

REWIRING THE HUMAN BRAIN TO FACE ITS MORTALITY: MEDITATIVE SELF-DISSOLUTION AS A PATHWAY TO EXISTENTIAL RESILIENCE

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Background/rationale: Across human wisdom traditions — from Buddhist contemplative practices to Greek Stoicism to shamanic plant-medicine cultures — the path to post-conventional human development is understood to invariably pass through the experiential realization and acceptance of one's inevitable death. We term the capacity to face and integrate this embodied realization as *existential resilience*. Using a self-specific, prediction-based magnetoencephalogram (MEG) visual MisMatch Response (vMMR) paradigm, we previously demonstrated that death denial is mediated by early self-specific prediction-based perceptual mechanisms that shield the self from existential threat by categorizing death as relating to the 'other' but not the 'self'. Whether these automatic protective mechanisms can be modulated via self-dissolution pathways remains unknown.

Research questions: We thus aimed to (1) test whether these early death-denial mechanisms are 'hard-wired' or amenable to change, (2) assess whether self/ego-dissolution experiences — meditation-based vs. pharmacologically induced — serve as the underlying mechanism, and (3) examine whether meditative self-dissolution phenomenology constrains the neural data.

Methods: Using a neurophenomenological approach, in two studies, groups of experienced meditation practitioners ($n=38$; pre-registered) and long-term ayahuasca users ($n=50$) completed questionnaires and underwent the death-denial vMMR task. Meditators additionally entered self-dissolution states in the MEG lab and underwent micro-phenomenological interviews to map the experiential structure of these states.

Results: Using cluster-based permutation statistics, the results indicate that the meditators, but not ayahuasca users, exhibited vMMR patterns consistent with death acceptance rather than denial, predicting higher levels of well-being. This occurred despite both groups experiencing self/ego-dissolution, reporting comparable reductions in fear of death, and holding similar ontological afterlife beliefs. Finally, death acceptance was associated with affective valence, but not the depth, of self-dissolution experiences.

Discussion: The findings show that self-specific neural mechanisms of death denial are plastic, but that acute self-dissolution experiences alone are insufficient to modify them. Rather, the results suggest that the pathway through which self-dissolution is cultivated — repeated, intentional, and positively-valenced meditative training versus pharmacologically induced states — critically determines its downstream impact on early predictive self-processing and existential resilience.

Keywords: Meditation, Death-denial, Self/ego dissolution, Ayahuasca, MEG

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Dor-Ziderman, Y., David, J., & Berkovich-Ohana, A. (2025). Intact neurophysiological markers of death denial in long-term ayahuasca users. *Psychopharmacology*. Advance online publication. <https://doi.org/10.1007/s00213-025-06963-z>

Dor-Ziderman, Y., Schweitzer, Y., Nave, O., Trautwein, F. M., Fulder, S., Lutz, A., Goldstein, A., & Berkovich-Ohana, A. (2025). Training the embodied self in its impermanence: Meditators evidence neurophysiological markers of death acceptance. *Neuroscience of Consciousness*, 2025(1), niaf002. <https://doi.org/10.1093/nc/niaf002>

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