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PRINCIPLES OF MONADIC HOMEOSTASIS

~ a quasi-principled view on immortality ~

SUMMARY

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I. Introduction

Following the conclusions derived in my previous work *Monadic Conditionality* in terms of total-being-for-itself's dynamic, several questions got opened, one of which (and maybe the most interesting one) is associated with the idea of eternal return. In the research mentioned above, total-being-for-itself was defined as the totality of individual beings-for-itself, layered in harmonic subspaces and preserving monadic referentiality by keeping a constant interdependence between reflectors and reflected.

These harmonic layers were derived as being developed upon independent subspaces, meaning that any two vectors or abstract objects pertaining to different subspaces will be orthogonal to each other, implying absolute ontological separation. Also, in the subjective landscape, deciphered phenomenologically, each harmonic subspace is perceived by its being-for-itself constituents as the fundamental subspace. Thus the sequential harmonic-series trajectory of the transformations across the total-being-for-itself spectrum was defined by octave transformations for all beings-for-itself changing subspaces.

Borrowing some concepts and notation from quantum mechanics, we can think of these harmonic layers as orthogonal planes in an indefinite-dimensional vector space. We will loosely define individual beings-for-itself as abstract objects $\Psi_j(x)$ within their specific harmonic subspace.

Octave transformation was found to be the transformation that describes the migration of being-for-itself to the next harmonic subspace; we will denote this type of transformation by $\hat{T}\Psi_j(x)$, and the resulted state by $\Psi_j^{v}(x)$.

The eternal return necessity was derived from the contemporaneity of all possible worlds and all possible event lines defined by the *panpresence sculpting* performed by the being-for-itself, conveying affinities with Boltzmann brains[1] and Poincaré recurrences, backed up by the predeterministic nature of the block universe. Thus, in this model, all being-for-itself's experiences are eventually reconstructed identically or almost identically *ad infinitum*.

The abyss of time separating two identical configurations can be thought of as being the exponential of the maximum entropy described by the space of possibilities, thus being of the order of Poincaré recurrence time[2] specific to a closed Hilbert space universe, hypothesized to be roughly $e^{10^{120}}$ (regardless of time unit, because at this scale, fascinatingly, measuring in millennia or Planck times makes no real difference).

However, monadic homeostasis implies constant preservation of individual perspectives, so no being-for-itself can be absent for $e^{10^{120}}$ and then reinstated into existence. The purpose of this work is to investigate what happens with any being-for-itself in between the $e^{10^{120}}$ iterations.

In this regard we will make an *ansatz*. Imagine a transformation that changes an event line only infinitesimally, at each repetition, one which, after a sufficient amount of repetitions, will result in a totally different event line, but eventually morphing back into the arbitrary original state that started the observation, after a span of $e^{10^{120}}$. We will denote this infinitesimal transformation by $\hat{\Lambda}\Psi_j(x)$, and the resulted state by $\Psi_j^{\varepsilon}(x)$.

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[1] A "Boltzmann brain" is a hypothetical self-aware entity that arises due to random fluctuations out of a state of chaos, such as a high-entropy universe. This concept stems from the idea of Ludwig Boltzmann, an Austrian physicist, who suggested that the universe could fluctuate into ordered states given enough time. In this thought experiment, every possible structure will eventually get formed and reformed via random fluctuation, the timescale of which is related to the Poincaré recurrence time.

[2] The Poincaré recurrence theorem is a concept from dynamical systems theory that states that certain systems will, after a sufficiently long but finite time, return to a state extremely close to their initial state. (For the sake of simplicity, we will refer to the infinitesimally closest state as *identical)*. This theorem is a consequence of the recurrence properties of certain dynamical systems. Even if the Universe is expanding, it can be viewed as a Universe that has finite entropy and can be described via a finite-dimensional Hilbert space, which is eligible for Poincaré recurrences.

Proving that $\hat{T}\Psi_j(x)$ is equivalent to $\hat{\Lambda}\Psi_j(x)$ would show that the octave transformation is actually an infinitesimal transformation and would complete a quasi-principled view on immortality (suggested in *Monadic Conditionality*), but different than the "quantum immortality" derived from the many-worlds interpretation, and also different than the "immortality models" that imply the existence of souls.

II. Contextual Considerations

From an ontic standpoint, monadic conditionality implies that all event lines are contemporaneous to each other, as well as all "atoms" of event lines. This followed from the differential affirmation of any event's *thisness* opposing any other possible evolution, which in turn created an all-encompassing spectrum of possibilities; because no individual event line is privileged, this spectrum was also shown to be a predeterministic description, as no event line could influence other event lines in this already exhaustive array of possibilities.

Through the process of panpresence sculpting, being-for-itself unfolds time and space out of the monad. As a temporal being, being-for-itself, preserving its ipseity across all simultaneous iterations (similar to lives in parallel universes), must experience its characteristic event lines separately; and because of the temporal limitations specific to being-for-itself within the framework of a single harmonic subspace, the implied ontological manifestation arranges this necessary *separateness* as successive event lines.

In the overarching spectrum of all possibilities, variations between event lines range from infinitesimal to virtually infinite, similar to a Kullback-Leibler[3] divergence measure. It is not obvious however how actual event lines are developed *inter-idem*. Following the hypothesis presented in this work and in *Monadic Conditionality*, they are layered in a harmonic series closing onto itself, and the transformation that changes the host subspace was shown to always be an octave transformation, since ontologically, any being-for-itself

[3] In mathematical statistics, the Kullback–Leibler (KL) divergence is a type of statistical distance: a measure of how one probability distribution P is different from a second, reference probability distribution Q.

will experience its own subspace as the fundamental harmonic. However it is important to discover which of the possible event lines is assigned to each subspace. This is why we will test the equivalence between the two types of transformed being-for-itself that we have inferred so far: $\Psi_j^{v}(x)$ (octave-transformed) and $\Psi_j^{\varepsilon}(x)$ (infinitesimally-transformed).

III. Equivalence

The two transformations that govern this hypothesis are:

$$\hat{T}\Psi_j(x) = \Psi_j^{v}(x) \quad (1)$$
$$\hat{\Lambda}\Psi_j(x) = \Psi_j^{\varepsilon}(x) \quad (2)$$

Let's develop these expressions one by one to discover properties that might prove useful in our demonstration.

1. **The octave transformation.** As harmonic subspaces are independent and orthogonal to each other, it is natural to treat the being-for-itself abstract objects as eigenvectors of the transformation matrices, so we will introduce eigenvalues into our expressions (λ for the octave case):

$$\hat{T}\Psi_j(x) = \lambda\Psi_j(x) = \Psi_j^{v}(x)$$

The motion of Ψ_j across eigenspaces can be abstractly endowed with a Hamiltonian, which will be described entirely by the kinetic component, as the potential is basically the predeterministic binding of the spectrum, which applies equally to all event lines and subspaces (thus inconsequential in the context of the motion).

The quantum Hamiltonian is of the form:

$$\hat{H}|\Psi_j\rangle = i\hbar\frac{\partial|\Psi_j\rangle}{\partial t}$$

but it can also be expressed as $H = \frac{p^2}{2m}$ (after discarding the potential energy), where p represents the momentum. Developing further and solving for Ψ_j, we get:

$$\frac{\partial|\Psi_j\rangle}{\partial t} = -\frac{i}{\hbar}\hat{H}|\Psi_j\rangle$$

$$\int \frac{1}{|\Psi_j\rangle} d|\Psi_j\rangle = -\int \frac{i}{\hbar}\hat{H}\, dt$$

$$\ln \Psi_j = -\frac{i\hat{H}t}{\hbar}$$

The reduced Planck constant only serves for adjusting the scale, so, for the purposes of this research, we can equate it to 1 and write:

$$\Psi_j = e^{-i\hat{H}t} \qquad (3)$$

The octave-transformed being-for-itself ca be represented by doubling the frequency inherent to the reference Ψ_j. We can view expression (3) as a Fourier-like description of the waveform, where the frequency element is in the exponent, alongside time and the imaginary number. Energy is closely correlated to frequency, as confirmed by Planck's energy equation, so we can double the Hamiltonian to obtain an expression for Ψ_j^v:

$$\Psi_j^v(x) = e^{-2i\hat{H}t}$$

Thus, the transformation can be written as:

$$\hat{T}e^{-i\hat{H}t} = \lambda e^{-i\hat{H}t}$$
$$\Psi_j^v(x) = e^{-2i\hat{H}t} = \lambda e^{-i\hat{H}t}$$

We can now solve for the eigenvalue to get:

$$\lambda = e^{-i\hat{H}t} \tag{4}$$

2. The infinitesimal transformation. We introduce eigenvalue k in the ε-transformation and we get:

$$\hat{\Lambda}\Psi_j(x) = k\Psi_j(x) = \Psi_j^{\varepsilon}(x) \tag{5}$$

This type of transformation can be regarded as an infinitely small deviation from the identity matrix applied to the abstract object $\boldsymbol{\Psi_j}$, a process which is of course driven by the Hamiltonian:

$$\hat{\Lambda}\Psi_j(x) = (I - i\varepsilon\hat{H})\Psi_j(x)$$

The term inside parantheses can be viewed as the beginning of a Taylor expansion of an exponential of the type $\boldsymbol{e^{-i\varepsilon\hat{H}}}$, and, for infinitesimal quantities, such as the one outlined here, they can be equated altogether. Thus, we can write:

$$\hat{\Lambda}\Psi_j(x) = e^{-i\varepsilon\hat{H}}\Psi_j(x) \tag{6}$$

Having the infinitesimal transformation expressed in the form of equation (6) and comparing it to expression (5), we can notice that the term $\boldsymbol{e^{-i\varepsilon\hat{H}}}$ is nothing else than the eigenvalue:

$$k = e^{-i\varepsilon\hat{H}} \tag{7}$$

3. The ontic-ontological paradigm. At this point we have two eigenvalue expressions representing the two types of transformations that we are comparing:

$\lambda = e^{-it\hat{H}}$, for the octave transformation

$k = e^{-i\varepsilon\hat{H}}$, for the infinitesimal transformation

These eigenvalues are representations of the analyzed transformations and they encode the very temporal factor associated with the Hamiltonian harmonic activity.

At an ontic level, the monad encloses all modes of being into a panpresent manifestation-nonmanifestation. Ontologically, being-for-itself unfolds being-in-itself in a spatiotemporal paradigm, where sequential harmonic subspaces fill the entire spectrum of possibilities. We can define an ontic-ontological level as the abstract level where monadic conditionality is manifested as simultaneous eigenspaces that consolidate differentiated ontologies for any subspace.

We are interested in identifying the relationship between t and ε at this ontic-ontological level. Thinking that the superposition of eigenspaces is caused by harmonic activity, which is time-dependent only for filling all the layers in a swift action, the time elapsed for creating the "next" harmonic layer is actually infinitesimal. This applies to both types of transformations, so we can infer that $t = \varepsilon$ and, consequently, the two transformations are equivalent:

$$\begin{aligned} \Psi_j^{v}(x) &= \Psi_j^{\varepsilon}(x) \\ \hat{T}\Psi_j(x) &= \hat{\Lambda}\Psi_j(x) \end{aligned} \tag{8}$$

IV. Implications

We have derived an equivalence that shows that, while migrations across harmonic subspaces are done through octave transformations, the difference between successive event lines (pertaining to a specific being-for-itself) is infinitesimal. This model infers that these differences grow gradually across eigenspaces, until reaching the state of eternal return. The cycle repeats, resulting in each event line having its own eternal return. The evolution of event lines *inter-idem* helps keep individual perspectives intact with the purpose of preserving monadic homeostasis. Infinitesimal transformation was inferred as being the transformation that holds the meaning of the octave motion at an ontic-ontological level.

Although predeterminism is a central inference of monadic homeostasis, it is nevertheless an exhaustive predeterminism, not limiting event lines to single eternal returns, precisely due to its overarching nature. It is defined as predeterminism especially because the ontology of each possible event line determines the ontology of the others, since they fill the entire spectrum of possibilities. Therefore it is not a privative predeterminism, but one which generates exhaustive variation within endless cycles, thus enriching *amor fati* with the property of extending Nietzche's eternal recurrences with all *inter-idem* variations, and this can ultimately be a fertile ground for ataraxia.