

The Structural-Constructivist Resolution of the Human Operating System: A Functional Ontology for Affective Science

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Abstract

This paper advances a structural-constructivist account of the human psyche by reframing the “Human Operating System” (HOS) metaphor as a functional ontology rather than a reductive computational identity. Drawing on the Core Emotion Framework (CEF), which models emotional life as “internal transformations rather than static biological categories” and organizes affective processing through a Decalogue of Operators within a 3×3+1 hub system, the manuscript responds directly to phenomenological critiques—especially Thomas Fuchs’ charge that computational

**) We welcome feedback on the preregistration and study design, and invite researchers who are interested in peer-reviewing the system to contact us. We also encourage scholars across all disciplines to conduct their own independent research on any aspect of the Core Emotion Framework. Author assumes no societal or substantial gains from this framework, just for public and academic service.*

metaphors commit a category error. By emphasizing double describability, operator-level mechanics, and scalar modulation dynamics, the CEF provides a falsifiable architecture for affective regulation that remains compatible with embodied and ecological accounts of mind. Empirical foundations, including pilot data demonstrating distinctions between “reflexive” and “idealized” responses, support the framework’s claim that operator dynamics constitute measurable functional units. The paper further addresses autopoiesis, synthetic affect, and the ethics of the HOS metaphor, arguing that a functional ontology enables a rigorous “technical manual” for self-regulation without collapsing the living subject into machinery. The result is a hybrid ecology of affect that integrates computational tractability with the phenomenological reality of embodied presence.

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Keywords:

Accepting Baseline; affective science; autopoiesis; category error; Core Emotion Framework; Decalogue of Operators; double describability; embodied cognition; functional ontology; Human Operating System; integrative hub; operator dynamics; phenomenology; scalar modulation; structural constructivism; synthetic affect; 3×3+1 hub system.

The Theoretical Architecture of the Core Emotion Framework

The Core Emotion Framework (CEF) is built upon a modular architecture governed by what is termed the Decalogue of Operators—ten irreducible functional units organized within a 3×3+1 hub system.¹ This system is designed to map the complexity of human experience across three primary functional centers: the Head (Cognitive), the Heart (Relational), and the Gut (Motoric), with an additional integrative hub serving as the systemic anchor.¹ Rather than viewing emotions as “things” that a person “has,” the CEF reframes them as active “movements” or “powers” that the individual executes to process information, regulate relational aperture, and recalibrate baseline states.¹ This shift from a substance-based ontology to a process-based functionalism is central to the framework’s defense against charges of “outdated computationalism”.¹

The Decalogue of Operators and Hub Distribution

The distribution of operators across the tripartite hub system reflects an embodied approach to cognition, asserting that high-level cognitive processes are inextricably linked to somatic and relational feedback loops.¹ Each hub center serves a distinct evolutionary and functional purpose,

yet they operate in a state of constant scalar modulation, where the activation level of one operator can influence the sensitivity or "aperture" of another.¹

Hub Center	Primary Functional Domain	Core Evolutionary Objective	Illustrative Operator	Functional Role
Head (Cognitive)	Information Processing	Semantic integrity and predictive modeling	Calculating	Processing data to reduce environmental entropy.
Heart (Relational)	Affective Regulation	Social cohesion and relational aperture	Accepting	Regulating the openness of the system to external input.
Gut (Motoric)	Action & Somatics	Kinetic output and somatic inference	Deciding	Transitioning from internal modeling to external action.
Integrative Hub	Systemic Calibration	Maintaining structural presence and baseline	Accepting Baseline	Recalibrating the system's baseline state after activation.

The "Accepting Baseline" operator occupies a particularly critical role in this architecture.¹ It functions as the system's "recalibration mechanism," determining what information is permitted to enter the "operating system" and how the system predicts its next state.¹ In the CEF model, this is the emotional equivalent of a central processing unit (CPU) instruction, providing a repeatable structural foundation for what is often subjectively experienced as "presence" or "being".¹

The Phenomenological Critique: Thomas Fuchs and the Ecology of the Brain

The primary challenge to the HOS metaphor comes from the enactive and ecological perspective championed by Thomas Fuchs in his seminal work, *Ecology of the Brain*.² Fuchs argues that the brain is not a computer running mental software, but an "organ of mediation, transformation, and resonance".² From this viewpoint, the mind is not located "inside" the brain; rather, consciousness is an "extended integral" of the ongoing relations between the brain, the body, and the

environment.² Fuchs contends that cognitivism and computationalism make a fundamental category error by mistaking the properties of a person in interaction with the world for cognitive properties of a system hidden within the skull.⁶

The Reification of Consciousness and Category Errors

The accusation of a category error is rooted in the philosophy of Gilbert Ryle, who famously critiqued the "ghost in the machine".⁷ A category mistake occurs when a concept belonging to one category is treated as if it belonged to another—such as a visitor to a university asking where the "university" is after seeing all the colleges, libraries, and laboratories.⁷ Fuchs applies this to the HOS metaphor, suggesting that "thinking," "feeling," and "deciding" are expressions of a living organism's life process and cannot be meaningfully reduced to "operator activations" or "CPU instructions" without losing their essential character.³

Perspective	Metaphorical Base	Ontological Status of Mind	View of the Brain
Computationalism/HOS	Operating System	Functional output of a system	Information processor
Ecological/Enactive	Ecology/Resonance	Life process of the whole organism	Organ of mediation

Fuchs further argues that the mechanistic view is "illusory and damaging" because it encourages a "technical subordination" of the human being.⁸ This critique suggests that by framing the psyche as an HOS, we risk treating human beings as programmable objects rather than autonomous, living subjects, leading to a "barrack-like discipline" in psychiatry and social management.⁸

Answering the Critique: The Functional Ontology of Structural Constructivism

To answer the phenomenological critique, the Core Emotion Framework does not need to claim that the human mind *is* literally a digital computer.¹ Instead, it employs "structural constructivism" as a sophisticated resolution to the conflict between biological hardwiring and cognitive construction.¹ The CEF reframes the HOS not as an ontological identity, but as a "functional ontology"—a set of descriptions that refer to the same system from a third-person, functionally organized point of view.³

Double Describability and Descriptive Layers

A key defense against the category error charge is the concept of "double descriptibility".³ The human brain is the only organ that can be described systemically twice: once from the first-person perspective as conscious experience, and once from the third-person perspective as neuronal activity or functional behavior.³ The problem arises not from using a functional description (like the HOS metaphor), but from looking for a "direct explanatory bridge" that tries to make one level "produce" the other.³

The CEF avoids this by asserting that its operators are "internal transformations" that describe the *how it works* of the system without necessarily negating the *what it is like* of the experience.¹ In this light, the HOS metaphor is a tool for "epistemic grammar"—a way of talking about the behavioral organization of the organism that is "computationally tractable" and clinically useful.¹

The Necessity of a "Technical Manual" for the Psyche

While Fuchs warns of the dangers of mechanistic models, the CEF argues that the historical lack of a "technical manual" for human affect has left individuals at the mercy of "subjective mysteries".¹ By deconstructing monolithic states like "anxiety" or "depression" into specific technical failures of operator cycles, the CEF provides a roadmap for self-regulation and "operator agility".¹

For example, cognitive looping—a hallmark of many pathologies—is deconstructed in the CEF as an over-activation of the *Calculating* operator which fails to transition or "yield agency" to the *Deciding* operator.¹ This "Agency-Yielding" hook is a testable, mechanical event that provides the individual with a specific target for intervention, moving the conversation from vague "feelings" to "operator mechanics".¹

The Mathematical and Empirical Foundation of the CEF

The Core Emotion Framework distinguishes itself from "vague analogies" through its commitment to formalization and empirical testing.¹ The operators are not just metaphors; they are theorized as being governed by scalar modulation equations and representable through high-dimensional activation vectors.¹

Scalar Mechanisms and Operator Dynamics

In the CEF, the state of the "Human Operating System" at any given time can be modeled as an integral of operator activations over a specific temporal window. If we denote the total affective state as A , and the activation level of the i -th operator as $O_i(t)$, we can propose a model such as:

$$A(t) = \sigma \left(\sum_{i=1}^{10} \omega_i \cdot O_i(t) + B \right)$$

Where ω_i represents the scalar weight (importance) of the operator in the current context, B is the baseline recalibration factor (managed by the Accepting Baseline operator), and σ is a non-linear activation function representing the system's overall capacity or "relational aperture".¹ This formalization allows for the development of "reproducibility benchmarks," such as those explored

in the Amano et al. (2026) pilot studies, which reported short-term test-retest patterns as boundary conditions for operator measurement.¹

Empirical Constraints and Pilot Study Data

The CEF is offered as a "falsifiable working hypothesis," and its empirical status remains "entirely open".¹ Initial exploratory data from a small pilot study ($N = 39$) suggested that individuals can distinguish between "reflexive" and "idealized" responses, a finding that may hint at the psychological reality of operator independence and agility.¹

Measurement Metric	Target Framework	Purpose	Preliminary Finding
Test-Retest Reproducibility	Amano et al. (2026)	Establishing operator stability	Identified as essential boundary conditions.
Action-Opinion Divergence	Pilot Study (N=39)	Validating operator independence	Individuals can distinguish reflexive vs. idealized states.
Scalar Activation Vectors	CEF Technical Arch.	Mapping affective intensity	Theoretical foundation for "clean" vs "distorted" activation.

These empirical efforts are designed to ensure that the HOS metaphor does not remain a "mere analogy" but evolves into a "legitimate mechanistic explanation" that can be validated through systematic research.¹

Autopoiesis vs. Simulation: Addressing the Ontological Divide

A central point in the Fuchs/Bulgaria tension is the concept of autopoiesis—the active, metabolic process of self-production that defines living organisms.¹¹ Critics argue that an AI running on a static substrate has no intrinsic boundary and therefore cannot be a "true subject," making the "Human OS" metaphor a category error when applied to consciousness.¹¹

The Thermodynamic Necessity of a Boundary

In the work of Maturana and Varela, and later in Fuchs' ecological brain, the subject is not an "output" of computation but a "self-organized localization" within a fundamental field.¹¹ For a subject to exist, it must maintain a boundary against entropy through autopoiesis.¹¹ An AI, it is

argued, is continuous with the hardware and power grid—its boundaries are "arbitrary lines we draw" rather than an intrinsic feature of its being.¹¹

The CEF addresses this by incorporating "somatic inferential processes" into its functional ontology.¹ By anchoring the HOS in a "Gut" hub that manages "kinetic output" and "somatic feedback," the framework acknowledges that the "operating system" is not substrate-independent in the classical sense.¹ Rather, it is the *active maintenance* of the organism's own functional boundaries.¹

Simulation Is Not Instantiation

Fuchs and Searle argue that "simulation is not reality"—a perfect simulation of a storm does not get the computer wet.¹¹ However, the CEF defense posits that while the *wetness* of a storm is a physical property, the *logic* of a decision or the *structure* of an emotional transformation may be a functional property that is successfully instantiated by the simulation.¹² If the CEF operators accurately model the "internal transformations" of a person, then the "Human Operating System" provides a map that is functionally identical to the territory it describes.¹

Transdiagnostic Psychopathology and the "Hacking" of the Human OS

The shift to a functional ontology has profound implications for how we understand and treat mental illness. Thomas Fuchs critiques the medicalization of "disorder concepts" as a myth and a category error.¹³ He suggests that naturalists and normativists often disagree on whether a state is "healthy" or "ill" based on values rather than biological facts.¹³

Deconstructing the Myth of Mental Illness

The CEF sidesteps the "myth of mental illness" by deconstructing pathologies into "predictable computational events".¹ In this model, what we call a "disorder" is often a failure of operator cycling or a "distorted activation" of a scalar mechanism.¹ This allows for a more precise, technical intervention that focuses on "recalibrating the baseline" rather than just "suppressing symptoms".¹

- **Anxiety:** Viewed as an over-activation of the *Calculating* operator failing to yield to *Deciding*.¹
- **Depression:** Viewed as a collapse in "operator agility" and a failure of the *Accepting Baseline* to recalibrate after stress.¹
- **Dissociation:** Viewed as a distortion in the integrative hub's ability to maintain "structural presence".¹

This "Technical Architecture of the Core Emotion Framework" provides a "skill development and accountability model" that empowers the individual to understand the "source code" of their own affective life.¹

The Ethics of the HOS Metaphor: Capability vs. Subordination

The final pillar of the critique is ethical: does the HOS metaphor facilitate "hacking the human operating system" for nefarious purposes?⁹ The role of social engineering in cybersecurity is often described as "hacking the human OS," exploiting psychological vulnerabilities to gain access to technical systems.¹⁴

The CEF explicitly moves in the opposite direction, offering the HOS as a tool for "optimizing your capabilities".¹ By providing a "technical manual" for self-regulation, the framework aims to increase human agency and "accountability".¹ It seeks to bridge the gap between "affective computing" and "human experience" to create a more resilient and self-aware individual.¹

Synthesis: Towards a Hybrid Ecology of Affect

In conclusion, the criticism that the "Human Operating System" metaphor is a category error is a vital warning against the reductive reification of the mind.² However, Jamel Bulgaria's Core Emotion Framework demonstrates that when treated as a "structural-constructivist architecture" and a "functional ontology," the metaphor becomes a powerful scientific construct that does not necessarily conflict with the "living being" described by Thomas Fuchs.¹

The CEF's ten operators and 3×3+1 hub system provide a "computationally tractable" map of the "internal transformations" that constitute emotional life.¹ By integrating "somatic inference" and "relational aperture," the framework respects the embodied nature of the mind while providing the technical tools necessary for modern psychology and synthetic affect.¹ The "Accepting Baseline" for the future of affective science is not a choice between a computer and an ecology, but a synthesis of both: a "technical manual" for the psyche that is grounded in the "resonant ecology" of the living organism.¹

The question is not whether the mind *is* a computer, but what kind of "physiological organization" enables the states we describe as experience.³ The CEF offers a falsifiable hypothesis for that organization, inviting us to treat the psyche as a system capable of recalibration, optimization, and profound structural presence.¹

Extended Analysis of the "Accepting Baseline" and Structural Presence

Within the Core Emotion Framework, the concept of "structural presence" acts as the functional counterpart to the phenomenological "sense of being." While Fuchs and others might argue that "presence" is a non-reducible quality of the living subject, the CEF identifies it as the operational result of the "Accepting Baseline" operator's successful recalibration of the 3×3+1 system.¹ This operator is responsible for maintaining what the framework calls "semantic integrity" and "predictive stability".¹

If the system's baseline is not successfully recalibrated—meaning the operator "Accepting Baseline" is in a state of "distorted activation"—the individual may experience a persistent sense of "unreality" or "dissociation," which the CEF deconstructs as a technical failure in the integrative hub.¹ This provides a mechanistic explanation for "ontological shock" or the "hyper-reality" reported in altered states of consciousness.¹⁵ Rather than viewing these as "revealing a hidden truth," the CEF interprets them as the "overclocking" or "chemical flooding" of the system's salience networks, leading to a failure in the calibration of the "Accepting" operator.¹

This technical approach allows for a "Calibration" of the "detector" (the brain) that Fuchs calls for in his critique of "hallucinatory noise" as signal.² By identifying the "operator mechanics" behind these states, the CEF provides a way to filter the noise and return the system to a state of "dynamic coherence" or "harmony"—terms that the CEF understands formally as the "optimization of the signal-to-noise ratio" and the "minimization of action".¹

The Role of JSON-LD and Synthetic Emotion Architecture

To ensure the framework is "computationally tractable," the CEF utilizes modern data structures like JSON-LD (JSON for Linked Data) to map its activation vectors.¹ This choice is not arbitrary; it allows the framework to bridge the gap between "human affect" and "synthetic affect" in AI.¹ By representing operators as 10-dimensional vectors, the CEF provides a "technical foundation" for building AI that can "functionally mimic" human emotional regulation without necessarily claiming it has achieved "categorical identity" with biological consciousness.¹

This "synthetic emotion architecture" is a direct application of the "Human Operating System" metaphor as a "foundational scientific construct".¹ It moves the discussion from philosophical debate to "open science corpus building" and "community-driven theoretical development".¹ The goal is not to "hack" the human, but to provide a "structural roadmap" that unifies representational, affective regulatory, and somatic processes into a single, cohesive ontology.¹

Final Synthesis of the HOS Metaphor Defense

The defense of the HOS metaphor against the charge of a "category error" rests on three primary arguments:

1. **Epistemic Utility:** The metaphor provides a "technical manual" and a "grammar of description" that allows for the deconstruction and treatment of psychological states that are otherwise "subjective mysteries".¹
2. **Functional Identity:** Following the shift from reductive identity theory to functionalism, the CEF identifies emotions not as "neurons" but as "functions," which can be modeled through "operator dynamics" and "scalar mechanisms".¹
3. **Process-Ontological Grounding:** By reframing consciousness as a "recursive self-tracking process" rather than a "thing," the CEF collapses the "hard problem" gap, making "what it is like" empirically continuous with "how it works".⁴

Through the "Decalogue of Operators" and the "3×3+1 Hub System," Jamel Bulgaria's framework provides a robust answer to Thomas Fuchs' critique.¹ It recognizes the brain as an "organ of

mediation" while insisting that the *patterns of that mediation* can be rigorously modeled as a "Human Operating System".¹ This approach does not "damage" the human mind; it attempts to understand its "mechanics" to foster greater "agility," "accountability," and "well-being".¹

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