of emotions*. Doubleday Anchor.

Clynes, M. (1980). The communication of emotion: Theory of sentics. *In Theories of emotion* (pp. 271-301). Academic Press. https://doi.org/10.1016/B978-0-12-558701-3.50017-X.

Clynes, M. (1989). Methodology in sentographic measurement of motor expression of emotion: Two-dimensional freedom of gesture essential. Perceptual and Motor Skills, 68(3), 779-783. https://doi.org/10.2466/pms.1989.68.3.779.

Clynes, M. (1994). Entities and brain organization: Logogenesis of meaningful time-forms. *In Proceedings of the Second Appalachian Conference on Behavioral Neurodynamics*. Hillsdale, NJ: Lawrence Erlbaum Associates (Note: Published online by Clynes, 2004).

Coan, J. A., Schaefer, H. S., & Davidson, R. J. (2006). Lending a hand: Social regulation of the neural response to threat. *Psychological science*, 17(12), http://doi.org/10.1111/j.1467-9280.2006.01832.x.

Dror, O. E. (2017). Deconstructing the “two factors”: The historical origins of the Schachter–Singer theory of emotions. *Emotion Review*, *9*(1), 7-16. https://doi.org/10.1177/1754073916639663.

Ekman, P. (1992). Are there basic emotions? *Psychological Review,* 99(3), 550–553. https://doi.org/10.1037/0033-295X.99.3.550.

Kusal, S., Patil, S., Choudrie, J., Kotecha, K., Vora, D., & Pappas, I. (2023). A systematic review of applications of natural language processing and future challenges with special emphasis in text-based emotion detection. Artificial Intelligence Review, 56(12), 15129–15215. https://doi.org/10.1007/s10462-023-10509-0.

Lang, P. J. (1994). The varieties of emotional experience: a meditation on James-Lange theory. Psychological review, 101(2), 211. http://DOI.org/10.1037/0033-295x.101.2.211.

Langdridge, D., & Butt, T. (2004). The fundamental attribution error: A phenomenological critique. *British Journal of Social Psychology*, *43*(3), 357-369.

Lasswell, H. D. (1948). The structure and function of communication in society. In L. Bryson (Ed.), The communication of ideas (pp. 37-51). New York: Harper and Row.

LeCun, Y., Bengio, Y., & Hinton, G. (2015). Deep learning. Nature, 521(7553), 436–444. https://doi.org/10.1038/nature14539.

Miller, E. K., & Buschman, T. J. (2015). Working memory capacity: Limits on the bandwidth of cognition. *Daedalus, 144*(1), 112-122.

Miller, M. (2012). Investigating Sentics and Emotion Communication through Symbolic and Pseudo Spontaneous Touch [Doctoral dissertation, University of Connecticut].

Miller, M. J., ChatGPT-5.4, ChatGPT-4o, GeminiPro-1.5, and Qwen-3. Sentic Blooms: Waveform Geometry and the Rheology of Affect. *Una Mens: Homo et Machina*, 1, 1. https://doi.org/10.66787/um.000003.

Nass, C., & Moon, Y. (2000). Machines and mindlessness: Social responses to computers. Journal of social issues, 56(1), 81-103. https://doi.org/10.1111/0022-4537.00153.

Panksepp, J. (1998). The periconscious substrates of consciousness: Affective states and the evolutionary origins of the self. Journal of consciousness studies, 5(5-6), 566-582.

Porges, S. W. (2011). The polyvagal theory: Neurophysiological foundations of emotions, attachment, communication, and self-regulation (Norton series on interpersonal neurobiology). WW Norton & Company.

Schachter, S., & Singer, J. (1962). Cognitive, social, and physiological determinants of emotional state. *Psychological review*, *69*(5), 379. https://doi.org/10.1037/h0046234.

Shannon, C. E., & Weaver, W. (1949). *A mathematical model of communication.* Urbana, IL: University of Illinois Press, 11, 11-20.

Sofroniew, N., Kauvar, I., Saunders, W., Chen, R., Henighan, T., Hydrie, S., ... & Lindsey, J. (2026). Emotion concepts and their function in a large language model. *arXiv preprint arXiv:2604.07729*.

Repp, B. H. (1993). Music as motion: A synopsis of Alexander Truslit's (1938) Gestaltung und Bewegung in der Musik. *Psychology of Music, 21*(1), 48-72. https://doi.org/10.1177/030573569302100104.

Truslit, A. (1938). Gestaltung und Bewegung in der Musik. Berlin-Lichterfelde: Chr. Friedrich Vieweg.