On Perception as Dissipative Reorganization

A Graph-Theoretic Reading of Sensory Processing

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This is a work in progress. It is not submitted for publication. It is released for discussion among those engaged with the question it addresses.

Abstract

Emergent Graph Theory (EGT), developed elsewhere by the present author, models physical reality as a positionless graph in which spatial structure is emergent rather than primitive. This commitment leaves a question unaddressed within EGT itself: how does a positionless substrate become available to a perceiving system as the spatially structured field of ordinary experience? The present paper proposes that an intermediate step is logically required, and offers a working characterisation of that step. We propose to read sensory organs as local subgraphs with their own resonance conditions, and perception as a continuous dissipative reorganisation of such a subgraph under energy economy — a process that approaches a topological-tensional equilibrium without ever reaching it, because perceptual systems are open and their input does not terminate. Under this reading, what we ordinarily call a perceptual image is not a state but a second-order equilibrium: the fact that reorganisation is fast enough, relative to incoming input, to maintain coherence under continuous perturbation. The framework predicts that perception under processing disruption should expose a characteristic class of structures — clusters without global binding, repetitive geometries from local symmetry constraints, parallactic layers without integrated depth — corresponding to the intermediate states of an under-converged graph layout. We sketch the framework, identify the structural prediction, and discuss several phenomenal classes consistent with it. We do not claim the framework is correct. We claim it follows from EGT plus standard non-equilibrium thermodynamics, and that it makes the relation between substrate and experience tractable in a way that the alternatives do not.

Keywords. perception; sensory processing; dissipative structures; graph dynamics; emergent representation; Emergent Graph Theory; phenomenology of perception

1 The Problem We Face

1.1 The Gap Between Substrate and Experience

Emergent Graph Theory holds that physical reality is, at its substrate, a positionless graph: a structure of nodes and edges in which spatial relations are not primitive but emergent. Position, distance, dimension — all of these are properties that arise from the dynamics of edge tension and node coupling, not features of an antecedent stage on which dynamics occur. The thesis is radical, and we have argued elsewhere that it is precisely this radicality that distinguishes EGT from approaches in which a substrate graph is embedded into a background space whose metric is not itself emergent.

The radicality has a consequence which the EGT paper itself does not address. If the substrate is positionless, and ordinary experience is spatially structured, then between the substrate and experience there must lie a translation. The phenomenal field — the structured visual world we inhabit, the integrated auditory scene, the felt geometry of the body — is not the substrate. It is something the substrate has been turned into, by a process that cannot be assumed to be either trivial or transparent.

The present paper takes up this gap. We do not propose a theory of consciousness; that question is treated, in working form, in a parallel paper of ours. We propose only an account of the operation by which positionless substrate becomes spatially structured experience. We will refer to this operation as the rendering process, and we will argue that it has a specific dynamical character that can be read off from EGT plus standard non-equilibrium thermodynamics, without further postulates.

1.2 What This Paper Is Not

This paper is not a theory of perception in the full sense developed in cognitive science or in the philosophy of perception. It does not engage in detail with the literature on predictive processing, on the free energy principle, or on integrated information theory, although affinities and tensions with these frameworks will be noted in passing and treated more fully in an appendix.

This paper does not rest its case on phenomenological reports. Reports from disrupted perceptual states are mentioned in Section 5 as illustrations of structural predictions the framework makes; they are not advanced as evidence. The framework would stand or fall on its theoretical coherence with EGT and on whether its predictions can, in principle, be operationalised — not on whether anyone has reported anything in particular.

This paper does not take a position on the moral or therapeutic significance of any of the phenomena it discusses in Section 5. It treats them strictly as candidate cases of perception under processing disruption, with the aim of showing that a structural prediction can be made and recognised.

1.3 What This Paper Attempts

We attempt three things. First, we argue that an intermediate step between substrate and phenomenal experience is logically required, given the commitments of EGT, and we name this step the rendering process. Second, we characterise its dynamics: we propose that the rendering process is a continuous dissipative reorganisation of a sensory-organ subgraph, governed by energy economy, approaching but never attaining a topological-tensional equilibrium. Third, we identify a structural class of phenomena that the framework predicts should become accessible when reorganisation is too slow to keep pace with incoming input — what we will call the backlog. We conclude with brief discussion of three phenomenal domains in which something resembling this structural class has been reported.

1.4 Tone

We have tried to write in the same register as our parallel work on the structure of experience: making proposals precise enough to be wrong, marking conjecture as conjecture, and refraining from claims our methods cannot underwrite. The framework presented here is offered as a working hypothesis, not a finished position.

2 From Substrate to Sensorium

2.1 The Positionless Graph

We assume the reader is broadly familiar with the EGT framework, but the relevant features can be stated briefly. The substrate of physical reality, on this account, is a graph whose nodes carry spectral information and whose edges carry tension. Dynamics consist in the propagation of energy through edges and the formation, dissolution, and reconfiguration of edges and nodes under conservation constraints. Position in any spatial sense is not a feature of the substrate; it is a consequence of dynamics, visible in clusters of nodes whose tension structure produces locally stable configurations.

From the perspective of a perceiving system embedded in such a substrate, the substrate itself is not directly accessible. What is accessible is whatever of the substrate's activity couples into the perceiving system's own structure. This coupling is the topic of the next subsection.

2.2 Sensory Organs as Subgraphs

We propose that sensory organs are themselves graphs — local subgraphs of the substrate, with their own topology, their own characteristic patterns of edge tension, and their own resonance conditions. The eye is one such subgraph; the cochlea is another; the proprioceptive system is a third. These subgraphs are not generic samplers of the substrate. They are highly specific topologies, and what they sample from the substrate is determined by their own structural properties.

This is a substantive claim and worth pausing on. It is tempting to think of sensory organs as detectors that receive properties already present in the world — to think of the eye as receiving light, where light is taken to be an antecedent feature of reality. EGT does not licence this picture. Light, on EGT terms, is not an antecedent feature of the substrate; it is a class of substrate-level dynamics whose coupling to the visual subgraph produces what we phenomenologically describe as light. What the eye receives is not a property of reality but a resonance between the substrate's activity and the eye's own topology. Different sensory subgraphs resonate with different aspects of substrate activity; this is what makes them different senses.

The consequence we wish to draw out is that what enters a sensory organ is, considered in itself, structured but not yet integrated. It is a flux of node and edge activations whose pattern is determined jointly by the substrate's activity and by the organ's resonance conditions. This flux is not yet experience. It is the material from which experience must be made.

2.3 The Necessity of an Intermediate Step

If the substrate is positionless and the sensory subgraph receives a structured but unintegrated flux, then between this flux and the spatially organised perceptual field there must lie a process of integration. This is not a metaphysical addition to EGT; it is a logical consequence. Either the perceptual field is identical with the flux (which it is not — the flux is undifferentiated activation, whereas perception is integrated structure), or it is identical with some property of the substrate (which EGT excludes, since the substrate has no spatial properties to be identical with), or there is a process by which the flux is made into the field. The third is the only option EGT permits.

We will call this process the rendering process. The term is borrowed from computer graphics for its directness; we mean by it the operation by which an underlying representation is converted into a presented representation. We do not mean to import any specific commitment about the algorithms of computer graphics. We use the term only to mark the step that EGT requires but does not itself name.

> ***Question to hold open:* Are sensory subgraphs sharply demarcated from the rest of the organism, or are they porous — continuously coupled to the wider physiological graph in ways that affect what they sample? If the latter, then the rendering process cannot be cleanly localised to the organ itself, and the framework here presented may need refinement to handle the boundary.**

3 Perception as Dissipative Reorganization

3.1 Energy Economy and Convergence

Under EGT, graphs evolve under energy-conservation dynamics that drive them toward configurations of minimal local tension, subject to topological constraints. A graph with a fixed input — a closed system — converges, over time, toward a stable configuration in which no further edge formation, edge dissolution, or node migration occurs. This convergence is not a single trajectory; it is approach to an attractor. The attractor is determined by the graph's topology and by the energy distribution it began with.

The sensory-organ subgraph, taken in isolation, would behave the same way. Given a fixed flux of activation as input, it would reorganise its internal structure to minimise tension under that input, converging toward a stable configuration in which the activation pattern is integrated with the subgraph's existing topology. This integration is what we mean by the rendering process at its most basic. It is the dynamic by which incoming flux is made into a coherent local structure.

3.2 The Topological-Tensional Equilibrium

The configuration toward which such a subgraph converges, under fixed input, is what we will call the topological-tensional equilibrium, or TT-equilibrium. The term names a state in which two conditions hold simultaneously: no further topological change occurs (no new edges or nodes form, none dissolve), and the tension distribution across edges has reached a minimum compatible with the topology. The equilibrium is not a point; it is a basin of attraction, a region of the configuration space that the dynamics enter and remain within.

TT-equilibrium is the same kind of state, on a generic dynamical level, as the final folded configuration of a protein, or the heat-death configuration of a closed cosmological system. The scale and the specific structure differ enormously across these cases, but the dynamical character — convergence to a basin under energy-economy constraints — is the same. This is the scale-invariance claim of EGT applied to a particular class of subgraphs.

3.3 Why the Equilibrium Cannot Be Reached

Sensory organs, however, are not closed systems. The flux of activation entering them does not terminate. While the subgraph is reorganising in response to one moment's input, the next moment's input is already arriving. Each fresh input perturbs the dynamics that the previous input set in motion. The subgraph never reaches the basin; it is continuously displaced from approach by new perturbations.

This is not a defect of perception. It is the condition of perception. A perceptual system that converged to TT-equilibrium would have, by definition, ceased to perceive — its configuration would no longer change in response to input. The perceptual field would freeze. What we ordinarily call perception is precisely the maintenance of a non-equilibrium state in which reorganisation is continuous, driven by continuous input.

This places perception, in formal terms, in the class of dissipative structures in the sense of Prigogine: open systems that maintain ordered configurations not by reaching minima but by continuously processing energy. A whirlpool is the canonical example; it has stable form only because water continuously flows through it. We are proposing that the perceptual field has a similar formal character: it has stable structure only because activation continuously flows through it.

3.4 Perception as a Second-Order Equilibrium

If perception is dissipative, then what we ordinarily experience as a stable perceptual image is not a state in any conventional sense. It is a second-order equilibrium: not the configuration of the subgraph at a moment, but the dynamic balance between the rate of incoming input and the rate of reorganisational response. When the rate of response is high enough, relative to the rate of input, the subgraph maintains a coherent quasi-stable configuration, and what we experience is a structured perceptual field. When the rate of response falls — for whatever reason — the configuration begins to lag behind the input, and the quasi-stability breaks down.

The framework thus has an explicit dependence on processing rate. This is not a free parameter; it is set by the physical properties of the subgraph and by the energy economy of its operation. But it is a quantity that can in principle be modulated, and the consequences of its modulation are the subject of the next section.

Question to hold open: **Is there a critical processing rate, below which the dissipative dynamic ceases to produce a coherent perceptual field at all? If so, what determines its value, and is it system-specific or general?**

4 The Backlog Hypothesis

4.1 Two Modes of Disruption

Disruption of perception can occur in at least two distinct modes, with structurally different consequences. The first mode reduces the input. Sensory deprivation is the canonical case: the activation flux entering the subgraph drops below ordinary levels, and the dynamics that would ordinarily be displaced by fresh input instead continue to converge, in the absence of perturbation, toward the basin. What is reported from sensory deprivation — geometric patterns, persistent structures, eventually full hallucinatory content — is consistent with a subgraph that has begun to approach TT-equilibrium more closely than ordinary input permits.

The second mode does not reduce the input. It reduces the rate of reorganisational response. Whatever the cause — pharmacological modulation, fatigue, neural disruption — the consequence is that the subgraph continues to receive input at its ordinary rate but processes it more slowly. The subgraph cannot keep up. The reorganisation that would ordinarily integrate this moment's input has not been completed before the next moment's input arrives. The subgraph accumulates partially-integrated material. It is this accumulated, partially-integrated material that we will call the backlog.

4.2 Predicted Structure of the Backlog

The structural character of the backlog is not arbitrary. It is what an under-converged graph layout looks like, considered as a configuration. We can specify several features that the backlog should display, given standard graph dynamics under energy economy:

First, local clustering without global integration. A graph reorganising under tension minimisation will form local clusters — subsets of nodes whose mutual coupling is strong — well before it integrates these clusters into a globally coherent structure. A backlog therefore should display patches of internal coherence that do not bind into a unified whole. Reported correlate: layered structures at different apparent depths that fail to compose into an integrated three-dimensional scene.

Second, repetitive geometries from local symmetry constraints. When clusters form under energy minimisation in a graph with regular connectivity, they tend toward configurations that satisfy local symmetry — repeating motifs, regular spacings, characteristic shapes such as triangulations and hexagonal close-packing. Reported correlate: repetitive geometric patterns, especially in early or transitional phases of disruption.

Third, parallactic motion without integrated depth. In an integrated perceptual field, depth is constructed as a unified property of the scene; layers cohere into a single space. In an under-converged layout, layers exist at distinct convergence stages and respond differently to perturbation. Reported correlate: structures at apparent different depths that move at different rates under attention shifts, without composing into a unified spatial frame.

Fourth, internal structure at multiple scales without scale-binding. An integrated perceptual field has resolved the relation between fine detail and gross form; in a backlog, both may be present but their relation is not yet fixed. Reported correlate: the experience of structure within structure — fine elements that resolve, on continued attention, into elements that compose larger structures, with the compositional relation itself unstable.

4.3 Why Reports Read as Revelation

When the backlog becomes phenomenologically accessible, the perceiving system has no internal capacity to recognise it as such. From the inside, what is presented is presented as content — as something the system is encountering, not as a state of the system itself. Under ordinary conditions the rendering process is invisible because it converges fast enough to produce only finished output; under disruption, the unfinished material itself becomes the output, but it is still presented in the format the system has for content rather than the format the system has for self-monitoring.

This is sufficient to explain why such states are commonly experienced and reported as revelatory access to deeper layers of reality. The phenomenal character of the backlog — its structural richness, its apparent independence of ordinary input, its quasi-objective feel — is precisely what one would expect from material that the system is processing but has not yet bound. To the experiencer it presents as discovery; structurally it is delay.

We take no position on whether such states have any further significance — therapeutic, contemplative, or otherwise. We claim only that their phenomenology, considered structurally, fits the backlog profile better than it fits the alternative reading on which they are veridical encounters with otherwise inaccessible substrate.

4.4 Falsifiability

The framework makes a structural prediction. Reports from perception under processing disruption, considered as a class, should display the four features listed in Section 4.2 — local clustering without integration, repetitive geometries, parallactic layering without unified depth, multi-scale structure without scale-binding. They should not, generically, display fully integrated three-dimensional scenes with coherent illumination, internally consistent physics, and stable spatial frames. If a substantial body of disruption reports were to display such fully integrated content, the framework would be in trouble. It would have to either accommodate such reports as ordinary perception that happens to occur during disruption, or revise its account of what disruption does.

This is a weak form of falsifiability — it bears on the typology of reports rather than on a single crucial test — but it is more than the alternative reading offers. A framework on which disruption opens access to deeper layers of reality predicts nothing in particular about the structural character of those layers, and is therefore consistent with whatever is reported. A framework on which disruption exposes an under-converged layout predicts a specific class of structures, and would be embarrassed by reports outside that class.

> ***Question to hold open:*** **Can backlog structure be quantitatively distinguished from ordinary perceptual structure by an external observer — that is, by structural measurements on the perceptual system itself rather than by phenomenological report? If so, what would the relevant measurements be? If not, the framework remains plausibly true but operationally limited.**

5 Illustrations: Phenomena Consistent With the Backlog Hypothesis

We turn now to three classes of phenomena in which something resembling the backlog profile has been reported. We emphasise that these are illustrations, not evidence. The framework's claim to take seriously is that it predicts a structural class; whether reported phenomena actually fall within that class is itself a question requiring careful empirical work which is not undertaken here.

5.1 Charles Bonnet Syndrome

Charles Bonnet syndrome is a condition in which individuals with substantial visual impairment — typically due to age-related macular degeneration or similar conditions — experience visual hallucinations in the absence of cognitive impairment or other psychiatric symptoms. The condition is well documented and the affected individuals retain full insight into the unreality of their experiences.

What is striking about Charles Bonnet hallucinations is their structural character. They tend toward geometric patterns, repetitive motifs, ornate figures, sometimes lattice-like structures — the kind of content that suggests a visual subgraph operating on reduced input, converging toward configurations dictated more by its own topology than by external sampling. This is consistent with Section 4.1's first mode of disruption, in which input reduction allows the subgraph to approach its basin more closely than ordinary input permits.

5.2 Hypnagogic States

Hypnagogic phenomena — the perceptual events that arise in the transition from wakefulness to sleep — are familiar to most people and have been described phenomenologically in considerable detail. Common features include phosphene-like luminous patterns, geometric structures of striking regularity, faces or fragments of figures that emerge briefly and dissolve, and a characteristic sense of layers without integrated depth.

These features map directly onto the predicted backlog profile. The state involves a global slowing of cortical processing — a reduction in the rate of reorganisational response — without immediate cessation of perceptual input. The structural correlates are local clustering, repetitive geometries, and unintegrated layering, in close agreement with what Section 4.2 predicts.

5.3 Pharmacological Disruption

A wide range of pharmacological agents modulate perceptual processing. Among them, classical psychedelics — psilocybin, LSD, DMT, and others — have been the subject of substantial recent attention, both in clinical research and in popular discourse. We make no commitments here about therapeutic efficacy, mechanism of action at the neural level, or moral status of use; these are questions the present framework does not address.

What the framework does say is the following. To the extent that such agents modulate the rate of reorganisational response in perceptual subgraphs without correspondingly reducing input, they should produce experiences whose structural character falls within the backlog profile rather than the ordinary-perception profile. Reports from such states, considered as a class, are widely described in terms that fit this profile: layered structures at different apparent depths, repetitive geometric content, fine elements that compose into larger structures whose compositional relation is unstable, and the characteristic experience of finished perceptual content giving way to its constitutive parts.

We note in particular that a class of reports describes the perception of code-like or character-like elements making up larger structures, sometimes in conjunction with diffractive optical setups (laser speckle and similar). The structural features described — discrete elements at the smallest visible scale, compositional relations to larger structures, parallactic layering, repetitive geometry — are precisely the features the framework predicts for a backlog. We do not advance these reports as evidence; we observe only that they are consistent with the framework's structural prediction, and that this consistency obtains without requiring postulation of any non-physical layer or veridical access to substrate.

5.4 What These Illustrations Cannot Show

The convergence of three independent disruption classes (input reduction, processing slowing in transitional states, pharmacological modulation) on a similar structural profile is consistent with the framework. It is not evidence for it. The same convergence could in principle be produced by confabulation, by cultural shaping of report-language, by pareidolia operating on noise, or by features of perceptual systems that have nothing to do with graph dynamics. A serious empirical test would require structural measurements on the perceptual system itself, not reliance on first-person report.

We take the illustrations to show only that the framework is not idle: it makes predictions that can in principle be checked against existing report literature, and that, on first inspection, the literature is not obviously inconsistent with the predictions. This is a weak result, and we do not claim more for it.

Question to hold open: **Of the phenomenal classes discussed here, which is most amenable to controlled experimental investigation? Charles Bonnet syndrome occurs spontaneously in a clinical population; hypnagogic states are universally accessible but transient; pharmacological induction is controllable but ethically constrained. Each affords different methodological purchase.**

6 Position Within the Pantareon Foundations Programme

The framework presented here occupies a specific position within the wider research programme of Pantareon. Its substrate-level commitments are those of Emergent Graph Theory, which establishes the cosmological and particle-physics foundations of the wider programme; we do not develop EGT further here, and refer the reader to its dedicated treatment. Its phenomenological commitments are those of our parallel work on the structure of experience, in which the categories of soul, consciousness, and sentience are stipulated and defended; we do not engage those categories directly here either.

What the present paper adds is a treatment of the operation that connects substrate to experience — the rendering process — which is required by the conjunction of EGT and any framework on which experience has spatial structure, but which neither of the foundational papers addresses. The rendering process is therefore a bridge concept: it is not part of the substrate, and it is not part of the phenomenology. It is the dynamical operation in which substrate becomes phenomenally accessible, and its character must be specified for the wider framework to be coherent.

We note also several adjacent frameworks in cognitive science with which the present account has affinities. Predictive processing accounts, in their generative-model formulations, share with our framework the commitment that perception is constructive rather than receptive. The free-energy principle, in Friston's formulation, frames perception as a form of variational inference under energy-economy constraints; this is structurally adjacent to our characterisation of the rendering process as energy-economic reorganisation, although the formal apparatuses differ. The REBUS model of Carhart-Harris and Friston, treating psychedelic effects as relaxation of high-level priors, makes predictions in the pharmacological case that overlap with ours, although from a different theoretical starting point. We do not commit to any of these frameworks; we note that our account is not isolated, and that engagement with them is a natural next step which we defer to subsequent work.

7 Where We Stand

We have proposed that EGT, as a framework committed to a positionless substrate, requires an account of how substrate becomes phenomenal experience. We have called this account the rendering process and have argued that it has the formal character of dissipative reorganisation: a sensory-organ subgraph continuously reorganising under input flux, approaching but never reaching a topological-tensional equilibrium, and producing the perceptual field as a second-order equilibrium between input rate and reorganisational rate. We have argued that under disruption of this dynamic, an under-converged layout — what we have called the backlog — should become phenomenologically accessible, and that its structural character is predictable from standard graph dynamics. We have illustrated the prediction with three phenomenal classes that appear, prima facie, consistent with it.

We have not claimed that the framework is correct. We have claimed that it follows from EGT plus standard non-equilibrium thermodynamics, and that it makes the relation between substrate and experience tractable in a way that the alternatives do not. The claim to evaluate, if the framework is to be taken further, is whether its structural prediction can be made operational — whether the backlog profile can be specified precisely enough to be checked against report data with appropriate methodological controls, and whether structural measurements on perceptual systems can be brought to bear on the same prediction independently of report. Both are research programmes rather than results.

We close in the same spirit as our other working papers: this draft is a request for conversation. If anything in it overclaims, we ask the reader to treat it as an invitation to correction rather than as a finished position.

A On Terminology

We have used several terms with technical stipulation. We summarise the stipulations here for ease of reference.

Rendering process. The dynamical operation by which the activation flux entering a sensory subgraph is integrated into a coherent local configuration. Stipulated as a continuous dissipative reorganisation under energy economy.

Sensory subgraph. A local subgraph of the EGT substrate corresponding to a sensory organ, with topology and resonance conditions specific to that organ.

Topological-tensional equilibrium (TT-equilibrium). The basin of attraction toward which a sensory subgraph would converge under fixed input — a state in which no further topological change occurs and tension distribution has reached a local minimum compatible with topology. In open perceptual systems, TT-equilibrium is approached but not reached.

Backlog. The accumulated, partially-integrated material in a sensory subgraph whose rate of reorganisational response has fallen below its rate of input. Distinguished from the ordinary perceptual field by its structural character: local clustering without global integration, repetitive geometries, parallactic layering without unified depth, multi-scale structure without scale-binding.

Second-order equilibrium. The dynamic balance, in an open perceptual system, between the rate of input and the rate of reorganisational response. The ordinary perceptual field is identified with this balance, not with any momentary configuration of the subgraph.

B Relationship to Other Frameworks

We note four frameworks in cognitive science with which the present account has affinities or contrasts. We do not commit to any of them; we note them to position the present work in a wider conversation.

Predictive Processing. On predictive-processing accounts, perception is constructed by a hierarchical generative model that issues predictions and updates in light of prediction error. Our account shares the commitment that perception is constructive rather than receptive, but it is committed at a different level of description: we describe the dynamical character of construction, not the algorithmic structure that performs it. The two accounts are not in competition; they describe different aspects of the same operation.

Free Energy Principle. Friston's framing of perception and action as variational inference under energy-economy constraints is structurally adjacent to our characterisation of the rendering process as energy-economic reorganisation of a graph. The formal apparatuses differ — variational inference operates on probability distributions; our account operates on graph topology. The conceptual proximity warrants more careful examination than we offer here.

REBUS Model. Carhart-Harris and Friston's REBUS account treats psychedelic effects as relaxation of high-level priors, allowing lower-level processing to express itself more freely. This makes predictions in the pharmacological case that overlap with ours: under our account, processing slowing exposes the under-converged layout; under REBUS, prior relaxation exposes lower-level structure. The two accounts differ in mechanism but converge in some predictions, and the convergence is itself worth study.

Integrated Information Theory. IIT proposes that experience corresponds to integrated information (ϕ) in a system. Our framework is silent on the question IIT answers (what makes a configuration conscious) and addresses a question IIT does not directly answer (how a positionless substrate becomes spatially structured experience). The two frameworks are largely orthogonal, and either could in principle be combined with the other.

C Open Research Questions

We close with a list of questions that the framework leaves open and that seem to us worth pursuing.

First, can the backlog profile be specified precisely enough to be checked against report data with appropriate methodological controls? Second, can structural measurements on perceptual systems — neural-imaging data, psychophysical timing measurements, attentional dynamics under disruption — be brought to bear on the framework's predictions independently of phenomenological report? Third, what is the relation between the present framework and predictive-processing or free-energy accounts at the level of formal apparatus, and could a unified treatment be constructed? Fourth, does the dissipative-reorganisation account extend to non-perceptual cognitive operations, or is it specific to sensory subgraphs? Fifth, what is the appropriate methodology for studying perception under disruption when the disrupting agent is itself the object of study? Each of these is offered as an invitation, not a verdict.