

Participatory Relational Logic and Origin-Tag Logic: Identity, Transformation, and Persistence by Robert M. Dryer

Participatory Relational Logic (PRL) and its core component, Origin-Tag Logic (OTL), offer a novel framework for understanding identity through change. Philosophers have long grappled with how an entity can undergo transformation yet remain the same individual – from ancient puzzles like the Ship of Theseus to contemporary debates on personal identity and metaphysics. PRL/OTL provides a rigorous logical system that addresses these issues by anchoring identity in *provenance*: the origin and history of an entity. This approach stands in contrast to classical theories that rely on comparing properties or positing static substances. In what follows, we will justify the philosophical coherence of PRL and OTL, relating them to traditional and contemporary discussions in identity theory, metaphysics, and ontology. We will compare PRL's tag-persistence model with major theories – Leibniz's Law, bundle theory, substance-accident metaphysics, temporal-parts theory, and process philosophy – and illustrate its advantages through the Ship of Theseus paradox, the question of resurrection, and sacramental ontology. Throughout, the aim is to show how PRL/OTL secures diachronic identity (identity over time) in a way that avoids the pitfalls of earlier models while unifying insights from each.

Identity Through Origin: The Foundations of PRL and OTL

At the heart of PRL is Origin-Tag Logic, a system that redefines what it means for something to be “the same” entity over time. OTL begins with the **Origin-Tag Axiom**: each entity, at the first moment it is recognized or comes into being, is assigned a unique *root tag* (an origin-marker) that will forever identify it

¹. This tag is indelible – it is never erased or transferred – and it remains at the top of the entity's “ledger” of identity. Every subsequent change the entity undergoes is recorded by appending new tags to this ledger rather than altering the original tag ². In formal terms, *numerical identity* is defined by the persistence of the same root tag: if two observed stages or time-slices carry the same origin-tag in their ledger, they are one and the same entity, regardless of how dissimilar their properties or states might be ². This principle is called **tag-persistence**, and it replaces the classical method of testing identity via a complete comparison of properties ³. Instead of asking whether an entity at time t_1 shares all the same qualities as an entity at time t_2 , PRL asks whether they share an origin-tag in their ontological ledger. If they do, they are identical; if not, they are distinct entities ⁴.

Upon this foundation, PRL introduces two further operators to enrich the logic for broader applications ⁵. The **participation operator** allows one entity's ledger to receive or share in a tag from another ledger, but crucially this sharing comes in different modes or “ranks” of participation ⁵. A univocal mode means sharing the tag in the same way (applicable, for instance, to identical divine entities sharing one essence), whereas a δ -mode (analogical mode) means sharing by likeness or participation rather than identity ⁵. This distinction prevents *modal collapse* or the blurring of distinct beings: for example, created beings can participate in divinity (share in *being*) only analogically, never in the exact univocal way that the Persons of the Trinity share the divine essence ^{6 7}. The **relation operator**, on the other hand, records origination relations between ledgers: one ledger can be marked as the source or cause of another, as in parent-child, creator-creature, or in theological terms, Father-Son relations ⁵. These additions extend the framework

beyond mere identity over time, enabling PRL to formally represent hierarchies of being and causal relationships without confusion. The result is a flexible but unified ledger system: every entity is represented by an **add-only vector of tags** (its origin and the subsequent forms or states it acquires), and identity is nothing more (and nothing less) than continuity of this vector from its first entry onward ⁸ ⁹ . By codifying identity as an unbroken provenance chain, PRL promises “genuine transformation without numerical loss or ontological confusion,” offering what advocates call an *airtight framework* for identity across all domains ¹⁰ .

PRL versus Classical Theories of Identity and Ontology

PRL’s approach can be understood in contrast to several major philosophical theories of identity and ontology. Traditional frameworks have tried to explain how something remains the same through change, each with its own limitations. PRL/OTL challenges or refines these views by shifting the criterion for identity to origin tags and by allowing attributes to accrue in a one-directional, non-destructive manner. We will examine each in turn: Leibniz’s Law, Aristotelian substance theory, bundle theory, four-dimensionalism, and process philosophy.

Leibniz’s Law (Identity of Indiscernibles). A cornerstone of classical identity theory is Leibniz’s Law, which actually comprises two related principles ¹¹ . The first is the **Indiscernibility of Identicals**, asserting that if $x = y$ (if x is identical to y), then any property of x is also a property of y ¹¹ . This is generally accepted as true – an identical thing cannot differ from itself. The second, more controversial, principle is the **Identity of Indiscernibles**, which states that if x and y share all the same properties, then x and y must actually be one and the same thing ¹¹ ¹² . Leibniz’s view implies that perfect qualitative overlap guarantees numerical identity. However, philosophers have noted problems with this bidirectional criterion: one can imagine two distinct entities that have all the same observable properties (such as two identical spheres in a symmetric universe, or twins, or a molecule-for-molecule duplicate) which Leibniz’s Law would force us to treat as one entity ¹³ . PRL decisively breaks from Leibniz’s property-based test and offers a different criterion: what matters is not an exhaustive comparison of properties, but whether the entities have the same origin tag in their ledger ¹⁴ ⁴ . In PRL, identity is *historical and contextual* (traced by origin), not purely *qualitative*. If two entities share all qualities but have different origins, they remain distinct – they do not magically collapse into one just because they look indiscernible ⁴ . Conversely, an entity can change many or all of its properties over time and still be considered the same individual so long as its original tag persists in its record ¹⁵ . By keeping only the indiscernibility of identicals (the one-way direction) and rejecting the identity of indiscernibles, PRL avoids puzzles like temporary identity and fission/fusion scenarios that violate Leibniz’s Law in its strong form ¹⁶ ⁴ . Identity, for PRL, is a question of continuity of origin (a **provenance mark** ¹⁷), not a snapshot comparison of attributes. This move has deep philosophical import: it aligns with intuitions in modal metaphysics (such as Kripke’s notion that an individual cannot have a completely different origin and still be the same individual ¹⁸) while allowing us to distinguish look-alikes or duplicates by tracing their different histories.

Substance and Accidents (Aristotelian Metaphysics). Another classical approach to persistence is the **substance-accident** ontology from Aristotle and the Scholastic tradition. On this view, an individual substance (ousia) is an underlying bearer of properties, and it remains numerically the same through change because only its **accidental properties** (non-essential attributes) change while the core substance endures. As Aristotle defined it, an accident is a property a substance has “contingently, without which the substance can still retain its identity” ¹⁹ . For example, a person might gain or lose the accident of “being-tanned” or “wearing a hat” without ceasing to be the same person; the substance “Socrates” remains, while

properties come and go. This hylomorphic idea (matter-form composition) explains change by positing an underlying subject that persists through any alteration in accidents or form ²⁰ ²¹. PRL/OTL can be seen as a modernization of this idea, translating it into logical form. In PRL, the original tag of an entity corresponds to a kind of core identity – analogous to a substance – which is placed at the top rank of its ledger ²². Any attribute, state, or form that the entity acquires later is added as a lower-rank tag on the same ledger, analogous to an accident in Aristotelian terms ²². For instance, if we consider an apple that turns from green to red: in PRL we assign the apple an origin tag (its existence as *this individual apple*) and then add a “green” tag during its unripe phase, which can later be suspended and replaced by a “red” tag when it ripens – yet the original apple-tag remains untouched. The top-level tag ensures the apple’s numerical identity is intact, while color properties are just lower-level tags that come and go ²³. Thus, change is represented as *adding or deactivating tags*, never removing the identity-bearing tag ²⁴. The PRL ledger is effectively a formal ledger of substance (the first entry) and accidents (subsequent entries). In this way, PRL provides a clear criterion for real change “without numerical replacement” ²⁵: the same substance-tagged entity gains new features or loses features, but remains the same one – precisely mirroring Aristotle’s notion that accidents can change without destroying the essence or identity of the thing ¹⁹. One advantage of PRL’s formulation is that it sidesteps the need for a mysterious substratum or “bare particular” underlying all properties. Classical substance theory was sometimes critiqued for invoking an unknowable underlying entity that has no properties of its own. PRL, by contrast, concretely identifies the substance with the origin tag (which can encode, for example, the entity’s kind or nature at creation) and thereafter treats the identity as *nothing over and above the historical continuity of that tag*. The “bare particular” is replaced by a formal tag – a kind of unique identifier – which is not featureless (it usually denotes the entity’s initial nature or category) yet is immune to the changes that follow. This resolves worries about what exactly persists: what persists is the tag and its traceable chain of being, not an invisible metaphysical substrate. In summary, PRL agrees with substance metaphysics that there is a persistent factor through change, but it explicates that factor as an origin mark in a ledger, providing a logical mechanism to model Aristotle’s insight that a thing can receive contrary properties over time while remaining one and the same ²⁶.

Bundle Theory and Property-Based Identity. In contrast to substance ontology, **bundle theory** (often associated with Hume and empiricist metaphysics) denies any underlying substance and claims that an object just *is* the collection (or “bundle”) of all its properties. In a bundle theory, to say an apple exists is to say there is a green, hard, sweet, round, etc. set of properties co-instantiated; the object has no identity beyond those properties. Different versions of bundle theory treat the properties as universals or tropes, but in all cases, the object is nothing over and above the bundle of traits ²⁷. A challenge for bundle theory is explaining unity and persistence: what makes certain properties hang together as one object, and what makes an object at t_1 the same as an object at t_2 , given that their bundles differ? Bundle theorists sometimes appeal to a special “compresence” relation tying properties together ²⁸, and some endorse Leibniz’s principle by effectively saying that if two bundles share all the same properties, they are the same bundle (or that the Identity of Indiscernibles must hold for bundles) ²⁹. PRL diverges sharply from a pure bundle view by insisting that *an object’s identity is not a mere set of properties, but a sequence anchored in an origin*. While PRL certainly accommodates properties (as tags), it does not treat an entity as exhausted by the set of properties it has at any given moment. Instead, PRL’s object is like a thread through time: an initial tag (which could be thought of as the object’s essence or defining origin) followed by an ordered list of acquired features ¹ ³⁰. Two objects could have exactly the same properties at a snapshot in time – in bundle theory one might mistakenly identify them – but in PRL they are distinct if their ledgers begin differently. This is a crucial improvement in scenarios of duplication or fission. For example, imagine a person who is “copied” perfectly (like in a teleportation thought experiment or a sci-fi cloning scenario). The original and the copy might, at the moment of creation of the copy, share *all* properties (memories,

appearance, etc.), making them indiscernible in bundle terms. Bundle theory would either have to say they are the same person (which is absurd, as now there are two) or abandon the idea that properties determine identity. PRL easily handles this: the original and the duplicate have different origin tags (different “first entries” in their ledgers), so despite any indiscernibility of content at that moment, they are numerically distinct individuals ³¹ ⁴. The criterion of sameness is not “having the same properties” but “having the same provenance.” In essence, PRL adds a key ingredient that bundle theory lacks: a notion of *trans-temporal unity* that isn’t reducible to the set of properties. This can be thought of as a kind of organizing principle (somewhat akin to a thin substance or bare particular, but formalized). Interestingly, PRL thereby navigates between bundle theory and substance theory: it doesn’t posit a metaphysically thick substance behind properties, but it also doesn’t let identity be a mere aggregate of qualities. Identity becomes a matter of the continuity of an entity’s record. In doing so, PRL’s tag-ledger can be seen as giving each object an inherent *narrative identity* – a story of what it has been – rather than a mere checklist of what it is right now. This makes PRL especially suited to capture how objects and persons persist in time with changing attributes: not as static bundles, but as continuants with a history.

Temporal-Parts and Four-Dimensionalism. A more recent approach in analytic metaphysics is **four-dimensionalism**, which proposes that objects extend across time just as they extend across space. In this view, an entity is a four-dimensional “worm” composed of **temporal parts** or stages for each moment of its existence. A classic articulation by David Lewis is that a thing like a table or a person is spread out in time and consists of different temporal segments, each of which is the table-or-person at a given time ³². Persistence through time (diachronic identity) is then not a primitive fact but a matter of different temporal parts being related (usually by a continuity or causality relation) to compose one timeline of an object. The Ship of Theseus puzzle, for example, is handled by saying the “original ship” and the “reconstructed ship” are overlapping worms that share some segments or something similar – or by saying only the maximal worm is the true object and the apparent puzzle is a matter of comparing parts of worms. PRL’s stance on this is quite different: it does **not** treat an enduring entity as a series of distinct parts, but as one entity with an accumulating ledger. In other words, PRL is closer to **endurantism** (the view that objects are wholly present at each moment of their existence) than to **perdurantism** (objects as sums of temporal parts), but it gives endurantism a formal twist. In PRL, the object at time t_1 and the object at time t_2 are the same if and only if they share the same origin tag in their ledger ³³. We do not say there are two entities (two temporal slices) that need to be glued together; we say there is a single entity that lived at t_1 and at t_2 with one continuous ledger. The ledger itself can mark the time-index of when each tag was added, thereby recording the history within the object’s identity, but these are not separate objects—just one evolving record ¹. This way, PRL avoids the counter-intuitive consequences that sometimes plague four-dimensionalism, such as the idea that only instantaneous stages are truly “real” and that the feeling of being a single continuing person is an illusion. Instead, PRL maintains a robust concept of *diachronic identity*: the entity persists as a unity, and time is merely the dimension along which its ledger grows. Notably, PRL can tolerate even radical change without resorting to different temporal parts as separate existences. If a thing changes so much that none of its original matter or qualities remain, PRL would say the same entity still exists (with its root tag) – a conclusion four-dimensionalists also reach, but through the artifice of overlapping worms or shared starting parts ³¹. PRL’s explanation is more straightforward: the “before” and “after” are connected by an ongoing ledger, period. No need to invoke a multitude of part-subentities. Moreover, PRL explicitly refutes the idea that identity is “spread across worlds or times” in the sense of requiring summing parts ³⁴. As the text of its introduction states, “None of this requires... *temporal parts sliced across worlds*” ³⁵ – a clear rejection of the notion that we must treat each time-slice as a different object to solve identity puzzles. By keeping identity criteria within one world-line (the ledger), PRL also steers clear of tricky issues in modal identity (counterparts in other possible worlds) by focusing on

origin within our actual sequence of events. In sum, PRL affirms an enduring self that gains new determinations, whereas four-dimensionalism often dissolves the self into a series. PRL therefore preserves the intuition of unity and offers a simpler ontology: one entity, one continuous existence, tracked by one origin-tag, versus the proliferation of entities (stages) required by stage theory or worm theory ³⁶ .

Process Philosophy and Identity as Becoming. An even more radical departure from substances and permanence is found in **process philosophy** (as in Heraclitus, Bergson, and Whitehead), which holds that the fundamental constituents of reality are processes or events, not static things. In this view, what we call a “persisting object” is really a continual process of change – a river rather than a rock, so to speak. Heraclitus’s famous dictum that one cannot step into the same river twice highlights the extreme: everything flows, and stability is an illusion. Whitehead’s *Process and Reality* similarly describes entities (actual occasions) as momentary flashes that are connected by relations of inheritance, with nothing truly enduring underneath ²¹ . Process philosophers accuse substance-based views of being too static and missing the primacy of change and flux. PRL is highly sympathetic to the reality of change, yet it does not completely forsake the idea of a continuing entity. Instead, it can be seen as **bridging the static-dynamic divide**. In PRL’s ledger model, *being* is an ongoing act of receiving new determinations (new tags) – “being is receiving and giving of forms, rather than toggling between ‘thing’ and ‘event’” as the formulation puts it ³⁷ . This means that PRL treats change as real and fundamental (each new tag may represent a new phase, an event, an interaction), aligning with process ontology’s emphasis on becoming. A seed becoming a tree, for instance, is represented in PRL by the seed’s ledger gaining a “sapling” tag and then a “tree” tag as it grows ⁸ . There is no mysterious leap or loss of identity; growth is just *ledger-extension* ⁸ . This is very much in the spirit of process thought: what something is is partially a function of its history and development. However, PRL avoids the process philosopher’s problem of dissolving the self entirely. In pure process philosophy, it can be hard to say in what sense a later stage is the same entity as an earlier stage, since everything is new – some process theorists end up with views not unlike the bundle theory or the four-dimensional stage view, where continuity is pragmatic or relational rather than strict. PRL, by contrast, *keeps a handle on identity via the origin tag*. The origin tag acts like a **through-line** that ensures that the process has a subject that remains numerically the same *through* the change. We might say PRL agrees with Heraclitus that the river’s waters are always new, but adds a clarification: the “River of Theseus” (to coin a hybrid of metaphors) remains the same river because it started at a certain source and follows a continuous course marked by that source tag. Even if every drop of water changes, the river’s identity as *that river* is preserved by its origin and continuous flow path. PRL thus *unifies static and dynamic viewpoints*: it accepts the processual nature of reality (everything accumulates changes, nothing is utterly immutable except perhaps God in theological contexts), yet it encodes those changes in a way that a stable identity is never lost. The ledger’s first entry can be seen as a static anchor (being), while the subsequent entries represent the dynamic becoming. Many philosophers have struggled to reconcile these aspects (how to have a world of flux that still contains enduring individuals); PRL’s answer is to formalize *persistence as provenance*. In doing so, it provides a coherent account of change that neither denies change (as Parmenides or extreme substance theorists might) nor denies identity (as extreme process-relativism might). It is telling that PRL’s framework can subsume both **substance metaphysics** and **process metaphysics** as special cases or perspectives within one system ³⁷ . The static view sees the ledger’s first tag as fundamental; the dynamic view sees the ledger’s growth as fundamental; PRL says both are true and integrated.

In summary, PRL/OTL distinguishes itself from these classical and contemporary theories by positing a single invariant marker of identity (the origin tag) and allowing all other aspects of an entity to vary through additive (never destructive) changes. Unlike Leibniz’s identity criteria, it does not demand indiscernibility for identity – it demands shared origin. Unlike bundle theory, it supplies a unifying thread that binds properties

over time. Unlike substance metaphysics, it makes the enduring “substance” explicitly identifiable (the tag) and compatible with accruing new features formally. Unlike four-dimensionalism, it maintains one entity through time rather than an aggregate of time-bound slices. And unlike pure process philosophy, it preserves a strict notion of numerical identity amid the flux. By **making diachronic provenance the decisive mark of sameness** ³⁸, PRL is able to “tolerate complete material replacement, psychological discontinuity, or radical teleological elevation without numerical break” ³⁹ – scenarios that typically stump other theories. We will now turn to some of those scenarios as concrete illustrations of PRL’s advantages.

Illustrative Examples: Ship of Theseus, Resurrection, and Sacramental Ontology

To appreciate the power and coherence of Participatory Relational Logic, it is helpful to see how it tackles classic and contemporary puzzles. Three examples will be discussed here: the ancient **Ship of Theseus** paradox as a model of gradual change of parts, the issue of personal identity in **resurrection** (or more broadly, reconstitution after death) as an example of seemingly discontinuous identity, and the **sacramental ontology** of the Eucharist as an example of one entity having two natures or modes of being. These cases highlight PRL’s capacity to secure identity and meaning through change and transformation in ways that other frameworks find problematic.

Ship of Theseus – Persistence Through Complete Replacement. The Ship of Theseus story asks: if you gradually replace every plank of Theseus’s ship with new planks, is it still the same ship? Furthermore, what if someone builds a second ship out of all the discarded original planks – which ship, if either, is the “real” Ship of Theseus? This puzzle has long been a touchstone for theories of identity over time. Traditional responses vary: a strict Leibnizian might say the ship with all new planks is not strictly identical because its material properties differ (none of the original wood remains); a temporal-parts theorist would say the ship “worm” continues unbroken if we consider spatiotemporal continuity, but the reconstructed ship from old parts is a different worm; a relativist about identity might even allow that we have to specify a sortal (same ship or same wood) to answer the question ⁴⁰ ⁴¹. PRL offers a refreshingly clear answer: the ship remains numerically the same as long as its origin-tag remains at the head of its ledger ³¹. We presume that when Theseus first commissioned or recognized his ship, a root tag – call it τ_{ship} – was assigned to that vessel. At t_0 the ledger might look like $\langle \tau_{\text{ship}}, \text{plank1}, \text{plank2}, \dots, \text{plankN} \rangle$ listing all original planks as lower tags ⁴². As each plank is replaced, the PRL ledger updates: the removal of an old plank might suspend that plank’s tag (or mark it as historical), and the addition of a new plank adds a new tag for that plank. Crucially, the top tag τ_{ship} never changes or disappears through this maintenance process ⁴³. Thus at the end, when none of the initial material remains, the ledger may contain $\langle \tau_{\text{ship}}, \text{plank1_old (archived)}, \text{plank1_new}, \text{plank2_old}, \text{plank2_new}, \dots \rangle$, etc., preserving in sequence the entire history of parts. The ship at that final stage still has τ_{ship} as its first entry, so by definition it **is** the Ship of Theseus ¹⁷. A copy of the ship built from the old planks, however, receives its own new origin tag when it is assembled (say, τ_{ship2}); even though it consists of the original wood, it does not carry τ_{ship} in its ledger, and hence it is a numerically distinct ship ⁴⁴. PRL’s criterion cleanly demarcates: The authentic Ship of Theseus is the one with the continuous provenance trace back to the original, whereas the replica is just that – a replica with a different provenance. This solution has significant advantages. It captures our intuition that an object can endure total replacement of constituents if the replacement is done as a continuation of the same project or form (the ship in drydock being repaired is intended to be “the same ship” coming out) – PRL formalizes that intention as the preservation of the identity tag through continuous update. It also matches legal or practical views of identity: we would say the *institutional identity* of the ship (its registration, its identity as

Theseus's property) follows the repaired vessel, not the heap of discarded planks. The "copy" ship might be qualitatively identical to an earlier phase of Theseus's ship, but it lacks the *original origin*, much as a counterfeit might look identical to an original painting but lacks the proper provenance documentation and hence is not the original. In classical terms, PRL here provides a non-arbitrary answer to the riddle that doesn't depend on how much of the original material remains (there's no need to say "if more than 50% of planks remain it's the same ship" or other ad hoc rules). The identity is all-or-nothing and depends on the continuous lineage of the object. This approach resolves the puzzle **without** appealing to obscure metaphysical notions like an unchanging essence separate from the parts – it simply tracks the object's life through changes. The Ship of Theseus under PRL stays the Ship because "its original ship-tag is still first in the ledger" ¹⁷; the competitor ship made from old parts is new because its ledger begins differently. This fine-grained but principled approach outperforms theories that rely on qualitative sameness (which get confused here) or on temporal parts (which often conclude that the "ship" after replacement is not strictly identical to the earlier ship except as part of a longer worm, leaving it vague why we favor one worm over another). PRL yields a *verdict with justification*: provenance, not material composition at a given moment, carries the identity.

Resurrection and Radical Transformation – Identity Beyond Physical Continuity. The question of a person's identity after death and resurrection (or any hypothetical radical change) has been a topic of both theological and philosophical speculation. In Christian theology, for instance, it is said that the person who dies is the same person who will rise at the end of time, even if their body has disintegrated and been reconstituted. John Locke famously considered whether the same person could exist in a resurrected body, and personal identity theorists have debated whether bodily continuity, psychological continuity, or something else is necessary for someone at two different times (e.g., on earth and after resurrection) to be the same person. PRL provides a rigorous account of how **diachronic identity** can be maintained through such a dramatic transformation. The key again is the origin-tag: the person's ledger begins with a tag representing their origin (one might say the ensoulment or the conception of that person, their "human nature" tag) and perhaps also includes an indelible tag for baptism or other defining life events, if we take the theological angle ⁴⁵. When the person dies, their material constituents (body) and even their psychological traits might cease, yet their ledger is not erased – it remains in principle, with the root identity tag intact (and perhaps marked as awaiting new embodiment). In resurrection, PRL posits that the *same ledger* is resumed or re-embodied, now augmented by new tags (for example, a "glorified body" tag or a "resurrected" state tag) ⁴⁵. Because the ledger "still begins with the nature tag received at conception" and carries through intermediate tags like baptism up to the new state, the resurrected person is numerically identical to the original person ⁴⁶. From the standpoint of PRL logic, no mysterious metaphysical bridge is needed between death and life – it is a matter of the continuity of the identity ledger undergirded by whatever divine or natural process preserves it. Philosophically, this scenario is analogous to the Ship of Theseus but to an extreme degree: *all* the parts (body) and perhaps *all* the memories (mind) might be replaced or restored anew, yet we want to say it is still *that person*. Traditional theories struggle here. A Leibnizian property-comparison would fail because presumably the resurrected person does not share all the same properties as the earthly person (they might have a perfected body, no illness, different knowledge, etc.). A body-based continuity theory fails because the matter is entirely discontinuous (God could form a new body from new atoms). A psychology-based theory might fail if one assumes a gap in consciousness between death and resurrection or if memory is not continuous. Some have invoked the existence of an immaterial soul or a divine fiat to assert identity, but these moves lie outside philosophical logic proper. PRL, by contrast, offers a formally defined identity criterion that can straightforwardly say "yes, it is the same person because it's the same ledger – the same origin and baptismal tag still lead the sequence, now followed by new tags for the new life" ³¹. This mirrors theological notions of an enduring

soul or spiritual identity, but PRL casts it in logical terms of an origin tag. One might even say PRL is offering a **logic of resurrection identity** that supports the coherence of the doctrine: identity is preserved not by continuous matter or memory, but by continuous origin/provenance. In more everyday philosophical terms, this has implications for any thought experiment involving radical transformation: teleportation (destroying and recreating a person), mind uploading, etc. PRL would judge identity in those cases by asking: is the resulting being running on the **same ledger** as the original? If a teleporter faithfully carries over the identity tag (imagine it transfers an identity certificate), then the teleported person is the same as the original. If it merely creates a copy with a new ledger, then it's not the same, just a duplicate. This crisp solution bypasses muddy debates about spatio-temporal continuity or psychological sameness by focusing on what we might call an information-theoretic continuity: the preservation of the "tag ledger" information. Indeed, in digital contexts, one could imagine implementing OTL by assigning unique IDs to data objects; PRL's own authors note that OTL's axioms can handle digital files or legal contracts through changes ⁴⁷ ⁴⁸ . Whether biological or digital, identity is a function of maintained identity-tags. The **philosophical advantage** here is enormous: PRL can countenance "resurrection" or total replacement *without* sacrificing the concept of strict identity. It avoids the conclusion some philosophers like Derek Parfit reached – that in cases of extreme change, identity might be indeterminate or unimportant – by instead preserving identity determinately via origin. Therefore, PRL provides a framework in which notions of personal immortality or continuity after drastic change make logical sense: no atoms in common? no problem – the person is the same because their originating identity token endures in the new instantiation.

Sacramental Ontology – One Entity, Multiple Participations. Our final example comes from ontology and theology: the case of the Eucharist and sacramental identity. In classical metaphysics, especially as employed by Thomas Aquinas, the Eucharistic bread after consecration is said to undergo *transubstantiation*: the substance of bread is converted into the substance of Christ's Body, while the **accidents** (appearances of bread – shape, taste, color) remain ⁴⁹ . This explanation uses Aristotelian substance-accident distinctions to say the underlying reality changes (hence it is truly Christ present), but all observable properties remain those of bread (hence it still looks and tastes like bread). This can be seen as a kind of layered ontology: the Eucharist is *both* sign and reality, symbol and what is symbolized, in different respects. However, outside of strict Scholastic categories, such claims often appear paradoxical: How can one thing be literally two things (bread and Christ)? Is it one substance or two? Non-Catholic theologians might opt for a purely symbolic interpretation (it's just bread, symbolizing Christ), whereas a naive realist interpretation might tempt one to say the bread simply *becomes* flesh (which is empirically hard to defend). PRL offers a formalism that accommodates **sacramental ontology** elegantly by using its tag and participation system. In PRL terms, the consecrated host can be described by a ledger like $\langle \tau_{\text{bread}}^{\sigma}, \tau_{\text{body}}^{\delta} \rangle$ ⁵⁰ . Here τ_{bread} is the original bread nature of the host, tagged perhaps at a lower rank σ indicating a *symbolic or material order*, and τ_{body} is a higher-rank tag denoting participation in the Body of Christ, marked with δ to indicate it's an analogical participation ⁵⁰ . The single ledger containing both tags means we are speaking of one and the same entity carrying both attributes. The rank and mode markers (σ vs δ) ensure we do not conflate the two: the bread-tag remains to account for the empirical properties (it is truly still in the form of bread), while the body-of-Christ tag indicates a higher ontological participation (it truly, though mystically, is the Body of Christ in essence) ⁵⁰ . Traditional analyses had to choose either a dual substance model (which is problematic, as one thing can't normally have two substances) or collapse one aspect into the other. PRL shows that in one ledger, you can have two **ordered tags** that don't erase one another: the original tag is not abolished by adding the new tag ⁵⁰ . The bread becomes the Body of Christ not by ceasing to be bread in every respect, but by acquiring a new identity-tag at a superior rank in the hierarchy of being. The logic enforces that these tags are of different modes (symbolic vs real participation) so there is no contradiction; it's not as if it's claiming "bread = Christ's Body" in a univocal way, which would

violate logic or theology – rather, “bread-symbol (σ) and Christ’s-body-reality (δ) coincide in this one entity without merging” ⁵¹ . The philosophical payoff is that PRL can reconcile symbol and reality in a single coherent ontology. Beyond the Eucharist, think of any case where something has a role in one system and another role in a higher system – for instance, a physical object that is also a legal object (like a piece of paper that is legally a \$100 bill). One might say the paper “participates” in the value of money while remaining paper. PRL would handle this with a ledger: $\langle \tau_{\text{paper}}, \tau_{\text{money}} \rangle$ at different ranks. The paper tag accounts for its physical properties, the money tag (perhaps at an analogical or conventional rank) accounts for its fiduciary role. Destroying the paper removes both, but one can see how the same entity holds two identities without confusion. In the Eucharist, the stakes are higher – it’s an ontological claim of divine presence – yet PRL’s framework is general enough to capture it. The **advantage in philosophical theology** is clear: PRL avoids the false dichotomy of **either** mere symbolism **or** crude literalism by formally allowing “both to coexist in one ledger at different ranks” ⁵² . This example also demonstrates the **participatory** aspect of PRL: the consecrated host *participates* in the being of Christ. Classical participatory metaphysics (as in Neoplatonism or Aquinas) struggled to say how something could partake of a higher reality without either becoming that reality or remaining completely separate. If one said, for example, that creatures participate in God’s being, one risked either blurring the Creator-creature distinction (if taken too literally, it veers to pantheism) or emptying participation of meaning (if it’s just metaphorical, then creatures don’t *really* share in God at all). PRL’s solution is the δ -mode participation: creatures can carry a tag derived from God (like a grace or a share in divine life) but marked as analogical, preserving an ontological distinction ⁵³ . In the Trinity, PRL would allow univocal sharing (Father, Son, Holy Spirit share the same divine essence tag exactly ⁵⁴), whereas creatures only ever get an analogical share of any divine attribute. This fine-tuning goes beyond our main topic of identity per se, but it underscores the versatility of PRL’s logic in handling identity in relational and hierarchical contexts. The key point for identity theory is that PRL shows how an entity can undergo a profound change of status (bread to sacrament, human nature to glorified nature) *without losing its original identity*. The original tag remains as a guarantee of numerical continuity ⁵⁵ ³¹ , even as new tags elevate or modify the being. This is a kind of **continuity-in-transformation** that few if any traditional ontologies can articulate so clearly.

Coherence and Advantages of PRL/OTL in Diachronic Identity

The foregoing analysis reveals several philosophical advantages of Participatory Relational Logic and Origin-Tag Logic. First and foremost is **coherence in diachronic identity**: PRL gives a consistent criterion for when an entity at two times is the same, a criterion that can be universally applied. Identity is no longer a patchwork of ad hoc solutions (one for ships, another for persons, another for religious mysteries); it is a single principle – shared origin tag – instantiated across cases. This yields clarity. As the PRL framework puts it, it makes “diachronic provenance, not synchronic similarity or underlying stuff, the decisive mark of sameness” ⁵⁶ . Such a stance resolves debates where other theories flip-flop between requiring some same matter, or some same form, or insisting that identity questions are mere semantics. By pointing to an indelible origin, PRL cuts through the ambiguity.

Another advantage is that PRL **resolves identity puzzles without exotic or dubious assumptions**. It does not require that an object have an inexpressible substratum (as some substance theories do), nor that two things cannot share all properties (it allows they can, if they have different tags), nor that we accept unexplained “brute identities” across time. Everything is accounted for by the formal ledger. If one demands a further explanation of what the tag itself is metaphysically, one might consider it as a primitive individuator – akin to haecceity (thisness) in medieval philosophy, but with the important difference that it is embedded in a systematic logic and is empirically anchored (the tag appears when the entity is first

recognized in reality) ⁵⁷ ¹ . PRL's tags could be interpreted as a formal stand-in for what makes an entity unique from the start (Leibniz might have called it its complete individual concept). The crucial thing is that PRL shows that one **can** incorporate such an individuator without hindering a thing's ability to change. In fact, change is just new information appended to that individual's concept.

Furthermore, PRL demonstrates **logical consistency** with the standard axioms of identity (reflexivity, symmetry, transitivity) while modifying Leibniz's Law in a justified way. Identity remains an equivalence relation – it's reflexive (each ledger is of course identical to itself), symmetric, and transitive – but we no longer presume that sharing all predicates is either necessary or sufficient for identity. As the PRL formulation notes, classical identity theorems treat indiscernibility of identicals as a biconditional, whereas PRL keeps only the one direction (if identical, then indiscernible in all properties) and drops the converse ⁴ . This move is supported by many philosophers' intuitions (recall that the Identity of Indiscernibles has long been considered not logically necessary ¹³). PRL thus aligns with mainstream logic on what must be true of identicals, while offering a new insight into how we discern when things are identical: by tracing their origin rather than checking their attributes. This is arguably a more **metaphysically robust** account: it grounds identity in something existential (coming-to-be from a source) rather than purely in abstract set-of-properties comparisons.

Another benefit of PRL/OTL is its **generality and unification** of various perspectives. Throughout our comparisons, we've seen that PRL can reproduce the strengths of different theories within one framework. It agrees with Aristotelianism that something persists through change (the tag is like the essence) and with processism that change is fundamental (the ledger constantly grows). It can emulate a four-dimensionalist description (by listing stages as tags), but without fragmenting the object. It can incorporate psychological, biological, and social facets of personal identity all as tags on the same person's ledger ⁵⁸ . For example, debates between "animalist" theorists (who say a person is essentially a biological organism) and "psychological continuity" theorists (who say memory or mind makes personal identity) can be resolved by PRL's stance: the organism's continuity and the mind's continuity are both registered as tags, neither alone constitutes identity, but each is part of the one ledger of the person ⁵⁹ . The person's identity isn't reducible to any one of these aspects, but encompasses them in a structured way. This is a holistic approach that moves beyond siloed theories. In the text of PRL, it is claimed that it "dissolves disputes" between those accounts by providing a place for each: "Every feature is a tag; persistence is ledger-continuity" ⁵⁹ . That elegance is a strong mark of theoretical virtue: PRL posits one basic ontology (entities with ledgers) and finds room in it for the truths that other theories each pointed to (the importance of origin, of continuity, of substance, of process, etc.).

Importantly, PRL is not just a metaphysical abstraction; it was developed with theological and existential questions in mind. Its coherence therefore extends to domains often kept separate from analytic metaphysics. It provides a way to talk about the **Trinity** (as seen, each Person has the same divine nature tag but different origin relation tags ⁶⁰), about **grace and transformation** (a person receiving grace or enlightenment gains new tags without ceasing to be themselves ⁶¹), and about **community identity** (even something like a church community can be tagged and retain identity through schism and reunion ⁶²). The fact that one formal system can span these examples – which range from puzzles of material constitution to eschatological doctrines – speaks to its conceptual power. It suggests that PRL/OTL has captured something fundamental about how we ought to track identity: through a kind of *historical index* that can be extended but not erased. Indeed, in everyday practice, we use origin and continuity to identify things more often than we realize (we look at serial numbers on parts, we trace ownership history for antiques, we keep diaries of a

life's narrative to say it's one life). PRL formalizes this commonsense reliance on history, elevating it to the primary principle.

Finally, PRL's approach has the advantage of handling **edge cases** gracefully. It naturally handles cases of **fission** (one entity splitting into two): only one can carry the original tag, the other must receive a new tag at the moment of splitting, so they are distinct after the split (which resolves the philosophically notorious puzzle of fission in personal identity without needing to say a person can be "half-identical" to two successors). It handles **fusion** (two entities merge into one): the new merged entity would have to pick one original tag as primary (perhaps the process of fusion designates one as absorbing the other, whose tag might become a subordinate tag), or perhaps a genuinely equal fusion creates a brand new tag and thus a new entity. In either case, PRL can describe what happens in a rule-governed way. Classical logic struggled with fission/fusion because Leibniz's law doesn't directly tell you what to do when one becomes two or two become one. PRL, by focusing on tags, can explicitly say what rules apply (e.g., no two distinct entities can share the same root tag by definition, so one will have to yield). In short, PRL delivers a system that is both **philosophically rigorous** and **applicably clear**.

Conclusion

Participatory Relational Logic and Origin-Tag Logic together constitute a bold synthesis of ideas in identity theory, metaphysics, and ontology. By positing an indelible origin tag as the anchor of identity and defining existence as the accretion of participatory and relational tags, PRL resolves the age-old tension between change and permanence. It provides a formal grammar in which something can genuinely transform (gain new attributes, enter new relations, even change its very mode of being) without ceasing to be itself ⁶¹. ⁸. This approach subsumes classical insights like Aristotle's enduring substance and Leibniz's indiscernibility of identicals (keeping their truth but not their exclusivity) while also embracing the dynamic insights of process and the nuanced distinctions of modal ontology (univocal vs analogical participation). The Ship of Theseus remains the same ship, the resurrected person is the same person, and the consecrated bread is both itself and more than itself – all under a single logical canopy. The philosophical coherence of PRL/OTL lies in its **emphasis on provenance**: identity is fundamentally about "coming from" – from an origin, from a cause, from a source – and remaining tethered to that origin through every change ⁶³. This vision has the advantage of explaining identity in terms of historical continuity (a concept intuitive to us in fields like law, art, and narrative) rather than in terms of abstract metaphysical substances or an impossible stasis of properties.

In the end, PRL and OTL offer not just a solution to specific puzzles but a new perspective on *what it means to be the same thing over time*. It reframes the conversation: instead of asking "By what properties or parts do we recognize something as the same?", we ask "Does this trace back to the same origin and follow the same line of receiving form?". Through that lens, many intractable debates in ontology and identity theory find resolution or at least clarification. The framework invites further exploration and application, but even in its initial form it stands as a compelling alternative to orthodox positions. As our analysis has shown, PRL/OTL's tag-persistence model carries significant philosophical merit, marrying logical precision with metaphysical depth. It allows us to affirm, with formal rigor, that transformation need not entail replacement and that the unity of an identity can endure through any assortment of changes – a true "logic of genuine transformation without numerical loss" ¹⁰ that is poised to inform both classical debates and contemporary discussions about identity in an evolving world.

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Bibliography

- Aristotle. *Categories*. In *The Complete Works of Aristotle*, edited by Jonathan Barnes. Princeton: Princeton University Press, 1984.
- Leibniz, Gottfried Wilhelm. *Discourse on Metaphysics and Other Essays*. Translated by Roger Ariew and Daniel Garber. Indianapolis: Hackett, 1991.
- Hume, David. *A Treatise of Human Nature*. Edited by L. A. Selby-Bigge. Oxford: Clarendon Press, 1888 (1739).
- Frege, Gottlob. "On Sense and Reference." *Zeitschrift für Philosophie und philosophische Kritik* 100 (1892): 25–50. Reprinted in *Translations from the Philosophical Writings of Gottlob Frege*, edited by Peter Geach and Max Black. Oxford: Blackwell, 1980.
- Whitehead, Alfred North. *Process and Reality*. New York: Free Press, 1978 (1929).
- Parfit, Derek. *Reasons and Persons*. Oxford: Clarendon Press, 1984.
- Sider, Theodore. *Four-Dimensionalism: An Ontology of Persistence and Time*. Oxford: Oxford University Press, 2001.

1 2 3 4 5 6 7 8 9 10 14 15 17 22 23 24 25 30 31 33 34 35 37 38 39 42 43 44 45 46
47 48 50 51 52 53 54 55 56 57 58 59 60 61 62 63 PRL and OTL.docx

file:///file-1GsyDJFHQipMuo6cSLGTZp

11 13 27 28 29 **Object (Stanford Encyclopedia of Philosophy)**

<https://plato.stanford.edu/entries/object/>

12 16 32 36 40 41 **Identity Over Time (Stanford Encyclopedia of Philosophy)**

<https://plato.stanford.edu/entries/identity-time/>

18 **Origin Essentialism in Biology | The Philosophical Quarterly**

<https://academic.oup.com/pq/article-abstract/64/254/60/1539900>

19 49 **Accident (philosophy) - Wikipedia**

[https://en.wikipedia.org/wiki/Accident_\(philosophy\)](https://en.wikipedia.org/wiki/Accident_(philosophy))

20 21 26 **Substance - Stanford Encyclopedia of Philosophy**

<https://plato.stanford.edu/entries/substance/>