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POSTER: **508**

Problem & Solution

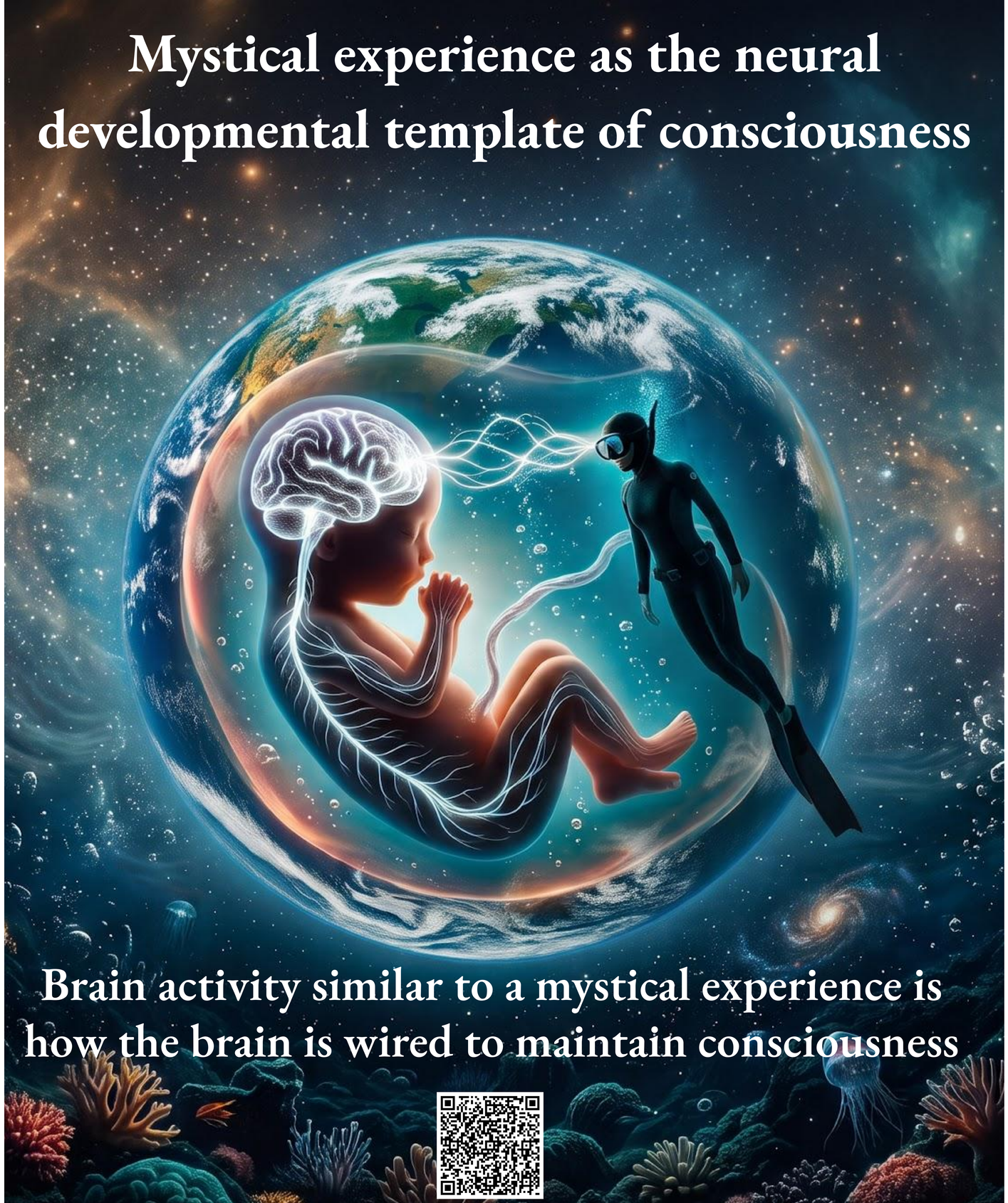
- Problem: Why do spiritual and religious experiences feel so deeply innate, and what is their relationship to our neurobiology? Because these non-pathological states lack a clear place in current models, understanding their functional relationship to a healthy brain may be key to advancing our understanding of consciousness.

- Solution / Hypothesis: Brain activity associated with a mystical experience provides a template for the architecture necessary to maintain consciousness in a developing brain. This is why a mystical experience feels so deeply innate, like coming home. It is the reemergence of unique neural activity, providing a window into how the physical brain is constructed to maintain the enduring mystery we call consciousness.

Argument

1.	Internally generated spontaneous brain activity has been shown to be involved in nearly every aspect of brain development, including: ❑ Neurogenesis ❑ Neuronal migration ❑ Programmed cell death or apoptosis ❑ Cellular differentiation ❑ Axon guidance ❑ Synaptogenesis ❑ Initial wiring of local neural networks ❑ Guiding the development of fiber tracts ❑ Providing a "calibration signal" to bind functional networks The mechanism supporting this hypothesis is widely accepted as fundamental to neurodevelopment as a whole.	✔
2.	Spontaneous neural activity contains information and can act as a dynamic template to sculpt neural architecture during critical periods.	✔
3.	Spontaneous neural activity is intimately involved in regulating metaplasticity and critical periods.	✔
4.	Both mystical experiences and psychedelic induced mystical-like experiences have the capacity to produce lasting, positive changes in a person's beliefs, values, and behavior, regardless of the origin of the subjective experience. Pointing to their relationship to windows of time of increased neuroplasticity.	✔
5.	Classic psychedelics that occasion mystical-like experiences have been shown to trigger developmental mechanisms of neuroplasticity in the adult brain.	✔
6.	Both mystical experiences and psychedelic induced mystical-like experiences have been shown to reduce the connectivity within the default mode network and promote a simultaneous increase in global functional connectivity.	✔
7.	Spontaneous neural activity, metaplasticity, and mystical experience intersect at a crossroads. Within the NMDA receptor, we have a shared link between the molecular mechanisms of psychedelic-induced metaplasticity and the activity-dependent plasticity of perinatal neural development.	✔

Mystical experience as the neural developmental template of consciousness



Brain activity similar to a mystical experience is how the brain is wired to maintain consciousness

Similar Theories

- **Alison Gopnik** - The lantern consciousness of childhood vs. the spotlight of adult consciousness from the book The Philosophical Baby (2009). In the book, Gopnik explicitly compares a baby's consciousness to the "oceanic feeling" often described in religious texts or psychedelic experiences.

- **John M. de Castro** - Primal State Hypothesis. Officially called the Model of Enlightened/Mystical/Awakened Experience (MEMAE). The Primal State is a state of consciousness that exists before the development of adult cognitive processing. Specifically preceding the development of a separate "self" and "other" cognitive, perceptual, and sensory layers. It represents a return to baseline. De Castro argues that mystical states of experience are a return to a raw, unfiltered, fundamental, primal state of consciousness.

- **Eero Castren** - iPlasticity Hypothesis. Castren's research changed our understanding of how SSRIs and other neuroplastigens (like psychedelics) work by altering the structure of the brain by reopening windows of juvenile-like plasticity in an adult brain normally reserved for early development.

- **Robin Carhart-Harris** - The Entropic Brain Theory, where Carhart-Harris argues that in our ancestral past, consciousness was predominantly rich, in the way that psychedelic trips, meditative states, or infancy are all experientially rich. He calls this primary consciousness.

Proposed Experiment

1. **Study A: Connectome Harmonic Decomposition of Developmental Trajectories vs. Mystical/Non-dual States.** Do the spatial harmonics activated during mystical/non-dual states represent a regression to the foundational, unconstrained baseline harmonic modes that guide structural connectome development?
   a. Supports: Mystical/non-dual states and perinatal resting states occupy the same low-frequency, macro-scale harmonics (global uncoupling from sensory modules), structurally mirroring the earliest developmental wiring modes.
   b. Falsifies: Harmonic configurations in mystical/non-dual states occupy entirely novel or random subspaces that bear no structural resemblance to early perinatal connectome eigenmodes.

Conclusion

We have so much to learn from those infinitely beautiful moments of noetic truth that grace the human experience. If empirical science revealed that the developmental mechanisms underlying our conscious minds are related to our capacity to experience awe, connection, transcendence, and meaning, it would fundamentally reframe our understanding of ourselves. This would offer an epistemic lens we could use to probe both mysteries at once. Brain activity during mystical experience could inform research on the neural development of consciousness. Advancements in our understanding of the neural development of consciousness could deepen our understanding of the mystery of profound spiritual and religious experiences. Non-dual awareness would no longer be understood as simply an infinitely beautiful moment of noetic truth, but as the fundamental ground state of human consciousness itself. A direct, experiential window into what defines us as human.

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