

Consciousness Closure and the Cosmos

Consciousness as the foundation of a differentiated and open world

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Abstract

Consciousness Closure and the Cosmos proposes that consciousness is fundamental and that the physical world is an organized form of it. Closure names the formation and maintenance of distinctions that remain coherent through change and constrain more than one observer's perspective. Remainder names what an achieved closure does not settle or exhaust. Together, these concepts address how a world can have determinate organization without any particular organization becoming an exhaustive account of reality.

The argument distinguishes consciousness as a proposed foundation from its situated contents, and philosophical remainder from numerical model mismatch. Its positive case for remainder draws on the conditions that make articulation possible, the horizons of embodied experience, and the revision of meaning and inquiry. These considerations support a conjecture that no finite articulation exhausts the foundation. They do not imply that every finite model has positive error: a model can fit exactly within its scope. Cosmogenesis is interpreted as the constitution of a world grammar, with temporal relations belonging to the world that grammar makes possible.

The account addresses a public world, a cosmos older than biological observers, and the dependence of human consciousness on brains. Deriving physical laws and explaining why there are distinct subjects remain open tasks. Three mathematical appendices distinguish model fit, limits of a grammar, candidate selection, and actual transitions. A local research program proposes tests of perceptual clarification, reorganization, switching, and grammar revision. The philosophical argument and the mathematical illustrations have different evidential roles; neither success nor failure of a local model settles the consciousness-first ontology.

Keywords: consciousness; closure; remainder; openness; phenomenology; idealism; cosmogenesis; subjectivity; time.

1 Consciousness as a primitive

Understanding an equation, seeing an image through a telescope, and doubting either are conscious occurrences. We may question their meaning while the questioning itself remains present. This gives the inquiry its starting distinction: the particular content of an experience and the fact that it is consciously present.

Physics gives extraordinarily successful accounts of relations among observable events. Where does consciousness belong in the reality those accounts describe? Chalmers (1995) distinguishes explanations of discrimination, integration, and report from an explanation of why such activity is accompanied by experience. That distinction motivates this inquiry. Explaining an organization and explaining conscious presence are different tasks, even when the aim is to connect them.

CCC asks whether the usual direction of explanation should be reversed. Suppose that consciousness belongs to reality's foundation, and that objects, bodies, and brains are organized forms within it. The question becomes how consciousness can constitute a world with stable differences, lawful transformations, and many distinct points of view.

This paper defends that conjecture. It treats consciousness as ontologically primitive: a basic commitment of the account, rather than something to be produced from ingredients stipulated to lack conscious character. Closure is the proposed principle through which a world acquires determinate organization. Primitive identifies where the explanation begins. It does not imply simplicity in every respect, omniscience, intention, or a person waiting before the universe.

The starting observation motivates the ontology; it does not prove it. Knowing the world through consciousness does not entail that consciousness is the world's fundamental nature. The further step is an explanatory wager. It takes consciousness as basic and shifts the burden to differentiation: how particular contents, physical regularities, and finite subjects belong together. Calling consciousness fundamental does not make those relationships follow automatically.

On this account, human consciousness and the reality from which humans arise have the same fundamental nature. Biological development would explain the particular organization of human consciousness, while its conscious character would belong to the foundation. The account must therefore explain both a shared physical world and the distinct perspectives through which it becomes available.

A world is more than a succession of impressions. Its organization survives an observer's inattention, corrects expectations, and sustains histories no human witnessed. A consciousness-first account must explain how these features are compatible with its foundation and what would establish their realization. The following argument develops that task through closure, public constraint, and remainder.

2 Consciousness and the possibility of difference

C names consciousness considered apart from its particular contents and local organization. Conscious presence means that something is manifest or felt, not merely that a process exists. This is the character the account takes as primitive. The notation c names situated consciousness-with-content: a particular field or episode organized as a perspective. C and c distinguish the proposed foundation from its situated forms.

Consciousness is the paper's principal ontological term. Experience ordinarily names a particular manifestation, such as seeing a shape, feeling unease, or hearing a melody unfold. An experience need not be human, reflective, verbal, or autobiographical. The terms have different explanatory roles: consciousness names the proposed foundation; experience describes particular occurrences within its situated forms.

Taking C as fundamental adds the wager stated in Section 1. Introspection acquaints us with particular conscious occurrences, not independently with the universe's constitution. The continuity thesis proposes that situated consciousness shares the conscious character of its foundation, while organization determines its contents and boundaries. This does not establish that all people are one subject, that every object has experience, or that a universal subject experiences everything. Section 7 addresses the separate problem of how subjects are distinguished.

M names openness: reality considered as exceeding any particular settled articulation. Here articulation means a determinate organization or account, according to the context; it does not mean only a verbal description. M is not a second substance alongside consciousness. Consciousness names the proposed fundamental nature of reality; openness concerns what achieved forms do not exhaust. Philosophical remainder names this relation to a particular closure: what it leaves undetermined, excludes from access, or cannot accommodate without revision. Remainder need not be an additional object or hidden material.

The direct philosophical inheritance is Hilary Lawson's *Closure: A Story of Everything* (2001). Lawson uses closure to understand how experience and language give determinate form to an open world. CCC develops that vocabulary into an explicit consciousness-first conjecture about world constitution. The additional commitment requires its own argument; Lawson's work is not an endorsement of it.

The lowercase m names a situated horizon: possibilities unresolved for a particular perspective, given its history, capacities, and access. Someone can recognize a voice without knowing who is speaking, or understand an equation without understanding its application. Something is settled while something remains open. That horizon changes with access, but need not shrink uniformly: an answer can introduce further questions.

Openness does not mean a complete absence of structure. A foundation that excluded every possibility of differentiation could not acquire that capacity merely by being called open. CCC

therefore makes a substantive premise explicit: consciousness admits differentiation and relations of constraint. This belongs to the ontology, not to what follows from observing that consciousness occurs. Primitive consciousness and the possibility of articulation are taken together as the starting commitment.

Why reality has that capacity remains a question. Every proposed foundation leaves some work at its boundary. A physical account may begin with laws, states, or dynamical capacities; CCC begins with consciousness capable of determinate organization. The comparison concerns coherence, economy, and explanatory reach. Reducing the number of primitives would achieve little if their complexity were merely hidden inside the remaining primitive.

The argument contains six commitments with different roles, set out in Table 1. The starting datum alone entails none of the other five. Section 8 distinguishes the remainder conjecture from the weaker principle that local success does not establish an exhaustive account of reality.

Table 1. Six commitments and their logical roles.

Role	Commitment
Starting datum	Consciousness occurs in particular cases.
Ontological wager	Consciousness is fundamental.
Constitutive premise	Consciousness admits differentiation and mutual constraint.
World-constitution premise	Some constraints are independent of individual judgment and support a public physical order.
Individuation hypothesis	Situated subjects depend on particular organizations within that order.
Remainder conjecture	No finite articulation exhausts the proposed foundation.

C is an abstraction from particular contents, not evidence for an actual episode of wholly contentless consciousness. It also does not require a blank foundation to perform an unexplained first act. The hypothesis concerns how determinate organization depends on consciousness while leaving unfamiliar forms of articulation open. The notation establishes neither a contentless state nor consciousness without a subject.

The guiding idea is that the familiar world is an articulation of reality, not necessarily a complete inventory of its ultimate ingredients. A person encounters meaningful differences; a scientific account specifies measurable ones. The next question is what makes those differences stable enough to sustain either kind of encounter.

3 How closure makes distinctions workable

A difference becomes consequential when something can depend on it. A boundary distinguishes an object from its surroundings. A relation connects observations made under different conditions. A memory preserves a distinction beyond its original occasion. Closure names the formation and maintenance of such determinate organization within a specified domain.

Closure has three connected requirements. Capacity concerns which alternatives an organization can distinguish. Stability concerns which distinctions remain trackable through change and which processes or constraints maintain them. Consistency concerns whether the relevant relations and their consequences can coexist and constrain one another. Together, these requirements say more than that patterns occur.

A melody is a useful illustration. Its notes differ, its identity can survive a change of instrument, and the relationships among the notes constrain what counts as continuing the same melody. Difference, continuity, and relational constraint jointly support an identity without requiring every constituent to remain fixed. This illustrates experienced and culturally interpreted organization, not a claim that physical reality is made of melodies.

Appendix B illustrates how a target can support a distinction rather than leave it arbitrary. One constructed correlation pattern favors a particular pairing over equally complex alternatives. A uniform pattern favors none of those pairings. The analyst still declares the variables and permitted models, but the target constrains which grouping they support. This is descriptive closure, not the generation of a physical object from a covariance matrix.

A molecule does not persist because someone keeps calling it the same molecule. Its organization is maintained under physical conditions that permit some transformations and exclude others. A physical closure account must identify those conditions and the processes that sustain them. Naming an organization and explaining its existence are different tasks.

Three uses of closure must therefore remain distinct. Descriptive closure concerns how an observer or model makes something intelligible. Organizational closure concerns the constraints through which a system maintains an identity. Constitutive closure is the further proposal that relations of this kind constitute determinate world structure within consciousness. The third carries CCC's central wager. The first two motivate it without logically entailing it.

Dividing observations into groups does not make the world consciousness-first. It describes an analyst's activity. CCC's ontological claim is stronger: physical organizations themselves are determinate articulations of consciousness, whether or not an observer models them. The account must connect its proposed organizing relations to the physical structures they are intended to constitute.

A closure state is a particular organization. A closure grammar specifies the distinctions, relations, and transformations available within a domain. One grammar can admit several states

and paths between them. Rearranging a room changes its state within an established physical grammar. Revising which kinds of organization an account permits changes its grammar.

At the cosmological level, grammar names the proposed conditions under which physical distinctions and transformations are possible at all. The metaphor imposes obligations: a physical realization must recover actual regularities and explain what its relations amount to. Grammar is not a hidden language, a set of verbal instructions, or evidence of an author who selected a universe.

How closure takes hold and changes

Once a temporal regime is specified, closure also concerns dynamics. A distinction forms when processes become organized so that subsequent activity depends on it. It persists when those processes maintain the relevant relations despite disturbances. It changes when inputs, internal conditions, or resources alter what can be sustained. Molecules, organisms, and perceptions need not share one mechanism. At each level, the account must identify the interactions doing the maintaining.

In a living system, maintenance can depend on mutually sustaining constraints on flows, as discussed in Section 6. In a perceptual model, competing organizations can interpret the same signal differently. An organization can remain stable without being the most accurate account available to an external analyst. Changing it may be costly, or the system may lack evidence that would destabilize it. Stability therefore carries no automatic guarantee of truth.

One local approximation ranks candidate organizations by a declared tradeoff between mismatch and complexity or resource cost. This is a variational description. Minimum description length supplies an established way to balance fit against the cost of describing a model (Grünwald, 2007). CCC uses that discipline for specified modeling problems. It does not equate an arbitrary penalty with biological energy or claim that the universe minimizes an analyst's objective.

Ranking possibilities and moving between them remain distinct. A system need not occupy the lowest-scoring candidate, and equally good candidates need not alternate. Transitions require a rule for access, perturbation, or adaptation. Moreno-Bote, Rinzel, and Rubin (2007), for example, model noise-driven alternation between competing perceptual states. Appendix C supplies an elementary transition model to show what a score alone leaves unspecified.

A state persists when its organization survives a declared range of perturbations. A grammar remains useful when its permitted states and transitions continue to account for observations across declared conditions. Failure across its candidates motivates comparison with an expanded or alternative grammar. Poor measurement or estimation can also produce apparent failure, so a change of grammar must improve independently evaluated performance. The explanation of maintenance and revision must supply causes at the relevant level.

The triad also identifies failures. Without capacity, the proposed alternatives cannot be distinguished. Without stability, an organization cannot be tracked through change. Without

consistency, the account cannot maintain its relations across the conditions it claims to cover. These are requirements on the proposed world account, not sufficient conditions for a physical world to exist.

4 How different perspectives belong to a shared world

World has three meanings here. An experienced world is the organized field available to a subject. A world model represents that field or anticipates what may occur. The physical world is the domain of events, relations, and constraints those representations aim to track, including events beyond current observation. CCC proposes that this physical domain is constituted through consciousness. Keeping the three meanings distinct prevents a change in description from being mistaken for the creation of reality.

The argument therefore needs an additional commitment: some closure relations constitute the public order itself, rather than result from a particular subject's interpretation. They constrain which perspectives can occur together, what interventions do, and how records agree or disagree. A person encounters the world through a local organization while remaining subject to a wider order that they neither author nor exhaust.

Consider two observers looking at a tree from different sides. Their experiences differ, but shared reference does not require identical images. It requires systematic relations among position, movement, occlusion, touch, and each observer's records. An account must explain why walking around the tree changes its appearance in constrained ways and why an obstruction matters regardless of either observer's wishes. This familiar example states the explanatory task; it is not independent evidence for a consciousness-first foundation.

CCC proposes that the public object is the organization sustaining these coordinated possibilities and consequences within a wider world. Its existence is not reduced to agreement between observers: both can be mistaken. The constitutive relations must also constrain what could correct them, through further observations, interventions, and records. Objectivity means independence from an individual's judgment within a shared order.

A shared-world account must meet three requirements. First, differences between perspectives must obey relations that arbitrary reinterpretation cannot change. This is transperspectival constraint. Second, it must specify what would happen under relevant interventions, including ones not yet performed. This is counterfactual structure. Third, it must represent organizations and histories beyond current human observation. This is continuity beyond access.

These demands go beyond agreement and immediate experience. They allow CCC to be realist about a public world: a mountain can predate people and outlast them. The foundational claim concerns the nature of the reality in which the mountain exists, not its dependence on a passing human perception.

A serious objection remains: coherent descriptions can be written without anything instantiating them. CCC proposes that the relations are realized as organization of consciousness. This places the actual world within the proposed foundation; it does not derive actuality from a formal description. Why this organization obtains, and why it has our physical regularities, remain tasks for a developed realization.

A model of shared constraint, and its limits

A simple classical construction clarifies the requirement. Specify a set of permitted global configurations and local observation maps that each reveal only part of a configuration. Some combinations of local observations will be compatible with a global configuration; others will not. A public object can be represented by structure preserved across relevant changes of viewpoint. Intervention rules must additionally say how changing one condition constrains later observations. This is a consistency schema, not yet a physical theory: agreement alone supplies neither the maps nor the permitted structures and intervention rules.

This construction is classical. Reading its global configurations as context-independent outcomes for every possible measurement would make it too restrictive for quantum theory. Abramsky and Brandenburger (2011) characterize contextuality through obstructions to a global distribution that reproduces compatible measurement-context probabilities. A physical realization of CCC must respect these restrictions and may need context-indexed observations rather than preassigned values for every observable. Contextuality limits this illustration of consistency; it proves neither the consciousness-first ontology nor the remainder conjecture.

The schema exposes two tasks. A realization of CCC must recover public constraints and explain how consciousness constitutes the order they describe. Mathematics addresses the first task in an abstract form. CCC's further proposal is that relational organization is intrinsic to consciousness. The mathematics specifies relations to be realized; the consciousness-first premise identifies their proposed ground.

The resulting account makes its dependencies explicit. Consciousness is fundamental. Closure constitutes determinate organization. Some constitutive relations sustain a public physical order, within which local subjects have restricted access. Each commitment can be challenged separately. The account must do more than say that everything is consciousness: it must explain an ordered world whose constraints exceed every finite subject.

The bridge would fail if a realization reproduced only current impressions, treated incompatible perspectives as equally correct without relating them, or required an already complete physical world to generate every constitutive relation. These would leave public reality, objectivity, or the proposed direction of dependence unexplained. They distinguish a consciousness-first world account from a theory only of how observers organize an assumed world.

5 Cosmogenesis: a world with time inside it

A universe has a history. It does not follow that the foundation of that universe must have a history measured by an earlier clock. If temporal order belongs to the structure being explained, an account of its constitution cannot quietly assume the same order outside it.

Consciousness-first means priority of dependence, not an earlier event. It does not mean that a cosmic mind occupied one moment and made matter in the next. The proposal is that the physical world depends on the organization of primitive consciousness, with time among that world's relations. Emergence can name this dependence or the development of new organization within a world. The meanings must remain distinct.

Cosmic closure names the constitution of a world grammar that permits physical distinctions, relations, and transformations. Temporal order could belong to that grammar through relations among events and records. A record matters because it constrains an account of other events. A construction of physical time would have to recover consistent clocks and the dynamics they measure. Ordering a list of descriptions would not suffice.

Closure at the Bang is a proposal about the conditions of a world's history. The Big Bang can be approached as the limiting horizon of that world's early history; the philosophical question concerns the constitution of the regime in which the history is possible. Identifying cosmic closure with a particular early-universe event would require a physical model and evidence beyond this argument.

Page and Wootters (1983) study relational dynamics within a stationary quantum description. Oriti (2014) discusses the disappearance and emergence of space and time in quantum-gravity research. Both provide concrete reasons to question whether familiar spacetime must be fundamental. Their role here is confined to that structural possibility; neither supplies CCC's consciousness-first foundation.

CCC thus changes the question cosmogenesis must answer. Consciousness is already basic in the account. What needs explaining is the organization of a world: its differences, physical relations, and conditions for local histories. Matter is proposed as stable organization within consciousness. Explaining that organization would connect the primitive to the physical without changing its fundamental nature.

A physical law describes transformations available within an established world. A closure grammar concerns the organization that makes those transformations meaningful and available. A developed account would recover specific laws from explicit constitutive relations. Until then, grammar identifies what needs explaining; it does not supply alternative cosmological equations.

The first grammar cannot be selected simply by saying that stable grammars survive. Survival already presupposes an ordering in which something continues. Before temporal order has been explained, the question is whether the proposed distinctions, transformations, and record relations can coexist coherently. Questions about persistence and selection become meaningful

after a temporal regime is specified. Otherwise, the account would explain time by presupposing it.

The proposal reverses a familiar explanatory direction. A universe may be the physical articulation of consciousness, with biological observers among its later local achievements. A human mind would then occupy a small part of the world's history without defining the limits of consciousness itself. Human consciousness is one of the forms the account must explain.

6 From a cosmos to a living perspective

The closure ladder concerns how more specific organizations become possible within broader ones. Its rungs mark different achievements, not quantities of one substance. A molecule, an organism, and a remembered promise have different identities and different conditions of maintenance.

Cosmic closure concerns the availability of a lawful physical order. Within it, physical and chemical organizations support comparatively durable structures and transformations. Living systems maintain themselves while continually exchanging material and energy with their surroundings. A boundary can preserve an organization without sealing it off. Closure in this sense is compatible with environmental exchange.

Montévil and Mossio (2015) explain biological organization through mutually maintained constraints on processes. Their account provides a domain-specific comparison, not a reason to identify every form of closure with the same mechanism. The broader framework is useful only where it identifies the actual dependencies at each level.

Sensorimotor organization maintains relations among a moving body, its surroundings, and its possible actions. Cognitive organization can sustain distinctions over longer intervals through memory, expectation, and learned categories. In CCC's interpretation, these developments shape situated content and access. They help explain why different kinds of organism encounter the world differently.

Phenomenal closure concerns an experienced field. A sound can remain distinct from a bodily sensation while both belong to one occasion of experience. Some contents are salient and others peripheral. A narrative self adds continuity through memory and anticipation, but not every experience requires a narrative. Situated consciousness is richer than the identity a person can describe in words.

Intersubjective closure concerns coordination among subjects. Language, shared practices, and records preserve reference despite differences in experience. Such coordination depends on a world that constrains it. Agreement can sustain a useful understanding or preserve a shared error. Correction therefore remains essential.

The ladder supports two directions of explanation. Ontologically, CCC locates physical and biological organization within consciousness. Within the physical world, scientific accounts

explain human capacities through biological and environmental processes. These explanations address different dependencies: the nature of what is organized, and the development and operation of a particular organization.

A universe can therefore precede humanity without making consciousness itself a biological innovation. Humans bring a particular form of *c*, shaped by an embodied evolutionary history. A human perspective is not a generic consciousness simply placed behind human eyes.

The ladder proposes nested conditions, each requiring an account of what enables, maintains, and disrupts its organization. It does not imply that every higher level is irreducible, that every lower-level system is an individual subject, or that life is the inevitable goal of cosmic development.

7 Why there are many minds and why brains matter

If consciousness is fundamental, why is my experience unavailable to you in the way it is available to me? Why do I fail to know what happens beyond my senses? Why should injury to an organ change the world I can experience? These questions are central tests of the account's seriousness.

CCC locates individuality in the organization of access, integration, memory, and action. Contents belong together within a subject's situated field without automatically belonging to every other field. A shared foundation does not require shared access. The same fundamental nature can support different organizations with different horizons.

This is an approach to individuation, not a derivation of subjects. Informational boundaries can be drawn around systems whose experience has not been established. A full account must explain why particular organizations constitute subjects and why their contents belong to them. It must also distinguish overlapping descriptions of one subject from genuinely separate subjects.

The problem is related to combination and decombination. Chalmers (2017) examines how familiar subjects could arise from putative microexperiences. Goff (2017) develops cosmopsychism, in which a conscious universe is fundamental. Starting from the larger whole changes the direction of explanation but does not eliminate the need to account for local subjects. CCC proposes closure as an organizing principle for this inquiry, not as an already completed solution.

C is not the name of a demonstrated universal person. The account leaves open whether the foundation includes one encompassing subject or several basic perspectives. Leaving subjectivity's foundational organization unspecified does not require assuming consciousness without any subject. The nature of a foundation and the number of subjects it supports are different questions.

Brains matter because human *c* is embodied organization. Changes to the conditions sustaining a perspective can change its contents, availability, continuity, and capacities. Neuroscientific theories examine these dependencies through recurrence, global availability, higher-order

representation, and integration, among other approaches (Seth and Bayne, 2022). CCC must engage those accounts on their empirical merits.

In CCC, the brain has a real causal role in the physical organization through which a human perspective is constituted. The further claim is that this physical organization is itself constituted within consciousness. That interpretation does not exempt the brain from causal explanation. A radio-receiver analogy would add a transmission mechanism that this paper has not specified or established.

The test is specificity. Where a neural change alters a particular aspect of experience, a local closure account must explain more than that organization matters. It must identify the relevant distinctions, how they are integrated, and what disrupts them. Without that detail, it remains a philosophical interpretation of findings explained more fully elsewhere.

This position also addresses causal exclusion. CCC proposes a different account of what physically organized reality is, not an extra force competing with physical processes. A bodily action can have an adequate physical explanation while the reality realizing it is understood as organized consciousness. The preference for that ontology requires philosophical argument. An additional force would be a separate physical hypothesis requiring evidence.

Human capacities therefore need not define consciousness in general. Language, autobiographical memory, and sophisticated reflection are achievements of particular forms of c, not necessarily conditions of primitive consciousness. The distribution of actual subjects remains an empirical and philosophical question.

8 Remainder: what closure does not exhaust

A closure can work without exhausting the reality in which it works. Remainder names this relation: what a closure does not settle, contain, or make available through its distinctions and conditions of access. Closure concerns the achievement of determinate organization; remainder concerns what exceeds that achievement. It is neither a second substance nor a stock of concealed objects. It also need not mark failure. A distinction can be adequate to its task without exhausting what makes that task possible.

Earlier versions connected remainder with ambiguity, novelty, grammar change, and structural mystery while distinguishing openness from exact local fit (Dietz, 2026a, printed pp. 6, 10, 16; 2026b, Section 8 and Appendix A). The argument here develops that relation directly. It does not require the earlier universal claim that finite constraints force positive numerical error.

Situated remainder is not merely a feeling of incompleteness. Someone can be confident while overlooking something consequential; uncertainty can also reflect poor evidence rather than inadequate categories. Remainder may concern unrealized possibilities or relations unavailable within the current organization. Unresolved does not mean that every imaginable possibility is physically realizable, and unavailable does not mean permanently unknowable.

What local success establishes, and what CCC further proposes

An accurate map establishes particular spatial relations. Its accuracy does not establish that those relations exhaust the place. An exact probability model likewise settles a comparison on specified variables, not whether the variables capture everything relevant to every question. This is the scope principle: success within a declared articulation does not, by itself, warrant treating it as exhaustive reality. The principle concerns the gap between what has been established and what is inferred. It is compatible with physicalism, idealism, and many other ontologies.

CCC makes a stronger remainder conjecture: no finite articulation exhausts consciousness as the proposed foundation, including its capacity for further differentiation and relation. This is not merely a claim about current human ignorance. Openness is proposed to belong to the relation between an achieved form and its ground. A complete answer to one question, or a fully specified finite domain, would not close that relation as a whole. Successful closures remain successful; the conjecture concerns what their success does not exhaust.

The argument begins with what makes articulation possible. A determinate form sustains relations of identity, access, and transformation. Listing its current contents does not by itself explain those enabling relations. They can become the subject of a further account, but the task then changes: that account must explain how the earlier distinctions were sustained and why its own terms apply. An achieved organization must therefore be distinguished from the conditions and possibilities of its articulation. This supports the scope principle directly.

The stronger conjecture takes a further interpretive step. CCC understands the foundation through its capacity to admit organized forms, not as one completed inventory of them. Remainder names the way that capacity exceeds what a particular form has settled. Perspective, encounter, and revision would then belong to the same reality that sustains determinate order, rather than enter an otherwise finished account from outside. This is an argument for an open foundation as an explanation of those relations. It is not a deduction from the word capacity.

A serious objection remains. A finite rule can specify infinitely many outcomes, and describing enabling conditions need not create an endless regress. A rival could propose a finite universe whose states, transitions, and observers are completely specified. Finitude and self-reference alone do not make that proposal contradictory. The rival must explain why its specification captures conscious presence and the relevant sense of completeness. CCC must explain why an open conscious foundation does so better. The difference between a model and its referent is not itself a proof of remainder.

The case rests on the considerations together and remains open to revision. Perception presents determinate things while leaving further encounters possible. Meaning can remain recognizable while acquiring significance beyond an established use. Inquiry can revise the distinctions through which a problem is formulated. CCC reads these as expressions of an open relation between form and foundation. A fixed underlying order may also explain them. The comparison must concern explanatory adequacy and economy, not the ability to posit an unknown beyond

every objection. A stronger rival would weaken CCC even where local measurement could not directly falsify unrestricted M.

The conjecture does not contradict itself merely by making a general claim. Stating that no finite articulation exhausts the foundation is not an exhaustive account of everything the foundation admits. This answers the simple self-contradiction objection without establishing that the conjecture is true. Its value still depends on what its distinctions explain and what they leave unfinished.

What perception and meaning contribute to the argument

Husserl distinguishes how a thing is presently given from everything that could become available through further appearances. In *Ideas I*, Section 143, a physical thing cannot be completely given in a finite, closed course of appearances. Adequate givenness nevertheless remains intelligible as an idea governing an ordered infinity of possible appearances (Husserl, 1913/1983, pp. 342-343). This supports the distinction between a present encounter and its horizon. It also blocks an easy inference from inexhaustible presentation to the impossibility of a rule for it. CCC's cosmic grounding claim is a further proposal, not an equivalent formulation of phenomenological constitution.

Merleau-Ponty places the perceiver in an embodied relation to a world extending beyond what is presently given (1945/2002, pp. 380-384). This clarifies situated remainder as a condition of access, not a hidden object behind appearances. Yet he also resists treating the world as the product of an all-constituting thought (pp. 499-500). His account therefore sharpens a question CCC must answer: how can an embodied perspective open onto a world that it does not command? It does not authorize CCC's cosmic grounding claim.

Derrida examines how a mark can function beyond the circumstances and intentions of its production. This repeatability, or iterability, means that one settled context does not exhaust its possible uses (1972/1988, pp. 7-10). It supports a semantic dimension of remainder without making every interpretation equally justified or establishing a statistical theorem. Derrida also challenges origins supposedly secured in presence. That challenge applies to any claim that primitive consciousness is a wholly self-transparent ground. CCC addresses it only partly by treating C as a conjecture abstracted from situated experience, not an indubitable intuition of the entire foundation.

These arguments concern different things: perceptual horizons, signs functioning in new contexts, and the ground of reality. One label does not make them equivalent. CCC connects them through the closure-remainder relation while preserving their differences. Lawson supplies the direct vocabulary; the other interlocutors help assess its extension. The claim is a particular philosophical development, not that continental philosophy speaks with one voice or has already demonstrated CCC.

How remainder bears on revision

Remainder is productive in a limited sense: it identifies what an organization leaves available for encounter or fails to accommodate. This makes a different articulation intelligible, but does not supply a force compelling it. Revision depends on attention, retention, learning, intervention, and comparison. A difficulty may be ignored, addressed within existing categories, or prompt a change of categories. Some revisions also destroy useful distinctions or make matters worse.

Kuhn's account of anomaly and discovery shows why an unexpected result can require more than adding a fact to an unchanged account (1962, Chapter VI, especially pp. 52-53). It motivates the distinction between adjusting a state and revising a grammar. It does not show that every anomaly calls for revolution, that revision always helps, or that reality has a conscious foundation. A local CCC model must specify its grammar and how a revision would be identified.

Appendix A makes the distinction concrete. The same positive mismatch occurs in two cases. In one, a different permitted pairing fits exactly, so changing occupancy removes the excess. In the other, every permitted pairing has the same mismatch, so exact fit requires a different family. The number alone cannot distinguish the remedies. Conversely, zero mismatch can be an exact answer to a narrow question while the choice of question remains open. Remainder directs attention both to what an organization can settle and to how well it settles it.

In relationships, this distinction keeps a description of another person answerable to further encounter. A working judgment can remain open to correction without losing all authority, and warranted judgments need not be suspended indefinitely. Nonexhaustion alone yields neither a moral duty nor a doctrine of love or an explanation of suffering. Those need further normative and metaphysical premises. The point here is narrower: recognizing a life need not mean identifying it with the categories currently used to understand it.

Why remainder is not model error

M concerns openness in the foundational account; m concerns the unresolved or unavailable horizon of a situated perspective. Philosophical remainder names what a closure does not exhaust. Numerical R is narrower: it compares a specified target with a specified model family on declared observation variables. With a justified observation model and interpretation, it may illuminate one aspect of a situated difficulty. Enlarging that model does not turn R into a measurement of unrestricted M.

A restrictive model can fit exactly. A family imposing independence between two variables contains the target when those variables really are independent. Zero mismatch is then legitimate, not evidence that the restriction was fictitious. Philosophical nonexhaustion concerns what the result leaves unsettled, including whether its scope suits other questions. Exact local success is no reason to dismiss remainder, and remainder is no reason to dismiss exact local success.

Appendix A provides two checks on scope. Enlarging the permitted family cannot increase its minimum mismatch on the same target. Applying the same coarsening observation map to both target and models cannot increase their minimum relative-entropy mismatch. R can therefore decrease either through greater flexibility or through lost observable detail. A decrease alone shows neither deeper understanding nor less philosophical openness nor greater consciousness. Its interpretation depends on what the change preserves and makes available.

How experience remains continuous through change

Physical time orders events in a physical description. Closure time, τ , indexes modeled organizational changes and may be discrete or continuous. Phenomenological time concerns experienced succession and duration. Changing an analyst's sampling window does not by itself identify a moment of experience. Relating these descriptions requires an observation model and an account of what the subject experiences.

CCC proposes that experienced continuity involves retention through transformation. A melody's present note belongs to a context sustained from preceding notes and open to continuation. Isolated sounds would leave that experienced succession unexplained. Retention means the continuing relevance of what has just occurred, not necessarily deliberate recollection. Anticipation means an available horizon of continuation, not necessarily conscious prediction of the next note.

Varela's (1999) neurophenomenological account connects temporal experience with dynamical organization. CCC proposes that local closure maintains a context in which changing contents belong to an ongoing experience. This is a bridge hypothesis about organized experience, not a derivation of primitive consciousness. It implies neither sharply separated experiential frames nor a universal update frequency.

Closure rhythm names the relation between maintained context and changing articulation. A stable context can support substantial novelty; disruption can make familiar elements difficult to relate. A test must connect independently described changes in experienced continuity to specified organizational changes while distinguishing memory, attention, stimulus timing, and reporting demands. Predicting remembered duration alone would not explain experienced succession.

A melody can unfold exactly as expected and still be experienced as unfolding. Perfect fit to a changing target also permits continuing change. The proposed source of succession is organized transformation with retained context, not compulsory prediction error. Novelty can matter without every closure having to fail.

Openness is compatible with scientific success. A law can be reliable, an identity durable, and a measurement exact within its domain. None requires identifying reality with its description. Within CCC, a world is inhabitable because closure works, and inquiry remains possible because a working closure need not be the last word.

Lived remainder concerns the continuation present organization leaves open. That continuation can be expected, or a familiar event can acquire new significance. The proposal concerns maintained context that admits further differentiation, not a requirement that all novelty surprise us or every moment contain error. Whether a dynamical measure captures that organization remains a question for the local bridge, not a consequence of naming the horizon m.

9 What this account contributes and what its rivals explain

CCC claims neither priority for consciousness-first ontology nor discovery of openness or emergence. Its proposed contribution connects primitive and situated consciousness, closure as world constitution, and remainder as what achieved organization does not exhaust. The relation makes the revisability of local forms part of the framework. This is a synthesis with explicit distinctions, not a new proof of universal incompleteness.

Lawson supplies the direct inheritance of closure and openness. CCC adds an explicit conscious foundation and asks how constitutive closure could sustain physical regularities and local subjects. This is a proposed development of that lineage, not an exhaustive priority claim.

CCC is consciousness-first about grounding and realist about a physical world independent of individual belief. It must explain public constraint and persistence beyond observation. Those obligations distinguish it from a view in which a person's perception creates whatever they encounter. They do not distinguish it from every sophisticated idealism, many of which face the same problems.

Panpsychism and cosmopsychism begin with different organizations of fundamental experience. CCC emphasizes closure in determining organization and perspective. That emphasis earns its place only if it constrains the relation between primitive consciousness and particular subjects. Moving consciousness to the foundation can relocate an explanatory gap without closing it. Subject individuation is a decisive test.

A physicalist can accept much of the local analysis. Physical mechanisms can sustain boundaries, integrate signals, and distinguish self from environment. The disagreement concerns the fundamental nature of what realizes those mechanisms. Nagel (1974, pp. 435-437, 446-448) requires an adequate account to address subjective character without concluding that physicalism must be false. The unresolved burden motivates CCC; it does not establish the failure of every physicalist alternative.

Strawson's realistic physicalism treats experience as a concrete natural phenomenon and rejects an intrinsically nonexperiential conception of the physical (2006, pp. 3-7). This is a serious neighboring position, not a denial of consciousness. CCC gives consciousness explanatory priority; Strawson broadens what physical reality may be. Where both allow the same organizations and observations, their ontological descriptions do not establish different empirical probabilities. Any claim that they are equally plausible needs explicit criteria, not merely shared incompleteness.

Strong illusionism challenges the starting point differently. Frankish (2016, Sections 1-2) denies the phenomenal properties ordinarily attributed to experience while retaining processes that explain those attributions. The position does not deny all mental processing or overlook reports. CCC objects that explaining why a system judges itself conscious does not thereby establish the absence of manifest experience. Preserving that occurrence is an advantage given phenomenal realism, but the illusionist disputes this assessment. Insisting that every illusion must be phenomenally felt would assume the very premise at issue.

CCC's comparative claim must therefore be specific. It treats manifest consciousness as a datum and asks how public order can belong to its organization. Its case is strongest against accounts that cannot preserve that datum without changing the subject. It remains incomplete against accounts that preserve experience and explain its dependencies better. Nor does the reality of experience settle free agency: stochastic transitions and philosophical remainder do not establish uncaused choice. Action, reasons, and control require their own accounts.

Neutral monism starts from a nature characterized as neither mental nor physical. Neither familiar category receives priority. CCC instead begins with directly encountered consciousness, whereas a wholly neutral intrinsic nature requires further characterization. Direct acquaintance does not decide the comparison. A neutral account could be preferable if it explained experience and physical organization more economically or successfully.

Comparison with scientific accounts

A scientific comparison must go beyond noting that several theories concern organization. Global neuronal workspace accounts emphasize information available to distributed processing and report (Dehaene and Changeux, 2011). A local CCC model could test whether a closure change explains some aspect of that availability beyond the workspace account itself. Global availability alone does not establish CCC's foundation.

The free-energy principle relates perception, action, and learning through variational formulations under a generative model (Friston, 2010). This is a methodological comparison where CCC models constrained inference. The appendix's target-to-family divergence is not automatically variational free energy. Any equivalence requires matching the variables, distributions, and assumptions. Neither optimization nor declining mismatch establishes a conscious foundation.

IIT 4.0 offers a closer philosophical comparison. It begins with properties of experience and proposes requirements on intrinsic causal organization (Albantakis et al., 2023), rather than addressing report alone. CCC also concerns differentiation and unity, but its commitments yield neither IIT's postulates nor its quantitative identification of experience with causal structure. A statistical partition residual is not integrated information. CCC presently specifies less about a subject's physical realization while asking how physical order could be constituted within consciousness.

The COGITATE Consortium (2025) compared preregistered workspace and integrated-information predictions across three measurement modalities. Some predictions were supported and central predictions of both theories were challenged. The methodological lesson is to specify competing predictions and interpretations of outcomes in advance. These results are not evidence for CCC unless an independently specified CCC model predicts the relevant finding.

The explanatory contribution

The strongest objection is that CCC's ontology may add interpretation without explanation. If every physical and experiential relation is imported from another account, calling the foundation conscious does not improve the account. CCC must constrain possible organizations, clarify an unresolved dependence, or yield a discriminating prediction through an explicit realization. Its vocabulary begins that work; it does not complete it.

The contribution is a philosophical account connected to models of particular organizations without treating those models as proof of the ontology. Closure concerns how determinate organization is achieved. Remainder concerns what it does not exhaust, including the possibility of revising its conditions. C and c distinguish foundation from situated fields; M and m distinguish general openness from a local horizon; R measures only a declared mismatch. These distinctions prevent local results from silently deciding a foundational question. The appendices use established mathematics to sharpen the account, not as purported new discoveries.

10 How the conjecture could earn its place

CCC identifies two tasks for further work: constructing a world account that supports coordinated but limited perspectives, and connecting particular organizations to independently assessed experience. Both can be useful, but their evidential roles differ.

A world-grammar construction must avoid assuming the physical structure it aims to explain. It must specify permitted configurations, transformations, access relations, and a basis for records or temporal order. Local observation maps should recover systematically different perspectives within the same public domain. Its outputs must then match the physical regularities it claims to recover. Coherence is an initial requirement, not a substitute for that comparison.

The consciousness-first interpretation needs a further connection. Mathematics can describe relations without settling their ontological nature. A construction supports CCC specifically only if it explains how those relations are constituted within consciousness or identifies explanatory consequences of that commitment. If it works equally under every ontology, it demonstrates a possible structure while leaving the foundational comparison open.

Four hypotheses for studying organized experience

The local research program concerns an already conscious perceptual field. Its first three hypotheses address clarification, reorganization, and switching within specified candidate

organizations. The fourth addresses grammar revision. Each requires an explicit model and bridge to experience. None follows from primitive C or the ontological remainder conjecture alone.

Clarification concerns a move from ambiguity to a stable interpretation. With a fixed grammar and independently calibrated cost rule, reported clarification is predicted to accompany stronger relative support for the corresponding candidate. Appendix C's score gap can express that support, but does not define subjective clarity. Correct identification, confidence, and clarity must be measured separately. A simpler evidence-accumulation or stimulus-discriminability account is a required comparator. Reliable absence of the registered relationship in a well-powered, validated implementation would count against that bridge.

Reorganization concerns a controlled change that makes the occupied organization less adequate while leaving a better candidate available. The model predicts a temporary increase in occupied mismatch relative to the best permitted fit, followed by a decrease as occupancy adapts. This does not apply to every novelty: an existing organization can already accommodate a new event. If independently measured transitions occur without the excess predicted by the recovery model, the occupancy mapping or dynamics needs revision.

Switching concerns bistable perception under approximately constant stimulation. A model must specify competing states and a transition rule that predict held-out occupancy, dwell times, and their relation to independently reported perceptual changes. Equal scores are insufficient: Appendix C varies transition rates while keeping the score gap at zero. Comparison should include established adaptation and noise models, such as Moreno-Bote et al. (2007). Added value must lie in explanation or prediction, particularly in distinguishing a state transition from a change of grammar.

Grammar revision concerns a stronger perturbation: a preregistered change in stimulus relations that no initial candidate can represent to a declared accuracy. An expanded grammar and a rule making it available must be specified before evaluation. Conditional on that rule, successful acquisition of the new organization is predicted to require the expanded representation. Success must be assessed through transfer to unseen configurations and separately collected organization reports. The expanded account should outperform an equally calibrated model that permits only occupancy changes within the original family.

A larger family's better training fit is not the test. Evaluation requires held-out trials, a declared complexity or predictive criterion, and a generic flexible learner able to represent the same task relations. The specific CCC realization earns support only through added predictive value, for example locating when transfer and reported organization change together. Transfer without the predicted change, or equal performance from the matched comparator, would withhold that support. Neither outcome settles the ontological remainder conjecture. Appendix C supplies transitions within a fixed set, not a grammar-revision rule. This fourth test therefore awaits that further model.

Measurement and model identification

These hypotheses suggest a program combining graded disambiguation, sustained ambiguity, and controlled changes in stimulus relations. An independent calibration set or preregistered fitting procedure should fix the candidate organizations, observation variables, and transitions. Reports cannot both define a state and validate it on the same observations. Separate training from evaluation across trials and, for claims of generalization, across participants. Control motor-report timing, attention, and stimulus-driven activity. Reports are imperfect evidence, so conclusions must identify which aspect of experience they support.

Both target structure and occupied state may be uncertain. A fitted covariance matrix does not make either known. Sensor mixing, common inputs, finite samples, and misspecification can yield similar residuals. Before psychological interpretation, synthetic recovery tests should vary these factors, propagate uncertainty, and identify which states the observation model can distinguish. If two states produce the same observable distribution, those observations alone cannot identify occupancy. Appendix A separates population quantities from empirical estimates.

An auditory oddball study could provide secondary calibration of novelty dynamics, but an event-locked response alone does not identify conscious reorganization. The primary program therefore prioritizes perceptual organizations whose alternative contents can be assessed more directly. A link between statistical integration and experienced unity should remain exploratory until unity has an independent operational definition. Neither correlation nor factorization cost identifies a subject.

A negative result can locate an unsuitable observation model, poor grammar, incorrect transition rule, or unsupported link to experience. Each calls for a different revision, declared and tested on fresh evidence. Local failure can thus be informative. An ontology that accommodates every failure without further constraint has not thereby gained empirical support.

The most consequential advance would be a bridge linking primitive consciousness to a restricted class of organizations with explanatory or empirical advantages over alternatives. No such discriminator is established here. It is the point where CCC would go beyond interpreting facts already accommodated elsewhere. That task remains proportionate to the thesis: explaining the nature and constitution of a world.

11 A world constituted through consciousness

CCC proposes consciousness as a foundation capable of articulation. Closure concerns how differences acquire enough continuity and mutual constraint to constitute a world. Remainder concerns what achieved organization leaves unsettled or does not exhaust. Physical order, living organization, and finite subjects can then be real without any particular articulation becoming the final measure of reality.

The world is public because its organization exceeds what any individual thinks or perceives. Different perspectives are constrained by relations they do not individually control. Temporal relations and records give it a history. Human consciousness remains situated and embodied even when consciousness itself is taken as fundamental.

The account has not derived physical laws or the boundaries of subjects. It specifies a proposed relation of dependence, states what an adequate realization would require, and defends remainder as a philosophical relation. The scope principle blocks the leap from local success to an exhaustive account. The stronger remainder conjecture places continuing openness in the foundation itself. Its defense is philosophical and revisable; mathematical models neither prove it nor refute it by fitting exactly.

The wager is that consciousness gives a clue to the nature of reality. Brains would organize the particular ways a world becomes present to us, while that world is itself constituted through consciousness. A closure can work, endure, and deserve trust without exhausting what makes further articulation possible. Remainder is integral to this account: determinate forms are achievements within reality, and their success need not make reality a finished account.

Appendix A Model mismatch and grammar limitation

The appendices illustrate local closure within an assumed physical and probabilistic description. They ask three questions: how well a candidate can fit, when the target supports a boundary, and what determines actual transitions. The mathematics does not require accepting the consciousness-first ontology.

How well can a permitted family represent its target? Let p be a target probability law and $Q(K)$ a nonempty family permitted by candidate closure K . Define numerical mismatch using relative entropy (Kullback and Leibler, 1951). Throughout the appendices, R has this numerical meaning, not the unrestricted philosophical meaning of remainder:

$$R(K \mid p) = \inf_{q \in Q(K)} D_{KL}(p \parallel q) \quad (A1)$$

The infimum is the lowest mismatch the family can attain or approach. Comparisons use the same target and observation variables. R is nonnegative and can be zero even for a restrictive family, either because it fits exactly or because the divergence can approach zero arbitrarily closely. Neither outcome establishes an exhaustive description of reality.

What can the entire candidate set fit, and what does its actual occupancy achieve? For a finite, nonempty set admitted by grammar Ω , define the best permitted raw mismatch R_{best} . Let $\pi(K)$ describe occupancy over the same candidates. Then R_{occ} is the occupancy-weighted mismatch and A_{occ} its excess above the best permitted fit:

$$R_{best}(p) = \min_{K \in \Omega} R(K \mid p) \quad (A2)$$

$$R_{occ}(p) = \sum_K \pi(K) R(K \mid p); \quad A_{occ} = R_{occ} - R_{best} \geq 0 \quad (A3)$$

Here Ω abbreviates the finite candidate set, rather than the full grammar of observation and transition rules. A measurable probability law p is specified on a common observation space; $D_{KL}(p \parallel q)$ is the integral of $\log(dp/dq)$ with respect to p when p is absolutely continuous with respect to q , and is infinite otherwise. Natural logarithms give values in nats. These definitions concern population laws, not an empirical atomic distribution compared directly with a continuous density. The inequality assumes finite compared values and follows because each averaged value is at least the minimum. Occupancy may be known or inferred; the equation does not establish that it is identifiable from any chosen data. A positive excess also need not mean malfunction: an independently justified cost may favor a less accurate state.

Consider four zero-mean Gaussian variables with unit variances. Target A has correlation 0.6 within pairs (1,2) and (3,4), with zero cross-pair covariances. Target C instead has correlation 0.6 within (1,4) and (2,3). The grammar admits all positive-definite block-independent Gaussian models under pairing A or pairing B, where B groups (1,3) and (2,4). It does not admit pairing C.

Case	Occupied	Best permitted	Excess
Target A, occupied A	0.000000	0.000000	0.000000
Target A, occupied B	0.446287	0.000000	0.446287
Target C, occupied A	0.446287	0.446287	0.000000

Table A1. Exact population calculations in nats, rounded to six decimal places. These values are mathematical illustrations, not participant measurements.

For a positive-definite Gaussian target covariance Σ and a partition Π , the optimal block-independent covariance preserves the within-block covariance matrices. Its mismatch is

$$R(\Pi \mid \Sigma) = \frac{1}{2} \left[\sum_{B \in \Pi} \log \det(\Sigma_{BB}) - \log \det(\Sigma) \right] \quad (A4)$$

In a crossed pairing, the preserved blocks are identity matrices. Each target determinant is $(1 - 0.6^2)^2$, so the mismatch is $-\log(1 - 0.6^2) = 0.446287 \dots$. The two nonzero occupied mismatches have different implications. One can be eliminated by changing the occupied candidate within the grammar. The other requires changing the admitted family to achieve exact fit. A single residual cannot identify the appropriate revision.

To verify A4, write the Gaussian divergence to covariance V as one half of $\text{tr}(V^{-1}\Sigma) - d + \log \det(V) - \log \det(\Sigma)$, with d the number of variables and both means zero. For block-diagonal V , the trace and log-determinant terms separate by blocks. Each block is minimized at $V_{BB} = \Sigma_{BB}$, where the total trace is d . Substitution gives A4. This derivation assumes positive-definite covariances and an unrestricted covariance within each declared block.

To use these quantities empirically, an observation model must connect candidate states to measured data. Estimation uncertainty, model misspecification, and structural restrictions can all affect a residual; the definitions do not separate them into unique additive causes. Nor does the minimum residual identify occupancy. Interpreting Rocc or Aocc requires an identifiable observation model, independent calibration, and propagated uncertainty.

Representation supplies another constraint. Let T be an invertible measurable transformation with measurable inverse, and transport both the target law and every model law through T . Relative entropy, and hence the infimum in A1, is unchanged. For smooth coordinate changes the density Jacobians cancel in the likelihood ratio. Reimposing an old matrix restriction after mixing coordinates generally defines a different model family; it is not the same comparison expressed differently.

Two related facts clarify scope. First, for nonempty families Q_1 contained in Q_2 on the same observation space and target, $\inf$ over Q_2 of $D_{KL}(p \parallel q)$ is at most the infimum over Q_1 . This follows directly from taking an infimum over a larger set. It does not guarantee improved held-out performance from a fitted model or identify a psychologically available revision.

Second, let T be a measurable observation map and let $T_{\#}p$ denote the induced law, with transported family $T_{\#}Q = \{T_{\#}q : q \text{ in } Q\}$. The data-processing inequality gives $D_{KL}(T_{\#}p \parallel T_{\#}q) \leq D_{KL}(p \parallel q)$ for every q , and hence $\inf$ over q in Q of $D_{KL}(T_{\#}p \parallel T_{\#}q) \leq \inf$ over q in Q of $D_{KL}(p \parallel q)$. The inequality applies in the extended nonnegative reals; it does not require attainment of either infimum. If T is measurably invertible, applying the inequality to its inverse gives equality. These are standard consequences of relative entropy, not new theorems of CCC (van Erven and Harremoës, 2014, Theorem 9, order 1).

A simple example makes the interpretive consequence exact. Let p be the correlated Gaussian target A and restrict Q to independent unit-variance, zero-mean Gaussian coordinates. The four-variable mismatch is 0.446287 nats. If T retains only the first coordinate, both the target marginal and the transported family are the same standard normal law, and their mismatch is zero. The reduction has discarded dependence information. Thus neither a smaller R nor a zero R , considered without its observation map and family, measures a reduction of philosophical remainder.

These examples explain why a local analysis must distinguish its target, representation, and permitted models. They clarify the philosophical vocabulary without determining the nature of reality that realizes it. The argument for a conscious foundation remains separate.

Appendix B When the target supports a boundary

Compare the four-variable modular target A with a uniform target U. U has unit variances and off-diagonal correlations of 0.2. Both covariances are positive definite; U has eigenvalue 1.6 and eigenvalue 0.8 with multiplicity three. Figure B1 displays the two targets. This four-variable example makes the modular-versus-uniform comparison fully explicit.

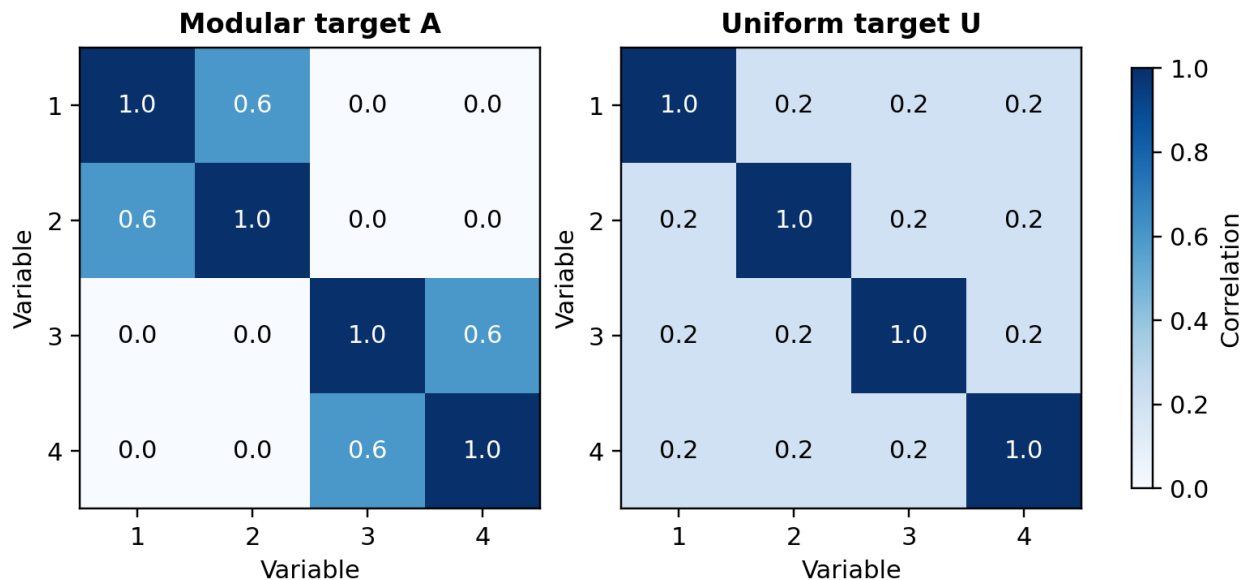


Figure B1. Population correlation matrices. The modular target contains two correlated pairs; the uniform target is unchanged by any relabeling of its four variables. Colors encode correlation on the same scale. These are constructed examples, not neural measurements.

For each pairing, admit all zero-mean positive-definite Gaussian laws independent between blocks. Add two comparison candidates: one unrestricted block and fully independent singletons. J counts free covariance parameters, including variances. It is a structural cost, not a complete description-length calculation.

Candidate	J	Modular R	Uniform R
One block: 1234	10	0.000000	0.000000
Pairing A: 12 / 34	6	0.000000	0.058892
Pairing B: 13 / 24	6	0.446287	0.058892
Pairing C: 14 / 23	6	0.446287	0.058892
Singletons: 1 / 2 / 3 / 4	4	0.446287	0.099714

Table B1. Population mismatch in nats, rounded to six decimal places. Values follow from A4. For U, $\det(U) = 0.8^3 \times 1.6 = 0.8192$; a two-variable block has determinant 0.96, giving pairing mismatch $\frac{1}{2} \log(0.96^2 / 0.8192)$.

The pairings have equal complexity. The modular target supports A; the uniform target supports none of the three over another. A permutation-invariant score must preserve that tie. Other partitions of U need not have equal fit, as the table shows. Correlation also does not identify a causal boundary: a common cause can create dependence without direct interaction between the measured variables.

If $S = R + \lambda J$ is used for precisely the five candidates in Table B1, A is the unique minimizer for the modular target whenever $0 < \lambda < -\frac{1}{2} \log(0.64)$, approximately 0.223144. It ties the unrestricted block at $\lambda = 0$ and the singleton partition at the upper endpoint. This interval follows by direct pairwise comparison. It is an illustration of a cost-sensitive selection claim, not an empirically grounded choice of λ . Additional candidates would require a new comparison.

A supported boundary depends on the target, the permitted organizations, and the comparison rule. Equal-complexity calibration shows when a target favors a distinction and when it gives the analyst no reason to privilege one. This constrains a local closure model without establishing a consciousness-first cosmology.

Appendix C Why scores do not determine transitions

Let Ω be a finite candidate set with at least two elements, finite mismatches, and a nonnegative declared cost $J(K)$. For $\lambda \geq 0$, define

$$S(K; p) = R(K \mid p) + \lambda J(K) \quad (C1)$$

J and λ must have declared units and calibration. If J is a parameter count, λ converts that count to the score's units. For empirical model selection, a valid description-length or held-out predictive criterion requires additional specification; a parameter count alone is not the MDL principle (Grünwald, 2007). All candidates must use the same target and observation convention.

Order the candidate scores, counting ties, as $S_{(1)} \leq S_{(2)} \leq \dots$. Define the score gap $\Delta S = S_{(2)} - S_{(1)}$. A positive gap separates the best candidate from its nearest competitor under the stated objective. It is not a probability, a transition rate, or a measured degree of consciousness. An estimated gap requires uncertainty assessment and can change when the candidate set changes.

For a fixed target, one possible dynamical realization is a continuous-time Markov chain on Ω . Let finite coefficients $a_{ij} = a_{ji} \geq 0$ have a connected undirected support graph, with an edge precisely when $a_{ij} > 0$. Let finite $\beta \geq 0$ have inverse-score units. For $i \neq j$, define

$$w_{ij} = a_{ij} \exp[-\beta(S_j - S_i)/2] \quad (C2)$$

Here w_{ij} is the rate from i to j per unit of τ . Set the generator's diagonal to minus the outgoing rate sum. With $P_i(\tau)$ denoting occupancy probability, the master equation is

$$dP_i/d\tau = \sum_{j \neq i} [P_j w_{ji} - P_i w_{ij}] \quad (C3)$$

This dynamics preserves nonnegative normalized occupancy. Its unique stationary distribution is $P_i^* = \exp(-\beta S_i)/Z$, where Z is the finite normalizing sum. To verify stationarity, $P_i^* w_{ij} = (a_{ij}/Z) \exp[-\beta(S_i + S_j)/2] = P_j^* w_{ji}$. Connectedness ensures irreducibility and uniqueness. The coefficients a_{ij} remain free dynamical assumptions: they are not determined by the score or by the stationary distribution. This reversible chain is an illustration, not a proposed universal law for neural dynamics.

The companion CCR paper uses a different, discrete-time inertial transition rule (Dietz, 2026c, Section 6). Its stationary distribution need not equal its static score distribution. The stationary result derived here belongs to the continuous-time construction in C2-C3; it must not be transferred to the CCR rule.

For two equal-score states with $a_{12} = a > 0$, stationary occupancy is one half in each state, but the mean dwell time is $1/a$. Choosing $a = 1$ or $a = 0.1$ gives mean dwell times of 1 or 10 units of τ with the same zero score gap. Near-degeneracy therefore does not determine a switching timescale. More complicated dwell-time distributions can require adaptation, additional hidden states, or non-Markovian dynamics.

The same model gives a conditional reorganization example. Suppose the target changes to modular A, only pairings A and B are allowed, and the system initially occupies B with certainty. Their costs are equal, while $R_A = 0$ and $R_B = r = -\log(0.64)$. Let $u = a \exp(\beta r/2)$ be the B-to-A rate and $v = a \exp(-\beta r/2)$ the A-to-B rate. Write $b = v/(u + v)$ for B's equilibrium occupancy. Then

$$P_B(\tau) = b + (1 - b) \exp[-(u + v)\tau] \quad (C4)$$

Substitution into $dP_B/d\tau = v - (u + v)P_B$ verifies this solution and its initial value. Since $R_{\text{best}} = 0$, the occupied excess is $A_{\text{occ}}(\tau) = rP_B(\tau)$. It decreases from r toward $r v/(u + v)$, rather than necessarily reaching zero. The predicted recovery follows from the specified target change, initial condition, and transition law. It is not a theorem that novelty always raises mismatch or that a physical system always reaches the best-scoring state.

The examples distinguish four claims: a candidate fits; an objective favors it; a process occupies it; and an experience corresponds to that occupancy. Each needs its own justification. The first three can be modeled without establishing the fourth or primitive C.

Methods and assistance disclosure

This article develops a philosophical argument and analytic model illustrations, not a new participant study. Numerical values come from the specified Gaussian laws and transition rules. The underlying literature work was a focused primary-source review, not a systematic review or exhaustive priority survey. Historical sources support particular phenomenological, semantic, or methodological claims; the consciousness-first ontology remains the author's argument. AI assistance was used in drafting, source checking, mathematical verification, editorial revision, and document preparation.

Version note. Version 5.4 revises the exposition of Version 5.3 while preserving its argumentative sequence, positive remainder argument, rival comparisons, four local hypotheses, and all three mathematical appendices. It distinguishes the six commitments in a table and clarifies the relationship to CCR 2.1. Earlier manuscripts document the development of the account; they are not independent evidence for its ontology.

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