

From Neurofunctional *Stability* to Neurofunctional *Integrity*

Expanding Neurorights in Consciousness Research

Horacio A. Correa Arechavala

NeuroEthics Research Lab · Neuroderechos.cl · Fundación LIBERTECH, Chile

hcorrea@neuroderechos.cl · neuroethics.cl

§ 01

The Implicit *Assumption*

Traditional models measure clinical affectation — but share a systematic blind spot: the **sociotechnological environment**.

CLINICAL MODELS

- Structural lesions (MRI, CT)
- Population norm deviation
- Diagnostic categories (DSM/ICD)
- **Sociotechnological exposure**
- **Individual-baseline deviation**
- **Sub-clinical-functional interference**

SOCIOTECHNOLOGICAL DIMENSION

- Directed interference, no structural damage
- Deviation from individual's own baseline
- Sub-cognitive somatic perturbation
- Environmental — persistent, algorithmic, invisible
- Can become a sociotechnological phenomenon
- Measurable — but not by clinical instruments

GAP

⚠ A blind spot in measurement is a blind spot in law, governance, and science. **PEM closes this gap.**

§ 02

The Missing Layer in Consciousness Research

Contemporary theories — IIT, Global Workspace, Predictive Processing — share an unexamined premise: that the informational environment reaching the conscious system is unmanipulated at the somatic-autonomic level.

Modern sociotechnological systems can produce directed interference that leaves no structural damage. Neural architecture intact. Neuroimaging normal. Yet consciousness operates on adulterated inputs.

*The question is not whether the mind is conscious — it is whether the **conditions for free consciousness remain intact.***

"Neurofunctional integrity connects neuroscience, consciousness research, and neurorights — as a unified concept whose absence has left a measurable gap in all three fields."

§ 03

Two Independent Biological Routes of Interference

Neurofunctional interference operates through two independent biological pathways — neither produces detectable anatomical lesions. The argument *"the MRI is normal, therefore there is no damage"* is a methodological category error in both cases.

1 SYNAPTIC PROBABILITY MODULATION § 7.2

Cognitive & Autonomic Layer

External interference alters the parameters governing synaptic transmission — **firing frequency**, temporal synchronization, excitation/inhibition balance — modifying cognitive function, autonomic regulation, and behavioral autonomy without touching anatomical structure.

2 HYPOTHALAMIC-GHRH-SWS AXIS DISRUPTION § 5.6.12

Sleep-Neurophysiology Layer

Disruption of **slow-wave sleep** simultaneously compromises four independent pathways: NMDA-mediated synaptic plasticity, autonomic axis stability, neuroendocrine balance, and glymphatic waste clearance — producing progressive deterioration without structural lesion.

*Both routes converge on the same forensic principle: **interference is real, structural instruments cannot detect it.** PEM resolves this by measuring functional deviation from individual baseline.*

ILLUSTRATIVE LIVE DEMONSTRATION — NDF / BHS

A. BASELINE (REGULATED)



♥ HRV High
🧠 Cog. Load Optimal
~ NDF ≈ 0

Coherent attention, autonomic balance, stable performance

B. PERTURBATION (CHALLENGE)



♥ HRV Reduced
🧠 Cog. Load Elevated
~ NDF > 0.40

Physiological strain, decreased stability, reduced performance

C. RECOVERY (RESTORED)



♥ HRV Recovering
🧠 Cog. Load Normalizing
~ NDF ↓ 0.18

Regulatory recovery, restored balance, return to baseline

Conceptual illustration only. Does not claim causal technological influence. Operationalizes the distinction between measurable stability and its ethical implications.

§ 04

The Neurodynamic *Signature*

Every individual carries a unique baseline of physiological rhythm and coherence — a **Neurodynamic Signature**. NDF (Indicador de Desviación de Firma Neurodinámica) measures deviation from that signature, not from a population

§ 05

The Progressive Evidence *Model* — Six Forensic Instruments → One Output

If neurofunctional integrity can be compromised below the threshold of conscious attribution — it must also be measurable below that threshold.

GHE-QI

Environmental gradient index across 5 weighted dimensions (D₁-D₅)
Threshold >0.40 → forensic Loop 6 / IER activation

NAGM

Neurofunctional impact grading · ordinal scale 0-4
From baseline perturbation to severe autonomic compromise