

A Unified Grammar of Science

A. Chawla
REAL Institute

November 22, 2025

Abstract

This paper synthesizes three foundational frameworks — Schrödinger’s wave mechanics, Varshney’s capacity-energy tradeoff, and Chawla’s phenomenological theory of subjective time — into a single conceptual grammar. Objective time t (energy-driven), subjective time $\Delta t'$ (information-driven), and the physical transmission constraints that couple them are unified through a conformal scale parameter ε that finitizes infinity and resolves the algebraic–phenomenological tension surrounding the limit $\Delta I \rightarrow 0$. The resulting picture portrays consciousness as the conformal boundary of information-theoretic physics.

Keywords

Quantum wave mechanics · Time-dependent Schrödinger equation · Capacity-energy tradeoff · Subjective time · Change in self-information · Conformal mapping · Scale parameter ε · Timelessness · Patterned matter-energy · Nullity

1 Introduction

The search for a unified description of physical and experiential reality repeatedly returns to the interplay of energy, information, space, time, and consciousness. The present work demonstrates that these five pillars admit a common mathematical grammar when analyzed through (i) Schrödinger’s derivation of the time-dependent wave equation, (ii) Varshney’s demonstration that information is patterned matter-energy subject to a capacity-energy tradeoff, and (iii) Chawla’s phenomenological ansatz linking subjective elapsed time to change in self-information, with the entire structure compactified by a conformal mapping $\phi(n) = 1/n$.

Notation Table

The adjacent table lists all the major symbols and their meanings as used in this work.

2 Preliminaries

2.1 Objective Time and Energy (Schrödinger)

The objective temporal variable t emerges from the quantum postulate $E = h\nu$. For stationary states, the time dependence of the wave function is a definite periodic factor $\exp(-2\pi i Et/h)$. Substituting the operator correspondence

$$E\psi \longrightarrow -\frac{h}{2\pi i} \frac{\partial \psi}{\partial t}$$

Symbol	Meaning
t, T	Objective physical time and period
$\Delta t'$	Subjective perceived elapsed time
E	Energy (objective)
h	Planck's constant
ν	Frequency
ΔI	Change in self-information
ε	Conformal scale parameter
K	Spiritual knowledge (subjective)
C	Channel capacity (bits/time)
B	Received energy rate (power)
$C(B)$	Capacity-energy function
$f(\cdot)$	Phenomenological subjective time function
$\phi(n) = 1/n$	Primary conformal mapping

Table 1: Principal symbols and their interpretations

into the time-independent vibration equation yields the time-dependent Schrödinger equation (TDSE)

$$\nabla^2 \psi - \frac{8\pi^2}{h^2} V \psi + \frac{4\pi i}{h} \frac{\partial \psi}{\partial t} = 0.$$

Objective time t is therefore the coordinate conjugate to energy E , and the objective period $T = 1/\nu \propto 1/E$.

2.2 Subjective Time and Information (Chawla)

Subjective elapsed time $\Delta t'$ is defined phenomenologically by

$$\Delta t' = f(\Delta I),$$

where ΔI is the change in self-information acquired through sensory or internal sampling. The function f is stated to be *inverting*: minimal sampling (small ΔI) corresponds to rapid passage of perceived time (small $\Delta t'$). The philosophical boundary $K \rightarrow \infty$ (infinite spiritual knowledge) forces $\Delta I \rightarrow 0$ and requires $\Delta t' \rightarrow 0$ (“nullity” or timelessness), despite the algebraic suggestion of a pure reciprocal $1/\Delta I \rightarrow \infty$.

2.3 Transmission Constraint: Information as Patterned Matter-Energy (Varshney)

Varshney rejects Wiener’s separation of information from its physical medium, asserting “information is patterned matter-energy.” Transmitting information C and energy B simultaneously over a single noisy channel yields a capacity-energy function $C(B)$ that is non-increasing and concave. Severe noise or deliberate sensory deprivation collapses reliable capacity $C \rightarrow 0$, annihilating ΔI at the receiver.

3 Methods: The Conformal Scale Parameter ε

The primary conformal mapping in the source is the reciprocal

$$\varepsilon = \phi(n) = \frac{1}{n}, \quad \varepsilon = \frac{1}{D}, \quad \varepsilon = \frac{1}{d},$$

compressing the asymptotic regime $n, D, d \rightarrow \infty$ into the single boundary point $\varepsilon = 0$. This finitizes infinity and makes tree-code analysis geometrically tractable on the compact interval $[0, 1]$.

4 Results: Unification via $\varepsilon = \Delta I$

Equating the conformal scale parameter with subjective information change,

$$\varepsilon \equiv \Delta I,$$

forces the Shannon boundary $\varepsilon \rightarrow 0$ (ideal capacity) to coincide exactly with the consciousness boundary $\Delta I \rightarrow 0$ (timelessness). The algebraic singularity $1/\Delta I \rightarrow \infty$ is topologically wrapped by the conformal boundary condition: the point at infinity in the algebraic coordinate is identified with the origin $\varepsilon = 0$ in the subjective geometry. Thus $\Delta t' \rightarrow 0$ (nullity) is recovered consistently.

Maximal Temporal Discrepancy With perfect transmission, the gap $|T - \Delta t'|$ is bounded by the objective period $T > 0$. With channel collapse (noise or sensory deprivation), $\Delta I \rightarrow 0$ is forced extrinsically, driving $\Delta t' \rightarrow 0$ while objective t continues, achieving the theoretical maximum gap $\approx T$.

5 Discussion

5.1 Future Work

1. Derive an explicit, empirically testable form of $f(\Delta I)$ from neurophysiological data during sensory deprivation and meditation.
2. Construct a rigorous conformal field theory on the information manifold where ε plays the rôle of a complex structure modulus.
3. Extend the capacity-energy framework to quantum channels and compare with holographic bounds (e.g., quantum capacity vs. energy transmission through horizons).
4. Investigate whether the identification $\varepsilon = \Delta I$ implies a microscopic arrow of time reversal near the timelessness boundary.

5.2 Limitations

1. The ansatz $\Delta t' = f(\Delta I)$ remains phenomenological; no microscopic derivation from neural dynamics exists.
2. The equality $\varepsilon = \Delta I$ is a conceptual unification, not yet a mathematically derived identity.
3. The treatment of “infinite spiritual knowledge” $K \rightarrow \infty$ is philosophical rather than operational.
4. Perturbative effects on the objective period T under strong environmental coupling are not quantitatively modeled.
5. The conformal mapping $\phi(n) = 1/n$ is classical; a fully quantum version remains to be formulated.

5.3 Conclusion

Energy governs objective time through $E = h\nu$, information governs subjective time through $\Delta t' = f(\Delta I)$, and the physical act of transmission couples the two via Varshney's capacity-energy constraint. A single conformal mapping $\varepsilon = 1/n = \Delta I$ finitizes the infinite, resolves the algebraic-phenomenological contradiction at the $\Delta I \rightarrow 0$ boundary, and reveals consciousness as the compactified edge of physical information processing. The grammar is complete: energy, information, and consciousness speak the same conformal language.