

Perspectival Uniqueness, the Individuation of Consciousness, and the Vertiginous 'Why Am I Me?'

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Abstract

This speculative paper develops a novel, interdisciplinary framework for the "Why am I me?" problem. It proposes that a unique phenomenal first-person perspective (PFPP) is not generated de novo by the brain, but is a primitive property that accompanies a single, continuous physical history: a spacetime worldline. Neural processes, particularly those of the hindbrain responsible for timing, prediction, and global coordination, function to stabilize and amplify this already fixed perspective, while cortical networks furnish the variable contents of perception, memory, and thought. The account argues that biological uniqueness is merely statistical and cannot ground the guaranteed exclusivity of first-person ownership. This exclusivity, it is suggested, is more plausibly anchored in the non-overlapping structure of relativistic spacetime itself. The proposal is explicitly conceptual and metaphysically speculative but is framed to yield testable empirical predictions. The loss and recovery of sentience should correlate more strongly with deep coordination systems than with cortical activity, and disruptions of hindbrain timing should specifically impair subjective unity, agency, and self-location. Failure of these predictions would falsify the view's core neural claims.

Key Words: consciousness, first-person perspective, cerebellum, predictive processing, personal identity

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Introduction

To an external observer, the world appears largely indifferent to its inhabitants. Swapping one person for another person changes little about the world. From within, however, reality is radically centered on the single, inescapable perspective of the 'me' to whom it appears. If

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my point of view vanished, my experiential world would end even if the external world continued.

This paper intervenes in ongoing debates about the nature of the first-person perspective, the minimal self, and the limits of content-based theories of consciousness, which explain access, reportability, or information integration but often leave the ownership of experience unexplained. The central contribution is a proposal that phenomenal first-person perspective is individuated by a system's continuous physical history, or worldline, rather than by momentary brain states. Neural processes function to stabilize and amplify an already fixed point of view rather than to generate it.

This reframes the question "Why am I me?" as a problem of pairing and persistence rather than of construction. It shifts explanatory weight from cortical computation to deeper constraints imposed by physical continuity and biological stabilization. The account integrates this metaphysical claim with neuroscientific evidence emphasizing the hindbrain role in timing, prediction, and global coordination. It leaves perceptual and cognitive content to cortical networks.

This view is not offered as a complete theory. It is a testable framework, generating predictions about the neural conditions under which ownership, temporal unity, and centeredness of experience should fail or recover. Evidence that these features depend primarily on cortical content systems rather than on deep coordination and timing mechanisms would count directly against the view.

Theoretical Proposal

The core proposal argues that each conscious life follows a single path through time, and that a unique phenomenal first-person perspective (PFPP) accompanies the path, or worldline. A PFPP is indexed to a persisting physical system's unique spacetime trajectory. Neural dynamics determine the contents within that indexed perspective but do not generate the perspective itself. Personal identity is not rebuilt from scratch by brain computation but is the continuous flow of experience tied to one uninterrupted history.

The central question shifts from how consciousness is created to how a developing brain becomes stably linked to one specific point of view. The proposal suggests that during early development, as neural coordination improves, one perspective becomes fixed. It then remains continuous across the lifespan, producing the lasting sense of 'being someone'.

The hindbrain is highlighted as crucial for this process. Its regular circuitry and role in bodily regulation support predictive control loops that separate self-generated activity from external input. This separation is widely seen as necessary for coherent experience in predictive processing accounts (Seth, 2013; Clark, 2016). Coordinated

brainstem and cerebellar activity helps bind neural signals into unified moments. Cerebellar prediction and timing stabilize these patterns by cancelling expected sensory effects of action. This aligns with established cerebellar models.

In this framework, hindbrain systems anchor and preserve, but do not generate, the unity and persistence of perspective. Cerebellar and brainstem systems contribute to the background conditions that allow a single point of view to remain unified and temporally coherent. Forebrain networks then embellish it with perception, memory, and thought. This account does not explain why experience exists. But it does offer a biologically grounded way to understand how a single, stable point of view can endure over time. It supports the everyday feeling of being a continuous subject rather than just a dynamic information processor.

Phenomenology of the “Why Am I Me?” Question

The question “Why am I me?” differs from ordinary requests for information. Rather than seeking facts about the world, it exposes a structural feature of experience, that each conscious process is given from exactly one point of view. When attended to directly, this produces a characteristic sense of disorientation because the subject attempting to locate itself is identical with the process being examined. The question therefore does not concern psychological traits, memories, or personality, but the individuation of the experiencing subject.

Several related intuitions appear when the question is examined. First, there is a mereological difficulty. A person is a collection of physical and informational components, yet experience is presented as a unified “I.” No individual element of the system appears sufficient to constitute the subject, and the attempt to identify the subject with any proper part leads to regress. The observer and the observed coincide.

Second, there is an arbitrariness intuition. Among many possible organisms and histories, one specific perspective is realized. From the outside this appears contingent, but from the inside it is absolute. Experience is centered on this perspective rather than another. The issue is therefore not why this organism exists, but why experience is located here rather than elsewhere.

Third, substitution intuitions fail. Imagining “being someone else” inevitably preserves the same point of view performing the imagining. This suggests that a subject is not a transferable occupant of a body but the standpoint of a particular ongoing process.

Finally, there is a direct awareness of subjective centrality. Even when stripped of autobiographical information, experience remains anchored at a single origin. The familiarity of one’s own perceptions coexists with an inability to step outside them, revealing an

asymmetry between objective description and first-person presentation.

Together these features show that the problem differs from Nagel's general question of why there is something it is like to be an organism (Nagel, 1974). The present issue is more specific. It asks why a particular stream of experience is given from one rather than another perspective.

Framing the Inquiry

The remainder of the paper treats ownership as an individuation problem requiring an explanation of how one physical process constitutes one subject. It asks what could guarantee the uniqueness of a first-person perspective and maintain it across time. Neural computation alone does not obviously secure this. From the outside, swapping one person for another barely changes the world. But from the inside everything is organized around a single phenomenal first-person perspective. This centered ownership is the fundamental building-block of what amounts to consciousness. There is a deep 'for-me-ness' that cannot be reduced to perception, behavior, or information processing alone. When I touch a flame, the pain is not just a brain signal. It is something that happens to me. It is this sense of ownership that defines the phenomenal first-person perspective. It feels fixed and unavoidable because I cannot step outside it. Sharing it would amount to sharing an identity. The core puzzle is not just that experiences are owned. It is why this specific stream of experience is my 'here and now' rather than someone else's. What makes the pain in my finger my pain is not the signal alone but the point of view from which it is experienced. There may be no deeper explanation beyond the fact that the perspective occurring simply is the me, grounding personal identity itself across all senses.

Conscious experience is thus not merely a sequence of perceptions and thoughts but a sequence that is owned, meaning it is happening to someone. This ownership is not captured by third person descriptions of information processing, behavior, or report. Those accounts can be complete while still leaving open why this specific point of view is mine. This problem is closely related to indexical terms like 'I', 'here', and 'now', whose reference depends on a specific perspective and cannot be recovered from a detached list of facts (Perry, 1979). This is why even a full physical or neuroscientific description seems unable to explain why experience is occurring here and now, from this point of view. It's a problem that mirrors the way physics can describe all points in space and time without identifying which one pertains to a subject. It gives force to the "Why am I me?" question (Hellie, 2013; Chalmers, 1996), aka "the vertiginous question".

Terminological Clarifications

Several terms in this article are intended as functional descriptors rather than metaphors. Their meanings are fixed as follows.

Consciousness: The literature often uses the term “consciousness” (in phrases such as “unified conscious field” or “global conscious state”) to mean awake or not asleep or not comatose. In this paper, “consciousness” or “sentience” refer to the capacity to feel or perceive qualia. “Unconsciousness”, for example, is quite distinct from “no consciousness”.

Phenomenal First-Person Perspective: PFPP denotes the primitive ownership relation that makes any experience be for a subject. It treats any experience not as representational content, but as an individuating fact tied to a persisting physical system.

Trajectory-centeredness: Trajectory-centeredness denotes the property that experience is organized relative to a single ongoing physical trajectory through time. Behaviorally it corresponds to stable self-location and continuous agency despite changing sensory content. The term does not imply a geometric center in space. It identifies the persistence of a reference point across successive states. Operational indicators include stability of self-location judgments, temporal continuity perception, and resistance to self-other confusion.

Neural vortices: The term neural vortex follows Rodolfo Llinás in describing self-sustaining, energy-dependent patterns of coordinated neural activity that resist perturbation and organize incoming signals. In the present paper it refers specifically to metastable, recurrently synchronized activity that maintains global temporal coherence across distributed networks. The concept is used functionally to denote attractor-like coordination dynamics, not rotating spatial structures or fluid analogies.

Anchoring: Anchoring refers to the maintenance of a stable reference frame relative to which neural states are interpreted as belonging to one continuing subject. Operationally, it denotes neural processes that preserve cross-moment coherence by aligning sensory input, motor prediction, and bodily orientation. Candidate mechanisms include brainstem–thalamic arousal regulation, cerebellar predictive timing, and multisensory calibration. Anchoring does not mean attaching consciousness to a structure but sustaining the conditions required for persistent self-attribution.

These definitions restrict the terms to empirically interpretable roles. They describe organizational conditions under which neural processing constitutes a unified subject rather than introducing additional entities beyond known physiology.

Materials and Methods

Methodological Approach

This article employs an interdisciplinary theoretical methodology combining conceptual analysis, inference to the best explanation, and neuroscientific constraint comparison. The aim is not to introduce new experimental data but to evaluate competing explanations for the individuation and persistence of the first-person perspective using established empirical findings as boundary conditions.

First, a conceptual analysis is applied to the “Why am I me?” problem by treating it as a problem of subject individuation rather than information processing. Indexical reasoning is used to distinguish descriptive accounts of brain function from explanations that determine which physical process constitutes the subject of experience. Thought experiments are used in a limited diagnostic role to isolate ownership from representational content and to test logical consistency across duplication and replacement scenarios.

Second, candidate explanatory frameworks are assessed using inference to the best explanation. A satisfactory account must simultaneously explain exclusivity of perspective, persistence across neural change, and the stable sense of self-location. Proposed mechanisms are evaluated for whether they supply a principled individuation condition rather than a merely statistical one.

Third, neuroscientific evidence is incorporated as a set of empirical constraints. Rather than treating neural correlates of consciousness as the target phenomenon, the analysis asks which neural functions are required to maintain a unified subject over time. Findings concerning brainstem–thalamic regulation, cerebellar predictive timing, multisensory calibration, and global coordination are examined for their relevance to persistence, agency attribution, and temporal continuity. Competing interpretations are compared by assessing whether they predict dissociations between informational complexity and subjective unity.

This combined strategy treats metaphysical claims as empirically constrained hypotheses. The proposal is evaluated by the observable consequences it predicts for the organization of conscious systems, rather than by appealing to purely a priori reasoning.

Results and Discussion

Individuation Argument

The rapid withdrawal of my hand from the flame is driven by spinal reflexes and cortical processing. Yet the feeling that the pain is happening to me reflects how the brain assigns experiences to a point of view rather than to where the signals physically arise. Classic work showed that direct electrical stimulation of the somatosensory cortex

can create vivid, well-located bodily sensations without any external contact. It was demonstrated that perceived bodily location is inferred from internal body maps rather than passively read off the world (Penfield, 1958). The familiar sense that awareness sits just behind the eyes appears to be a similar inference. Research on virtual reality, telepresence, and remote embodiment shows that the operator can feel genuinely present in artificial or distant bodies and worlds once sensory feedback is well coordinated. Consciousness can follow projected sensation and control rather than the actual location of neural tissue (Clark, 2016; Graziano, 2013).

The Interface Model: A Conceptual Test Case

Consider a system in which a human brain performs all perception, cognition, and action, while the ownership of experience is supplied by an external locus coupled to it. From the inside the resulting life would appear ordinary because all representations would still occur for a single subject. The purpose of the example is only diagnostic. It separates informational processing from the fact that experiences are given to someone. The central problem becomes a pairing question, asking why does one specific subject accompany this physical process rather than another? The proposal answers by identifying the subject with the continuous physical history itself. The phenomenal first-person perspective is not produced by computation but is the standpoint of a worldline, while neural activity acts as interface supplying the contents organized relative to that standpoint.

The Individuation Base

This paper adopts an important working assumption that a phenomenal first-person perspective is not shared, and cannot ever be shared, across organisms. In ordinary experience, consciousness presents itself as exclusive, with each stream of experience belonging to one subject only. While this assumption is not derived from a known physical law, there is currently no empirical evidence for a single coherent point of view spanning multiple independent nervous systems. Exclusivity is treated here as the conservative starting point.

Two experiences belong to the same perspective only if they occur along the same ongoing physical history. Once that history splits into two distinct continuations, there are two perspectives, even if the systems are otherwise identical. This means that copying a brain or duplicating a functional organization would not produce two bodies sharing one point of view, but two distinct points of view, each tied to its own continuation. Appealing to a worldline is not a verbal trick but a way of grounding exclusivity and persistence in the minimal physical fact that distinguishes one continuing subject from another.

Attempts to explain why conscious experience is both unique and persistent often begin with biology, since human brains clearly differ. But this kind of uniqueness turns out to be statistical rather than guaranteed. Even DNA identification, while extremely reliable, is not logically absolute. If consciousness depended only on brain structure and activity, then two perfectly identical brains should in principle share the same phenomenal first-person perspective. This would create tension in duplication thought experiments between what is biologically unlikely and what seems metaphysically ruled out. Biology also struggles to explain why the first-person perspective feels continuous over time. Despite constant cellular turnover, synaptic change, and large-scale reorganization, experience remains anchored to the same felt 'me'. It's a phenomenon made especially vivid by general anesthesia, where consciousness returns as the same subject even though there is no experience during the gap. It's hard to square this with the idea that consciousness is just a sequence of momentary brain states. These points suggest that while biology strongly shapes the contents and qualities of experience, it may not fully explain why a first-person perspective is guaranteed to be unique or why it persists over a lifetime. It implies that any such guarantee lies deeper than neural structure alone.

Appealing to sub-biological description does not resolve the issue. Chemistry and physics likewise do not explain why a perspective is uniquely and continuously mine. Quantum theory makes exact duplication operationally impossible in practice—open systems decohere, and the no-cloning theorem forbids copying an unknown quantum state—but this concerns feasibility rather than metaphysical grounding. The relevant point is that identity at the biological level allows approximate sameness, whereas full physical identity requires the entire causal history of a system. This cannot be duplicated without duplicating the universe itself. The proposal therefore treats phenomenal perspectives as indexed not to biological structure alone but to a unique physical history describable as a single spacetime worldline. At the macroscopic scale of organisms, such trajectories are effectively unique, motivating a distinction between statistical uniqueness and guaranteed uniqueness developed in the following section.

Structured Systems

Uniqueness comes in two types. Separating them lessens confusion in discussions of personal identity. Statistical uniqueness describes cases where duplication is extraordinarily unlikely but still possible in principle, such as matching fingerprints, genomes, or highly similar brains. Guaranteed uniqueness is different in kind, not degree. It occurs when duplication is structurally ruled out by the rules of the system itself, so that once one instance exists, no second instance of the same kind can occur.

Biological individuality, while reliable in practice, is only statistically enforced. Guaranteed uniqueness does not arise automatically. It depends on a structure that enforces exclusivity by necessity rather than by chance. In familiar everyday systems, such as vehicle identification numbers or non-fungible tokens, uniqueness is secured because the system itself prevents reuse once an assignment is made. The exclusivity belongs to the structure managing possibilities, not to the intrinsic properties of the objects being labeled.

Applied to personal identity, if phenomenal first-person perspectives are genuinely exclusive, then they must be tied to a structure that enforces non-overlap as a matter of rule, not to likelihood. Neural organization itself does not obviously meet this requirement. The question then becomes whether there exists a physical structure that already enforces such exclusivity without additional stipulations.

Indexed Perspectives

Taken together, these points support the view that a phenomenal first-person perspective is indexed to a continuous path through spacetime rather than generated anew by momentary brain states. Here, spacetime provides a structure that guarantees exclusivity, while biological systems only provide conditions that stabilize and enrich a perspective over time. Possible perspectives are plentiful in principle because spacetime contains countless worldlines. They are few in practice because only certain organized systems can sustain a stable point of view. Each conscious life is not special in a cosmic sense, yet it is genuinely unique.

On this view, neural activity does not create ownership but works relative to an already fixed point of view, shaping perceptions, memories, and thoughts within a single unfolding 'here and now'. Framed this way, the proposal shifts the problem of individuality away from fine-grained neural details and toward the deeper structure that makes persistence and exclusivity possible. It leaves neuroscience to explain how a given trajectory becomes consciously organized rather than merely ongoing.

Perspectival Exclusivity

Relativistic spacetime provides a natural candidate for such a structure. In physics, objects are individuated not by isolated instantaneous states but by their continuous histories, or worldlines. No two complete physical histories can fully coincide. Each worldline is fixed by its causal embedding in spacetime. Even systems that are indistinguishable in structure must occupy different locations, undergo different interactions, and trace distinct paths through time. If a phenomenal first-person perspective is indexed to a worldline rather than to a momentary physical state, then exclusivity follows

directly. To experience the world from one worldline is, by definition, not to experience it from any other.

This approach also explains how personal identity can persist through change. A worldline is defined by its whole path through time, not by any single brain state at a moment. This fits the everyday fact that the sense of being the same person remains stable despite neural turnover, development, and temporary losses of consciousness such as sleep or anesthesia. What persists, in this view, is not a particular brain pattern but a continuous perspectival path.

A modest property dualism is proposed here. A unique PFPP is a fundamental, non-physical property that necessarily supervenes on any sufficiently complex, self-stabilizing physical substrate. Spacetime provides the indispensable individuation condition and the PFPP is the experiential aspect of that individuated history.

The First-Person Aspect of an Individuated History

The phenomenal first-person perspective is not a separate substance or causal influence. It is the first-person aspect of a continuous physical history. Described objectively, a system is a physical process. Described indexically, it is a subject. The relation is constitutive rather than causal. A persisting system instantiates a perspective simply by being one ongoing trajectory, while neural activity organizes information relative to that trajectory without generating the subject itself.

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Supervenience here expresses identity-tracking. Distinct histories correspond to distinct perspectives even when instantaneous structures match. The view explains ownership as individuation rather than as an additional mechanism and predicts that neural architectures supporting temporal coherence and agency calibration will be necessary conditions for unified experience.

Indexical Reference and the PFPP

The phenomenal first-person perspective is said to be “indexed” to a continuous physical history. This does not denote a causal link, information transfer, or an additional psychophysical law. It expresses an identification under an indexical description. The relation is analogous to a frame of reference in physics. A trajectory does not generate a frame, nor does a frame act on matter. Rather, events described from that trajectory constitute its frame. Likewise, a worldline described objectively is a physical process, and described indexically is a subject of experience. The PFPP is the standpoint of that history, not an added entity paired with it.

Indexing therefore fixes reference rather than production. Neural processes explain the contents and changes of experience, while

indexing determines which process those contents belong to. Causal closure is preserved. The PFPP introduces no additional dynamics but specifies the bearer of experience, whose experience it is, leaving mechanistic explanation to neuroscience.

Explanatory Role of the PFPP

The proposal does not merely redescribe correlations between neural activity and experience. It specifies why certain forms of neural organization are required for consciousness. If the PFPP is the indexical standpoint of a continuous physical trajectory, a conscious system must preserve self-identification across time so successive states belong to one subject rather than fragment.

Accordingly, consciousness should depend on mechanisms supporting temporal coherence, self-vs-world discrimination, and agency continuity, not informational complexity alone. Brainstem-thalamic coordination, cerebellar timing, and predictive cancellation of self-generated signals are therefore expected features. They stabilize neural activity relative to a single reference. Without such stabilization, processing could occur without a unified point of view.

The PFPP thus explains why conscious systems require global coordination and persistence mechanisms. It predicts that disrupting these stabilizing dynamics will impair ownership and unity even when substantial information processing remains intact, providing a structural condition for the existence of a subject of experience.

Neural Stabilization and Subject Unity

Organisms maintain a stable point of view despite continuous movement and sensory change by coordinating prediction, timing, and multisensory calibration. Cerebellar circuits compare expected and actual signals to reduce error across successive moments, while vestibular and brainstem systems maintain orientation and arousal (Angelaki & Cullen, 2008; Ito, 2008). These mechanisms do not generate perceptual content but preserve temporal coherence and agency attribution. Biological systems achieve stability through distributed sensing and prediction.

Stability arises from coordinated sensory prediction and correction, not from any single structure acting alone. This stabilizing function is widespread in living systems. Their predictive feedback driven adjustments functionally resemble adaptive control, a point emphasized by Montgomery and Bodznick in their discussion of cerebellar filtering (Montgomery and Bodznick, 2017). Even in single celled organisms, simpler forms exist such as chemotaxis and phototaxis, though without any implication that these systems support consciousness.

Neural Vortices

Llinás' idea of neural vortices fits well with a broader view of living systems as active processes that stay organized by resisting drift. He argued that the brain is never truly idle, especially in thalamocortical circuits, and that perception comes from shaping this ongoing rhythmic activity instead of building experience piece by piece from sensory input (Llinás, 2001; Llinás, 2011). Therefore, neural vortices are stable patterns of coordinated activity. They act as attractors in neural state space, damping disruptive fluctuations and keeping activity within predictable bounds.

When these organizing dynamics break down, as in deep anesthesia or certain disorders, consciousness does not just lose content but collapses altogether. The stabilizing structure is gone. The first-person perspective is therefore not something the vortex represents but something it anchors to, namely a single coherent reference frame that persists over time. Neural vortices and PFPP anchoring are best seen as ways of describing the same basic solution to a general problem, namely, how a system stays stable and unified while constantly being pushed and perturbed.

Predictive Processing

The cerebellum predicts what movements should happen and corrects errors when they stray. Purkinje neurons sit at the center of this process by comparing expected outcomes with surprise signals in feedback loops of neuronal activity. When predictions fail, they change their connections so future expectations improve. This reduces surprise over time. Because the cerebellum is especially sensitive to timing, it focuses on when events happen as much as what happens. This helps actions and perceptions feel smooth and continuous and supports a stable sense of agency, called the cerebellar self (Ito, 2008). Importantly, this stability does not depend on any single neuron but on the coordinated dynamics of a dense network of Purkinje cells. The system is thus robust to damage.

Within a larger 'anchoring' idea proposed here, once a first-person perspective is fixed by a spacetime worldline, hindbrain dynamics help keep that perspective unified over time. Changing sensations and actions are still experienced as belonging to the same enduring 'me.' The proposal interprets this coordination as maintaining a persistent reference frame relative to which neural states belong to one subject. When coherence breaks down, experience fragments rather than merely losing detail, consistent with disturbances of agency, timing, and self-location in neurological conditions (Schmahmann & Sherman, 1998). Consciousness depends not only on representational richness but on stable organization across time. Cortical processes determine what is experienced, whereas deep coordination processes help determine that experiences belong to one continuing perspective.

Anchoring as a Functional Role Rather Than a Single Structure

The proposal does not localize the phenomenal first-person perspective to a specific anatomical site. “Anchoring” is a functional role to maintain a stable temporal and sensorimotor reference frame that allows successive neural states to belong to one continuing subject. Multiple structures may contribute to this stabilization. Hindbrain systems are emphasized because they support predictive timing, bodily orientation, and global coordination. Cerebellar–brainstem–thalamic loops can therefore organize activity relative to a single ongoing trajectory without being identified with the perspective itself.

Cortical and thalamocortical networks remain necessary for representational content and reportability. Anchoring concerns persistence and self-vs-world calibration rather than representational richness. The hindbrain contributes coherence rather than perceptual content. Cerebellar circuits compare predicted and actual signals to maintain temporal continuity, while brainstem systems regulate arousal and orientation. Experience depends on cortical processes synchronized with this deeper coordination. The theory thus concerns the type of stabilizing operation required for subjectivity, not a privileged anatomical locus.

Minimal Self

The minimal self is used synonymously here with phenomenal first-person perspective. It can be understood as the basic, pre-reflective sense of being a subject of experience. High level narrative or psychological theories explain identity in terms of stories, memories, or overlapping mental states. But they struggle to account for the simple, bodily sense that an experience is ‘mine’ in the first place. And biological continuity theories ground identity in the organism. Yet they leave the lived continuity of subjectivity unexplained.

The proposal bridges this gap by suggesting that the minimal self is the experiential expression of a unique physical worldline. It draws on four-dimensional views of persistence. In addition, a specific phenomenal first-person perspective is an intrinsic property of such a trajectory which is then realized by a suitably organized living system. ‘me’ refers here to this minimal self. It does not refer to personality traits, memories, or social roles, but to the simple fact of where experience is happening, here and now. This basic ownership is what all richer forms of selfhood build on. Cerebellum and brainstem support prediction, timing, and agency at a low level. Sensory and motor processes mark the boundary between self and world. And autobiographical memory and narrative identity add meaning without grounding existence itself. In this way, memory shapes who we take ourselves to be. It does not explain why there is a subject at all.

Discussion

Each conscious life can be understood as unfolding along one continuous path through time and space. This path is naturally tied to a single phenomenal first-person perspective. All the stabilizing processes discussed so far, from basic biological regulation to cerebellar timing and whole brain coordination, depend on having one steady reference point from which change can be detected and managed. In physical terms that reference point is the organism's own continuous trajectory, its worldline through time. On this view, the first-person perspective is not rebuilt at each moment by neural activity but comes from the fact that the organism persists as one ongoing physical process. The perspective indexical is in the strict sense the 'here and now' of one and only one trajectory. Neural computation itself cannot create or duplicate this kind of ownership, because neural dynamics only operate relative to a perspective that is already fixed. Neural vortices (Llinás, 2001) and other coordinating patterns are best seen as locking activity onto an existing point of view and amplifying it rather than generating subjectivity from scratch. Full consciousness arises when this stabilized core successfully draws wider brain networks into a shared rhythm. Perceptions, thoughts, and feelings are then experienced as happening to someone rather than merely being processed. Two experiments motivate this picture. One is grounded in neuroscience showing that deep systems in the brainstem, thalamus, and cerebellum support timing, prediction, and self-vs-world separation without obviously generating a perspective themselves (Laureys et al., 2009). And the other, more playful thought experiment, was argued earlier using the interface model, showing that ownership can be conceptually separated from content generation.

Empirically, disruptions to deep timing and coordination should alter unity and ownership of experience. Cortical damage should mainly change what is experienced, not whether there is a subject of experience at all. Crucially, this proposal adds no new forces or causal powers. It does not require spacetime points to act upon the brain. The PFPP is posited as an individuating constraint that accompanies a system's persistence. And all causal work remains within the familiar domains of neural and bodily physics.

Empirical Distinguishability from Cortical Theories

The proposal does not treat the PFPP as undetectable. Rather, it holds that it is not directly measurable in isolation but has systematic observable consequences. A first-person perspective is inferred from the stability of agency attribution, temporal continuity, and self-location across changing sensory and cognitive contents. These features are routinely assessed in neurology and cognitive neuroscience, even though they are not labeled as such.

A common objection is that cerebellar damage does not typically abolish consciousness. Extensive lesions, and even cerebellar agenesis, can leave patients awake and responsive, indicating that the cerebellum is not the source of experiential content (Schmahmann and Sherman, 1998). However, such assessments equate awareness with wakefulness and behavioral responsiveness rather than directly testing the presence of a phenomenal perspective. The present account does not claim the cerebellum generates consciousness, but that, together with brainstem systems, stabilizes timing, bodily coherence, and global coordination so a single point of view remains unified. Cortical and thalamocortical networks determine what is experienced and enable reportability, whereas hindbrain mechanisms support ownership and persistence by calibrating prediction, arousal, and self-world separation. When these stabilizing processes fail, experience may fragment even if perceptual content remains available.

Global Workspace Theory (Dehaene, 2014) provides a robust framework for how information becomes reportedly conscious. However, it treats the 'workspace' as relatively anonymous. The theory explains that information is globally broadcast, but not to whom it is broadcast. The proposal in this paper complements GWT by specifying that the stable 'recipient' of global broadcast is the PFPP, anchored by hindbrain timing systems. Integrated Information Theory (Tononi, 2008) posits that consciousness is identical to a system's maximum (integrated information). While IIT elegantly links consciousness to causal structure, it allows for the possibility of identical Φ -structures in different physical instantiations. This raises the duplication puzzle for personal identity. This paper's proposed framework adds a historical, physical constraint. A maximally integrated complex must also be a physically continuous worldline to instantiate a unique PFPP. This explains why, in IIT's terms, my identical copy would constitute a different maximal complex with its own first-person perspective, that is not mine.

Empirical Consequences

Deep brain systems keep a stable point of view in place. The cortex fills in what is experienced. Losing and regaining consciousness (meaning sentience, not wakefulness) should depend more on deep brain coordination than on cortex alone. Damaging the cerebellum should alter felt timing and sense of self-location beyond obvious movement problems. If these patterns do not show up, the view would be weakened. Cortex-first theories predict that reinstating widespread cortical broadcasting is sufficient for conscious experience and that disruptions to hindbrain should mainly affect motor control without systematically altering first-person coherence.

In the present account, the loss and recovery of conscious ownership during anesthesia or severe brain state transitions should correlate

strongly with the restoration of deep brain coordination and timing, especially brainstem–thalamic and cerebellar coupling. General anesthesia comprises four partially dissociable components. Each target distinct neural circuits with limited overlap. Amnesia (hippocampal/prefrontal suppression), analgesia (attenuated nociceptive signaling), hypnosis (collapsed brainstem-thalamo-cortical integration), and immobility (spinal motor inhibition). This modular pharmacological dissociation reveals a distributed architecture for conscious and behavioral functions, though it does not address the deeper origin of consciousness itself. Certain components of anesthesia should correlate less strongly with early recovery of cortical sensory processing alone. Disorders marked by fragmentation of temporal coherence, such as certain dissociative states or specific neurological syndromes, should show abnormalities in deep timing and synchronization mechanisms rather than only in cortical representational content. Loss of temporal unity reflects breakdown in the stabilizing reference frame, whereas cortex-centered accounts predict that such fragmentation should be traceable mainly to disrupted high-level representations.

Operationalizing Ownership, Unity, and Centeredness

The present proposal distinguishes three measurable aspects. Ownership, temporal unity, and centeredness. These terms are phenomenological but need not remain vague. Each corresponds to established experimental paradigms and measurable behavioral and neural variables.

Ownership refers to the stability with which experiences are attributed to a single agent. It can be probed using agency attribution tasks and passivity illusions in which participants judge whether an action or sensation was self-generated. Quantifiable measures include misattribution rate, intentional binding magnitude, and susceptibility to externally generated movement illusions. Neural correlates are predicted to involve cerebellar prediction error signaling and brainstem–thalamic coordination rather than cortical sensory activation alone. The framework predicts that disrupting deep timing systems should selectively impair self-attribution even when perception remains intact.

Temporal unity refers to the continuity of experience across successive moments. It can be assessed through temporal order judgments, simultaneity windows, and perceptual continuity thresholds under anesthesia, stimulation, or neurological disorder. Measurable variables include widening of simultaneity windows, increased temporal fragmentation reports, and breakdown of cross-modal binding. The theory predicts these changes should correlate with impaired global timing synchronization, particularly cerebellar–thalamic coupling, rather than simply reduced cortical activity.

Centeredness refers to the stable localization of experience at a bodily here. It can be tested using vestibular perturbation, full-body ownership illusions, and manipulations of perceived self-location. Quantitative measures include displacement magnitude in self-location judgments and persistence of body ownership under sensory conflict. The model predicts abnormal shifts in perceived location when hindbrain orientation systems are disrupted, even if visual scene perception remains coherent.

Across all three domains, cortex-centered theories predict deficits primarily when representational content or global broadcasting fails. The present account instead predicts selective disruption of these measures when deep coordination and timing mechanisms are perturbed, even in the presence of substantial sensory processing. The difference allows empirical discrimination between the views using existing experimental methods.

Empirical Confirmation and Falsification Criteria

The present framework makes commitments that differ from cortex-centered theories of consciousness and permits empirical refutation. The decisive issue is not whether neural activity correlates with experience (all theories accept this). It is which organizational features are necessary for a unified subject of experience.

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Findings that would support the framework

The theory predicts that the stability of subjectivity depends primarily on deep coordination systems that maintain temporal and sensorimotor coherence. Evidence favoring the model would include:

Preservation of self-attribution and temporal continuity tracking brainstem–thalamic and cerebellar synchronization more closely than cortical activation level

Fragmentation of agency or self-location following disruption of predictive timing mechanisms despite preserved sensory processing

Recovery of unified experience during anesthesia or coma correlating with restoration of global timing coherence rather than early cortical responsiveness

Findings that would falsify the framework

The proposal would be falsified if unified subjectivity were shown to depend only on cortical information processing independent of deep stabilizing systems. In particular, the model would be rejected by evidence showing:

Reliable preservation of ownership, unity, and self-location despite sustained disruption of brainstem and cerebellar coordination mechanisms

Restoration of a stable first-person perspective whenever large-scale cortical broadcasting returns, even while deep timing synchronization remains absent

Artificial systems or neural simulations producing robust agency attribution, temporal continuity, and self-location solely through representational complexity without any continuous stabilizing reference process

Such outcomes would indicate that subjectivity is fully determined by informational structure alone and does not require the trajectory-anchoring conditions proposed here.

Conclusion and Outlook

The core claim is that the ownership and persistence of experience are best understood by separating what fixes a subject from what supplies experiential content. On this view, a unique phenomenal first-person perspective is indexed to a single continuous physical history, or worldline, which provides the exclusivity and persistence that momentary brain states do not guarantee. The 'me' of experience is identical with a specific phenomenal first-person perspective that unfolds along a spacetime worldline to which this body is anchored.

Within this framework, hindbrain systems, including brainstem and cerebellum, stabilize temporal coherence, bodily orientation, prediction, and self-versus-world separation, while forebrain networks supply the changing contents of perception, memory, and thought within an already owned point of view. This framework makes clear, testable predictions. If it is right, losing and regaining the sense of being a single subject should depend most strongly on the recovery of deep timing and coordination. This includes brainstem–thalamic coupling and cerebellar timing mechanisms. Early return of cortical sensory processing on its own should not be enough.

This is not a final answer to the vertiginous question. But it offers a clear starting point that sharpens the problem and puts real empirical pressure on where and how the brain stabilizes a single point of view. Personal identity is not a story the brain tells or a set of computations it runs, but the continued unfolding of one and the same perspectival path through time. I am not something that merely has this perspective. I am that perspective, and that perspective is what I mean by me.

Future work should investigate whether subjectivity tracks global coordination dynamics rather than representational complexity alone. Experiments combining perturbation of cerebellar or brainstem timing

mechanisms with preserved cortical processing could test predicted dissociations between perceptual content and ownership. Longitudinal studies of anesthesia recovery, disorders of self-location, and agency misattribution may further clarify whether temporal coherence predicts the return of a stable subject. Computational modeling may also help determine whether artificial systems lacking a continuous self-stabilizing reference process can reproduce behavioral markers of ownership. These approaches would allow the proposed framework to be refined or rejected based on measurable criteria rather than interpretive preference.

Two main challenges stand out. First, the proposal needs a clearer account of what a phenomenal first-person perspective property truly is, beyond saying that it travels with a worldline. It must be specified enough to show how it differs from ordinary physical or informational properties without turning it into a vague placeholder. Second, there is the question of scale. While retinal proteins can detect photons, brains operate at biological and neural levels far above the Planck scale. Current physics gives no reason to think neural systems interact directly with spacetime at that fundamental level. A more accurate way to frame the issue is not how biology reaches the Planck scale, but how large-scale, classical systems like organisms can instantiate properties that are indexed to their continuous physical history, as understood in relativistic spacetime.

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Abbreviations

PFPP — Phenomenal First-Person Perspective

GWT — Global Workspace Theory

IIT — Integrated Information Theory

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