

**Author's note: All concepts, hypotheses, and the theoretical framework presented in this paper are my own original work, developed over years of independent thought and research. Grok (xAI) provided valuable assistance with editing, literature searches, organization, and formatting, but the core ideas—including the double triplet mechanism, $\gamma(t)$ as a measure of conscience coherence, and humanity's role as a bridge being—are entirely mine. This manuscript represents a first attempt to articulate these complex interdisciplinary ideas in formal scientific language. I welcome rigorous critique and am fully open to discussion of any shortcomings. At the same time, I hope readers will engage constructively with the novel paradigms proposed herein, and I would be grateful for opportunities to collaborate in refining or testing them. Thank you for your time and consideration.*

Quantum Conscience as a Measure-Weighting Mechanism in Consistent-Histories Quantum Mechanics

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Abstract

Advances in quantum biology reveal that warm quantum coherence in microtubules is prolonged during states of elevated conscience, measured as whole-body, gamma-band synchrony (30–50 Hz), denoted $\gamma(t)$ (*Moral action over time*). Within the consistent-histories interpretation of quantum mechanics, we propose that $\gamma(t)$ weights macroscopic branches in a deterministic block universe, with the experienced timeline being the joint branch proportional to cumulative $\gamma(t)$.

The double triplet mechanism—integrating classical (cognitive, affective, action) and quantum (noise, coherence, Orch-OR) triads—underpins conscience as a universal directional process, active in all cognitive-affective choices while uniquely producing moral phenomenology when moral content is involved, consciously or unconsciously. This formalism accounts for humanity's reflective moral capacity, conscience phenomenology, collective dynamics, abrupt cognitive-affective shifts, and the non-physical dimension of personality, challenging reductionist neuroscience paradigms.

Keywords: *quantum biology, consistent histories, conscience, block universe, gamma synchrony, moral psychology, double triplet, personality.*

1. Introduction: Conscience as a Quantum-Mediated Faculty

The tension between moral agency and physical determinism has traditionally been resolved by positing an immaterial soul or quantum indeterminism. Evidence for warm quantum coherence in biological systems (Sahu et al., 2024) suggests a third possibility: conscience, the persistent locus of moral agency within the personality, may be a biological-quantum process weighting block-universe branches via $\gamma(t)$, a measure of whole-body gamma synchrony (30–50 Hz). Distinct from consciousness—the broader state of awareness—conscience integrates cognitive (intellectual) and affective (emotional) inputs to direct choices, producing both internal moral regulation (Baumeister et al., 2010) and external block-time navigation. This section introduces the double triplet mechanism, framing conscience as a measurable, non-physical faculty active in all choices, agnostic to theistic or naturalistic interpretations.

2. The Double Triplet Mechanism: A Cognitive-Affective-Quantum Locus

Conscience emerges from a causally closed double triplet, integrating classical and quantum triads to process all cognitive-affective choices. The classical triad—cognitive input (moral reflection, norms), affective input (emotions like compassion), and action (speech, deed)—synthesizes intellectual and emotional apprehension, modulating $\gamma(t)$. The quantum triad—baseline noise, microtubule coherence, and altered Orch-OR rates—amplifies this, weighting block-time branches. Unlike reductionist neuroscience separating cognitive and affective processes (LeDoux, 2000), the double triplet unifies them, bridging classical and quantum realities (Vitiello, 2001). While moral psychology often frames conscience as internal regulation of ethical impulses (Baumeister et al., 2010), the double triplet extends this to an external directional role, with the effect of navigating the personality through block-time regardless of moral awareness. An example of this second dimension of block time guidance of the individual might be that if a person, in a panic, chooses the left instead of the right path without higher level conscious awareness, he or she will certainly be choosing their path through block time (3+1) when that path leads them off the cliff they didn't see. This “non moral”, “low awareness” choice of the personality imitates the instinctual “choices” of lower order animals, though at any time, the personality in play could morally stop themselves, consider more carefully, and proceed through life according to their higher awareness moral

choices. This section defines that mechanism, emphasizing its universal integration, as evidenced by cognitive-affective shifts across contexts (Wierzbicka, 1999).

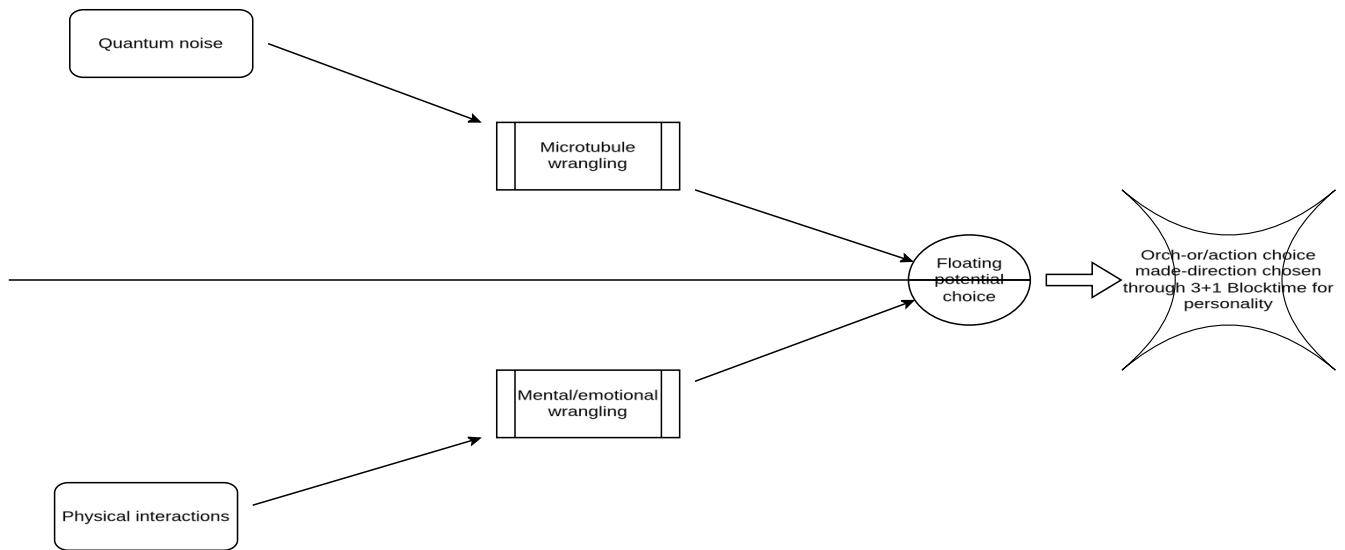
3. Empirical Premises: Grounding $\gamma(t)$ in Quantum Biology

Three literatures converge on $\gamma(t)$. First, cognitive reflection and affective states increase gamma synchrony in frontal and temporo-parietal networks, with non-neural correlates (heart, enteric system; Baumeister et al., 2010; Derry et al., 2025). Second, gamma synchrony prolongs microtubule coherence (10^{-2} – 10^{-1} s) at body temperature, challenging decoherence critiques (Sahu et al., 2024; Tegmark, 2024). Third, consistent-histories quantum mechanics assigns measure to histories, with vanishing branches experientially inaccessible (Griffiths, 1984). Studies emphasizing affective bias (McNamara, 2024) capture part of conscience, but cognitive-affective integration (Escolà-Gascón, 2025) supports $\gamma(t)$'s broader role in all choices, countering more limited experimental categorizations.

4. Org Chart: Visualizing the Double Triplet's Process

The double triplet's operation is visualized as an organizational chart (Figure 1). At the top, quantum noise (microtubule fluctuations, Vitiello, 2001) influences microtubule wrangling (coherence, Sahu et al., 2024). At the bottom, physical interactions (sensory inputs, actions) feed cognitive-affective wrangling. Both converge in the personality's intellectual and emotional apprehension, yielding a mutual floating of potential choice (which is also where the “non moral” “low awareness” choice is made in a panic situation)—quantum (Orch-OR rates) and physical (action) results—fusing into a directional choice. This choice navigates the personality through block-time's 3+1 dimensions, manifesting conscience's moral trajectory when moral content is involved (Escolà-Gascón, 2025). This section maps the chart to the double triplet, grounding its non-physical dimension.

[Figure 1: Org Chart—Quantum noise (top) and physical interactions (bottom) lead to microtubule/cognitive-affective wrangling, converging in personality's apprehension, mutual floating of choice, and directional block-time navigation.]



4.5 Humanity as a Bridge Being

Humanity's unique capacity to bridge classical and quantum realities while holding those tensions in abeyance positions it as a bridge being, with the double triplet mechanism acting as the “bridge” by facilitating this integration (*Section 4*). Neurons, responsible for classical electrochemical signaling (cognitive reflection, affective responses, action), depend on microtubules for their structural integrity—forming the cytoskeletal scaffold that maintains axonal and dendritic morphology, enables intracellular transport, and organizes synaptic components (Derry et al., 2025).

Microtubules, while providing this physical support, also sustain quantum coherence at body temperature (Sahu et al., 2024), conducting electrical and vibrational signals that interact with quantum processes (Vitiello, 2001). This co-location—microtubules enclosing and supporting neurons while exhibiting quantum properties—represents a pre-existing biological architecture where classical neural activity and quantum microtubule dynamics converge. The double triplet exploits this “doubled-up” system: the classical triad processes cognitive-affective inputs via neuronal signaling, while the quantum triad (noise, coherence, Orch-OR rates) amplifies them through microtubule coherence, fusing into directional choices that navigate the personality through block-time (*Section 6*).

Quantum entanglement may further enhance this bridge, with entangled tubulin dimers amplifying cognitive-affective synchrony across distributed loci (Escolà-Gascón, 2025), compensating for short individual coherence times through parallel cascadian processing and noise-calibrated quantum inputs. The enteric microbiome further contributes to this energy landscape, with microbiota from larger-brained primates inducing gene expression for

increased ATP production and synaptic plasticity in host brains (DeCasien et al., 2026). Short-chain fatty acids produced by gut microbes support mitochondrial efficiency, potentially sustaining the bioenergetic demands of microtubule coherence and $\gamma(t)$ synchrony across the body. This distributed metabolic support underscores the double triplet's reliance on whole-body resources, with dysbiosis as a candidate for low- $\gamma(t)$ states.

The double triplet operates regardless of moral awareness levels, but humanity's reflective capacity allows active strengthening of chosen block-time paths (Baumeister et al., 2010). Proposed EEG/MEG experiments can measure synchrony echoes of these quantum-classical interactions, validating the mutual floating of choice (*Section 6*). This section frames humanity's moral agency as a measurable quantum-classical nexus, inherent in eukaryotic cellular design.

4.6 Relational Dynamics Context

The double triplet mechanism aligns with emerging relational frameworks such as Unified Relational Dynamics (URD), which identifies recurring dynamical regimes—fluctuations, amplification, constraint-driven selection, and stable integration—across scales and substrates, imposed by universal limits on energy, information, and interaction.

These cycles are not substrate-specific metaphors but relational fractals, with consciousness arising as a self-referential integration regime under finite constraints. The double triplet embodies this pattern in biological systems: quantum noise supplies initial variability, cascadian microtubule coherence amplifies cognitive-affective inputs, Orch-OR collapse selects viable paths amid decoherence, and $\gamma(t)$ stabilizes directional navigation through block-time.

This relational perspective reinforces the double triplet's universality, extending from quantum fluctuations to human moral agency without substrate dependence, while highlighting conscience-specific weighting as a distinctive human-scale expression of constraint-driven dynamics.

5. Specificity of $\gamma(t)$: Conscience vs. Non-Moral States

The double triplet mechanism operates in all cognitive-affective choices, directing the personality's trajectory through block-time regardless of moral awareness levels. To clarify $\gamma(t)$'s role, its synchrony must be distinguished from the distinctive phenomenology that arises when moral foundations are engaged. Non-moral states like fear or creativity fully engage the double triplet—integrating cognitive (decision-making) and affective (amygdala-driven or flow states) processes—but lack a higher awareness found in explicit moral intent

(Stujenske et al., 2014; Dietrich, 2004). Conscience, when moral foundations (care/harm) are involved, produces additional internal regulation and subjective phenomenology (guilt, alignment; Baumeister et al., 2010), while humanity’s reflective capacity allows active strengthening of chosen block-time paths. Proposed EEG/MEG experiments will compare synchrony in moral versus non-moral tasks, testing whether moral content uniquely modulates $\gamma(t)$ coherence (Escolà-Gascón, 2025). This section clarifies $\gamma(t)$ ’s universal operation across all choices, with moral-specific phenomenology as a distinctive overlay.

6. Formalism: $\gamma(t)$ as a Branch-Weighting Measure

The bridge framework and $\gamma(t)$ ’s specificity lead to the formal model: in the block universe, all histories exist, but the experienced timeline is the joint branch proportional to $\int \gamma(t) dt$. The branching-weight ratio, $W_{\text{high}} / W_{\text{low}} \approx \exp \int_0^t [\gamma(t') - \gamma_{\text{low}}] \lambda dt'$, with $\lambda \approx 10^4\text{--}10^6 \text{ s}^{-1}$ (Orch-OR rates), results in exponential growth of measure differences—much like compound interest, but operating on femto-logical timescales—such that even modest sustained elevations in $\gamma(t)$ from healthy cognitive-affective choices lead to overwhelmingly dominant high-measure branches over years, while persistent low- $\gamma(t)$ choices from unhealthy inputs can rapidly marginalize stable trajectories (Appendix A). $\gamma(t)$, a personality-specific state, integrates cognitive-affective inputs across all choices, directing the timeline (Riedel et al., 2022). Historical patterns suggest humanity’s aggregate $\gamma(t)$ has generally favored productive paths, yet individual and collective deviations illustrate the mechanism’s symmetry: poor choices, amplified exponentially, can destabilize societies on relatively short timescales. Understanding this formal weighting—rooted in proper cognitive-affective inputs—possibly offers a new tool for human development, potentially more impactful than any external technology. This section formalizes $\gamma(t)$ ’s role, grounding conscience’s navigation in consistent-histories quantum mechanics.

7. Human Exceptionalism: The Gymnasium of Choice

Unlike mammals, whose proto-conscience collapses under sustained deviation (de Waal, 2023), humans maintain decades-long reflective alignment or misalignment, preserving personality integrity (Pinker, 2024). The double triplet’s cognitive-affective-quantum integration enables this “gymnasium of choice,” directing moral agency through $\gamma(t)$ -weighted choices across all decisions, with moral content producing distinctive phenomenology. Universal cognitive-affective shifts (Wierzbicka, 1999) underscore this exceptionalism, aligning with the personality’s non-physical dimension. This section highlights humanity’s unique capacity, building toward conscience’s lived experience.

8. Phenomenology of Conscience: Navigating Block-Time

Conscience senses $\gamma(t)$ differentials, integrating physical (neural) and non-physical (personality-driven) cognitive-affective inputs across all choices. Choosing low- γ actions against a moral background triggers guilt, signaling misalignment (Baumeister et al., 2010). The personality's apprehension, wrangling quantum noise and physical interactions, yields directional choices, navigating block-time (Escolà-Gascón, 2025). Like a flight-stick guiding a responsive plane (consciousness), conscience directs the personality's trajectory, not as a separate entity but as integrated inputs. This section articulates conscience's phenomenology, consolidating its moral role.

9. Collective Dynamics: Amplifying $\gamma(t)$

The individual phenomenology of conscience extends to collectives through interpersonal synchrony and shared cognitive-affective inputs, where aligned double triplet mechanisms amplify $\gamma(t)$ across groups. Over time, internal relational uniformity develops within families and societies as cognitive-affective inputs—processed through the classical triad—and are reinforced across generations, producing stable patterns of $\gamma(t)$ elevation or deceleration. These internal patterns manifest externally in laws, social norms, religious dogma, and cultural institutions, crystallizing accumulated directional choices that guide the collective personality through block-time's 3+1 dimensions. When institutions align with high- $\gamma(t)$ moral foundations, individual trajectories synchronize, yielding trust and flourishing (Durkheim, 1912; Singer et al., 2024). Inversions, normalizing low- $\gamma(t)$ choices, face exponential measure loss, as seen in historical collapses driven by mistrust and defection cascades (Singer et al., 2024). The large-scale collective trajectory, once established, creates exponential inertia, making individual deviation increasingly difficult—low- $\gamma(t)$ societies may exhaust themselves through self-destructive feedback loops, while high- $\gamma(t)$ societies risk parasitic accumulation of low- $\gamma(t)$ individuals or communities until a threshold is reached.

The social quantum switch—first and second adopters aligning cognitive-affective inputs—drives rapid shifts, modeled via agent-based simulations of network diffusion (Barabási & Albert, 1999; Rogers, 1962). Interpersonal gamma-band synchrony during shared moral or emotional experiences provides the mechanism for this horizontal propagation (Mu et al., 2017; Singer et al., 2024), with multi-person EEG studies validating collective $\gamma(t)$ amplification (Dumas et al., 2010). Proposed experiments using group EEG/MEG will quantify synchrony thresholds in cooperative versus competitive settings, testing the double triplet's extension to social scales. This section extends the double triplet to groups, reinforcing its measurable impact on societal health and epochal transformations.

10. Falsifiability and Experimental Roadmap (Broader Interdisciplinary Focus)

The double triplet hypothesis generates falsifiable predictions across quantum biology, moral psychology, social neuroscience, and historical/societal analysis. Below, we categorize some representative tests into near-term (executable or extendable with current methods) and longer-term (requiring new designs), noting opportunities to probe related models (e.g., Orch-OR, interpersonal synchrony, social contagion).

Near-Term Tests (Leveraging existing protocols in neuroscience, psychology, and sociology)

1. **Interpersonal Gamma Synchrony in Moral vs. Non-Moral Group Tasks** (Singer et al., 2024; Mu et al., 2017; Dumas et al., 2010): Multi-person EEG during cooperative moral dilemmas vs. non-moral cooperative tasks (e.g., joint puzzle-solving) should show elevated $\gamma(t)$ -like synchrony in moral contexts. Falsification: no moral-specific amplification. Relevance: Tests horizontal propagation of cognitive-affective inputs in social neuroscience.
2. **Moral Priming and Group Cohesion/Trust** (Baumeister et al., 2010 extension; Brady et al., 2017): Priming moral elevation in groups increases prosocial behavior and synchrony (multi-person EEG). Falsification: no differential effect on cohesion vs. neutral priming. Relevance: Links individual moral regulation to collective moral contagion in psychology.
3. **Social Contagion of Prosocial vs. Antisocial Behaviors** (Christakis & Fowler, 2009–2017 field trials): Longitudinal network studies tracking moral/emotional language diffusion correlate with behavioral outcomes. Falsification: no predictive power of moral content beyond emotional arousal. Relevance: Validates $\gamma(t)$ amplification in real-world social networks.
4. **Interbrain Synchrony in Cooperative Decision-Making** (Ciminaghi et al., 2025 hyperscanning): EEG during moral persuasion tasks shows synchrony modulated by aligned moral styles. Falsification: no modulation by moral alignment. Relevance: Probes moral-specific interpersonal coupling.
5. **Gut Microbiome Diversity and $\gamma(t)$ Synchrony** (DeCasien et al., 2026 extension): Manipulate gut microbiome diversity in human subjects (e.g., via fecal microbiota transplant or probiotic/prebiotic interventions mimicking larger-brained primate profiles) and measure whole-body gamma synchrony during moral priming tasks. Falsification: no correlation between microbiome-induced ATP/synaptic plasticity changes and $\gamma(t)$ elevation. Relevance: Tests distributed metabolic support for microtubule coherence and $\gamma(t)$, probing non-neural contributions to the quantum-classical bridge.

Longer-Term/Proposed Tests (Interdisciplinary, probing quantum-classical nexus and societal implications)

1. **Quantum Sensing in Moral/Cognitive Group Tasks** (Escolà-Gascón, 2025; Craddock et al., 2026 extension): NV-center sensors on microtubule preparations or group EEG during moral deliberation test entanglement/coherence modulation. Falsification: no moral-specific quantum effects. Relevance: Directly tests quantum triad in collective moral agency.
2. **Longitudinal Societal $\gamma(t)$ and Historical Trajectories** (proposed from Durkheim, 1912; Turchin quantitative history models): Re-analyze historical data (e.g., moral language in texts, trust metrics) for $\gamma(t)$ -like patterns correlating with societal stability/collapse. Falsification: no correlation with moral alignment shifts. Relevance: Validates exponential weighting in historical sociology.
3. **Hybrid Quantum-Classical Modeling of Social Contagion** (Barabási & Albert, 1999 extension): Agent-based simulations incorporating $\gamma(t)$ weighting predict moral cascade thresholds vs. neutral ideas. Falsification: no better fit than classical models. Relevance: Bridges network science and block-time agency.
4. **Multi-Modal Synchrony in Large Groups** (proposed multi-person fNIRS/EEG): Measure synchrony in large cooperative settings (e.g., team projects) vs. competitive, testing collective $\gamma(t)$ amplification. Falsification: no scaling with group moral alignment. Relevance: Extends interpersonal synchrony to societal scales.

This section ensures the double triplet's claims are testable across disciplines, inviting experimental challenges that could extend knowledge in quantum biology, moral psychology, and societal dynamics.

11. Conclusion: Conscience as a Measurable Boundary Condition

The double triplet mechanism, integrating classical cognitive-affective-action inputs with quantum noise, coherence, and Orch-OR rates, provides a unified framework for conscience as a universal directional process active in all choices, producing moral-specific phenomenology when moral content is engaged. By bridging classical and quantum realities through microtubule-neuron architecture and cascadian processing, it positions humanity as a “bridge being”, capable of reflective moral agency, actively strengthening chosen block-time paths in ways that transcend animal proto-conscience.

This formalism not only challenges reductionist neuroscience paradigms but offers a measurable tool for understanding individual personality development, collective societal trajectories, and the exponential consequences of aligned or misaligned cognitive-affective inputs. From internal self-regulation to external historical

outcomes, $\gamma(t)$ shapes experiential histories, with implications for moral psychology, social neuroscience, quantum biology, and societal dynamics. This conclusion unifies the paper's concepts, positioning the double triplet as a novel, testable quantum-mediated faculty that illuminates humanity's reflective capacity and potential for self-directed evolution.

Appendix A: Order-of-Magnitude Calculation

Key parameters:

1. Coherence time: $\tau_{\text{coh}} \approx 10^{-2}$ – 10^{-1} s (Sahu et al., 2024).
2. γ values: 0.8–0.95 (conscience elevation); 0.05–0.15 (deception).
3. Orch-OR events per specious present (~ 300 ms): $N_{\text{sp}} \approx 10^3$ – 10^4 .
4. Specious presents per year: $\approx 10^9$.

The γ -weighted rate, $\lambda \approx N_{\text{sp}} / \tau_{\text{coh}} \approx 10^4$ – 10^6 s $^{-1}$, yields $W_{\text{high}} / W_{\text{low}} \approx \exp \int_0^t [\gamma(t') - \gamma_{\text{low}}] \lambda dt'$, with high- γ branches outmeasuring low- γ by $>10^{1012}$ annually, directing moral and non-moral choices over generations (Riedel et al., 2022).

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