

Presence Without Specification

*Ego dissolution as a widening of the local horizon, and its joint
entropy-and-reportability signature*

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Abstract

Psychedelic ego dissolution is usually explained one of two ways: as a rise in neural entropy (the entropic brain and its Bayesian successor REBUS), or as disinhibition, a release of top-down constraint over lower processing. This paper argues that both accounts, while well supported at the level of mechanism, under-describe the phenomenon they are invoked to explain. Increased entropy is a claim about the disorder or diversity of neural signal; disinhibition is a claim about the loss of a controller. Neither, on its own, says anything about the structure of what the experience becomes. We propose a sharper reading: ego dissolution is a widening of the local horizon of experience, a state in which markedly more of the world is present to the subject yet resists being specified, discriminated, or put into words. This reading makes a risky joint prediction. If ego dissolution is horizon-widening rather than generic enrichment or generic release, then it should show a specific and dissociable double signature: increased neural signal diversity (Lempel-Ziv complexity, spectral entropy) together with a characteristic decoupling of subjective presence from metacognitive reportability, measured as reduced metacognitive sensitivity (meta-d') and reduced describability at preserved or elevated experienced vividness. We specify a within-subject placebo-controlled psilocybin protocol combining resting EEG signal diversity, a perceptual metacognition task, and quantified language and rating measures, and we state a kill condition that would retire the account. Metaphysical claims about the reality disclosed in these states are outside the paper's scope.

1. The explanandum, and why the standard accounts under-describe it

Ego dissolution is the loss or attenuation of the ordinary sense of being a bounded self set apart from the world. It is the most theoretically loaded component of the psychedelic state and the one most tightly linked to reported therapeutic and mystical-type outcomes. It is measurable: the Ego-Dissolution Inventory (EDI), an eight-item scale validated against a large sample of naturalistic psychedelic experiences, is unidimensional, internally consistent (Cronbach's alpha reported at 0.93), and scales with dose and with mystical-experience measures (Nour et al., 2016). So the target is real and quantifiable.

FACT.

Two families of explanation dominate. The first is entropic. The entropic brain hypothesis proposes that the richness of a conscious state tracks the entropy of its spontaneous neural activity, and that psychedelics push the brain from a constrained, low-entropy regime toward a more disordered, high-entropy one (Carhart-Harris et al., 2014). Its Bayesian formulation, REBUS, casts psychedelics as relaxing the precision of high-level priors so that lower-level prediction errors propagate more freely up the cortical hierarchy (Carhart-Harris and Friston, 2019). The second family is disinhibition: the self, or the default-mode machinery that instantiates it, is a top-down controller, and psychedelics release the systems it normally governs. In practice the two families overlap, because relaxed high-level priors are one way to describe disinhibited lower processing.

Both are supported. Signal diversity, indexed by Lempel-Ziv complexity, rises reliably under psilocybin, LSD, and ketamine, above levels seen in ordinary waking rest (Schartner et al., 2017), and rises further at the peak of intense states such as DMT, where the magnitude of the increase tracks the intensity of the experience (Timmermann et al., 2019; Timmermann et al., 2023). The disinhibition picture is likewise anchored in the collapse of hierarchical organization and the loss of network segregation seen under DMT (Timmermann et al., 2023). **FACT** for each mechanistic claim as stated.

The problem is not that these accounts are wrong. It is that they are answers to a different question. "The signal became more diverse" is a statement about the disorder of a measured quantity. "The controller was released" is a statement about a missing constraint. Ego dissolution, as reported, is neither disorder nor absence. It is an over-fullness with a specific character: subjects report that far more is present than usual, and that this more cannot be held, named, or told. Entropy indexes how much variety the signal carries; it is silent on whether that variety arrives as specifiable content or as unspecifiable presence. Disinhibition names what stopped; it does not name what took its place. The phenomenon has a shape, and the standard vocabularies do not have a word for that shape. **HYPOTHESIS.**

2. What a description would have to add

A better account would need to say something the entropy measure does not: it would have to distinguish two ways of being rich. A state can be rich because it contains more distinguishable things, more objects, colors, thoughts, each of which the subject could in principle point to and report. Or a state can be rich because the field of what is present has expanded past the reach of specification, so that presence outruns nameability. Both would raise signal diversity. Only the second matches the recurring phenomenology of ego dissolution, in which subjects describe an intense givenness that language cannot follow. Ineffability is not incidental to these reports; it is a defining and frequently rated feature. **FACT** that ineffability is a robust reported feature; **HYPOTHESIS** that it marks the second kind of richness rather than the first.

This is the gap the paper tries to close. The claim is that ego dissolution is specifically the second kind: an expansion of the region of experience that is present but not yet articulate. If that is right, it should leave a fingerprint that pure entropy does not predict, because the two kinds of richness are entropically similar but metacognitively opposite. In the first, more content means more to report. In the second, more presence means less that can be discriminated and told. The wager of this paper is that the difference is

measurable, and that measuring it separates the horizon reading from its rivals.

3. A C's reading: widening of the local horizon

The Academy works with a framework in which experience is openness settling into a definite "this." Openness (M) narrows to a local horizon (m) of what could still be specified but is not yet; content (c) is what has been specified and closed off (CI); and remainder (R) is what is present to the state without being taken up into any specific content. On this reading a stable, ordinary self is a tight local horizon: most of what is present has already resolved into nameable content, and the remainder is small and quiet.

The framework's reading of ego dissolution is compact: it is a widening of m and a flooding of R. The horizon of the unspecifiable-yet-present expands, and remainder that is normally negligible becomes the dominant feature of the state. Presence swells while specification lags, which is exactly the "present but not sayable" character described above. This is offered as a C's reading, a lens for framing the prediction, not as the paper's evidence. It earns its place only if it points at a signature the neuroscience can test, and it should be dropped the moment the neuroscience says otherwise. Nothing below depends on accepting the framework's vocabulary; the same prediction can be stated in plain terms as presence rising while reportability falls. **HYPOTHESIS**, tagged as interpretive scaffolding.

Two firewalls apply. First, "remainder becomes present" is a claim about the subject's state and its measurable correlates, not a claim that some hidden layer of reality is being disclosed. Whether psychedelic experience reveals anything about the world beyond the nervous system is outside this paper. Second, widening m is not the same as loading it with hallucinated content; the prediction is precisely that the added presence is under-specified, which is what distinguishes it from a simple increase in vivid, reportable imagery.

4. The joint signature, and why it must be a dissociation

The horizon reading predicts a double signature, and its whole evidential value lies in the joint requirement. Take the two arms separately.

Arm one is neural signal diversity. Widening the horizon should raise the diversity of spontaneous cortical activity, because more of the field is live and less of it is settled into a small set of stable, low-entropy attractor states. This arm is not novel; it is what the entropic brain and the Schartner and Timmermann results already show (Carhart-Harris et al., 2014; Schartner et al., 2017; Timmermann et al., 2019). On its own it does not discriminate between the two kinds of richness in section 2. **FACT** for the expected direction of the effect.

Arm two is reportability, and it is where the account risks something. If the added presence is genuinely unspecified, then the subject's ability to report on the contents of their own experience should decline even as the experienced intensity of that content holds or rises. Operationally this is a decoupling of first-order presence from metacognitive access. It has a precise measurement literature. Metacognitive sensitivity, the degree to which confidence tracks the correctness of one's own perceptual discriminations, is quantified as meta-d' and as the M-ratio (meta-d' divided by d'), which normalizes metacognition for first-order performance (Fleming and Lau, 2014). The horizon reading predicts that under psilocybin, at doses

producing ego dissolution, meta-d' and M-ratio for a perceptual task should fall, and that describability of the experience should fall, while subjective vividness and EDI stay high or climb. **HYPOTHESIS.**

Why insist that both arms co-occur? Because each arm alone is cheap. Entropy rises under generic arousal, under some anesthetics before loss of consciousness, and under many manipulations that have nothing to do with ego dissolution; a rise in Lempel-Ziv complexity is a weak, easily satisfied prediction. A drop in reportability is equally cheap: sedation, fatigue, aphasia, and simple task disengagement all reduce metacognitive performance and describability. The horizon reading stakes its claim on the conjunction, and on the sign of the coupling: presence up, entropy up, and specification down, all at once, in the same subjects, at the same time, tracking the same dose. A generic-arousal or disinhibition story does not predict that the metacognitive collapse is selective (sparing simple detection while hitting discrimination and description) or that it scales with EDI rather than with sedation. The dissociation is the test. **WAGER.**

5. Operationalizing "present but not specifiable"

The signature needs a concrete measurement model. The framework phrase "present but not specifiable" translates into a specific psychophysical profile: high signal detection, low discrimination, and low metacognitive access to what is present.

Consider a perceptual task with two levels. At the detection level the subject reports whether something is present. At the discrimination level the subject reports what it is (for example, the orientation, category, or identity of a masked stimulus), and rates confidence. "Present but not specifiable" predicts a characteristic pattern: detection sensitivity preserved or elevated (the field is full, things are there), discrimination sensitivity (d') reduced, and metacognitive sensitivity (meta-d', M-ratio) reduced beyond what the drop in d' alone would predict. In other words, the subject knows that something is present, is confident that it is present, and cannot say what it is or reliably tell when their guess about it was right. That profile is the operational face of flooded remainder. **HYPOTHESIS.**

This is distinguishable from three confounds. It is not sedation, which lowers detection first. It is not inattention, which lowers confidence-accuracy coupling globally rather than selectively at the discrimination level. It is not aphasia or word-finding failure alone, because the meta-d' measure is nonverbal and would show the deficit even if language were spared, and conversely a pure language deficit would spare meta-d'. The prediction is that all of detection-sparing, discrimination-drop, and metacognitive-drop appear together and covary with ego dissolution scores.

Reportability should also be measured in language, because ineffability is where the phenomenon announces itself. Retrospective and, where feasible, real-time verbal descriptions can be scored for quantity, semantic diversity, and rated describability ("how much of what you experienced could you put into words"). The literature already reports altered semantic structure under psychedelics, including greater semantic distances and increased semantic errors, consistent with a language system that is decoupling from the sensory field it is trying to name. The horizon reading predicts that describability falls while raw semantic diversity may rise, another presence-up, specification-down dissociation. **DISPUTED:** whether observed language changes reflect ineffability specifically, versus general cognitive disorganization, is not settled, and this measure is treated as convergent rather than decisive.

6. Proposed psilocybin protocol

The design is within-subject, double-blind, placebo-controlled, in healthy experienced participants, with psilocybin at a dose reliably producing ego dissolution (in the range used in contemporary imaging studies) versus placebo, order counterbalanced, sessions separated to avoid carryover.

Neural measure. High-density resting EEG during matched eyes-closed and eyes-open blocks, from which we compute Lempel-Ziv complexity and spectral entropy, following the pipelines that established increased signal diversity under psilocybin (Schartner et al., 2017; Timmermann et al., 2019). Primary neural readout is the drug-minus-placebo change in signal diversity.

Metacognition measure. A calibrated two-level perceptual task (staircased masked discrimination with detection catch trials and trial-by-trial confidence) administered on-drug at the plateau and at matched times on placebo. Primary readouts are d' , meta- d' , and M-ratio at the discrimination level, and detection sensitivity as a control. Staircasing to equate first-order difficulty is essential so that a meta- d' change is not an artifact of a d' change; the M-ratio is reported precisely to guard this (Fleming and Lau, 2014).

Experience measures. EDI and a mystical-experience measure after each session, plus intensity and vividness ratings, plus a describability rating and a recorded verbal description scored for quantity and semantic diversity.

Analysis. We test, per subject, the coupling among three deltas: change in signal diversity, change in metacognitive sensitivity (M-ratio), and change in EDI. The account predicts a specific three-way pattern: diversity up, M-ratio down, EDI up, with the diversity increase and the metacognitive decrease each correlating with EDI across subjects, and detection sensitivity spared. Generic arousal and sedation confounds are addressed by including physiological arousal covariates and by the detection-sparing control.

7. Prediction and kill condition

The account lives or dies on a conjunction, so the prediction is stated as a dissociation and the kill condition as either half failing.

Prediction. Under an ego-dissolution dose of psilocybin, individual participants will show, together and covarying with EDI: (a) increased resting-EEG signal diversity (Lempel-Ziv complexity, spectral entropy) relative to placebo, and (b) reduced metacognitive sensitivity (meta- d' , M-ratio) and reduced describability at preserved detection sensitivity and preserved or elevated subjective vividness. The two effects must co-occur within subjects and each must track ego-dissolution scores.

Kill. If signal diversity rises without the reportability signature (M-ratio and describability unchanged, or falling only in proportion to a sedation-like drop in detection), or if the reportability signature appears without any increase in signal diversity, then ego dissolution is not a widening of the local horizon. In the first case it reduces to the entropic-brain or disinhibition account; in the second it reduces to a language or sedation effect. Either outcome retires the horizon reading.

Note what the kill condition forbids that the rival accounts permit. The entropic brain, taken alone, is satisfied by arm (a) and is indifferent to arm (b); it would count a pure diversity increase as success.

Disinhibition is likewise satisfied by loss of top-down control without any commitment to a selective, detection-sparing metacognitive collapse. The horizon reading refuses both of those as successes. That is the sense in which it risks more than its rivals: the very results that would vindicate the standard accounts, taken alone, would falsify this one.

8. Limits, wager, and conclusion

Several limits are real. First, metacognition tasks are hard to administer at the peak of an intense psychedelic state; participants may disengage, and a failure to complete the task is not the same as flooded remainder. The detection-sparing control is the safeguard, but low data yield at high dose is a genuine risk to the design. Second, the account predicts a correlational structure across subjects and deltas, and correlations of this kind require adequate samples, which psychedelic imaging studies rarely have; the protocol should be powered accordingly or run as a multi-site effort. Third, EEG signal diversity is a coarse index, and a null on arm (a) using resting EEG would not by itself rule out a diversity increase visible in other modalities or task states. Fourth, the framework reading is doing no evidential work; if the joint signature holds, it is equally compatible with any theory that predicts presence-up, specification-down, and the horizon vocabulary should be kept only for its heuristic value. **DISPUTED** whether the framing adds anything beyond the operational prediction, and the paper concedes it may not.

There is also a deeper caution. "Present but not specifiable" is itself measured through report, including confidence reports, and one might worry that a metacognitive measure cannot cleanly capture a state defined by the failure of specification. The reply is that this is exactly why the measure is chosen: meta-d' quantifies the gap between first-order presence and second-order access, and a widening of that gap is the most direct available operationalization of presence outrunning specification. If the concept has empirical content, this is where it should show up. If it does not show up here, the concept probably has less content than its phenomenology suggests.

The wager, stated plainly: the recurring reports of psychedelic experience, the over-fullness that cannot be told, are pointing at something the entropy vocabulary cannot express, and that something is a selective, measurable decoupling of presence from reportability that rides on top of the entropy increase rather than being identical to it. If the decoupling is not there, if diversity rises and metacognition is either spared or falls only in lockstep with detection, then ego dissolution really is just the entropic brain and nothing is gained by talk of horizons. The bet of this paper is that the decoupling is there, that it is selective, and that it scales with ego dissolution. That bet is cheap to lose and worth making, because a clean result either way sharpens a theory that has so far been stated at a level too coarse to be wrong.

References

Carhart-Harris, R. L., Leech, R., Hellyer, P. J., Shanahan, M., Feilding, A., Tagliazucchi, E., Chialvo, D. R., and Nutt, D. (2014). The entropic brain: a theory of conscious states informed by neuroimaging research with psychedelic drugs. *Frontiers in Human Neuroscience*, 8, 20.

- Carhart-Harris, R. L., and Friston, K. J. (2019). REBUS and the anarchic brain: toward a unified model of the brain action of psychedelics. *Pharmacological Reviews*, 71(3), 316-344.
- Nour, M. M., Evans, L., Nutt, D., and Carhart-Harris, R. L. (2016). Ego-dissolution and psychedelics: validation of the Ego-Dissolution Inventory (EDI). *Frontiers in Human Neuroscience*, 10, 269.
- Schartner, M. M., Carhart-Harris, R. L., Barrett, A. B., Seth, A. K., and Muthukumaraswamy, S. D. (2017). Increased spontaneous MEG signal diversity for psychoactive doses of ketamine, LSD and psilocybin. *Scientific Reports*, 7, 46421.
- Timmermann, C., Roseman, L., Schartner, M., Milliere, R., Williams, L. T. J., Erritzoe, D., Muthukumaraswamy, S., Ashton, M., Bendrioua, A., Kaur, O., Turton, S., Nour, M. M., Day, C. M., Leech, R., Nutt, D. J., and Carhart-Harris, R. L. (2019). Neural correlates of the DMT experience assessed with multivariate EEG. *Scientific Reports*, 9, 16324.
- Timmermann, C., Roseman, L., Haridas, S., Rosas, F. E., Luan, L., Kettner, H., Martell, J., Erritzoe, D., Tagliazucchi, E., Pallavicini, C., Girn, M., Alamia, A., Leech, R., Nutt, D. J., and Carhart-Harris, R. L. (2023). Human brain effects of DMT assessed via EEG-fMRI. *Proceedings of the National Academy of Sciences*, 120(13), e2218949120.
- Fleming, S. M., and Lau, H. C. (2014). How to measure metacognition. *Frontiers in Human Neuroscience*, 8, 443.