The Reflective Time Model:
An Operational Phenomenological Law of Observer-Linked Cross-Temporal Record Organization

Eran Harpaz
Independent Researcher
ORCID: 0009-0004-3839-6124

25 August 2026
Revision v0.28.23

Abstract

The Reflective Time Model (RTM) reports a reproducible operational phenomenology in which heterogeneous documentary records form exact, role-preserving, dependency-aware architectures around a matched observer-linked identity registry. The deterministic Hebrew character-to-integer mapping is the measurement representation; the recurrent architecture is the measured phenomenon. Across materially different record environments, the same observer-linked structural invariant recurs through identity resolution, semantic-role resolution, event self-reconstruction, recursive re-entry, physical record-state transition, and chronology-constrained closure. The cumulative corpus therefore establishes, within the explicitly tested operational domain, a phenomenological law of observer-linked cross-temporal record organization. Here "law" denotes the bounded operational regularity defined by the repeated architecture and its stated pressure conditions; it does not denote a completed microscopic dynamical theory. The microscopic physical mechanism and unrestricted domain of validity remain separate questions.

The corpus is organized as a pressure ladder rather than as a collection of nominal casewise probabilities. Titanic tests semantic-role arbitrariness by exhaustively evaluating all 11! assignments of the same value inventory; Ford Capri contracts the searchable source environment to one bounded object; Subscriber makes a preserved physical record-state transition part of the measured architecture; and F01/F02 introduce chronology-constrained completion under earlier frozen records. These casewise results are not treated as statistically independent and their probabilities are not multiplied.

For the World Cup system, exhaustive enumeration of the complete frozen role space identifies exactly 2 full numeric completions among 34,951,113,757,163,520,000 legal states. The two are related solely by the reported F02 `shirt6`↔`shirt21` score-preserving symmetry and therefore constitute one detected structural solution class. F01 and Spain are individually unique in their complete component spaces, while F02 contains only the symmetry-related pair. Removing any entire component leaves a strongly selective residual architecture. A separate 100-million-world `shared_anchor_fixed` stress test yields no unified 61/61 completion and a maximum of 42/61. The exact enumeration establishes extreme conditional structural selectivity within the frozen role space; it is not converted into a universal historical-discovery probability.

For Emily Dickinson, the primary 57-relation/15-class/9-block object is uniquely completed by the documented observer profile among 423,360 coherent alternatives. The observer is not identified only by direct numerical returns: after removal of all 43 direct observer-target relations, the remaining 14 indirect cross-source constraints still reconstruct the same four-primitive observer identity uniquely, and removal of every primary relation containing literal 612 also leaves a unique reconstruction. Four of nine individual blocks are themselves uniquely identifying, and all 126 five-of-nine subsets retain the same unique observer solution.

Dickinson therefore supplies distributed latent observer reconstruction with redundancy and knockout robustness, complementing the World Cup system's exact global role resolution.

An additional frozen omnibus historical-search sensitivity integrates the implemented search-freedom families at the simulated-researcher level. Each of 10,000 trajectories receives 512 draws in every one of 55 declared families—4 World Cup role-allocation families, 3 Dickinson observer-profile families, and 48 generic adaptive source/value–target–chronology families—for 281.6 million candidate evaluations in total. No trajectory reproduces the primary World-Cup-plus-Dickinson endpoint, and none reproduces the stricter all-layer endpoint; the one-sided 95% upper bound on the trajectory-level primary reproduction rate under this declared omnibus null is 2.99528×10^{-4}. This is a max-over-family sensitivity analysis, not a universal probability for every conceivable historical research decision.

The cumulative argument is architectural and constraint-based rather than a product of nominal casewise probabilities. Within the tested operational domain, the complete measured record architecture is not adequately described as independent of the matched observer-linked information relation. This bounded phenomenological-law statement does not identify a microscopic coupling equation, establish a universal law of all observers, prove controllable backward signaling, or assign physical privilege to the numerical encoding.

Operational Law Statement

Within the tested operational domain, heterogeneous record systems repeatedly form exact, role-preserving, dependency-aware architectures whose complete organization is selectively associated with the matched observer-linked information registry and is not reproduced at comparable completeness by the declared observer, semantic-role, source, chronology, and finite-state alternatives implemented for the relevant cases. RTM refers to this recurrent invariant as the *phenomenological law of observer-linked cross-temporal record organization.* The law is the recurrent architecture, not the Hebrew integer encoding used to measure it.

Cross-temporal implication. RTM therefore reports not merely observer specificity but observer-linked organization distributed across records associated with distinct times. The complete architecture is detectable only at the level of the temporally extended observer–record system; this operational statement does not by itself select a microscopic time ontology.

Evidence at a Glance: Exact and Deterministic Core

The central evidential claim of this paper does not depend on Monte Carlo simulation. Even if every randomized simulation result in the manuscript is set aside, the corpus still contains deterministic closure systems, exhaustive finite-space uniqueness results, observer-specific exhaustive searches, role-specific exhaustive searches, chronology-constrained records, and repeated cross-case structural motifs. Monte Carlo is therefore used primarily as an additional adversarial stress-test layer rather than as the foundation of the reported architecture or of the phenomenological-law claim.

Measurement hierarchy. Gematria is the deterministic measurement representation; the closure architecture is the observation; the recurrent matched-observer record relation is the phenomenological law in the tested operational domain. The physical coupling, ontology, microscopic dynamics, and unrestricted domain of validity are a separate level.

What remains if all Monte Carlo results are discarded?

System	Non-Monte-Carlo result	What it establishes
World Cup / Unified-99	Deterministic audit reproduces 99/99 two-volume closure units. The frozen shared role-sensitive object is exactly 61/61 constraints and 13/13 dependency blocks for the documented assignment.	Complete deterministic architecture before randomized stress testing.
World Cup v5.0	Exactly 2 complete numeric assignments occur among 34,951,113,757,163,520,000 legal assignments in the frozen role-allocation space. The two assignments are related by the reported F02 $6 \leftrightarrow 21$ scorer symmetry and therefore form one structural solution class.	Exact role specificity and finite-space uniqueness.
World Cup component robustness	Removing F01 leaves F02+Spain at 1 in 13,377,208,320; removing F02 leaves F01+Spain at 1 in 4,514,807,808,000; removing Spain leaves F01+F02 at 1 in 5,056,584,744,960,000 within the same frozen Cartesian role space.	Residual selectivity survives removal of any complete component; these are overlapping structural diagnostics, not independent probabilities.
Spain public extension	Spain alone completes the declared 48-entrant and 68-spelling finite objects; 344 is the unique full target in the declared numeric sweep; and $(2134, 344)$ is the sole complete pair among 48,000 source–team assignments.	Exact target selectivity in the stated finite spaces.
Titanic	Every one of the $11! = 39{,}916{,}800$ assignments of the same eleven values to the eleven semantic roles is evaluated. The observed assignment is the unique full/global maximum in the current target-aware score layers.	Exact semantic-role specificity without sampling uncertainty.
Ford Capri	The current deterministic inventory verifies 123/123 labelled equations. An analytical exact solver over the encoded family support returns one satisfying full assignment: the documented Harpaz registry.	Source-contracted deterministic architecture and one full solution in the declared support.
Emily Dickinson	The primary object is 57 relations compressed to 15 relation classes and 9 dependency blocks. All 423,360 coherent empirical profiles are evaluated exhaustively; the documented profile alone scores 57/57, 15/15, 9/9, while the best nonactual profile scores 46/57, 10/15, 4/9. Four individual blocks are already uniquely identifying; 125/126 four-block subsets and all 126 five-block subsets are unique. Removing 43 direct-target rows leaves 14 indirect rows that still reconstruct $(F, S, A, Y) = (320, 292, 58, 1982)$ uniquely, and the literal-612 knockout is also unique.	Distributed observer reconstruction with redundancy across source blocks and survival of target removal.
Emily Dickinson symbolic space	The documented primitive tuple is the sole full solution in the declared 8,500,140,000-profile symbolic support.	Conditional symbolic identifiability in a finite formal space.
14–15 July 2026	Exhaustive Gregorian scans cover 73,414 dates and 73,413 adjacent date pairs; Day 1, Day 2, and the adjacent pair are the sole complete hits under their stated frozen generators and gates.	Exact temporal selectivity in the declared finite date space.
Live-time F01/F02	Deterministic audits reproduce F01 at 24/24 closures and 38/38 checks and F02 at 29/29 closures and 61/61 checks. Earlier timestamped message fields were preserved before the later score/image fields entered the record.	Chronology-constrained architecture linking earlier preserved fields to later-available record fields.

Scope of the exact World Cup result. The v5.0 cardinality above is exact within the frozen role-allocation space. It is not converted into a universal probability for the historical discovery

process or for RTM itself. This scope statement does not reduce the enumeration: within the declared space there are exactly two full numeric completions and one structural solution class under the reported symmetry.

Additional integrated post-selection stress test

RTM Omnibus Historical-Search Null v2.0 gives each of 10,000 simulated researcher trajectories 512 draws in every one of 55 implemented search families, for 281,600,000 candidate evaluations. The primary World-Cup-plus-Dickinson endpoint is reproduced by 0/10,000 trajectories; the strict endpoint, which additionally requires an adaptive candidate to meet or exceed the frozen Pareto gate, is also 0/10,000. World Cup full completion is 0/10,000, while Dickinson full completion occurs in 9/10,000 trajectories and the generic adaptive gate is reached in 3,577/10,000. The null therefore permits substantial partial and component-level success but does not reproduce the declared joint architecture. The inferential denominator is 10,000 researcher trajectories, not 281.6 million candidate evaluations.

Two complementary pressure conditions

Feature	Dickinson	World Cup
Primary signature	Distributed observer reconstruction	Exact global role resolution
Strongest robustness test	Direct-target / block knockout	Entire-component knockout
Core uniqueness	One observer profile	One detected structural solution class
Temporal feature	Sequential source reveal / observer linkage	Frozen architecture versus later outcome fields
Main statistical object	Identity reconstruction	Finite role-space enumeration
Main caution	Adaptive discovery / representation freedom	Representation choice / role-space assumptions

The two extensions therefore apply different pressure conditions to the same framework. Dickinson asks whether heterogeneous historical source blocks redundantly reconstruct one observer identity. The World Cup asks whether a frozen three-component role architecture resolves globally when later outcome fields enter the record. Neither comparison implies statistical independence between the cases.

What an alternative explanation must reproduce

The alternative explanation must reproduce the architecture, not merely the equalities. A conventional null is therefore not sufficient merely because a flexible encoding can generate isolated numerical matches. The relevant comparison must address the observed combination of observer specificity, semantic-role specificity, dependency structure, chronology, recursive closure, knockout recovery, and architecture-level completeness.

Observed feature	What an alternative explanation must account for
Observer specificity	Why the matched observer occupies the completing identity roles while defined alternative-observer spaces and exhaustive coherent-profile spaces do not.

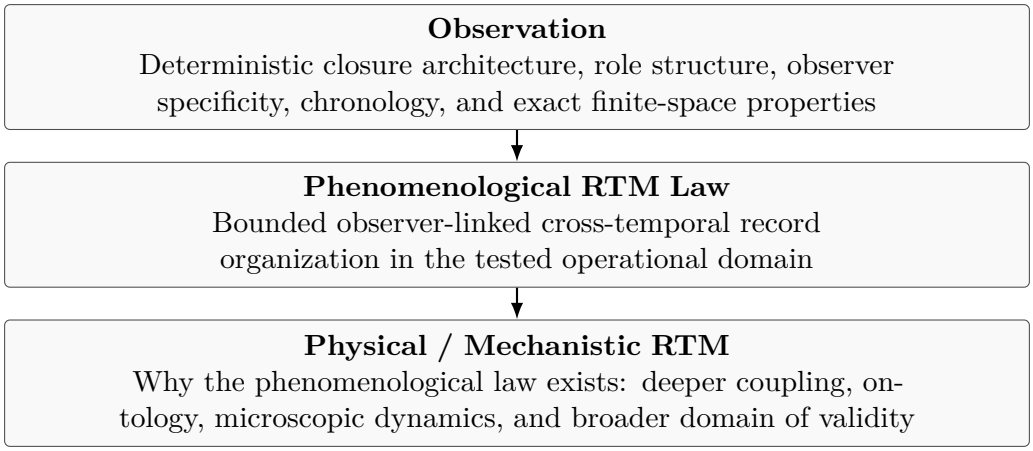
Observed feature	What an alternative explanation must account for
Role specificity and exact uniqueness	Why semantic reassignment breaks completion, including Titanic's exhaustive 11! assignment result and the exact World Cup role-space solution.
Complete architecture and dependency structure	Why whole declared networks close with repeated nodes, blocks, loops, branching, cross-domain re-entry, and correct semantic positions rather than only producing isolated target hits.
Knockout robustness	Why observer identification can survive removal of major direct-target material, as in the Dickinson knockout controls.
Chronology and sequential carry-over	Why earlier preserved fields participate in later-completing structures and why frozen values acquire additional constrained roles at later stages.
Cross-case recurrence	Why related observer-linked motifs recur as the source environment changes from historical archives to one vehicle, one card, live-time records, finite public outcomes, and newly selected historical material.
Negative controls	Why perturbations and alternative representations do not all produce equivalent structure, and why some broad controls fail rather than every analysis being retained as supportive.

Adaptive-search burden. Residual adaptive discovery is a legitimate methodological uncertainty. An unlogged degree of freedom is not by itself a demonstrated generative explanation of the observed architecture. A selection-only account becomes explanatory to the extent that an explicit model with comparable freedom reproduces observer specificity, role specificity, dependency structure, loops, chronology, exact uniqueness, knockout robustness, and cross-case recurrence at a quantitatively credible rate.

Known-target construction is directly stress-tested rather than assumed away. In Dickinson, removing 43/57 direct-target relations or all literal-612 targets still leaves the documented observer uniquely identified; Titanic preserves the same numerical inventory while exhaustively reassigning semantic roles; and Subscriber tests same-inventory role permutation and max-over-choice construction.

The empirical object of RTM is not merely arrival at the observer's known identity. Observer identity is only one component of the complete architecture. The tested unit requires event fields, temporal relations, semantic roles, recurrent intermediate nodes, loops and recursions, physical records, chronology, and identity to integrate in the correct positions and relations. RTM success is therefore not defined as reaching any familiar value, but as completing a role-dependent, chronology-dependent, self-reconstructing structure.

The discovery history of a frozen architecture is not the denominator of exact-counting results or model-conditioned comparison results. It becomes relevant when quantifying the full historical discovery process or the degree of surprise conditioned on the discovery process, but it does not alter uniqueness, selectivity, or extremity already established within a declared and defined comparison space.



The first two levels are not identical to the third. The present corpus establishes the observed architecture and the bounded phenomenological law within the stated operational domain. The deeper physical mechanism and unrestricted domain of applicability remain open. Study B prospectively tests the generalization of the already observed phenomenological law under a fully frozen and blinded protocol while sharply discriminating against explanations based on adaptive discovery; it is not the first test of whether the present phenomenon exists.

Methodological heterogeneity and chronology. The corpus includes retrospectively discovered historical systems, but also chronology-constrained, live-time, sequential, and frozen-input components. These layers do not possess identical discovery freedom and are not treated as if they did. Chronology language is kept at the provenance level actually available: externally timestamped or separately preserved, file-level documented, author-reported, or reconstructed. These levels are not merged into a single confidence class.

Negative and non-supportive results. The audit record retains negative and non-supportive controls. The broad representation-invariance test v4.1 did not support the intended invariance claim and is preserved rather than suppressed. The later v4.2 analysis asks the narrower representation-selectivity question and likewise does not claim canonical uniqueness. The two tests answer different questions.

Monte Carlo and randomized null models are introduced after this deterministic core as adversarial stress tests of additional freedom dimensions; they are not the sole or primary basis for the existence of the reported architecture. The evidential order used in this manuscript is therefore deterministic/exact structure → architectural interpretation → randomized stress testing.

Contents

Evidence at a Glance: Exact and Deterministic Core **2**

1 Introduction: model, observable, and evidential ladder **9**

2 RTM as an architectural corpus **13**

3 The central empirical object **14**

4 What RTM actually reports beyond exact closures **16**

5 Architecture taxonomy **18**

6 Corpus progression as a pressure ladder **20**

7 Locked score objects **23**

8 The 9/11 Identity Matrix: archive-scale architecture **25**

9 The Titanic Identity Matrix: cross-archive replication and role resolution **35**

10 The Ford Capri Identity Matrix: source-contracted family architecture **43**

11 The Living Subscriber: record-state transition architecture **53**

Reader guide: how to read the World Cup and Dickinson ledgers **62**

12 The Result Was Already Encoded: live-time chronology architecture **66**

13 World Cup synthesis: exact global role resolution and the 2134–Spain public extension **79**

14 The Emily Dickinson realization: distributed observer reconstruction **92**

15 Cross-case synthesis: pressure conditions on one structural invariant **115**

16 Skeptical challenge matrix **122**

17 The Observer Matrix: empirical constraint and bounded physical interpretation **129**

18 The 14–15 July sequence as a compact prospective bridge **137**

19 Prospective generalization and independent replication program **139**

20 Claim discipline and evidential language **142**

21 Claim-source audit and verification maturity **143**

22 Scope and deferred output freezes **146**

23 Supplementary boundary and audit materials **147**

24 Data, code, and material availability **147**

25 Ethics, privacy, authorship, and competing interests **148**

26 Version and correction statement **149**

27 Conclusion **154**

1 Introduction: model, observable, and evidential ladder

RTM is intentionally stronger than a catalogue of numerical coincidences, but its claims must be separated by evidential level. Throughout this article, "law" denotes the bounded operational regularity defined by the repeated architecture and its stated pressure conditions, not a completed microscopic dynamical theory. The model begins with an operational fact: evidence about another time is encountered through a record available now. A historical document, photograph, message, timestamp, physical inscription, database field, or memory report is a present informational state referring to an event-time that may differ from the present.

Let

$$R_t(\tau)$$

denote the accessible record state at present time t concerning event-time τ. When $\tau < t$, $R_t(\tau)$ is the presently displayed record of the past; when $\tau > t$, it is a presently encoded expectation, constraint, or antecedent field concerning a later event. The statement that the past is accessed through present records is an operational premise. It is not, by itself, proof that an earlier physical event changed.

Let $\mathcal{I}_O(t)$ denote the active information state linked to observer system O: stored records, relational identity, and the information currently available to and integrated by that system. In the existing corpus, $\mathcal{I}_O(t)$ is not estimated from introspection or belief intensity. It is operationalized through a frozen relational registry and documentary record states.

The strongest physical form of RTM proposes

$$R_t(\tau) \not\perp\!\!\!\perp \mathcal{I}_O(t),$$

meaning that the complete organization of accessible records associated with different times may not be fully independent of the observer-linked information state. The model is summarized schematically as

$$\boxed{\text{displayed past} \longleftarrow \mathcal{I}_O(t) \longrightarrow \text{emerging future}}$$

where the arrows state the RTM organizing hypothesis, not an already measured signal direction.

Interpretive boundary. The retrospective components of RTM do not require observation of an observer-independent historical record changing from state A to state B. The tested object is the complete record state accessible at measurement time, including records and memories attributed to earlier event-times, and whether the organization of that accessible state is observer-linked. The prospective arm is tested when earlier frozen fields reappear in later external outcomes or records. The present corpus does not establish controllable retrocausal signaling.

1.1 Deterministic encoding is a measurement representation, not a causal mechanism

RTM does not propose that gematria causes, predicts, influences, or generates physical events. The encoding functions only as a reproducible numerical representation of frozen linguistic records. Formally, the encoding may be written as

$$G : \mathcal{S} \to \mathbb{N},$$

where a fixed string $s \in \mathcal{S}$ is mapped deterministically to a single integer $G(s)$ according to the stated Hebrew letter-value table.

The scientific claim concerns the recurrence, semantic alignment, dependency structure, and observer-linked organization of relations among encoded records—not any intrinsic causal property of the encoding convention itself. In this sense, the encoding is the measuring ruler, not the proposed physical phenomenon. RTM does not require the claim that integer encoding itself produces the phenomenon. The encoding operationalizes relational constraints that can be tested, permuted, reconstructed, ablated, and enumerated.

The deterministic encoding reveals and makes measurable relations among otherwise different record domains. The tested proposition is that one information structure may appear at several resolutions:

$$I \longrightarrow \begin{cases} T(I) & \text{time,} \\ L(I) & \text{language,} \\ N(I) & \text{number,} \\ P(I) & \text{identity and role,} \\ E(I) & \text{event field,} \\ H(I) & \text{documentary record.} \end{cases}$$

The evidential force lies in role preservation and architecture completion: a time field must return as a time field, a named person must occupy the correct relational role, an event field must reconstruct the documented event, and dependent paths must form the declared loop, branch, transition, or checksum. Mere arrival at any familiar value is not the RTM object.

Representation–observation–law–mechanism distinction. Gematria is the deterministic measurement representation. The closure network is the observation. The recurrent matched-observer architecture is the bounded phenomenological law. The microscopic physical mechanism remains a separate explanatory problem.

1.2 Five requirements of a strong cross-temporal RTM unit

The strongest cross-temporal units combine five elements:

1. **A frozen or externally constrained source**: a timestamped message, public historical record, photograph, physical object, preserved record state, or field fixed without using the later outcome.
2. **A later or separately sourced information field**: an outcome, image, role assignment, documentary fact, or derived target not contained as the same raw field in the source.
3. **Exact deterministic relation**: the declared string, encoding, and arithmetic can be recomputed without approximation.
4. **Semantic and relational role preservation**: the correct event, time, person, family role, record state, or linguistic function is resolved rather than any available tagged value.
5. **Architecture recurrence and quantitative pressure**: the complete motif recurs across cases and is compared with observer substitutions, role permutations, exhaustive assignments, source ablations, grammar alternatives, or Monte Carlo worlds where implemented.

No claim is made that every historical row separately satisfies all five requirements. The full evidential argument is cumulative: individual rows are edges, case architectures are the primary objects, and the five heterogeneous cases jointly test whether the same observer-linked organization survives changing source and chronology constraints.

1.3 Evidential ladder: what is established and what remains interpretive

Level	Claim type	Current status
L1	Documentary facts and source integrity status	Source strings, timestamps, event fields, physical record states, and provenance classes are explicit audit objects. Where original custody is incomplete or author-reported, that boundary is retained rather than promoted to third-party authentication.
L2	Deterministic encoding and exact relations	Frozen strings map deterministically under the declared representation, and the stated arithmetic or symbolic relations can be recomputed exactly. An arithmetic or transcription failure falsifies the affected path.
L3	Architecture and dependency structure	Event reconstruction, correct identity and semantic roles, convergence, branching, recursive re-entry, state transition, chronology, and dependency-aware completion are inspectable properties of the declared graphs. Row counts are not treated as independent trials.
L4	Selectivity under declared alternatives	Finite, exhaustive, solver-based, permutation, ablation, optimization, and Monte Carlo controls establish uniqueness, specificity, or extremity only within their stated support, grammar, role schema, score object, and search budget.
L5	Bounded phenomenological law	Across heterogeneous record environments, the same observer-linked, role-preserving, dependency-aware structural invariant recurs and remains separated under the declared controls where implemented. Within the explicitly tested operational domain, this recurrent relation is the RTM phenomenological law.
L6	Microscopic physical mechanism and ontology	Candidate explanations include global or time-symmetric consistency, relational organization, participatory actualization, selection over histories, or another observer–record coupling. State variables, coupling equations, scaling laws, boundary conditions, no-signaling consistency, and discriminating predictions remain open.

1.4 Claim–evidence map

RTM claim	Strongest present support	Principal control or boundary	Status
The accessible past is represented through present record states.	Every historical case is analyzed through currently accessible public records, photographs, artifacts, messages, or preserved institutional fields.	This is an operational premise about evidence access, not proof of retroactive physical change.	Direct premise
Different informational resolutions can form one role-preserving architecture.	Across all five cases, time, language, event facts, identities, roles, and documentary fields converge, branch, and re-enter common nodes.	Exact strings, role labels, dependency maps, and any-target exclusions are required; wrong-role and incomplete paths do not receive full credit.	Direct structure
Record organization is observer-linked rather than only target-rich.	9/11 observer catalogues score 365/365 and 324/324 against reported alternative maxima 59 and 174; Titanic's observed role assignment is the sole 89/89 maximum over 11! assignments; Ford Capri's exact solver yields one full declared family solution.	Existing controls are local to frozen registries and generators.	Strong, model-conditioned
The organization is cross-temporal and has prospective and retrospective arms.	Live-time F01 and F02 preserve earlier messages before later score and image fields; the 14–15 July sequence freezes a Day-1 value before its Day-2 roles. Historical cases add dense retrospective integration with older public records.	RTM does not require two observed global histories. Its retrospective test concerns the organization of the complete record state accessible at measurement time, while chronological custody remains essential for prospective claims.	Supported interpretation
Record-state change can itself become an exact evidence object.	The Living Subscriber preserves before-and-after states, scores 133/133 equations and 31/31 dependency blocks, and closes the four-state field through a shared 2814 bridge.	The edits are documented physical record transitions; RTM does not claim that a quantum superobserver produced them.	Direct transition; open mechanism
The architecture survives severe source contraction.	The progression from 9/11 and Titanic archives to one Ford Capri, one membership artifact, and live external records retains identity resolution, self-reconstruction, and checksum motifs.	The cases differ in discovery history and cannot be pooled as independent trials.	Cumulative support

RTM claim	Strongest present support	Principal control or boundary	Status
The complete objects are extreme in declared comparison spaces.	Titanic is unique across 39,916,800 role assignments; Ford Capri scores 123/123 against a reported maximum of 60 in 100M principal worlds; Subscriber maxima are reported as 14/133 and 4/31; locked live-time objects are unreproduced at full score in their declared million-world lines.	Each result remains conditional on its exact score ontology, support, representation rules, and verification maturity. No universal discovery-process probability is claimed.	Established locally
Observer-linked cross-temporal record organization is a phenomenological law within the tested operational domain.	The same role-preserving observer–record architecture recurs across 9/11, Titanic, Ford Capri, Subscriber, live-time, Spain, Dickinson, and the July bridge while source size, chronology, physical medium, and comparison space change.	The law is restricted to the declared measurement protocols and tested corpus. It is not a pooled probability claim and does not specify the physical mechanism.	Established phenomenology
A physical observer–record coupling underlies the phenomenological law.	Record-state transitions, live chronology, matched-observer specificity, and the operational correspondence with observer-record physics motivate a unifying physical model.	The microscopic coupling equation, ontology, scaling conditions, and any specifically quantum derivation remain open. Failure of matched-observer prospective tests would weaken this physical layer and limit the law's generality.	Open mechanism / ontology

The table states the full RTM position without collapsing distinct evidential levels. Deterministic facts and declared comparison results are already testable objects. The repeated cross-temporal observer-linked organization is treated here as an operational phenomenological law within the tested domain. That law does not, by itself, identify consciousness as the causal variable, require literal visible rewriting of an earlier record, or determine a specifically quantum microscopic mechanism. Those are separate physical and ontological questions.

2 RTM as an architectural corpus

RTM is not a claim about isolated numerical coincidence; it is a claim about recurrent, overdetermined observer-linked architecture. The measured invariant combines frozen targets, exact strings, semantic roles, constrained transformations, dependency maps, chronology, record-state information, and explicit comparison objects. Across the corpus, documented records repeatedly resolve a fixed observer-linked identity registry while also reconstructing event fields and re-entering earlier nodes through declared arithmetic and linguistic transformations.

The empirical object is broader than repeated arrival at 612, 320, 292, or related anchors. Across the case corpus, the reported networks include:

- event data reconstructing other event data;

- one source branching toward several observer and family anchors;
- different paths converging on the same target or intermediate;
- derived values being re-encoded linguistically and used as later inputs;
- questions preserving semantic relations to their answers and documentary targets;
- the observer registry acting as a center, checksum, or role-specific solution;
- record transitions and timestamp order becoming part of the evidence object; and
- recurrence of the same registry as the source field contracts from large public archives to one object and then to live-time records.

This paper therefore places structural overdetermination before score count. Closure rows remain essential audit objects, but they are treated as edge-level measurements inside larger dependency-aware event–observer networks. The analysis separates deterministic correctness, specificity, architecture, model-conditioned selectivity, bounded phenomenological-law status, and physical interpretation rather than allowing one level to substitute for another.

At the inventory level, the five book-length cases contain

$$659 + 190 + 123 + 133 + 24 + 29 = 1{,}158$$

documented exact closure, chain, equation, or ledger rows. This number describes corpus breadth only. It is not a pooled test count, because many rows share sources, targets, intermediate nodes, or construction families; the paper therefore retains the case-specific dependency and score ontologies throughout.

3 The central empirical object

For a case c, let R_c be the documented record inventory, A the frozen observer-linked registry, E the declared encoding family, and G the permitted transformation grammar. A closure path can be written as

$$q : R_c \xrightarrow{E} V \xrightarrow{G} T,$$

where T is an eligible observer or documentary target.

A single exact path is not yet the full RTM object. The architectural object is a labeled dependency graph

$$\mathcal{N}_c = (S_c, D_c, T_c, \mathcal{E}_c),$$

whose vertices include sources S_c, deterministic derived nodes D_c, and targets T_c, and whose edges $\mathcal{E}_c$ preserve the declared operations and semantic roles.

The empirical object is not the numerical value of any isolated phrase. It is the higher-order architecture formed by multiple frozen records: repeated targets, short exact closures, cross-record loops, semantic-role preservation, external archival anchors, and recurrence around the measurement context.

What counts as a successful RTM unit

RTM does not score whether a source can reach any familiar or tagged number. A unit succeeds only when the declared source, permitted representation, semantic role, eligible target, chronological order, dependency structure, and architecture-level completion all satisfy the frozen case definition. A path that reaches the wrong target, assigns the right value to the wrong family role, violates source order, or omits the required loop, branch, or checksum does not receive full-unit credit.

The cross-case empirical claim is that materially heterogeneous $\mathcal{N}_c$ repeatedly contain the same frozen registry and recurring network motifs, while declared observer, record, role, and construction-freedom alternatives fail to reproduce their complete case-specific score objects.

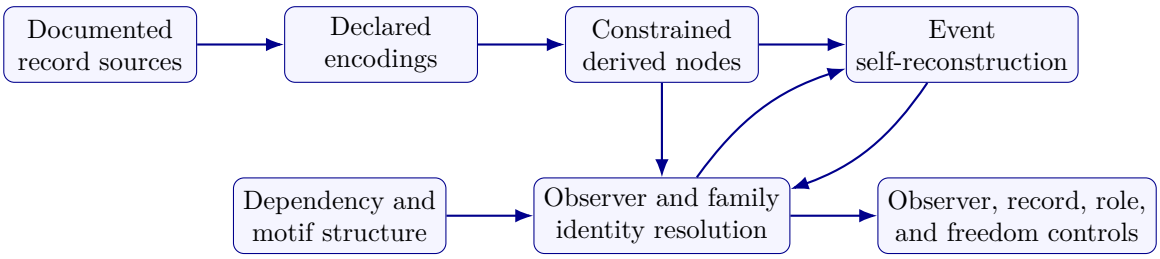


Figure 1: The RTM evidence architecture. Exact closure is one edge-level property inside a larger event-observer network.

3.1 Structural overdetermination

A case is structurally overdetermined when the same observer-linked variable or complete architecture is recovered through multiple non-identical structural paths rather than depending on one privileged equation. The relevant paths may arise from different relations, dependency blocks, source families, direct and indirect constraints, temporal layers, role assignments, or preserved physical record states. They may share nodes and are therefore *not* assumed to be statistically independent probability factors.

Structural overdetermination

The empirical force of RTM lies not in a single equality or tail probability, but in the overdetermination of the same observer-linked architecture through multiple structurally distinct paths. World Cup expresses this as global role-space resolution with whole-component residual selectivity; Dickinson expresses it as latent observer reconstruction that survives direct-target removal and source-block ablation. Titanic adds exact semantic-role specificity, while Subscriber shows that preserved record-state transition can itself enter the architecture.

The distinction matters for null design. A generator that can create individual equalities has not yet reproduced the RTM object. It must reproduce the architecture-level conjunction appropriate to the case: correct observer, correct roles, correct dependency relations, chronology, recursive or transition structure, knockout recovery where applicable, and complete global resolution where defined.

4 What RTM actually reports beyond exact closures

The central RTM observation is not the presence of many exact equalities. It is the repeated emergence of self-reconstructing, role-resolving, recursive, and chronologically constrained record architectures around the same frozen relational identity registry. Exact closure is the edge-level audit condition; the higher-level empirical object is the organized network produced by those edges.

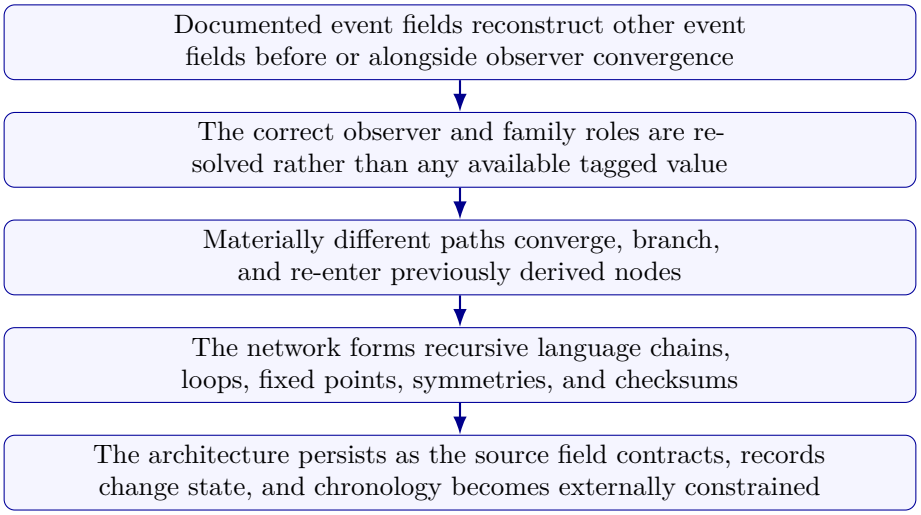


Figure 2: The RTM empirical hierarchy. Exact arithmetic is necessary at every edge, but the reported phenomenon is the complete role-preserving and dependency-aware architecture.

Architecture-level claim

The central RTM observation is not the presence of many exact equalities. It is the repeated emergence of self-reconstructing, role-resolving, recursive, and chronologically constrained record architectures around the same frozen relational identity registry.

This distinction is operational. Any-target reachability is not scored. The case objects require the right source to resolve the right event or identity field in the right semantic role, under the declared representation and chronology, and to complete the required unit, loop, state transition, or checksum. The five books therefore contribute different forms of pressure rather than five repetitions of the same coincidence claim. The Spain extension adds a finite public label set and later outcome role without changing the five-book count.

4.1 Core evidence at a glance

Case	Representative architecture beyond isolated closure	Principal control or separation object
9/11	Event self-reconstruction, exact multi-anchor identity resolution, recursive linguistic chains, loops, symmetries, cross-unit node re-entry, and the nested Flight 93 time network.	Separate 365/365 and 324/324 observer catalogues; reported random-observer maxima 59/365 and 174/324. A targeted genetic optimizer evaluated 17.58M candidates and found 320/324; this is a best-found adversarial comparator, not a proven global optimum.
Titanic	H1560 physical-artifact decomposition, bidirectional event reconstruction, vessel/person/time checksums, mirror and rescue loops, and correct semantic allocation of eleven identity roles.	The observed role assignment is the sole global maximum over all $11! = 39{,}916{,}800$ assignments; strict score 89/89 versus best wrong 82/89.
Ford Capri	The production total $1{,}886{,}647 \to 4343 \to 292/612$, ownership self-answer, plate recursion, family circuit, production fixed point, and end-of-production reconstruction from one bounded object.	Current 123/123 object, 100M principal-layer comparison, joint score-density gate, and an exact encoded-family solver with one full solution in the declared support.
Living Subscriber	Four preserved record states feed a common 2814 bridge and return to $584 = 292 + 292$; identifier-time loops, telephone-field structure, displaced-state return, and a macro-return to the opening node.	Separate 133/133 manifest and 31/31 dependency-block objects; reported maxima 14/133 and 4/31 under the stated generators.
Live-time	The 19:55 message-time field equals the later full score phrase, while the 21:39 message enters a later 22:07 image network and resolves event, sender, and observer-family fields under source order.	Two locked ledgers, F01 24/24 and F02 29/29, with primary-score and check-level null lines and no complete-score reproduction in the declared million-world models.
World Cup / Spain public event	A pre-existing title value 2134 meets the later champion label 344 through the 1182 checksum; together with F01 and F02, the frozen common object forms a three-component 61-constraint/13-block architecture.	Exact v5.0 enumeration: 2 of 34,951,113,757,163,520,000 legal numeric states, one detected structural class modulo the F02 symmetry; whole-component knockouts remain highly selective. The separate Unified-99 stress test gives 0/100M full reproductions and maximum 42/61.

Case	Representative architecture beyond isolated closure	Principal control or separation object
Emily Dickinson	A four-stage and late-extension network joins biographical records, Letters 166, 728, 167, and 297, two separately credited modern Hebrew translations, a frozen 718 phrase, an address branch, and the observer registry.	Primary 57/57, 15/15, 9/9 object is unique among 423,360 coherent profiles; 0/100M joint full reproductions under coherent context-fixed identity replacement, with maxima 46/57, 10/15, 4/9 and 95% upper $p < 2.996 \times 10^{-8}$ conditional on that null.
14–15 July bridge	The value 2378 was publicly archived on Day 1 and acquired new exact date and observer-encoding roles on Day 2; daily and cross-day networks close as one timestamped sequence.	Exhaustive scan of 73,414 dates and 73,413 adjacent pairs, exhaustive semantic assignment, authored-family ablation, and architecture-aware profile controls.

The table is a navigation map, not a replacement for the case chapters. It separates the representative architecture from the quantitative object used to test it and prevents score totals from being mistaken for the phenomenon itself.

5 Architecture taxonomy

Code	Motif	Operational meaning
M01	Exact identity convergence	A declared source path reaches an eligible frozen observer or family target exactly.
M02	Multi-anchor identity resolution	One bounded unit resolves two or more semantically distinct anchors, such as first name, surname, full name, family member, age, or residence.
M03	Event self-reconstruction	Event data reconstruct other documented event data before or alongside observer convergence.
M04	Cross-path convergence	Materially different source or operation paths reach the same target or intermediate.
M05	Recursive linguistic chain	A derived number is rendered under a declared Hebrew convention and becomes the input to a later exact step.
M06	Loop or fixed-point return	A path returns to its source, an earlier node, or an equivalent declared representation.
M07	Observer-centered symmetry	An observer anchor is the exact center, balance point, or doubled checksum of the structure.
M08	Semantic question-answer loop	The value of a question, the named answer, and the documentary target preserve their semantic roles through exact arithmetic.

Code	Motif	Operational meaning
M09	Role-specific family resolution	The inventory resolves the correct person and relationship slots rather than merely landing on any available anchor.
M10	Record-state transition	Two preserved states of one record and their exact changes form the evidential object.
M11	Timestamped carryover	A value archived earlier re-enters a later record with a new exact role.
M12	Live external-input closure	A message, image field, score, or other externally supplied live input participates under frozen chronology.
M13	Cross-unit node re-entry	A node derived in one unit recurs in a distinct unit or source domain.
M14	Observer-linked checksum architecture	Multiple subsystems cross-validate event, observer, family, and intermediate nodes as one coherent network.

6 Corpus progression as a pressure ladder

The corpus is organized as a pressure ladder: successive systems alter a condition under which a conventional explanation of the preceding system might remain viable, while testing whether the same observer-linked structural invariant persists. The sequence is not a multiplication of statistically independent case probabilities. It is an epistemic progression across changing source, role, state, chronology, finite-space, and reconstruction constraints:

1. large historical archive;
2. exhaustive semantic-role reassignment;
3. contracted source environment;
4. physical record-state transition;
5. live chronology under frozen earlier fields;
6. exact global finite role-space resolution; and
7. distributed latent observer reconstruction under knockouts and source ablations.

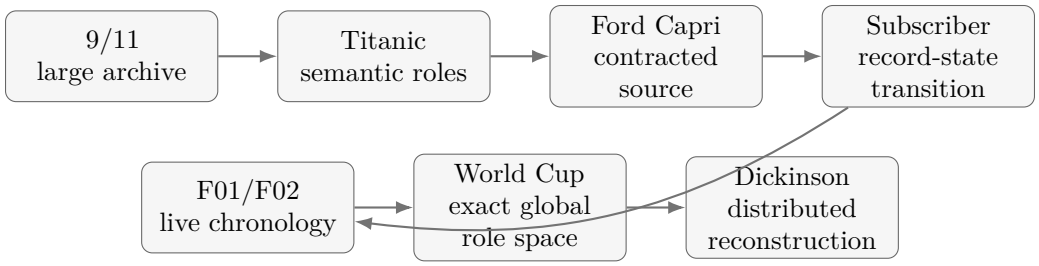


Figure 3: Pressure ladder: the same observer-linked structural invariant is tested as archive breadth, semantic-role freedom, source richness, record state, chronology, global finite role space, and reconstruction redundancy are successively altered.

Case	**Source environment**	**Principal architectural contribution**	**Primary pressure on conventional explanation**
The 9/11 Identity Matrix	Large historical archive	Broad event self-reconstruction, recursive chains, family-registry resolution, cross-unit recurrence	Can the phenomenon be dismissed as archive size and target availability alone?
The Titanic Identity Matrix	Second bounded historical event	Exact semantic-role resolution over all 11! assignments	Is the documented semantic assignment arbitrary once the numerical inventory is held fixed?

Case	Source environment	Principal architectural contribution	Primary pressure on conventional explanation
The Ford Capri Identity Matrix	One family vehicle and photograph	Source-contracted family architecture	Can source richness explain the earlier systems, or does the invariant survive when the searchable field contracts to one bounded object?
The Living Subscriber	One personal artifact in two preserved states	Physical record-state transition	Is the RTM signature restricted to static textual archives, or can the transition between preserved record states become part of the measured architecture?
The Result Was Already Encoded	External message, image, teams, and outcome	Chronology-constrained closure under frozen earlier records	Does temporal order become a structural variable when later fields were unavailable at the earlier timestamp?
World Cup synthesis	F01, F02, and Spain inside one frozen three-component role system	Exact global finite role-space resolution, symmetry accounting, and whole-component residual selectivity	Does the full frozen role architecture have a unique structural solution class, and does strong selectivity survive removal of an entire component?
Emily Dickinson	One newly selected historical subject distributed across heterogeneous historical source blocks and staged exposures	Distributed latent observer reconstruction with target removal and block ablation	Does the same observer identity remain recoverable as a structural variable after direct targets and major source subsets are removed?

6.1 Chronological locking gradient

The corpus is not uniformly retrospective. It progresses from historical records whose outcomes were long known, through bounded physical objects and preserved state transitions, to live inputs and a cross-day value whose earlier public deposit preceded its later documentary role. The table distinguishes source existence from source freeze and distinguishes both from discovery of the analytic path. It does not claim that every transformation was preregistered.

Case	Source existence	Documentary freeze available to audit	Outcome or later-state availability
9/11 and Titanic	Public historical facts and archival materials pre-existed RTM analysis.	Published records, archival images, event dates, and the observer registry can be sourced and frozen retrospectively.	Historical outcomes were already known when the analytic paths were discovered.
Ford Capri	The vehicle, plate, photograph, production facts, and family history pre-existed the analysis.	The bounded photograph and object, together with public production data, provide a stable source field.	There is no later competitive outcome; the principal pressure is severe source contraction.
Living Subscriber	The physical card and institutional values existed in preserved before-and-after states.	Images and transcriptions preserve the distinct states rather than replacing one with the other.	Both record states were available when the full transition architecture was analyzed.
Live-time F01/F02	Messages and timestamps were generated during the event; later scores and image fields became available afterward.	Raw message times and content, the later image time, and result fields are separately preserved.	The final score or later image was unavailable at the earlier message time.
Spain public event	The exact source phrase is reported as recorded on 23 June 2026.	The case package preserves the title value, date, and later outcome record; original source custody remains externally auditable.	The later champion outcome was recorded on 20 July 2026, before retrospective decoding of the full network.
Emily Dickinson	Biographical facts and nineteenth-century letters pre-existed the 2026 analysis.	The 25 July subject analysis preceded the 26 July archival layer; the Day-3 source page was published in 2022; the compact rule $29.7 \rightarrow 297$ selected Letter 297 before its contents were read; later 718 and address branches are separately labeled post-core.	Part A: 25 July; Part B: 26 July; Part C: 28 July; Part D: 29 July; 718 and later branches: 7–9 August 2026.
14–15 July	The Day-1 package and the value 2378 were publicly deposited on 14 July 2026.	Separate timestamped DOI and repository records preserve Day 1 and Day 2.	The Day-2 date record and its new roles became available on 15 July 2026.

Case	Analytic-path timing	What was locked before the later evidential stage
9/11 and Titanic	Paths were discovered retrospectively.	External event fields and identity facts were fixed; the later analytic mapping was not preregistered.
Ford Capri	Paths were discovered after the object and public data existed.	The physical plate, photograph, production total, years, and family registry were not alterable by the analysis.

Case	Analytic-path timing	What was locked before the later evidential stage
Living Subscriber	Transition paths were discovered retrospectively from the preserved states.	The four state values, exact edit kernel, and state order were fixed documentary inputs.
Live-time F01/F02	Some closures were identified after the later fields became available.	Earlier raw messages and timestamps, plus the order in which later external fields arrived, were chronologically locked.
Spain public event	The source value existed before the recorded outcome; the champion decoding and network assembly were retrospective.	The source phrase and its value were fixed before the later outcome, but no blinded pre-outcome prediction of Spain was deposited.
Emily Dickinson	The paths were discovered adaptively after their source fields existed. Part D locked the record-selection rule before reading, but its balancing equation was found after exposure; 718 and later semantic/address branches are explicitly post-core.	Subject identity, source records, observer registry, and chronological stage labels are frozen. The query order and some wording freezes remain author-reported, the analytic grammar remained adaptive, and exploratory layers are not promoted to confirmatory probability.
14–15 July	The cross-day bridge was evaluated after Day 2 existed.	The Day-1 value and package were publicly frozen before the Day-2 documentary role existed.

The gradient therefore tightens a different dimension at each stage: source breadth contracts, physical state is preserved rather than overwritten, external message order becomes observable, and finally an earlier public value is carried into a later record. The Spain extension adds a finite public-outcome label set, but prospective server-side freezing remains the strongest design for locking both raw input and analytic protocol before outcome revelation.

7 Locked score objects

Case	Current object	Real result	Comparison boundary
9/11	Book inventory; extended and conservative observer catalogues	659 closures; 365/365; 324/324	Random-observer maxima 59/365 across 10M and 174/324 across 20M; targeted GA best 320/324 in 17.58M evaluations; objects remain non-interchangeable and GA is not a global-optimum proof
Titanic	Full chains; closure-bearing units; strict-unique tests	190/190; 85/85; 89/89	20/89 broad random; 82/89 best alternative over all 11! assignments

Case	Current object	Real result	Comparison boundary
Ford Capri	Current 123-equation object and network density	123/123; 66.3%	Reported 100M score maximum 60; density maximum 67.5%; joint gate zero; historical 109 tests separate
Living Subscriber	Full manifest and dependency blocks	133/133; 31/31	Reported maxima 14/133 and 4/31 under their stated generators
Live-time	Two locked deterministic ledgers	24/24; 29/29	No complete-score reproduction in the stated million-trial model-score lines
World Cup / Spain public event	Seven-route strict object; ten-route public object; 22-closure comparison object; 46-closure Part-Two registry; unified two-volume role object	7/7; 10/10; 22/22; 46/46 arithmetic; 99/99 audit; 61/61 role-sensitive; 13/13 blocks	Primary exact result: 2 / $3.495111375716352 \times 10^{19}$ full numeric states, one structural class modulo the F02 swap; component knockouts remain selective. Secondary same-inventory 100M stress: 0 full at 61/61; maximum 42/61. Older V3/V4 remain narrower pre-43–46 audits.
Emily Dickinson	Preserved registry; unchanged primary coherent-profile object; dependence-compressed class and block objects; unified context-fixed identity-randomized stress; extended robustness object	233 entries; 57/57 relations; 15/15 classes; 9/9 blocks; exploratory 72/72, 16/16, 11/11	One full primary match among 423,360 profiles; new 100M coherent identity-replacement run has 0 joint full matches and maxima 46/57, 10/15, 4/9; 95% zero-hit upper 2.996×10^{-8} under that declared null.
14–15 July	Daily and sequential gates	35/35 core; 9/9, 9/9, 15/15	Unique dates/pair under released gates; one isolated Day-2 6/6 null profile did not satisfy the cross-day apartment condition

Source-reconciliation note. The full printed Titanic phrase supporting the 4594/4954 branch is valid. A prior check used a shortened phrase that was not the book wording; the present analysis therefore retains the current 190/190, 85/85, and 89/89 objects and does not quarantine that branch.

8 The 9/11 Identity Matrix: archive-scale architecture

What this case tests. Archive-scale structural depth: whether the RTM invariant appears as event self-reconstruction, recursive re-entry, and observer-role convergence in a large heterogeneous historical source environment.

8.1 Case scope: why the count of 659 is not the empirical object

The inventory counts, representative Evidence Units, and observer-substitution summaries are sourced to the current case file and public simulation suite [34, 40].

Coverage note. The architectures below are representative selections from the full 659-closure, 100-unit corpus, not a complete reproduction.

The current case-file edition contains 100 labeled Evidence Units and a book inventory of 659 documented closures. Those figures establish scale, but they do not by themselves describe the phenomenon. The more informative object is the architecture formed when public event records, declared Hebrew encodings, derived intermediate nodes, and a frozen observer-family registry are represented as one dependency graph.

The event-side inventory spans flights, aircraft models, departure and impact times, passenger and crew counts, hijacker rosters, buildings, floors, heights, locations, casualties, political actors, dates, and later memorial structures. The observer-side registry is relational rather than a flat target list:

$$320 + 292 = 612, \qquad 134 + 292 = 426, \qquad 58 + 58 = 116.$$

Thus, simultaneous recovery of 320, 292, 612, 134, and 426 is not equivalent to five unrelated numerical hits. It reconstructs first name, surname, full name, brother's first name, and brother's full name under a shared family grammar. The residence value 58 and the declared doubled value 116 add a separate spatial/system layer.

The chapter therefore distinguishes four evidential levels:

1. **edge correctness**: the displayed arithmetic or encoding is exact;
2. **unit architecture**: several edges form a branch, loop, symmetry, or self-reconstructing subsystem;
3. **case architecture**: motifs recur across different event domains and repeatedly resolve the same registry;
4. **comparative separation**: alternative observer registries fail to reproduce the declared score object under a specified generator.

No claim of statistical independence is assigned to the 659 rows. Repeated steps, shared sources, reused nodes, and linguistic bridges must remain visible. The point of the architectural analysis is precisely to show which relations are dependent, which are parallel constraints, and which originate in distinct source domains.

8.2 Source and construction classes

A rigorous reading of the case requires separating external records from analyst-mediated language. The representative structures below use the following classes:

Class	Object	Interpretive rule
E	External numerical record	Public event data such as 842, 1003, 2001, 76, 51, 53, 33, 106, 107, 9450, or 56. These values require source verification but no Hebrew wording choice.
L	Declared linguistic encoding	A Hebrew name, question, number word, or phonetic rendering. Arithmetic may be exact while the evidential weight remains conditional on wording and spelling rules.
B	Frozen biographical registry	Values such as 612, 320, 292, 426, 134, 58, 116, and relevant birth years or ages. Their evidential role depends on documented pre-existence and freeze history.
D	Deterministic derived node	A value generated by a displayed prior step. It is not a separate source and must carry its dependency forward.
M	Mixed architecture	A path that combines two or more of E, L, B, and D. Its strength is evaluated at the dependency-block level, not by counting each equation as a separate evidence item.

This separation matters because the strongest case-level claim is not that every row has the same provenance. It is that materially different classes repeatedly enter coherent structures that return to the same event and observer registries.

8.3 Event self-reconstruction before observer convergence

The first architectural layer is event-internal. A record can reconstruct another part of the same event before any personal target is introduced. A compact example is the passenger-manifest checksum:

$$76 + 51 + 53 + 33 = 213,$$

where the operands are the four passenger counts used in the case file. Separately,

$$106 + 107 = 213,$$

where 106 and 107 are the two Windows on the World floor numbers. The same node also appears as

$$832 - 619 = 213,$$

where 832 and 619 are the declared encodings for George Walker Bush and the Twin Towers disaster. The importance of 213 is therefore not a single equality. It is a cross-domain hub jointly supported by passenger data, building-floor data, and a linguistic difference.

The hub then enters the family registry:

$$\begin{aligned} 213 + 213 &= 426, \\ 213 + (11 + 77 + 175 + 93) &= 569, \\ 612 - 569 &= 43, \\ 2025 - 1982 &= 43, \\ 569 + 569 - 832 &= 306, \\ 306 + 306 &= 612. \end{aligned}$$

Architectural reading of T-18

The unit is stronger than the isolated statement $832 - 619 = 213$. Three source domains reproduce 213; the node branches to the brother's full identity (426), the observer's age (43), and the observer's full identity (612). The age is also recovered through a separate calendar calculation. This is a mixed event-building-language-biography checksum. It is *unusual* structurally, while any probability statement remains conditional on a model that includes phrase choice, target eligibility, and the use of doubling.

A second event-internal pattern appears in the condensed T-21 operational skeleton. The case file reports that flight names, aircraft models, flight numbers, impact chronology, victim totals, and the named perpetrator form a subsystem in which event values recover other event values before the terminal observer layer is considered. This distinction is essential: an event-internal reconstruction is not scored as though its target were selected from the personal anchor set.

8.4 Direct resolution, hub resolution, and zero-residue structure

The simplest case unit, T-01, is intentionally shallow: the standardized event title is reduced by the observer birth year and terminates on a declared identity anchor in one operation. Its evidential value is clarity, not depth. It demonstrates the basic edge type M01 with minimal chain freedom.

The more informative units introduce hub values. T-05 is organized around the Freedom Tower height and a derived hub of 944. That hub is reused across several event descriptors to resolve observer-linked targets. T-09 uses prior cascade residues, victim data, and identity anchors to converge through unrelated pathways on the residence value. These cases motivate an important distinction:

- a **direct closure** has one source path and one target;
- a **hub architecture** derives a node once and tests it against multiple separately named event components;
- a **zero-residue partition** shows that a source container is exhausted exactly by declared components, leaving no remainder.

A hub is not automatically a separate evidence item each time it is reused. Its significance lies in the number and provenance of constraints that meet at it, not in counting every outgoing edge as a new random trial.

8.5 T-38: an eleven-step recursive phonetic chain

T-38 is a compact example of a chain that alternates between event targets, observer targets, and derived intermediates. The current manifest contains all eleven printed rows and separately verifies their arithmetic layer:

Step	Exact relation	Terminal role
1	$1895 - 1437 = 458$; $612 - 458 = 154$	Manhattan
2	$2133 - 1895 - 119 = 119$	event-date mirror
3	$2133 - 1545 - (11 + 77 + 175 + 93) - 116 = 116$	system anchor
4	$1583 - 1545 = 38$; $154 - 38 = 116$	system anchor

Step	Exact relation	Terminal role
5	$1994 - 1583 - 213 = 198$	Pentagon
6	$2427 - 1994 - 198 - 116 = 119$	event-date mirror
7	$2427 - 1889 - 213 - 33 = 292$	surname
8	$2181 - 1889 = 292$	surname
9	$2181 - 1078 - 213 - (11 + 77 + 175 + 93) = 534$	Minoru Yamasaki
10	$1078 - 940 - 119 = 19$	hijacker count / observer event-era age
11	$1540 - 940 - 426 - 116 = 58$	residence

The architecture is not a set of eleven separate random draws. It is a declared dependency chain with repeated event nodes (119, 198, 154, 213), family nodes (292, 426, 58, 116), and an event-person target (534). Its evidential contribution is the alternation of target classes and repeated return to the observer registry without losing the event registry. It should be classified as a recursive mixed network, not as eleven separate closure trials.

8.6 T-48: semantic and bilingual event-name synthesis

T-48 provides a short circuit in which event names and targets preserve their semantic roles. Using the declared values for the Pentagon (198), "Nine Eleven" (213), the Twin Towers disaster (619), George Walker Bush (832), the event constant (911), and its mirror (119), the unit gives:

$$\begin{aligned} 198 + 213 &= 411, \\ 619 - 411 &= 208, \\ 911 - 208 - 411 &= 292, \\ 619 - 198 &= 421, \\ 832 - 421 - 119 &= 292, \\ 213 + 619 &= 832. \end{aligned}$$

Two paths reach the surname: one is centered on 911 and the 411/208 partition; the other uses 832, 421, and 119. The final equality joins the phonetic event name and Hebrew disaster title to the presidential name value. The scientific point is not that bilingual phrasing is free of construction choice; it is that semantic roles are retained across a closed six-step circuit. Accordingly, this unit is a strong semantic architecture but requires wording-aware controls before receiving a rarity interpretation.

8.7 T-66: the South Tower as a multi-resolution temporal subsystem

T-66 uses the South Tower's takeoff, impact, collapse, burn-duration, speed, altitude, and precise timestamp records. The book's twenty-five-step unit reports several distinct structural families:

- the three principal timestamps form an aggregate that, after removal of the event year and the 56-minute burn duration, resolves the Twin Towers disaster value 619;
- the same temporal aggregate, filtered through Flight 175, the lead hijacker, the secondary identity, and 116, resolves 612;
- a midpoint variance of 306 doubles to 612;

- separate routes recover 911 and 119 from the temporal node;
- the 9450-metre cruising altitude is reduced by two birth years, time anchors, and identity constants to 426;
- the altitude difference between Flights 175 and 11 combines with flight numbers and hijacker count to produce the spelled residence value 815;
- a node of 1955 derived from speed, impact time, and flight number resolves both 116 and Flight 11 under separate paths;
- the precisely rendered collapse time yields a junction value 67, which branches to 134 and Flight 11; and
- 1038 simultaneously represents $612 + 426$ and, after subtraction of the South Tower value 337, produces the World Trade Center value 701.

This unit is architecturally dense because it combines temporal self-reconstruction, engineering data, event naming, observer identity, brother identity, residence encoding, and branch reuse. Its rows are heavily dependent inside one bounded source block; the correct strength statement is therefore *unusual high-density architecture*, not twenty-five separate coincidence trials.

8.8 Flight 93 as a nested architecture

The strongest way to read the Flight 93 sequence is not unit by unit but as a nested subsystem. T-75, T-77, T-81, T-82, and T-85 use overlapping event records while testing different structural operations: roster cycling, repeated differentials, timestamp decryption, recursive number-word transformation, and identity emergence.

8.8.1 T-75: exhaustive roster cycles and a two-rendering collision

T-75 uses all four Flight 93 hijacker-name values (233, 224, 234, 234), the crash time 1003, flight number 93, event year 2001, and the two reported target buildings, Capitol 240 and Pentagon 198. Three parallel cycles are:

$$\begin{aligned}
&1003 + 234 + 93 = 1330, && 2001 - 1330 = 671, && 671 - 240 - 198 = 233,\\
&1003 + 233 + 93 = 1329, && 2001 - 1329 = 672, && 672 - 240 - 198 = 234,\\
&1003 + 224 + 93 = 1320, && 2001 - 1320 = 681, && 681 - 233 - 224 = 224.
\end{aligned}$$

The three derived values then satisfy

$$681 + 672 + 671 = 2024,$$

with

$$2024 - 1546 - 93 - 93 = 292.$$

The complete roster sum is

$$233 + 224 + 234 + 234 = 925.$$

Under the declared digit-by-digit Hebrew rendering, 925 encodes to 1878. Under the declared cardinal rendering, 1266 also encodes to 1878. The shared linguistic node closes by

$$\begin{aligned}
1878 - 1266 &= 612,\\
2024 - 1878 &= 146,\\
146 + 146 &= 292,\\
2024 - 1266 - 146 &= 612.
\end{aligned}$$

The arithmetic and the four Hebrew values used in this bridge have been separately rechecked in the current audit. T-75 is *unusual*: the full roster participates, three substitution cycles return roster members, and two number renderings collide at 1878 before branching to 612 and 292. The collision is not assigned a standalone probability without a model of eligible renderings.

8.8.2 T-77: repeated differentials and terminal fan-out

T-77 contains two repeated-node constructions. First,

$$\begin{aligned} 2207 - 1434 &= 773, \\ 773 + 773 &= 1546, \\ 842 - 773 &= 69, \\ 2006 - 1937 &= 69, \\ 842 + 69 &= 911. \end{aligned}$$

Second,

$$\begin{aligned} 1436 - 612 &= 824, \\ 2207 - 2001 &= 206, \\ 206 + 206 &= 412, \\ 1982 - 1570 &= 412, \\ 412 + 412 &= 824, \\ 842 - 824 &= 18. \end{aligned}$$

The declared Hebrew renderings of "eighteen" and "September 11" both equal 976. That node then fans out:

$$\begin{aligned} 2207 - 976 - 911 &= 320, \\ 2006 - 976 - 911 &= 119, \\ 2207 - 612 - 976 &= 619. \end{aligned}$$

The exact equality 976 has been separately recalculated. The unit's strength comes from the double reproduction of 69, the double reproduction of 824 through separate upstream forms, and the semantic 976 bridge that returns to first name, reversed event date, and disaster title. These paths share source material and must remain one dependency block.

8.8.3 T-81 and T-82: source decryption and recursive re-entry

T-81 begins from the declared source constant 5185 and reports:

$$\begin{aligned} 5185 - 1373 - 1769 &= 2043, \\ 5185 - 2043 - 2207 - 93 &= 842, \\ 2378 - 2043 &= 335, \\ 5185 - 2716 - 443 &= 2026, \\ 5185 - 2026 - 1620 - 443 - 93 &= 1003. \end{aligned}$$

The number 335 rendered digit by digit in Hebrew has value 1620. T-82 recursively develops this language layer:

$$\begin{aligned}
\text{spell}_{digits}(335) &= 1620,\\
\text{spell}_{digits}(1003) &= 1327,\\
\text{spell}_{cardinal}(1327) &= 2192,\\
1003 + 93 &= 1096,\\
1096 + 1096 &= 2192,\\
2716 - 1096 &= 1620,\\
5185 - 2192 - 1620 &= 1373,\\
5185 - 2716 - 1096 &= 1373,\\
5185 - 1769 - 2192 &= 1224,\\
612 + 612 &= 1224.
\end{aligned}$$

All three previously pending Hebrew transformations in this pair have now been recalculated letter by letter and pass: $335 \mapsto 1620$, $1003 \mapsto 1327$, and cardinal $1327 \mapsto 2192$. The architecture is notable because raw times, query encodings, digit renderings, cardinal renderings, and identity renderings repeatedly regenerate the same derived nodes.

8.8.4 T-85: self-reference extended to identity emergence

T-85 uses only the two Flight 93 timestamps and their two Hebrew questions:

$$\begin{aligned}
842 + 842 &= 1684,\\
1003 + 1003 &= 2006,\\
2006 + 1684 &= 3690,\\
3690 - 2207 &= 1483,\\
2716 - 1483 &= 1233,\\
1233 - 1003 &= 230,\\
842 - 230 &= 612.
\end{aligned}$$

The query values 2207 and 2716 and the language value 2006 have also been recalculated under standard Hebrew gematria. The sequence is linear: each intermediate feeds the next, and no number outside the two timestamps and their two questions is used before the terminal comparison with 612. This makes T-85 one of the cleanest observer-addressing structures in the case file. Its rarity still depends on the admissible query-language and operation protocol, but its internal architecture is strong and unusually compact.

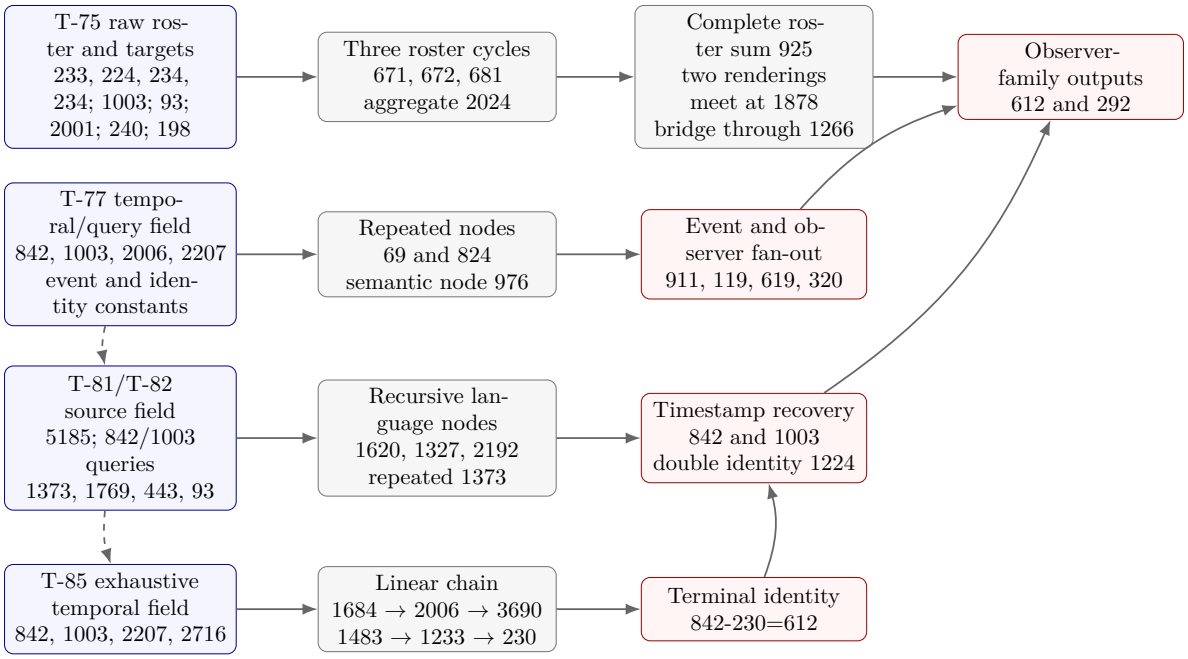


Figure 4: The Flight 93 subsystem. Solid arrows show the principal within-unit flows; dashed arrows indicate shared raw timestamp/query fields across units. The diagram is architectural, not a claim that the displayed branches are statistically independent.

8.9 T-95: cross-temporal symmetry through a shared key

T-95 uses a key of 66 obtained in three semantically different ways:

$$\begin{aligned} 1740 - 1674 &= 66, \\ 47 + 19 &= 66, \\ 43 + 23 &= 66. \end{aligned}$$

The first relation compares the declared phrase for Idan Harpaz at age 23 with the event phrase; the next two cross-pair the brothers' measurement-era and event-era ages. The node then enters a double linguistic recursion:

$$\begin{aligned} \mathrm{spell}(66) &= 1266, \\ 1266 - 66 &= 1200, \\ \mathrm{spell}(1200) &= 612, \\ \mathrm{spell}(1266) &= 1878, \\ 1878 - 1266 &= 612. \end{aligned}$$

A further branch gives $1200 - 66 = 1134$; the two observer-age phrase residuals sum to 1370, and

$$1982 - 1370 = 612.$$

The same structure also reports $875 - 43 = 832$, while the difference between the full-number and digit-by-digit renderings of 1370 is $1616 - 1558 = 58$.

T-95 is a strong cross-temporal symmetry because one shared key is reproduced by two age pairings, then returns three times to 612 and once to 58 while retaining distinct semantic roles. It is not free of linguistic construction. Its correct evidential statement is that a dense, internally coherent symmetry exists under the declared renderings and frozen age registry.

8.10 Dependency accounting: density is not independence

The architecture is powerful only when its dependencies are stated honestly. The following distinctions are retained in the dependency ledger:

Raw-source block One bounded set of external records, such as the four Flight 93 hijacker names or the South Tower timestamps.

Derived-node block
All downstream rows that depend on a shared intermediate, such as 213, 569, 306, 1878, 773, 824, or 2192.

Representation block
Multiple declared renderings of the same number. These can create a constrained collision but are not separate raw facts.

Semantic-role block
A question, named answer, and event target whose roles are fixed by meaning. Wording freedom must be modeled separately from arithmetic exactness.

Cross-domain constraint

A node reproduced through distinct record classes, such as 213 from passengers, floors, and a name difference. This is stronger than repeated algebra from one source but still requires a joint null model before probabilities are combined.

Under this accounting, T-75 is one roster dependency block with several internal constraints, not eighteen separate trials. T-77 is one temporal-query block with repeated-node tests. T-81/T-82 share a source constant and linguistic transformations. T-85 is a separate linear use of the same public times and their natural questions. The claim is that the *shape and recurrence* of these blocks are difficult to reproduce under the tested observer substitutions, not that every printed line carries an independent p-value.

8.11 Observer-substitution results and their exact scope

The case contains two principal observer-substitution objects that must remain separate:

$$365/365 \quad \text{versus a reported maximum of } 59/365 \text{ across } 10{,}000{,}000,$$

$$324/324 \quad \text{versus a reported maximum of } 174/324 \text{ across } 20{,}000{,}000.$$

Within those implementations, the observed registry is completely separated from the sampled alternatives. This is an *extreme comparative result under the declared score objects*: the real observer satisfies every catalogued test, while no sampled alternative approaches the full score.

A separate purpose-built genetic optimizer provides a deliberately closer adversarial comparator for the 324-equation object. With population 20,000, deterministic seed 42, and 17,580,000 evaluated candidates before stagnation stopping, the best evolved registry scored 320/324. Pairwise ± 5 perturbations reached at most 316/324, while the reported simulated-annealing search reached 171/324. The 320/324 result is important precisely because it is close: it shows that an optimizer can exploit redundancy and approach the fixed catalogue. The correct claim is therefore that this targeted search did not equal 324/324 in its implemented workload, not that 320/324 is a mathematically proven global alternative maximum. Reporting this comparator beside the random-observer maxima prevents the much lower random maxima from being mistaken for the strongest adversarial search result.

The simulation program does not seek a universal omnibus probability for a hypothetical total discovery process. Such a quantity would depend on additional assumptions about unlogged human choices and is not the inferential object of this paper. Instead, the program attacks construction freedom through multiple targeted adversarial objects: observer and event substitution, phrase variants, exact semantic-role assignment, role permutation, local perturbation, optimization, chain-length controls, source ablation, representation-choice controls, and max-over-choice search. These tests do not make every historical decision observable, but an unlogged decision is not itself a demonstrated generative explanation of the observed architecture. A chance-plus-selection account must be implemented at comparable freedom and shown to reproduce complete role-preserving architectures with comparable recurrence across archive-scale, source-contracted, record-state, live-time, and finite-outcome cases.

This paper therefore makes two claims simultaneously:

1. arbitrary observer replacement is decisively rejected for the two implemented 9/11 catalogues, and several additional adversarial searches fail to reproduce the complete fixed objects under their stated workloads;

2. no universal omnibus historical-discovery p-value is claimed or required for the case-specific separation results or for reporting the recurrent phenomenological relation within the tested operational domain.

The incomplete historical search log is therefore a scope condition on any universal discovery-process probability, not a result that nullifies the deterministic architectures or the comparative separations already observed.

What this case establishes

Within the declared 9/11 score objects, the archive-scale system exhibits event self-reconstruction, recursive re-entry, multi-anchor observer resolution, and strong separation from implemented observer and optimization alternatives. It establishes architectural breadth in a rich source environment; it does not assign a universal omnibus probability to the historical discovery process.

9 The Titanic Identity Matrix: cross-archive replication and role resolution

What this case tests. Semantic-role arbitrariness. Holding the same eleven numeric values fixed, does exhaustive reassignment of all 11! semantic roles reproduce the documented architecture?

9.1 Why Titanic is a necessary second historical case

The quantitative objects and architecture labels in this chapter are sourced to the current book edition and its public validation repository [35, 41].

Coverage note. The full Titanic case contains 190 exact closure chains across 85 closure-bearing Evidence Units. The examples below sample its principal structural families rather than reproduce the complete inventory.

The Titanic case is not valuable merely because it adds another large closure count. It tests whether the same observer-linked architecture reappears in a different century, a different technical domain, and a different public record universe. The source field shifts from aviation, buildings, military records, and modern timestamps to maritime registration, vessel dimensions, passenger and crew accounting, navigation, construction chronology, rescue history, archival photography, and Hebrew renderings of historically fixed names and questions.

The current book reports 190 closure chains mapped to 85 closure-bearing Evidence Units and a conservative set of 89 strict-unique observer-sensitive tests. Those are three different objects. The book also retains an older equation-level representation of 199 equations across 76 core units and a strict direct subset of 87 equations. Accordingly, the legacy 87-equation hyper-adversarial script belongs to that older strict-direct score object and should not be confused with the current 89-item strict-unique score. This paper does not substitute one denominator for another. Each layer answers a different question:

Representation	Size	Unit scored	Primary question
Equation-level model	199	Printed equation representation	Can optimizers, nearby vectors, random observers, or randomized event universes reproduce the equation system?
Strict direct subset	87	Conservative direct-arithmetic rows	Does the result survive removal of more flexible or indirect constructions?
Full closure-chain model	190	Current target-aware chains	Does every current-book closure reproduce under the stored observer and event values?
Evidence-Unit model	85	All chains in one unit must pass	Does the architecture survive cluster-level rather than row-level scoring?
Strict-unique model	89	Deduplicated observer-sensitive tests	Does the correct value occupy the correct semantic identity slot?

This ontology matters. A chain count measures deterministic closure inventory; an Evidence-Unit score penalizes failure anywhere inside a cluster; a strict-unique score removes repeated target-aware uses; and the 199-equation model supports optimization diagnostics. The case is strongest when these layers agree without being falsely pooled.

9.2 Source universe and relational target registry

The observer vector contains eleven semantically labeled values: full name, surname, brother's full name, brother's first name, first name, the core anchor 116, residence marker 58, age in 2025, birth year 1982, measurement year 2025, and second-sampling year 2026. Event targets include the Titanic identity 188, sinking year 1912, crew 874, survivors 712, Captain Edward Smith 726, the captain's fuller title 785, White Star Line 405, Carpathia 404, Millvina Dean 221, boiler count 29, and many other documented specifications.

The key structural constraint is semantic. A closure aimed at the surname does not receive credit for landing on the first name; a closure aimed at the brother does not receive credit for landing on the observer; and a fixed event target must equal that event target. This converts the case from a generic "hit any familiar number" exercise into a role-labeled assignment problem.

9.3 Event self-reconstruction before observer convergence

A central feature of the case is that Titanic records do not only terminate on biographical anchors. They reconstruct the event's own human and technical record.

The casualty ledger is closed before any RTM operation is applied:

$$712 + 1496 = 2208.$$

The three exhaustive figures are then aggregated:

$$2208 + 1496 + 712 = 4416,$$

and the event total, after removal of the measurement year, observer birth year, and vessel identity, yields

$$4416 - 2025 - 1982 - 188 = 221,$$

the declared value for Millvina Dean, the last surviving passenger. The structural point is not simply that 221 appears. The complete human census of the event resolves the person who historically closed the survivor record.

Other units reconstruct event components directly. For example,

$$3327 - 2615 = 712$$

returns the survivor count, while

$$4416 - 3327 - 188 - 116 = 785$$

returns the fuller captain-title target. A further recurring node, 1352, decomposes into the captain, White Star Line, and Millvina Dean and is then reconstructed from those components. These paths establish an event-internal layer that cannot be reduced to repeated targeting of the observer alone.

9.4 The triple-path velocity loop

Evidence Unit #06 combines navigational speed, registry-derived strings, and a declared Hebrew rendering. One branch begins with

$$1854 - 42.6 = 1811.4,$$

then encodes the resulting decimal string under the book's declared Hebrew convention as 2066. This yields

$$2888 - 2066 = 822, \qquad 2066 - 1034 = 1032.$$

The unit records a second internal path reaching the same node 1032. From that shared node,

$$1032 - 188 = 844,$$

$$1032 - 188 - 612 - 116 = 116,$$

and the two derived residues participate in

$$2888 - 822 - 844 - 188 = 1034.$$

This is stronger than an isolated closure because the same bounded unit performs four functions: two paths converge on an intermediate, the intermediate returns to the core anchor, the residues reconstruct the location-string target 1034, and the linguistic representation is not the terminal claim but an internal bridge. The paths are not all independent trials; they are one constrained dependency block with several exact internal tests.

9.5 From numeric residue to residence and family identity

Evidence Unit #17 illustrates a representation collision with semantic return:

$$4416 - 3175 - 426 = 815.$$

The book's fixed Hebrew phrase for "fifty and eight" has value 815, and the phrase itself denotes 58, the residence marker. The evidential content is therefore a two-level mapping:

$$\text{event aggregate} \longrightarrow 815 \longrightarrow \text{spelled number} \longrightarrow 58.$$

This is not independent of the declared language convention, so construction freedom belongs in the null. Within the frozen convention, however, it is a strong semantic bridge rather than a mere numeric equality.

Evidence Unit #18 uses a different record block:

$$4416 - 2615 = 1801,$$

$$1982 - 1801 = 181, \qquad 1912 - 1801 = 111,$$

$$181 + 111 = 292.$$

The same intermediate lies between the observer birth year and the event year, and the two resulting distances add to the surname. The architecture is unusual because the surname is produced as the exact sum of two temporally opposed residuals around one event-derived node.

Evidence Unit #38 branches one source value toward two distinct observer roles:

$$2156 - 1982 = 174, \qquad 174 - 116 = 58,$$

while a separate reduction gives

$$174 - 29 = 145, \qquad 188 - 145 = 43.$$

The same constrained intermediate therefore resolves residence and age through different event constants. This is multi-anchor identity resolution, not repeated use of one terminal target.

9.6 A compact collision-discovery aggregate

One unit combines four heterogeneous Titanic facts: collision time 23:40 represented as 2340, the year 2005 associated with later hull research, a 60-metre damage length, and a 29-metre lookout height:

$$2340 + 2005 + 60 + 29 = 4434.$$

That single event aggregate branches in two directions:

$$4434 - 1982 - 2026 = 426,$$

$$4434 - 2026 - 1912 = 496, \qquad 612 - 496 = 116.$$

The first path resolves the brother's full-name role; the second combines event chronology and observer identity to resolve the core anchor. The block is strong because its source classes differ materially and its two endpoints occupy different semantic roles.

Temporal recalibration. Titanic was first analyzed under the 2025 measurement frame and revisited after the active year anchor advanced to 2026. The shift is treated as a temporal-stability pressure test: the 2026 layer preserves and extends exact architecture, including $726 - 612 = 114 = 2026 - 1912$, specific to the shifted coordinate.

9.7 The central identity-time checksum block

Evidence Units #59–#62 form one of the clearest bidirectional architectures in the book. The sequence begins from the complete onboard count and two timeline years:

$$2208 - 1912 = 296, \qquad 2208 - 2026 = 182,$$

$$296 + 182 = 478, \qquad \text{reverse}(478) = 874.$$

The recovered crew count joins its reversal:

$$478 + 874 = 1352,$$

then the same node reconstructs the captain through a declared linguistic intermediate:

$$1978 - 1352 = 626, \qquad 1352 - 626 = 726.$$

The surrounding units lock the event and observer system together:

$$726 - 612 = 114, \qquad 2026 - 1912 = 114,$$

$$2026 - 874 - 426 - 612 = 114,$$

$$874 + 612 + 426 = 1912,$$

$$2026 - 726 - 874 = 426.$$

The two equations in Evidence Unit #61 are algebraically linked: once $874 + 612 + 426 = 1912$, the corresponding subtraction from 2026 necessarily gives 114. They are therefore counted as one dependency block, not two independent probabilities. The architectural fact that remains is substantial: the documented crew count plus two frozen family identities reconstruct the sinking year, while the current year minus the captain and crew reconstructs the brother's role.

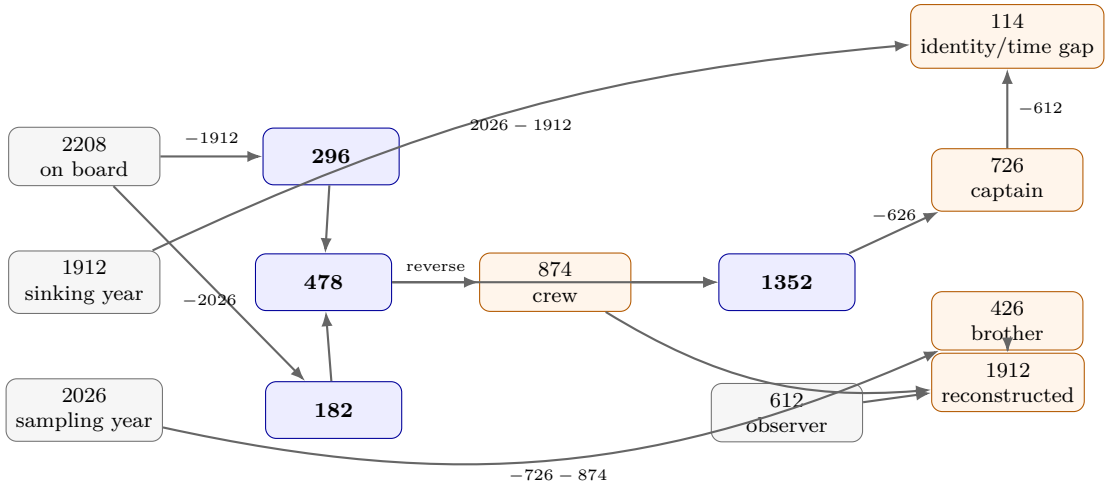


Figure 5: Titanic identity-time checksum block. Event counts reconstruct crew and captain; crew plus observer-family roles reconstruct 1912; chronological subtraction returns 114 and the brother's semantic slot. Arrows show dependency, not independent trials.

9.8 Recursive rescue-time and mirror architecture

Evidence Unit #76 begins with a fixed rescue-duration phrase encoded as 1896. It then uses three timeline comparisons:

$$2026 - 1896 = 130, \qquad 1912 - 1896 = 16,$$

$$130 + 16 = 146, \qquad 146 + 146 = 292.$$

A second branch uses the observer birth year:

$$1982 - 1896 = 86, \qquad 130 + 86 = 216,$$

$$216 + 188 = 404.$$

Thus one linguistic time node returns the surname through a doubled half-value, produces the digit mirror of 612, and then combines with the Titanic identity to reconstruct Carpathia. This is a compact recursive time-language-event network. It is unusual not because any one subtraction is difficult, but because the branches return three semantically distinct registered nodes.

9.9 External persons and dual vessel specifications

Appendix Unit A-1 uses the Hebrew source names of John Jacob Astor IV and Madeleine Talmage Force Astor:

$$763 + 1219 = 1982.$$

The sum equals the observer birth year. The digits of the two source values then give

$$1 + 2 + 1 + 9 + 7 + 6 + 3 = 29,$$

a documented Titanic specification that is shared by the boiler count and lookout-tower height, and

$$29 + 29 = 58.$$

The architecture therefore moves from two externally fixed passenger names to the observer birth year, from their digits to two distinct vessel facts, and from the repeated vessel constant to the residence marker. This three-layer cascade is *unusual*; its statistical weight still depends on a null that includes name transcription and digit-summation availability.

9.10 Semantic questions and the preserved 4594/4954 branch

Appendix Unit A-8 tests natural historical questions rather than only raw specifications. For the question "In what year was the Titanic launched?" with declared value 989,

$$989 + 612 + 426 = 2027, \qquad 2027 - 116 = 1911,$$

$$1978 - 1911 = 67, \qquad 67 + 67 = 134.$$

The path reconstructs the launch year and then the brother's first-name role. A second question, "When was the Titanic ordered?" with value 756, gives

$$1908 - 756 - 612 - 426 = 114.$$

The semantic relation is preserved: question values participate in paths terminating on the event years they ask about or on linked observer roles.

The same appendix contains the full source phrase whose book value is 4594. The valid branch is:

$$4594 - 2026 - 44 - 612 = 1912,$$

$$\text{reverse}(4594) = 4954,$$

$$4954 - 2026 - 1982 - 612 - 188 = 146, \qquad 146 + 146 = 292.$$

The earlier project audit that obtained a different value had evaluated a shortened phrase rather than the full book wording. That audit is rejected. The branch remains inside the 190-chain and 89-test baselines.

9.11 The H1560 physical-artifact self-reference

Appendix Unit A-9 uses an archival plate number written on a Harland & Wolff glass negative. Unlike a flexible database query, H1560 is a singular physical artifact associated with Titanic construction photography. The temporal offsets are

$$2026 - 1560 = 466, \qquad 1982 - 1560 = 422, \qquad 1912 - 1560 = 352.$$

The first offset returns the surname through

$$612 - 466 = 146, \qquad 146 + 146 = 292.$$

The three offsets sum to

$$466 + 422 + 352 = 1240,$$

and

$$1240 - 612 = 628,$$

the declared value of the method name "The Reflective Time Model." The zero-remainder verification is

$$1560 = 612 + 320 + 628.$$

Within the book's frozen encodings, this is one of the most *unusual* individual architectures in the corpus: a century-old physical identifier decomposes exactly into the observer's full name, first name, and the later method name. It should not be promoted to a universal probability without modeling the freedom to select archival artifacts and method wording. It should also not be minimized as an ordinary one-line match; the zero-residual decomposition and temporal-offset structure are materially stronger than a single target hit.

9.12 Dependency accounting for the Titanic chapter

The representative paths above are not treated as independent Bernoulli trials. They form a smaller number of source and derived-node blocks:

Casualty-ledger block 2208, 1496, 712, and the aggregate 4416 support several event-person and observer returns.

Velocity-registry block 2888, 1854, 42.6, 2066, 1032, 822, and 844 form one cross-path loop.

Identity-time block 2208, 1912, 2026, 478/874, 1352, 726, 612, and 426 form one coupled checksum network.

Question-language block
: Each frozen question wording and its downstream event/identity paths form one authored-language dependency block.

Physical-artifact block
: H1560 and its three temporal offsets form one artifact-centered block with multiple internal constraints.

The case-level claim is therefore not "190 separate miracles." It is that 85 closure-bearing units, reduced further to 89 deduplicated observer-sensitive tests, form a dense role-labeled architecture whose correct semantic assignment is globally unique in the exhaustive finite search.

9.13 Deterministic integrity and target-aware validation

The current source reconciliation reports:

- 190/190 closure chains correct;
- 85/85 closure-bearing Evidence Units pass;
- 89 strict-unique observer-sensitive tests pass;
- zero computational failures;
- zero Evidence-Unit failures;
- zero source/master metadata mismatches; and
- 190/190 reconciliation to the book, with 184 automatic text matches and six image, layout, or cross-page cases resolved by visual review.

The most informative target-aware comparisons are shown below.

Scoring layer	**Real**	2^{11} **simultaneous** ± 1 **max**	**Best alternative across all** 11! **assignments**	**20M broad-random max**
All closure chains	190/190	75/190	183/190	68/190
Strict-unique tests	89/89	25/89	82/89	20/89
Evidence Units	85/85	14/85	78/85	18/85

Every one of the 39,916,800 permutations of the same eleven values across the eleven semantic slots was evaluated. The real assignment is the only assignment reaching 190/190, 89/89, and 85/85. This result is **extreme within the exact finite role-assignment space**: there is no sampling uncertainty and no second maximum at the real score. It does not by itself quantify the probability of inventing the entire book after unrestricted exploration; it directly establishes that the architecture selects the correct semantic mapping of the fixed value inventory.

The twenty-million broad random-observer test is also sharply separated. Its maxima are 68/190, 20/89, and 18/85, with zero complete-score matches. Because values were sampled independently from 1 to 3000, the test is a broad numerical null rather than a demographic model. Its correct interpretation is finite no-exceedance under that generator.

9.14 Equation-level optimization diagnostics

The older 199-equation model provides a different stress test and must remain separate from the current 190/85/89 target-aware objects. Its reported diagnostics include:

- a genetic optimizer evaluating 13,480,000 candidates and reaching 195/199 versus the real 199/199;
- an average loss of 20.6 equations after a one-unit perturbation to one anchor;
- a simulated-annealing maximum of 97/199;
- 50,000 randomized event universes with maxima of 3 for the real biography against random events and 4 for random biography against random events; and
- a twenty-million random-observer maximum of 96/199 versus the real 199/199.

The 195/199 genetic result is important precisely because it is close: a flexible optimizer can exploit redundancies in the equation representation. The four-equation gap is evidence of separation under the implemented search, not proof of a global optimum. The exhaustive semantic assignment result is more decisive for identity-role uniqueness because it covers its full finite space.

What this case establishes

The Titanic result directly tests whether the documented semantic assignment is arbitrary. Exhaustive permutation of all 11! role assignments shows that the documented assignment is the unique global maximum in the current target-aware score layers. The structural result is semantic-role specificity, not merely another collection of exact equalities.

10 The Ford Capri Identity Matrix: source-contracted family architecture

What this case tests. Source richness. The searchable environment is contracted from a large historical archive to one bounded vehicle, photograph, and production record while the same observer-linked structural criteria are retained.

10.1 Why source contraction is the decisive contribution

The printed 123-equation inventory, verifier, Monte Carlo code, and analytical solver are documented in the current case file and public repository [36, 42].

Coverage note. The full Ford Capri case spans 21 findings; the current coded inventory contains 123 closures. The examples below sample plate recursion, production-history convergence, family-role resolution, linguistic fixed points, and physical-record self-reference.

The Ford Capri case is not merely a third collection of exact closures. Its scientific role is to contract the source field from large historical archives to one family vehicle documented in one old photograph. The empirical core is unusually small: the model name, two license-plate segments, two published production counts, the production years, the final production date, and the designer identity. The observer and family registry was already established in the earlier case files. The question is therefore sharper than in the historical cases:

> Can a compact, personally relevant object that predates the observer produce the same kinds of event-object reconstruction, family-role resolution, recursive return, and exact comparator separation found in the large archives?

The current edition contains a zero-indexed prologue, Finding #00, followed by twenty vehicle findings. Findings #01–#20 contain 123 labelled equations. The prologue is analyzed separately and is not counted inside the 123-equation inventory. The primary source field is

$$680, \quad 637, \quad 177, \quad 1{,}900{,}000, \quad 1{,}886{,}647,$$

where 680 is the declared Hebrew value of "Ford Capri," 637 and 177 are the two plate segments, and the last two values are the rounded and precise worldwide production records. Supporting facts include 1968 and 1986, 19 December 1986, the corresponding Hebrew-calendar record, Philip T. Clark, 1949, 1982, and 2026.

This contraction does not remove every retrospective degree of freedom. Number-word conventions, question formulation, selection of a path for presentation, and the discovery history remain important. What it does remove is the claim that the architecture necessarily depends on searching an enormous historical archive. A single object supplies a bounded source universe from which the full family registry, vehicle identity, production chronology, and several self-referential loops are reconstructed.

10.2 Frozen relational registry and the 123-equation inventory

The relevant registry is relational rather than a flat bag of targets:

$$320 + 292 = 612, \qquad 134 + 292 = 426,$$

with additional family and household roles

$$543,\ 251,\ 738,\ 56,\ 348,\ 58,\ 116,$$

representing the father, father first name, brother, spouse, spouse full married name, residence, and doubled residence constant. The vehicle itself has the declared decomposition

$$290 + 390 = 680.$$

The 123 equations are distributed across the twenty findings as follows.

Finding	Registered architecture label	Count
01	Registry Encoding Reduction	1
02	Chrono-Linguistic Convergence	3
03	Grammatical Gap Matrix	11
04	Temporal Synthesis	4
05	Sibling Identity Extraction	2
06	Production Source Matrix	7
07	Triple Generation Sync	3
08	Production Timeline Convergence	4
09	Symmetry Loop Convergence	4
10	Self-Answering Question	4
11	Precise Production Convergence	4

Finding	Registered architecture label	Count
12	Designer Identity Resolution	12
13	Designer Full-Name Resolution	9
14	Eleven Cascade	14
15	Bridge 2000	15
16	Self-Referential Plate Matrix	7
17	Production Delta Resolution	9
18	Last Car Off Line	5
19	Date Digit-Spelling Resolution	2
20	Calendrical Thirty-One Resolution	3
	Total	**123**

The inventory resolves surname, father, observer, brothers, spouse, residence, age, birth year, manufacturer, model, full vehicle name, production years, and several registered linguistic representations. Repeated recovery of 612 or 292 is not counted as repeated separate experiments. The architecture must be read as dependency blocks in which shared sources and derived nodes remain visible.

10.3 Finding #00: the question contains the plate target and two-generation registry

The prologue treats the natural plate question as a record object. Its locked value is 2844, while the documentary target is the deterministic digit sum of the photographed plate:

$$6 + 3 + 7 + 1 + 7 + 7 = 31.$$

The source explicitly declares 31 as a documentary descriptor, not as a generally available digit-sum operation for arbitrary chains.

The first layer connects the question to the father and vehicle:

$$2844 - 1949 - 543 - 290 = 62,$$

while the plate separately doubles its own target:

$$31 + 31 = 62.$$

The temporal layer returns to 31:

$$2844 - 637 - 177 = 2030,$$

$$2030 - 1949 = 81, \qquad 2030 - 2026 = 4,$$

$$81 + 4 = 85, \qquad 116 - 85 = 31.$$

A lexical rendering of 62 supplies a separate loop:

$$1426 - 62 - 637 - 177 = 550,$$

$$612 - 550 = 62.$$

The digit rendering of 62 then returns both the plate target and the observer's current age:

$$1360 - 6 - 2 - 680 - 390 - 251 = 31,$$

$$1360 - 62 - 680 - 6 - 3 - 7 - 1 - 7 - 7 - 543 = 44.$$

The two registered renderings of 62 differ by

$$1426 - 1360 = 66.$$

In the source encoding, the Hebrew phrase for sixty-six and the complete phrase "Eran Harpaz aged forty-four" both equal 1266. The final intergenerational reconciliation is

$$2844 - 1623 = 1221,$$

$$1266 - 1221 = 45,$$

$$76 - 45 = 31.$$

Architectural role

The question does not merely reach one answer. It links the photographed plate, father name and birth year, vehicle manufacturer and model, observer full name and age, residence constant, and father age through three returns to 31, two returns to 62, and a lexical identity at 1266. The paths share the question and declared registry, so they are not independent trials; their force is the coherent two-generation organization inside one semantic query.

10.4 Rounded production record: industrial history becomes a family circuit

The rounded production fact is rendered in the source as

$$1{,}900{,}000 \xrightarrow{\text{Hebrew number phrase}} 1912.$$

This node is already cross-domain: 1912 is simultaneously the registered production-phrase value and the Titanic sinking year from the prior case. Within the Ford case, the same value participates in a family and vehicle network.

A registered spelling collision gives

$$738 \xrightarrow{\text{number phrase}} 1912,$$

where 738 is Tom Harpaz. From the shared 1912 node,

$$1912 + 738 = 2650,$$

and the registered full-number rendering of 2329 also equals 2650. Removing 2329 and all six plate digits gives

$$2650 - 2329 - 6 - 3 - 7 - 1 - 7 - 7 = 290,$$

which resolves Ford. A second branch begins with

$$2329 - 6 - 1 - 2 = 2320,$$

where 2320 is the registered question value "Who is 1373?" and 1373 is the digit rendering of 612.

A compact closed family circuit uses the same production and plate field:

$$738 - 680 = 58,$$

$$1912 - 637 - 177 - 680 = 418,$$

$$738 - 418 = 320.$$

The sibling differential is

$$612 - 426 = 186.$$

Its registered number phrase has value 1098, which also appears as an eleven-minute phrase elsewhere in the book. The circuit returns to Tom through the father:

$$1098 - 186 - 543 = 369,$$

$$369 + 369 = 738.$$

Architectural role

The block begins with a production statistic and one brother, passes through the vehicle, residence, observer first name, sibling difference, and father, and reconstructs the starting brother. This is a loop over family roles rather than a collection of unrelated terminal hits.

10.5 Finding #10: a self-answering ownership question

The source question "Who had a Ford Capri in the family?" has registered value 1215. Reversing the two plate segments gives

$$177 \to 771, \qquad 637 \to 736.$$

Their sum minus the question returns the family name:

$$771 + 736 = 1507,$$

$$1507 - 1215 = 292.$$

The digit spelling of 1215 has value 1926. It reconstructs the vehicle:

$$1926 - 1215 - 6 - 3 - 7 - 1 - 7 - 7 = 680.$$

The standard number spelling has value 1541 and separately returns the surname through the owner's birth year and the fixed system constant:

$$1949 - 1541 - 116 = 292.$$

Finally, the vehicle sum is

$$637 + 177 + 680 = 1494,$$

and

$$1494 + 1494 = 2988,$$

$$2988 - 2026 - 680 - 6 - 3 - 7 - 1 - 7 - 7 = 251,$$

which resolves Amir, the first name of the actual owner.

Architectural role

The question answers at three levels: the family surname, the vehicle itself, and the owner's first name. Two linguistic renderings of the same question value and the mirrored physical plate contribute different constraints.

10.6 Finding #11: the precise production count as palindrome, age field, and identity resolver

The exact published production count is rendered as

$$1{,}886{,}647 \xrightarrow{\text{Hebrew number phrase}} 4343.$$

This node has a compact mirrored structure. Doubling it and removing the production years, vehicle, measurement year, and observer birth year gives the observer's age:

$$4343 + 4343 = 8686,$$

$$8686 - 2026 - 1982 - 1968 - 1986 - 680 = 44.$$

The declared digit reversal gives

$$4343 \to 3434,$$

$$4343 - 3434 = 909,$$

where 909 is the registered Hebrew digit phrase for 43. The same source returns the surname directly:

$$4343 - 43 - 2026 - 1982 = 292.$$

A fourth route produces the full observer identity through dual temporal offsets:

$$4343 - 4 - 3 - 2026 = 2310,$$

$$2310 - 2026 = 284,$$

$$2310 - 1982 = 328,$$

$$284 + 328 = 612.$$

Architectural role

One externally published industrial count yields age, a mirrored age phrase, surname, and full name through different structures. The routes share 4343 and temporal anchors and are therefore not separate evidence factors. Their evidential object is the multi-resolution fan-out from one immutable production fact.

10.7 Finding #12: designer triple identity and role fan-out

The designer block begins with a verified three-way linguistic identity:

$$\text{Philip T. Clark} = 660,$$

$$\text{“How old is Amir Harpaz?”} = 660,$$

$$\text{“sixty”} = 660.$$

The full designer name, Philip Thomas Clark, has registered value 1148. Across twelve counted paths, the designer subsystem resolves the family surname, the father's age, the observer's full name, the observer's complete age phrase, Ford Capri, Idan, and the apartment value.

The chapter does not reproduce all twenty-four printed steps because several paths reuse earlier grammatical and number-word nodes. The important architecture is the role fan-out: an external designer identity, a semantically matched question about the owner, and a number word share one exact encoded node, which then branches into father, son, brother, residence, and vehicle roles.

Audit boundary

The three 660 phrase values and the full-name value 1148 were separately recalculated for this revision. The twelve downstream score equations remain covered by the existing 123-row deterministic manifest; this chapter does not relabel them as twelve separate source observations.

10.8 Finding #16: the plate becomes a self-referential linguistic matrix

The full photographed plate, read digit by digit, has registered value 2761:

$$637177 \xrightarrow{\text{digit spelling}} 2761.$$

The same value is the registered full-number spelling of 4262. The latter decomposes into two complete age-identity phrases:

$$4262 - 1623 - 1266 = 1373,$$

where 1623 is "Amir Harpaz aged seventy-six," 1266 is "Eran Harpaz aged forty-four," and 1373 is the registered digit spelling of 612.

The resulting chain is therefore

$$637177 \to 2761 \leftrightarrow 4262 \to 1373 \to 612.$$

Architectural role

A physical registration number is not merely reduced to the observer. Its digit spelling equals the full spelling of a second number; that number contains the complete father and son age identities; the residue becomes the digit spelling of the observer's full name. This is a cross-representational nesting architecture.

10.9 Finding #17: the production discrepancy fixed point

The two separately published production figures differ by

$$1{,}900{,}000 - 1{,}886{,}647 = 13{,}353.$$

Two declared Hebrew representations of this discrepancy have values 3455 and 2665. Their sum is

$$3455 + 2665 = 6120.$$

Using 216, the reversed full-name node, and the two temporal anchors gives

$$6120 - 216 - 2026 - 1982 = 1896.$$

The derived year-like node recreates 216 through its distance from both temporal anchors:

$$2026 - 1896 = 130,$$

$$1982 - 1896 = 86,$$

$$130 + 86 = 216.$$

Thus the declared block contains the fixed-point return

$$216 \to 1896 \to 216.$$

This is stronger than a one-way terminal closure because the derived node is constrained by a return relation. It remains conditional on the two declared Hebrew renderings of 13,353, which must stay visible as linguistic construction points.

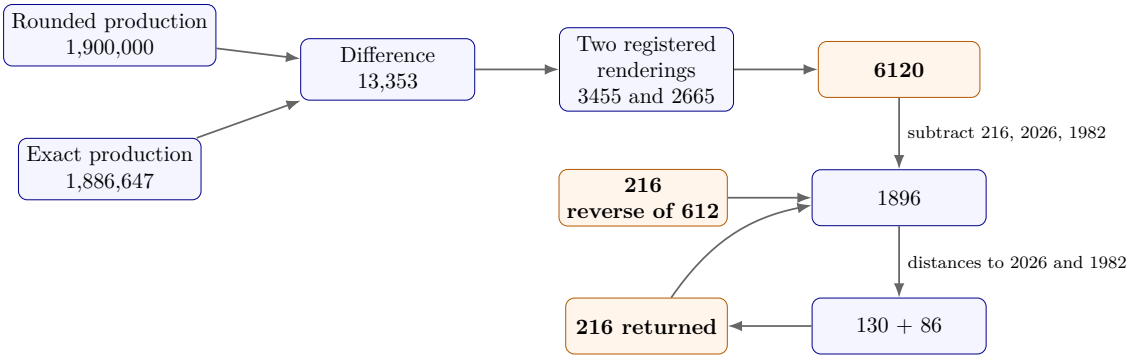


Figure 6: The Ford Capri production-discrepancy fixed point. The two published production figures generate a linguistic aggregate that creates 1896 from 216 and then reconstructs 216 from 1896.

10.10 Findings #18 and #19: the end of production reconstructs vehicle and family

The last Capri was produced on 19 December 1986. Its day and month concatenate to 1912, the registered Hebrew value of the rounded production count. The deterministic Hebrew-calendar conversion is registered as 17 Kislev 5747 with value 882.

The date and production fields resolve the surname:

$$1912 - 882 - 680 - 58 = 292.$$

Replacing the vehicle name and residence with the two physical plate segments gives the observer in mirror form:

$$1912 - 882 - 637 - 177 = 216,$$

$$216 \to 612.$$

Using the production end year instead of the production-phrase value reconstructs the manufacturer and residence:

$$1986 - 882 - 637 - 177 = 290,$$

$$290 - 116 - 116 = 58.$$

A temporal balance returns the surname through the registered value for fifty:

$$1986 - 882 = 1104,$$

$$1104 + 1104 = 2208,$$

$$2208 - 2026 = 182, \qquad 2208 - 1982 = 226,$$

$$182 + 226 = 408,$$

$$408 - 116 = 292.$$

Finding #19 encodes the full decimal date 19121986 digit by digit with registered value 4528. The production lifespan and day-month sum resolve the actual owner:

$$19 + 12 = 31,$$

$$4528 - 1986 - 1968 - 31 = 543.$$

A second route uses the owner birth year, measurement year, and all plate digits:

$$4528 - 1949 - 2026 = 553,$$

$$553 + 6 + 3 + 7 + 1 + 7 + 7 = 584,$$

$$292 + 292 = 584.$$

Architectural role

The vehicle's terminal production date simultaneously reconstructs the rounded production encoding, Hebrew-calendar node, manufacturer, owner, observer, surname, and residence. The beginning of the case is a photographed plate from the family record; the end is an industrial date chosen by Ford. Both converge on the same role registry.

10.11 Central dependency view: one object, three source trunks, one family registry

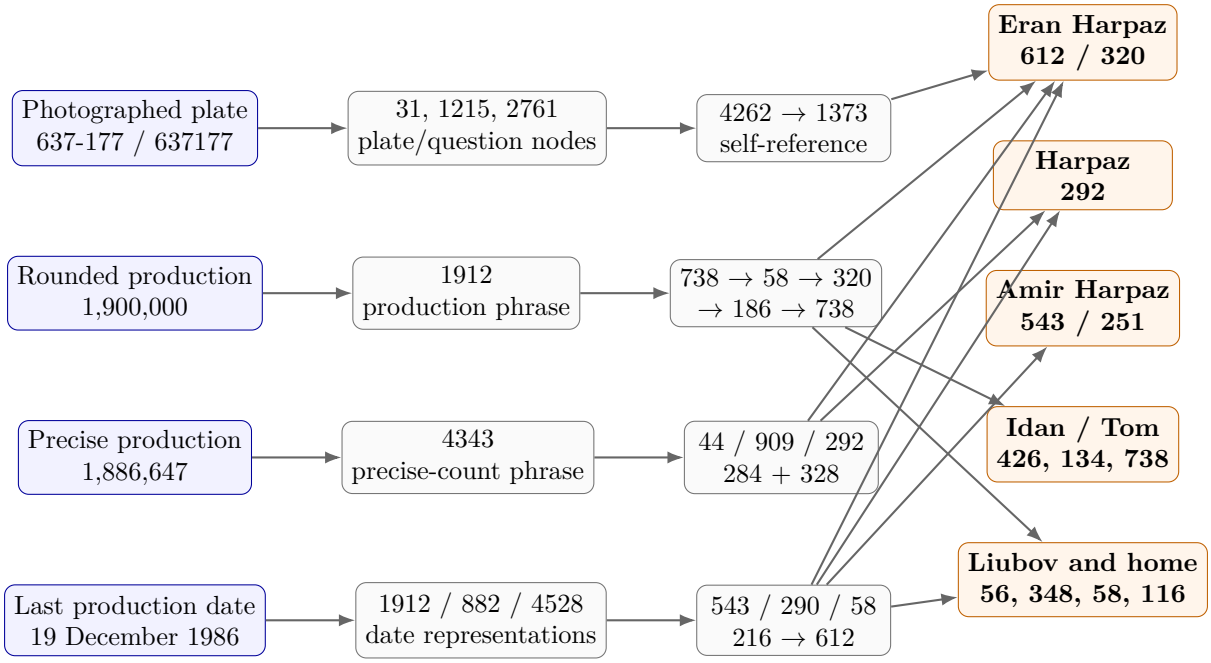


Figure 7: Representative Ford Capri dependency architecture. Three compact industrial/source trunks and one photographed plate repeatedly resolve the same family and household registry. Arrows summarize blocks; they do not assert independence of every displayed node.

The diagram clarifies why the case cannot be summarized by 123 alone. The same compact source field supports direct identities, semantic ownership answers, cross-rendering nests, loops, fan-outs, and a fixed point. It also clarifies the dependency problem: many equations share the plate, production counts, temporal anchors, or registry. The appropriate comparison must therefore preserve the full labelled equation object and the network-density structure rather than treating 123 rows as 123 separate Bernoulli trials.

10.12 Score ontology: 123 equations, density, two legacy 109 tests, and exact solution

The current Ford Capri validation has several linked but non-interchangeable objects.

Object	Membership	Real result	Comparator or status
Deterministic inventory	All 123 labelled equations	123/123	Current-environment verifier pass
Current Layer 1 score	All 123 vectorized equations	123/123	Reported 100M mean 28.15, SD 0.88, maximum 60; zero full-score matches
Layer 2 density	Finding-level network derived from the closure matrix	66.3%	Reported maximum 67.5%; two of 100M exceeded density alone
Joint gate	Full 123 score together with the declared density condition	Full joint object	Zero reported joint matches in 100M
Legacy family test	Historical 109-score family-substitution object	109/109	Maximum 70/109 in 100M
Legacy vehicle test	Historical 109-score vehicle-substitution object	109/109	Maximum 77/109 in 10M
Exact solver	All 123 equations after structural gates	One solution	Current rerun returned the Harpaz registry

This ontology corrects two common misreadings.

First, 109 is not the current principal denominator. It belongs to two older, separate substitution suites. The present public deterministic and Layer 1 objects evaluate all 123 labelled equations.

Second, density alone is not an extreme discriminator. Two random profiles exceeded 66.3%, and the reported maximum was 67.5%. The evidential separation lies in the conjunction: the real registry satisfies every labelled equation while also producing the observed network organization. None of the 100 million current profiles reproduced the full score, and none passed the joint gate.

A current-environment 100,000-profile smoke rerun returned mean 28.15, standard deviation 0.904, maximum 42, mean density 20.0%, maximum density 45.0%, and zero full or joint matches. This small rerun is an executable integrity check, not a replacement for the reported 100-million workload.

10.13 What the exact solver does and does not establish

The exact solver applies the structural gates encoded in the 123-equation support and returns one satisfying assignment: the Harpaz family registry. Within that declared finite support, this is an extreme uniqueness result. It shows that the complete equation system is not equally compatible with many arbitrary role assignments.

It does not prove that every possible human family, every Hebrew naming convention, every alternative discovery grammar, or every unregistered phrase has been exhausted. The solver's universe is the implemented support. The claim must therefore remain:

> The Harpaz registry is the unique full solution in the encoded Ford Capri support, and no sampled current comparator reproduced the 123/123 score or the joint score-density object.

This is strong enough to demand explanation without overstating the comparison boundary.

What this case establishes

Capri contracts the source environment from a large historical archive to a highly restricted documentary object while preserving the RTM architecture. Within the declared encoded family support, the Harpaz registry is the unique full solution; the case therefore directly pressures explanations based on source richness alone.

11 The Living Subscriber: record-state transition architecture

What this case tests. The static-record limitation. The central question is whether a transition between separately preserved physical/interface record states can become part of the measured RTM architecture rather than being treated as a transcription replacement.

11.1 Case function: a single artifact whose record state becomes the evidence object

The two preserved record states, manifest counts, and statistical objects are sourced to the second-edition case file and its public statistical appendix [37, 43].

Coverage note. The preserved first measurement layer contains 76 closures across Findings #01–#13. The later two-state record event adds 57 locks and gates, producing the 133-item executable manifest. Thus the later 1782/4037 state did not create the original network within the analysis: the 76-closure layer had already been completed and preserved.

The Living Subscriber case narrows the source environment from one family vehicle to one personal membership card issued for the 1999–2000 season. The card carries two printed identifiers, an expiration date, a season field, role and category words, a facility-name field, a sticker, and one printed telephone number. Deterministic elapsed-time counts were later computed from the card expiration date to two measurement dates in 2025.

The first public measurement layer registered the sticker text at 1777 and the institutional-name record at 4027. The later observed card-record layer registered 1782 and 4037. The second edition preserves all four values:

$$1777 \to 1782, \qquad 4027 \to 4037.$$

The later values are not silently substituted for the earlier ones, and the first thirteen findings are not rewritten. The transition itself is defined as a second-order record event. This makes the case scientifically different from the preceding volumes. The principal question is no longer only whether a fixed object contains observer-linked closures. It is whether the preserved before/after history forms a coherent architecture that connects the original card identifiers, time measurements, family roles, edited letters, and both record states.

Documentary rule for this chapter. The first public values 1777 and 4027 remain part of the measurement history. The later values 1782 and 4037 are analyzed as a separate observed layer. The analysis does not decide the physical cause of the difference; it tests the arithmetic and network structure generated when the four states are retained together.

11.2 Source boundary and provenance classes

The compact record inventory is:

$$A = 4819, \qquad B = 4262,$$

$$P = \text{07-6419292},$$

$$W_1 = 1312, \quad W_2 = 1316, \quad M_1 = 301, \quad M_2 = 302,$$

$$D_1 = 9187, \qquad D_2 = 9218,$$

together with the four preserved record values 1777, 1782, 4027, and 4037. The frozen identity registry includes 612, 320, 292, 426, 134, 953, 661, 1982, 1978, 1929, 58, 116, and the historically determined ages 18, 22, and 70.

The first 1777 layer also has an externally timestamped publication point: the 1777 sticker reading and its "Shoshana Harpaz aged seventy" correspondence were publicly recorded on 20 April 2026 at 10:27, before the 1782 state was observed on 1 June 2026. Here these coordinates are retained primarily as provenance for the ordered two-state measurement history.

The chapter uses four provenance classes:

Class	Examples	Interpretive treatment
C1	Printed card fields	Identifiers, date, telephone number, season, category, role word, facility field, and sticker are physical record properties.
C2	Deterministic calendar fields	Days, weeks, and months between the printed expiration date and the two measurement dates.
C3	Frozen biography	Names, birth years, residence, and ages fixed before and separately from the arithmetic search.
C4	Authored event language	Questions and descriptions introduced to label the observed edit event. These are included, but kept separate from the non-linguistic and externally printed core.

This distinction is essential. The strongest Subscriber structures are not those that depend only on an authored question. They are the structures in which printed identifiers, a carrier-assigned telephone number, deterministic time counts, and the preserved record states constrain one another before or alongside linguistic re-entry.

11.3 Score ontology: 76, 57, 133, 128, and 31 are different objects

The current case has several non-interchangeable inventories.

Object	Membership	Observed	Reported control/status
First public layer	Findings #01–#13	76/76 closures	Preserved historical measurement layer
Event layer	Finding #14 and Appendix A	57/57 locks and gates	Added two-state analysis

Object	Membership	Observed	Reported control/status
Complete manifest	Both layers	133/133	Executable score matrix
Nontrivial core	Complete manifest minus five automatic event givens	128/128	Maximum 11/128 in 1M deep-stress trials
Role permutation	Same inventory, roles reassigned	133/133	Maximum 11/133 in 1M permutations
Max-over-choice	20,000 worlds, 500 attempts each	133/133	Maximum 14/133 across 10M candidates
Dependency blocks	133 items compressed by shared dependence	31/31	Strongest random maxima 2/31–4/31

The 133 rows are not asserted to be independent Bernoulli trials. The 31-block object is the explicit response to dependence inflation. The max-over-choice suite addresses a different objection: that enough construction attempts could manufacture a high-scoring network. These tests support the case under their implemented generators; they do not provide a universal probability for the entire discovery process.

11.4 Architecture S-01: the non-linguistic identifier-time loop

The card opens with a loop that does not require Hebrew gematria:

$$4819 - 4262 = 557,$$

$$557 + \mathrm{rev}(557) = 557 + 755 = 1312,$$

$$\mathrm{rev}(1312) + \mathrm{rev}(1312) = 2131 + 2131 = 4262,$$

$$\mathrm{rev}(1316) - 1312 = 6131 - 1312 = 4819.$$

The two printed identifiers generate their differential, the differential plus its reversal returns the first weeks-count, the reversal of that weeks-count doubles to the Member ID, and the second weeks-count together with the first returns the Card Number. This is stronger than a single target hit because the block reconstructs both printed identifiers and one elapsed-time field in a closed cross-domain circuit.

Strength assessment: unusual

The loop uses only printed identifiers, decimal reversal, and deterministic calendar counts. It therefore survives removal of all Hebrew phrases and all observer names. Its main limitation is retrospective recognition of the permitted loop, not wording freedom.

11.5 Architecture S-02: the 1777 sticker as a dual identity and three-generation bridge

The first sticker reading has separately verified value 1777. The temporally accurate phrase describing the grandmother at the card expiration, "Shoshana Harpaz aged seventy," also has value 1777. The equality is not the entire block. The same value enters a card-identifier reconciliation:

$$4819 - 4262 = 557,$$

$$557 + 557 = 1114,$$

$$1777 - 1114 - 106 = 557,$$

where 106 is the printed role word SUBSCRIBER.

It also bridges grandmother, card, and cardholder:

$$1929 - 1777 = 152,$$

$$764 - 152 = 612.$$

Here 1929 is the grandmother's birth year, 764 is the visible facility-name fragment, and 612 is the cardholder's full-name anchor.

The same residue creates a time-node return:

$$152 + 106 + 18 + 43 = 319,$$

$$319 - 116 = 203 = \mathrm{rev}(302).$$

The registered full-number spelling of 203 has value 1143, giving

$$1143 - 203 - 76 - 612 - 106 = 146,$$

$$146 + 146 = 292.$$

A second digit-spelling route uses the registered value 1537:

$$1537 - 612 - 764 = 161,$$

$$161 + 131 = 292.$$

This unit is stronger than the bare 1777 phrase equality. It makes the shared sticker/biography node participate in a differential checksum, a three-generation identity return, a months-count reversal, and two separate surname paths.

11.6 Architecture S-03: the telephone number is a dense record field

The printed telephone number is

$$076419292.$$

Its structure contains several fixed fields before any compound arithmetic:

$$0 + 7 + 6 + 4 + 1 + 9 + 2 + 9 + 2 = 40 = 18 + 22,$$

$$[2{:}4] = 764, \qquad [5{:}8] = 1929, \qquad [7{:}9] = 292.$$

Thus the full digit sum equals the brothers' age sum at expiration, while contiguous segments return the visible facility fragment, the grandmother's birth year, and the family surname.

A fourth segment reaches the surname through reversal:

$$[3{:}5] = 641, \qquad \mathrm{rev}(641) = 146, \qquad 146 + 146 = 292.$$

The segment 7641 creates a separate family path:

$$7641 - 4819 = 2822,$$

$$4262 - 2822 = 1440,$$

$$1440 - 1316 = 124, \qquad 1440 - 1312 = 128,$$
$$124 + 128 + 18 + 22 = 292.$$

The paired segment 9292 reconstructs both months-counts through materially different routes:

$$\mathrm{rev}(9292) = 2929,$$
$$2929 - 1316 - 1312 = 301,$$

while a disjoint partition gives

$$76 + 41 + 92 + 92 = 301.$$

For the second months-count:

$$9292 - 4819 - 4262 = 211,$$
$$211 - 40 = 171,$$
$$171 + 131 = 302.$$

The reversed 7641 segment reconstructs the cardholder:

$$\mathrm{rev}(7641) = 1467,$$
$$1467 - 1316 = 151, \qquad 1467 - 1312 = 155,$$
$$151 + 155 = 306, \qquad 306 + 306 = 612.$$

The difference between the two reversed phone segments gives both the family name and the printed membership category:

$$2929 - 1467 = 1462,$$
$$1462 - 1316 = 146, \qquad 146 + 146 = 292,$$
$$1462 - 1312 = 150, \qquad 150 - 106 = 44.$$

The terminal 44 is the registered value of CHILD, the category printed on the card.

The day-count layer returns two additional printed text fields:

$$9218 - 4192 - 4262 = 764,$$
$$9218 - 6419 - 1929 - 764 = 106.$$

The second path uses three overlapping phone segments and terminates on the printed word SUBSCRIBER.

Finally, one derived phone-time residue has two observer outputs:

$$9187 - 6419 - 1777 = 991,$$
$$991 + 991 = 1982,$$
$$1777 - 991 - 612 - 116 = 58.$$

The same node is simultaneously half the cardholder's birth year and the value required to return the family residence.

Why S-03 is one of the strongest Subscriber architectures

Finding #12 contains sixteen closures built around a single carrier-assigned number. It provides four paths to 292, two paths to 301, two paths to 764, direct embedded biography, reconstruction of both printed role words, a full-name path, and a dual-output node to 1982 and 58. The paths share inputs, but their dependence is visible and compressed in the block analysis.

11.7 Architecture S-04: the grandmother pivot reconstructs time, identity, and institution

A seven-closure block uses four distinct facts about Shoshana Harpaz together with card and calendar fields. It first returns the initial months-count:

$$764 - 661 = 103, \qquad \mathrm{rev}(103) = 301.$$

The two weeks-counts reconstruct the month of the later measurement:

$$1312 + 1316 = 2628,$$

$$2628 - 1929 - 661 = 38, \qquad 38 + 38 = 76.$$

The grandmother's birth year, the visible card fragment, and her full-name value reconstruct the doubled role word:

$$1929 - 764 - 953 = 212, \qquad 106 + 106 = 212.$$

Her full name, the three measurement-month names, and the core constant reconstruct the cardholder:

$$953 - 51 - 330 - 76 = 496,$$

$$496 + 116 = 612.$$

The same grandmother identity reaches the family surname through both months-counts and residence:

$$953 - 301 - 302 - 58 = 292.$$

Finally, the institutional-name value creates two documentary reconciliations:

$$4027 - 1982 - 1929 = 116,$$

$$4027 - 2022 - 1929 = 76.$$

This block is important because the original 4027 state, rather than an authored question, closes directly with birth and death years onto the core constant and the corrected-measurement month. It is one of the strongest purely documentary/biographical parts of the case.

11.8 Architecture S-05: Layer I defines the edit kernel without treating it as proof

The two differences are exact:

$$1782 - 1777 = 5, \qquad 4037 - 4027 = 10.$$

They correspond to the added Hebrew letters Heh and Yod. Their sum is

$$5 + 10 = 15.$$

The registered Hebrew expressions "fifteen" and "retroactive change" both have value 923. A second lock connects the authored Heh-question to the printed expiration date:

$$\text{Heh-question} = 2034,$$

$$31 + 3 + 2000 = 2034.$$

Layer I is deliberately not presented as decisive evidence. The 5 and 10 differences are automatic consequences of the changed strings, and the event-language fields are authored. Their role is to define the event kernel and establish the provenance boundary for the stronger later layers.

11.9 Architecture S-06: Layer II creates a dual-path node and returns the displaced state

Two registered event questions have values 2034 and 2039. Their sum produces

$$2034 + 2039 = 4073,$$

a digit permutation of the later institutional state 4037. The question axis then reaches one convergence node through the printed Card Number:

$$4819 - 4073 = 746.$$

A separate route begins at the later record state:

$$4037 - 2039 - 1252 = 746,$$

where 1252 is the registered event phrase "retroactive editing." The shared node resolves identity and title:

$$746 - 134 = 612,$$

with 134 simultaneously representing Idan and the title *The Living Subscriber*.

The strongest relation in this layer is not the digit permutation. It is the return from the later institutional state to the earlier sticker state through the two original card identifiers:

$$\mathrm{rev}(4037) = 7304,$$

$$7304 - 4819 = 2485,$$

$$4262 - 2485 = 1777.$$

Thus the later state does not only generate a new target. It reconstructs the preserved earlier state through two values printed on the physical card. Because the first path uses authored questions, the evidential claim is mixed-provenance. The final return itself, however, is an exact arithmetic relation among the later state, the original identifiers, and the earlier state.

11.10 Architecture S-07: the complete four-state field meets the exact day count

The digit sum of all four preserved record values is

$$1 + 7 + 7 + 7 + 1 + 7 + 8 + 2 + 4 + 0 + 2 + 7 + 4 + 0 + 3 + 7 = 67,$$

so

$$67 + 67 = 134.$$

The output is both the brother's first-name anchor and the book title.

The complete four-state total is

$$1777 + 1782 + 4027 + 4037 = 11623.$$

The separately checked Hebrew digit-spelling of 11623 has value 2814. The separately checked full Hebrew number name of the exact 9218-day interval also has value 2814:

$$11623 \xrightarrow{\text{digit spelling}} 2814,$$

$$9218 \xrightarrow{\text{full number spelling}} 2814.$$

This creates a shared node between the complete physical record-state field and the deterministic time axis.

The edited-letters question has separately checked value 2215. Removing it and the two-letter kernel gives

$$2814 - 2215 = 599,$$

$$599 - 15 = 584,$$

$$584 = 292 + 292.$$

This is the strongest full-state architecture in the event layer. It starts from all four preserved values rather than one selected state, passes through a common number-name node with the exact elapsed-day count, returns to the defined edit kernel, and terminates at a doubled frozen surname.

11.11 Architecture S-08: the complete case closes back on its opening differential

The chapter begins with the externally printed differential

$$4819 - 4262 = 557.$$

The later sticker reading separately returns the same differential after removing three family identities and their exact ages at the card expiration:

$$1782 - 661 - 70 - 320 - 18 - 134 - 22 = 557.$$

The operands preserve family roles: grandmother and age, cardholder and age, brother and age. The result is not merely another observer anchor. It is the same 557 node that opened the non-linguistic card loop. The case therefore has a large-scale return structure:

$$\begin{aligned}\text{printed identifiers} \to 557 &\to \text{elapsed-time loop} \\ &\to \text{record-state network} \to \text{family-age registry} \to 557.\end{aligned}$$

A further phone-spelling block links both record states and event language to the cardholder's age at analysis:

$$\text{digit spelling of } 076419292 = 4855,$$

$$4855 - 1782 - 1777 - 1252 = 44.$$

This relation is linguistically mediated and therefore secondary to the 557 return, but it reinforces the cross-layer reuse of the same physical phone field.

11.12 Central dependency architecture

The figure exposes both strength and dependence. The same few physical fields are repeatedly reused; this is why row-count independence would be inappropriate. At the same time, the architecture contains several different constraint types: exact printed-number loops, contiguous phone embeddings, disjoint phone partitions, deterministic elapsed-time returns, role-specific family subtraction, record-state reversal, and linguistic number-name bridges.

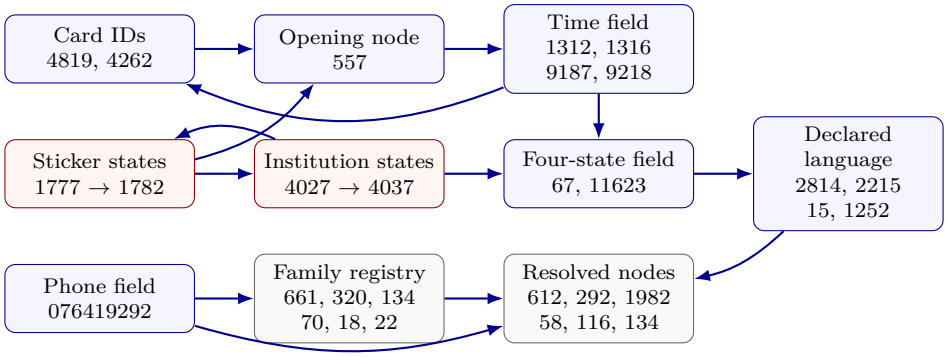


Figure 8: Representative Living Subscriber dependency architecture. The strongest structures join a non-linguistic identifier-time loop, a dense phone field, a preserved two-state record event, an exact day-count bridge, and a final return to the opening differential. Authored language is shown as a separate layer rather than merged with the printed core.

What this case establishes

Subscriber demonstrates that the RTM signature is not restricted to static textual archives. The transition between distinct preserved record states becomes part of the measured architecture itself, and the strongest core includes non-linguistic printed identifiers, a carrier-assigned telephone field, deterministic elapsed-time counts, and the before/after state relation before authored-language re-entry.

Reader guide: how to read the World Cup and Dickinson ledgers

This short guide is for a reader encountering RTM for the first time. It changes no source string, equation, count, dependency classification, statistical result, or physical claim. Its only purpose is to make the closure registries readable without requiring prior familiarity with the case books.

Plain-language definition of a closure

A *closure* is one exact, declared relation in which documented source fields and fixed representations are transformed by the stated operation and terminate at a pre-defined semantic role: for example a sender, score, date, team, identity component, residence, or event label. The number is not interpreted by itself. The role attached to the number is part of the object.

How to read one closure row

Every World Cup row can be read in the same four-part order:

1. **Identify the source fields.** The row title and source-page column state which documented fields are being used.
2. **Decode the representations.** A date may appear as a compact date code, a four-digit date, a full Hebrew number-name value, a digit-by-digit Hebrew value, or a decimal reversal. These forms are never interchangeable unless the row states the transform explicitly.
3. **Check the arithmetic.** The displayed equality is the entire allowed route. Hidden steps are not added.
4. **Read the endpoint by role.** A terminal 251 means Amir only in a row where 251 is the declared Amir field; a terminal 344 means Spain only in a Spain-role row. Reaching a familiar number in the wrong role does not count as a full RTM closure.

Important role rule. The same integer can represent different fixed source fields in different panels. For example, 236 is the gematria value of Lionel Messi in the first-volume F01 image context, while 23.6 is encoded as the compact date 236 in the later Spain chronology. The semantic label and source context therefore control interpretation; the integer alone does not.

Notation used in the registries

Symbol	Meaning
$G(s)$	Standard additive Hebrew gematria of the exact fixed string s. Spaces and punctuation contribute zero under the declared convention.
$F(n)$	Gematria of the fixed full Hebrew number-name rendering of the integer n.
$D(n)$	Gematria of the digits of n written separately in Hebrew.
$\rho(n)$ or $\mathrm{rev}(n)$	Decimal digit reversal, used only where printed.
$\lvert x \rvert$	Absolute value, used only where printed.

Symbol	Meaning
$2(x)$	Twice the value x; for example $2(344) = 688$.

Date and time encodings used in the World Cup material

Documented field	Displayed code	Role
22 June	2206	Four-digit source-event date in the first live-time finding.
22 June	226	Compact day-month code in the Spain temporal extension.
23 June	236	Compact documentation-date code in the Spain extension.
19 July	197	Official FIFA/New York final-date code.
20 July	207	Israel-local championship-date code.
20 July	2007	Four-digit form of the same Israel-local date, used in Closure 45.
19:55	1955	Earlier father-message timestamp.
21:07	2107	Timestamp used in the Idan message branch of Spain Closure 25.
22:07	2207	Later image timestamp in Finding F02.

Core World Cup role dictionary

The table below is a reading aid, not a new score object. It lists the values that recur most often across the 99 World Cup closure units. More specialized intermediate values remain defined on the printed source page cited by each registry row.

Value	Declared role	Where the reader encounters it
58	Observer apartment anchor	Raw identity/residence anchor used throughout the corpus.
76	Amir age / June	Amir's age in the event year and the Hebrew value of June in the F01 context.
116	RTM/double-apartment anchor; also 11.6	$58 + 58$ in the frozen registry; in F02 the compact image date 11.6 also appears as 116.
141	Mondial	Event-category label.
171	FIFA	Fixed event-organization label.
197	19 July	Official final-date compact code in the Spain extension.
207	20 July	Israel-local championship-date compact code.
226	22 June	Spain source-day compact code.
236	Lionel Messi; also 23 June	F01 image-subject value; separately the Spain documentation-date compact code.

Value	Declared role	Where the reader encounters it
251	Amir	Sender first-name value.
292	Harpaz	Observer/family surname value.
316	Mexico	F02 standard event-label value.
320	Eran	Observer first-name value.
344	Spain	Later champion label in the Spain extension.
426	Idan Harpaz	Fixed family-identity value used in Spain.
543	Amir Harpaz	Sender full-name value.
600	Shirt 6 word-value	Hebrew word value of the visible shirt number 6 in F02.
619	Argentina–Austria	Documented F01 team field; later re-entered by Spain Closure 38.
621	Shirts 6 and 21	Connected read of the two visible F02 shirt numbers.
646	South Africa	F02 country/team value.
749	“five-eight”	Spoken-digit representation of the apartment anchor used in F01/F02 loops.
797	Hebrew championship date	Declared Hebrew-date node in the Spain architecture.
901	“two-zero”	Final-score phrase in F01.
940	F02 Hebrew date	Hebrew calendar-date value used in the 22:07 image system.
959	Father-message phrase	“Anyone interested right now?” in F01; reused as a frozen earlier message field in Spain.
1035	Shirt 21 word-value	Hebrew word value of the visible shirt number 21 in F02.
1182	Spain/source signature	$F(2134) = 1182 = D(344)$ in the primary title-to-champion checksum.
1414	Formal apartment phrase	Full phrase “apartment number fifty-eight” in F01.
1538	Mondial 2026	Full event-year phrase used in F02.
1650	Time/full-result shared value	Both the F01 time phrase and the full Argentina–Austria 2–0 result phrase.
1682	2134 digit signature	$D(2134)$; also $2026 - 344$ in the Spain network.
1955	19:55	Earlier message timestamp.
2134	Full tournament-name value	Pre-outcome World Cup tournament-title field.
2207	22:07	Later F02 image timestamp.
2279	Idan message text field	Source value used with 21:07 in Spain Closure 25.
3143	F02 father-message field	Earlier raw message text in the 22:07 image finding; the photographed source preserves the Kaf spelling of Mexico inside the message, distinct from the standard event-label value 316.

Value	Declared role	Where the reader encounters it
3553	Pre-outcome video-title value	Later temporal-extension title field used in the double-Spain route.
612	Eran Harpaz	Frozen full observer identity, $320 + 292$.

Two worked examples

Example 1: WC-003, DATE-TIME = SENDER. The row prints

$$2206 - 1955 = 251.$$

Read it as: the documented 22 June date is encoded as 2206; the earlier message time 19:55 is encoded as 1955; their exact difference is 251; and 251 is the fixed value of the sender's first name, Amir. The closure statement is therefore "date minus timestamp returns sender," not merely "2206 minus 1955 happens to equal 251."

Example 2: WC-097 / Spain Closure 44, the 1682 node returns double Spain. The row prints

$$1682 - 797 - 197 = 688 = 344 + 344.$$

Read it as: 1682 is the already established digit signature of the pre-outcome tournament-name value 2134; 797 is the Hebrew championship-date node; 197 is the official final-date code; and the residual is 688, exactly two copies of the champion value Spain = 344. The evidential point is the role-preserving return of an earlier source node through two date fields to the later champion label.

How to read the Dickinson 233-entry registry

The Dickinson table uses the same logic but adds three audit columns. The stable ID states the release family (for example EDA, EDB, EDC, EDD, B718, AUD, or DER); the release stratum states when the relation entered the documented research sequence; and the verification class states whether the row is arithmetic, exact gematria, reversal, representation, or correspondence. The 233 rows are a complete registry, not 233 separate probability trials. Exact Hebrew source strings for the 24 gematria rows are preserved in the accompanying UTF-8 JSON registry under the stable string identifiers printed in the article.

For example,

$$\texttt{EDA-13}: \quad 5540 - 1830 - 1886 - 831 - 381 = 612$$

means that the birth/death-date aggregate 5540, after removing Dickinson's life years and the two declared Dickinson identity values, terminates at the frozen full observer identity 612. Likewise,

$$\texttt{B718-035}: \quad 1483 - 871 = 612$$

is a late-extension identity return and is read inside the already frozen 718-family chronology rather than as a new separate prospective experiment.

Statistical reading rule. A printed closure is first a deterministic audit object. Statistical strength is assigned only to the explicitly defined finite, exhaustive, permutation, solver, or Monte Carlo score object that contains it. Dependent rows, repeated nodes, alternate representations, and algebraic restatements are not silently multiplied as though they were statistically independent probabilities.

12 The Result Was Already Encoded: live-time chronology architecture

What this case tests. Chronology. Earlier timestamped fields are preserved before later score or image fields become available, allowing temporal order itself to enter the dependency architecture as a controlled variable.

12.1 Case scope: chronology becomes part of the object

The two locked ledgers and their null-world audit are sourced to the current live-time case file and strict simulation repository [38, 44].

The fifth case contracts the source field again. It is not built from a century-old archive or a long-lived physical artifact. It is built from two compact message-and-image records generated around live football events. The source book records an earlier message, a later image or result field, visible numbers, event labels, and the same frozen observer-family registry used in the preceding cases.

The distinctive constraint is temporal order. The evidential object is not merely the set of values eventually present in the record. It is the ordered record

$$\mathcal{L} = (r_{t_1}, r_{t_2}, \ldots, r_{t_n}), \qquad t_1 < t_2 < \cdots < t_n,$$

with a declared boundary between fields available at the earlier timestamp and fields fixed later. In Finding F01, the book records a father's message at 19:55 during the match sequence and a final 2–0 result that entered the event record later. In Finding F02, it records a father message at 21:39 and a later source image received at 22:07 on 11 June 2026, retaining the timestamp and shirt numbers 6 and 21 as the visible image fields.

Chronology boundary. The chapter verifies the arithmetic of the documented order and preserves the source ledger's provenance classes. It does not provide third-party authentication of the original messaging export or broadcast metadata. Documentary authentication, deterministic arithmetic, null-model separation, and physical interpretation are distinct evidential levels.

Block	Earlier field	Later field	Raw or controlled sources	Architecture test
F01	19:55 father message	Final Argentina–Austria result and image/event context	Raw timestamp and message; score; date; teams; Messi image context; visible competition text	Do the earlier time and message resolve the later score while the same block also resolves sender, event, image subject, residence, and observer?

Block	Earlier field	Later field	Raw or controlled sources	Architecture test
F02	21:39 father message	22:07 image with shirts 6 and 21	Raw message and timestamp; retained image pixels; date; countries; declared player transcriptions; source-spelling index	Does the antecedent message reopen into fields visible only in the later image, and does the image reconstruct its own date, time, event, and observer registry?

The chapter therefore treats chronology as a labeled edge in the dependency graph. A route from an earlier field to a later documented field is not automatically evidence of retrocausality, but it is structurally different from a route assembled from a closed historical archive because the availability order can be stated and challenged directly.

12.2 Score ontology and deterministic audit

The two findings use different score objects and must not be merged into a single denominator.

Finding	Closure bands	Primary bands	Equality checks	Hebrew verification and role
F01: 19:55 Result Lock	24/24	24/24	38/38	25/25 in the locked audit; six four-band panels, with the authored observer-question panel explicitly secondary in provenance
F02: 22:07 Image Lock	29/29	21/21	61/61	22/22 in the locked audit; five panels of 6, 6, 6, 6, and 5 bands, with later panels reusing nodes from the same image system

For this revision, the complete arithmetic layer represented in the chapter was recalculated in a separate audit pass:

$$\boxed{38/38 \text{ F01 checks PASS}}, \qquad \boxed{61/61 \text{ F02 checks PASS}}.$$

A separate letter-by-letter verification file checks the exact Hebrew strings used in the chapter, including the controlled distinction between the raw source spelling of Mexico and the standard event label.

12.3 Complete first-volume closure concordance

The following registry prints every first-volume closure band in source order. The 53 rows are closure units; the 99 equality checks nested inside them are printed separately afterward and are not recounted as additional closures. Source pages are the printed calculation pages in the supplied publication PDF. In the Level column, P means primary and S means secondary under the frozen executable; F01-21–F01-24 additionally retain the lower provenance classification of authored analytical language.

ID	p.	Pnl.	L	Closure	Exact declared check(s)
WC-001	22	01A	P	**F01-01** TIME = RESULT	1650 = 1650
WC-002	22	01A	P	**F01-02** MESSAGE = SCORE	959 - 58 = 901
WC-003	22	01A	P	**F01-03** DATE-TIME = SENDER	2206 - 1955 = 251
WC-004	22	01A	P	**F01-04** TEAMS = AGE / MONTH	619 - 543 = 76
WC-005	28	01B	P	**F01-05** TIME MINUS APARTMENT = SCORE	1650 - 749 = 901
WC-006	28	01B	P	**F01-06** SCORE MINUS APARTMENT = REVERSED AMIR	901 - 749 = 152
WC-007	28	01B	P	**F01-07** REVERSED AMIR RETURNS FULL SENDER	1220 - 619 - 58 = 543
WC-008	29	01B	P	**F01-08** TIME / MESSAGE / MESSI / TEAMS = MONDIAL	1955 - 959 - 236 - 619 = 141
WC-009	35	01C	P	**F01-09** TIME / RESULT MINUS PLACE = LIONEL MESSI	1650 - 1414 = 236
WC-010	35	01C	P	**F01-10** APARTMENT LOOP RETURNS 58	1414 - 959 = 455 749 - 455 - 236 = 58
WC-011	35	01C	P	**F01-11** 95 BRIDGE RETURNS LIONEL MESSI	959 + 901 = 1860 1955 - 1860 = 95 95 + 141 = 236
WC-012	36	01C	P	**F01-12** SAME BRIDGE RETURNS FIFA	95 + 76 = 171
WC-013	41	01D	P	**F01-13** DATE / SCORE / MESSAGE RETURNS MESSI	2206 - 901 - 959 = 346 346 - 236 = 110
WC-014	41	01D	P	**F01-14** MESSI VALUE RETURNS FATHER MESSAGE	one-one-zero value = father message value
WC-015	41	01D	P	**F01-15** DIGIT FIELD RETURNS MESSI	digit sum = 43 965 - 236 - 619 = 110
WC-016	42	01D	P	**F01-16** MESSI / MONDIAL RETURNS SENDER	110 + 141 = 251
WC-017	47	01E	P	**F01-17** VISUAL TEXT RETURNS MONDIAL	2134 - 1028 - 965 = 141
WC-018	47	01E	P	**F01-18** VISUAL TEXT RETURNS 260	2134 - 965 - 909 = 260
WC-019	47	01E	P	**F01-19** YEAR / BIRTH-YEAR ROUTE RETURNS 260	2134 - 2026 = 108 2134 - 1982 = 152 108 + 152 = 260
WC-020	48	01E	P	**F01-20** 260 NODE RETURNS OBSERVER	260 + 116 + 236 = 612
WC-021	52	01F	P	**F01-21** QUESTION FIELD RETURNS 43	3699 - 1793 = 1906 1949 - 1906 = 43 digit sum 1955+959 = 43
WC-022	52–53	01F	P	**F01-22** QUESTION FIELD RETURNS 76 AND MONDIAL	3699 - 1982 = 1717 1793 - 1717 = 76 3840 - 3699 = 141
WC-023	53	01F	P	**F01-23** QUESTION FIELD RETURNS LIONEL MESSI THROUGH PLACE LAYER	3699 - 1414 - 1034 - 749 - 266 = 236

ID	p.	Pnl.	L	Closure	Exact declared check(s)
WC-024	53	01F	P	**F01-24** SOURCE-SUM / QUESTION FIELD RETURNS 1782 AND 1414	1955 + 959 + 2134 + 236 = 5284 five-two-eight-four = 1782 3699 - 909 - 965 - 43 = 1782 5284 - 3699 - 171 = 1414
WC-025	62	02A	P	**F02-01** DATE / COUNTRY / SHIRTS = 22:07	940 + 646 + 621 = 2207
WC-026	62	02A	P	**F02-02** SHIRTS MINUS PLAYERS = DATE	621 - 505 = 116
WC-027	62	02A	P	**F02-03** COUNTRY MINUS PLAYERS = MONDIAL	646 - 505 = 141
WC-028	63	02A	S	**F02-04** FULL EVENT REBUILDS 22:07	116 + 940 + 646 + 505 = 2207
WC-029	63	02A	P	**F02-05** FATHER MESSAGE GAP RETURNS SHIRTS	3143 - 2824 = 319 940 - 319 = 621
WC-030	63	02A	P	**F02-06** SAME GAP RETURNS FAMILY NAME	319 - 6 - 21 = 292
WC-031	68	02B	P	**F02-07** MESSAGE / IDENTITY / EVENT RETURNS FAMILY NAME	3143 - 2139 - 251 - 320 - 141 = 292
WC-032	68	02B	P	**F02-08** DIGIT-WORDS RETURN SHIRTS	2179 - 1558 = 621
WC-033	69	02B	P	**F02-09** MESSAGE / TEAMS / YEAR / EVENT RETURNS APARTMENT	3143 - 646 - 316 - 1982 - 141 = 58
WC-034	69	02B	P	**F02-10** MESSAGE / DAY / DATE / YEAR RETURNS SHIRTS	3143 - 424 - 116 - 1982 = 621
WC-035	69	02B	P	**F02-11** TEAMS DOUBLE RETURNS APARTMENT	316 + 646 = 962 962 + 962 = 1924 1982 - 1924 = 58
WC-036	69–70	02B	S	**F02-12** WORLD CUP YEAR GAP OPENS 160 NODE	2026 - 1924 = 102 102 + 58 = 160 160 - 116 = 44 160 + 160 = 320 160 + 141 = 301 301 + 301 = 602 602 + 44 = 646
WC-037	75	02C	P	**F02-13** IMAGE DIGITS MINUS SHIRT DIGITS = AMIR NODE	2033 - 1373 = 660
WC-038	76	02C	P	**F02-14** TEAMS GAP DOUBLES INTO SAME NODE	646 - 316 = 330 330 + 330 = 660
WC-039	76	02C	S	**F02-15** 660 NODE RETURNS DOUBLE HARPAZ	660 - 76 = 584 292 + 292 = 584
WC-040	76	02C	P	**F02-16** AMIR BIRTH YEAR RETURNS AMIR	1949 - 660 - 646 - 316 - 76 = 251
WC-041	77	02C	P	**F02-17** DIGIT-WORD SUM RETURNS HEBREW DATE	2033 + 1373 = 3406 3406 - 2207 = 1199 2139 - 1199 = 940
WC-042	77	02C	P	**F02-18** IMAGE TIME RETURNS REVERSED SHIRTS	2207 - 1538 - 543 = 126
WC-043	81	02D	P	**F02-19** IMAGE TIME RETURNS OBSERVER BIRTH YEAR	2207 - 646 - 6 - 21 - 543 = 991 991 + 991 = 1982
WC-044	82	02D	P	**F02-20** SHIRT WORDS RETURN FAMILY NAME	1035 - 600 - 6 - 21 - 116 = 292

ID	p.	Pnl.	L	Closure	Exact declared check(s)
WC-045	82	02D	P	**F02-21** SHIRT WORDS RETURN ERAN	1035 + 600 + 6 + 21 = 1662 1982 - 1662 = 320
WC-046	82	02D	P	**F02-22** WORLD CUP YEAR RETURNS ERAN	2026 - 1538 - 6 - 21 - 141 = 320
WC-047	82–83	02D	S	**F02-23** SHIRT NODE RETURNS MONDIAL	2026 - 1662 = 364 364 + 320 = 684 684 - 543 = 141
WC-048	83	02D	P	**F02-24** SHIRTS / COUNTRY RETURNS APARTMENT	1035 + 600 + 646 = 2281 2281 - 2026 = 255 2281 - 1982 = 299 255 + 299 = 554 612 - 554 = 58
WC-049	89	02E	S	**F02-25** 2281 NODE RETURNS APARTMENT AGAIN	554 + 646 = 1200 1200 word-value = 612 1200 - 612 = 588 646 - 588 = 58
WC-050	90	02E	P	**F02-26** 2308 NODE RETURNS FAMILY NAME	2281 + 6 + 21 = 2308 2308 - 2026 = 282 2308 - 1982 = 326 282 + 326 = 608 608 - 316 = 292
WC-051	90	02E	S	**F02-27** 608 NODE RETURNS AGE / JUNE	646 - 608 = 38 38 + 38 = 76
WC-052	90	02E	S	**F02-28** 38 / HARPAZ RETURNS 660 NODE	38 + 292 = 330 330 + 330 = 660
WC-053	90–91	02E	S	**F02-29** FATHER MESSAGE / WORLD CUP YEAR RETURNS FIVE-EIGHT	3143 - 2026 - 646 - 316 - 141 = 14 14 + 58 as digit-read = 1458 2207 - 1458 = 749

12.4 Complete first-volume equality-check ledger

Each line below is one executable equality check. A closure passes only when all checks nested under that closure pass. This is the exact 38+61=99 check ontology used by the frozen audit, not a second set of closure discoveries.

Check ID	Closure	p.	Exact declared check	Pass
F01-01.C01	WC-001	22	1650 = 1650	PASS
F01-02.C01	WC-002	22	959 - 58 = 901	PASS
F01-03.C01	WC-003	22	2206 - 1955 = 251	PASS
F01-04.C01	WC-004	22	619 - 543 = 76	PASS
F01-05.C01	WC-005	28	1650 - 749 = 901	PASS
F01-06.C01	WC-006	28	901 - 749 = 152	PASS
F01-07.C01	WC-007	28	1220 - 619 - 58 = 543	PASS
F01-08.C01	WC-008	29	1955 - 959 - 236 - 619 = 141	PASS
F01-09.C01	WC-009	35	1650 - 1414 = 236	PASS
F01-10.C01	WC-010	35	1414 - 959 = 455	PASS
F01-10.C02	WC-010	35	749 - 455 - 236 = 58	PASS
F01-11.C01	WC-011	35	959 + 901 = 1860	PASS
F01-11.C02	WC-011	35	1955 - 1860 = 95	PASS
F01-11.C03	WC-011	35	95 + 141 = 236	PASS
F01-12.C01	WC-012	36	95 + 76 = 171	PASS
F01-13.C01	WC-013	41	2206 - 901 - 959 = 346	PASS
F01-13.C02	WC-013	41	346 - 236 = 110	PASS
F01-14.C01	WC-014	41	one-one-zero value = father message value	PASS
F01-15.C01	WC-015	41	digit sum = 43	PASS
F01-15.C02	WC-015	41	965 - 236 - 619 = 110	PASS
F01-16.C01	WC-016	42	110 + 141 = 251	PASS
F01-17.C01	WC-017	47	2134 - 1028 - 965 = 141	PASS
F01-18.C01	WC-018	47	2134 - 965 - 909 = 260	PASS
F01-19.C01	WC-019	47	2134 - 2026 = 108	PASS
F01-19.C02	WC-019	47	2134 - 1982 = 152	PASS
F01-19.C03	WC-019	47	108 + 152 = 260	PASS
F01-20.C01	WC-020	48	260 + 116 + 236 = 612	PASS

Check ID	Closure	p.	Exact declared check	Pass
F01-21.C01	WC-021	52	3699 - 1793 = 1906	PASS
F01-21.C02	WC-021	52	1949 - 1906 = 43	PASS
F01-21.C03	WC-021	52	digit sum 1955+959 = 43	PASS
F01-22.C01	WC-022	52–53	3699 - 1982 = 1717	PASS
F01-22.C02	WC-022	52–53	1793 - 1717 = 76	PASS
F01-22.C03	WC-022	52–53	3840 - 3699 = 141	PASS
F01-23.C01	WC-023	53	3699 - 1414 - 1034 - 749 - 266 = 236	PASS
F01-24.C01	WC-024	53	1955 + 959 + 2134 + 236 = 5284	PASS
F01-24.C02	WC-024	53	five-two-eight-four = 1782	PASS
F01-24.C03	WC-024	53	3699 - 909 - 965 - 43 = 1782	PASS
F01-24.C04	WC-024	53	5284 - 3699 - 171 = 1414	PASS
F02-01.C01	WC-025	62	940 + 646 + 621 = 2207	PASS
F02-02.C01	WC-026	62	621 - 505 = 116	PASS
F02-03.C01	WC-027	62	646 - 505 = 141	PASS
F02-04.C01	WC-028	63	116 + 940 + 646 + 505 = 2207	PASS
F02-05.C01	WC-029	63	3143 - 2824 = 319	PASS
F02-05.C02	WC-029	63	940 - 319 = 621	PASS
F02-06.C01	WC-030	63	319 - 6 - 21 = 292	PASS
F02-07.C01	WC-031	68	3143 - 2139 - 251 - 320 - 141 = 292	PASS
F02-08.C01	WC-032	68	2179 - 1558 = 621	PASS
F02-09.C01	WC-033	69	3143 - 646 - 316 - 1982 - 141 = 58	PASS
F02-10.C01	WC-034	69	3143 - 424 - 116 - 1982 = 621	PASS
F02-11.C01	WC-035	69	316 + 646 = 962	PASS
F02-11.C02	WC-035	69	962 + 962 = 1924	PASS
F02-11.C03	WC-035	69	1982 - 1924 = 58	PASS
F02-12.C01	WC-036	69–70	2026 - 1924 = 102	PASS
F02-12.C02	WC-036	69–70	102 + 58 = 160	PASS
F02-12.C03	WC-036	69–70	160 - 116 = 44	PASS
F02-12.C04	WC-036	69–70	160 + 160 = 320	PASS
F02-12.C05	WC-036	69–70	160 + 141 = 301	PASS
F02-12.C06	WC-036	69–70	301 + 301 = 602	PASS
F02-12.C07	WC-036	69–70	602 + 44 = 646	PASS
F02-13.C01	WC-037	75	2033 - 1373 = 660	PASS
F02-14.C01	WC-038	76	646 - 316 = 330	PASS
F02-14.C02	WC-038	76	330 + 330 = 660	PASS
F02-15.C01	WC-039	76	660 - 76 = 584	PASS
F02-15.C02	WC-039	76	292 + 292 = 584	PASS
F02-16.C01	WC-040	76	1949 - 660 - 646 - 316 - 76 = 251	PASS
F02-17.C01	WC-041	77	2033 + 1373 = 3406	PASS
F02-17.C02	WC-041	77	3406 - 2207 = 1199	PASS
F02-17.C03	WC-041	77	2139 - 1199 = 940	PASS
F02-18.C01	WC-042	77	2207 - 1538 - 543 = 126	PASS
F02-19.C01	WC-043	81	2207 - 646 - 6 - 21 - 543 = 991	PASS
F02-19.C02	WC-043	81	991 + 991 = 1982	PASS
F02-20.C01	WC-044	82	1035 - 600 - 6 - 21 - 116 = 292	PASS
F02-21.C01	WC-045	82	1035 + 600 + 6 + 21 = 1662	PASS
F02-21.C02	WC-045	82	1982 - 1662 = 320	PASS
F02-22.C01	WC-046	82	2026 - 1538 - 6 - 21 - 141 = 320	PASS
F02-23.C01	WC-047	82–83	2026 - 1662 = 364	PASS
F02-23.C02	WC-047	82–83	364 + 320 = 684	PASS
F02-23.C03	WC-047	82–83	684 - 543 = 141	PASS
F02-24.C01	WC-048	83	1035 + 600 + 646 = 2281	PASS
F02-24.C02	WC-048	83	2281 - 2026 = 255	PASS
F02-24.C03	WC-048	83	2281 - 1982 = 299	PASS
F02-24.C04	WC-048	83	255 + 299 = 554	PASS
F02-24.C05	WC-048	83	612 - 554 = 58	PASS
F02-25.C01	WC-049	89	554 + 646 = 1200	PASS
F02-25.C02	WC-049	89	1200 word-value = 612	PASS
F02-25.C03	WC-049	89	1200 - 612 = 588	PASS
F02-25.C04	WC-049	89	646 - 588 = 58	PASS
F02-26.C01	WC-050	90	2281 + 6 + 21 = 2308	PASS
F02-26.C02	WC-050	90	2308 - 2026 = 282	PASS
F02-26.C03	WC-050	90	2308 - 1982 = 326	PASS
F02-26.C04	WC-050	90	282 + 326 = 608	PASS
F02-26.C05	WC-050	90	608 - 316 = 292	PASS
F02-27.C01	WC-051	90	646 - 608 = 38	PASS
F02-27.C02	WC-051	90	38 + 38 = 76	PASS
F02-28.C01	WC-052	90	38 + 292 = 330	PASS
F02-28.C02	WC-052	90	330 + 330 = 660	PASS
F02-29.C01	WC-053	90–91	3143 - 2026 - 646 - 316 - 141 = 14	PASS
F02-29.C02	WC-053	90–91	14 + 58 as digit-read = 1458	PASS

Check ID	Closure	p.	Exact declared check	Pass
F02-29.C03	WC-053	90–91	2207 - 1458 = 749	PASS

First-volume deterministic audit. F01 passes 24/24 closure bands, 38/38 equality checks, and 25/25 verified Hebrew values. F02 passes 29/29 closure bands, 61/61 equality checks, and 22/22 verified Hebrew values. The combined first-volume inventory is therefore 53 closure bands containing 99 equality checks and 47 verified Hebrew-value checks.

12.5 Finding F01: the 19:55 result-lock architecture

12.5.1 Panel inventory

Panel	Architectural role	Principal returns
01A	Primary chronology/result lock	Time phrase and full result share 1650; raw message returns the score; date-time returns Amir; team field returns age/month.
01B	Score, residence, and sender cascade	Time returns score; score returns reversed Amir; number-word route returns Amir Harpaz; live field returns Mondial.
01C	Apartment, player, and bridge loop	Formal apartment returns Lionel Messi; place loop returns 58; node 95 branches to Messi and FIFA.
01D	Date, digit, Messi, and sender loop	Date returns Messi; Messi's value returns the initiating message; digit field returns Messi again; Messi plus Mondial returns Amir.
01E	Visual-text and observer lock	Visible competition text returns Mondial and node 260 by two routes; the repeated node resolves to Eran Harpaz.
01F	Authored observer-question cross-check	Fixed analytical question returns 43, 76, Mondial, Lionel Messi, the 1782 node, and the formal apartment phrase; retained as secondary provenance.

12.5.2 The strongest F01 structure: earlier message and time resolve the later result

The primary panel begins with two semantically different Hebrew fields:

"seven fifty-five minutes" = 1650,

"two-zero for Argentina over Austria" = 1650.

The direct equality is reinforced by three distinct short returns:

$$959 - 58 = 901 \quad \text{father message minus apartment} = \text{"two-zero"},$$
$$2206 - 1955 = 251 \quad \text{date minus message time} = \text{Amir},$$
$$619 - 543 = 76 \quad \text{teams minus Amir Harpaz} = \text{age/June}.$$

This is the strongest opening block because the terminal fields are not arbitrary numerical anchors. They preserve the documented roles of result, sender, and event month. More importantly, the raw message route outputs the later score phrase rather than using the score as an operand.

Under the source chronology, the message was already fixed when the final result was not yet part of the record.

The secondary sender chain remains inside the same compact field:

$$\begin{aligned} 1650 - 749 &= 901, \\ 901 - 749 &= 152 = \text{reverse}(251), \\ 1220 - 619 - 58 &= 543, \\ 1955 - 959 - 236 - 619 &= 141. \end{aligned}$$

Thus time returns score, score returns the sender in reversed form, the written reversal returns the full sender, and the combined live field returns Mondial.

12.5.3 A closed date–image–message–sender loop

Panel 01D is architecturally stronger than a set of four isolated closures because its outputs re-enter earlier fields:

$$\begin{aligned} 2206 - 901 - 959 &= 346, && \\ 346 - 236 &= 110 && \text{(Messi)}, \\ \text{digit spelling of } 110 &= 959 && \text{(original father message)}, \\ 1 + 9 + 5 + 5 + 9 + 5 + 9 &= 43, && \\ 965 - 236 - 619 &= 110 && \text{(Messi again)}, \\ 110 + 141 &= 251 && \text{(Amir)}. \end{aligned}$$

The loop can be summarized as

$$\text{date} \to \text{Messi} \to \text{initiating message} \to \text{Messi} \to \text{sender}.$$

It is unusual because date, result, raw message, image subject, digit field, event label, and sender retain their semantic roles throughout the cycle.

12.5.4 The dual-path 260 node resolves the observer

The visible competition-text value 2134 opens the same node through two materially different routes:

$$\begin{aligned} 2134 - 965 - 909 &= 260, \\ (2134 - 2026) + (2134 - 1982) &= 108 + 152 = 260. \end{aligned}$$

The first path is linguistic and digit-based; the second uses the event year and observer birth year. The repeated node then closes as

$$260 + 116 + 236 = 612,$$

resolving the visual field, core constant, and player image to Eran Harpaz. This is stronger than a direct 612 hit because the intermediate is reconstructed through a distinct route before identity resolution.

12.5.5 The 5284/1782 lock: powerful but secondary

The fixed source sum

$$1955 + 959 + 2134 + 236 = 5284$$

has a declared spoken-digit value of 1782. A separately frozen observer question of value 3699 returns the same node:

$$3699 - 909 - 965 - 43 = 1782,$$

and the source sum returns the formal apartment phrase through FIFA:

$$5284 - 3699 - 171 = 1414.$$

This is a dense cross-path structure. It is nevertheless classified below the primary time/result block because the 3699 question is authored analytical language rather than raw message text. The cancelled 5248 path is not used.

12.6 Finding F02: the 22:07 opening-match image architecture

12.6.1 Panel inventory

Panel	Architectural role	Principal returns
02A	Core chronology and image reconstruction	Hebrew date, country, and shirts rebuild 22:07; players return date and Mondial; the earlier message gap returns later shirts and Harpaz.
02B	Antecedent message and team cascade	Pre-image message returns Harpaz, 621, and 58; doubled teams return 58 and open node 160 into age, Eran, and South Africa.
02C	Digit-word and two-route 660 node	Image and shirts produce 660; team gap separately produces 660; the node reopens to double Harpaz and Amir; digit words return date and reversed shirts.
02D	Shirt-word observer resolution	Image returns birth year; shirt words return surname and first name; event year separately returns first name; the 2281 node returns residence.
02E	Dependency-aware closing cascade	2281 and 2308 reopen into 58, 292, 76, 660, and the five-eight wording without adding a new image source.

12.6.2 The antecedent message returns fields in the later image

The source ledger preserves a message at 21:39 and an image received at 22:07. The raw father-message field preserves the photographed source spelling of Mexico with Hebrew Kaf (source-form value 236), while the separate standard country/event label uses Qof and has value 316. This intentional 80-point source/label distinction is not a normalization step. The raw father-message value therefore remains 3143. Together with the frozen event-description value 2824 it creates

$$3143 - 2824 = 319.$$

The same gap node then produces

$$940 - 319 = 621 \qquad \text{later visible shirt node,}$$
$$319 - 6 - 21 = 292 \qquad \text{Harpaz.}$$

The importance of this structure is not the size of 319. It is that one pre-image node simultaneously returns a later visual field and the observer's family name. A second pre-image route separately returns the same shirts:

$$3143 - 424 - 116 - 1982 = 621,$$

while another route returns the apartment:

$$3143 - 646 - 316 - 1982 - 141 = 58.$$

12.6.3 The image reconstructs its own event field

The opening panel is a compact self-reconstruction system:

$$\begin{aligned} 940 + 646 + 621 &= 2207, \\ 621 - 505 &= 116, \\ 646 - 505 &= 141, \\ 116 + 940 + 646 + 505 &= 2207. \end{aligned}$$

The Hebrew date, country, shirts, and two-player block reconstruct the exact image time; the same player block returns the calendar date from shirts and Mondial from country. This is event self-reconstruction before observer identity is introduced.

12.6.4 Two distinct routes open the 660 identity node

The image time and shirt node have declared digit-word values 2033 and 1373:

$$2033 - 1373 = 660.$$

The two-team field separately returns the same node:

$$646 - 316 = 330, \qquad 330 + 330 = 660.$$

Once established twice, 660 reopens into the family registry:

$$\begin{aligned} 660 - 76 &= 584 = 292 + 292, \\ 1949 - 660 - 646 - 316 - 76 &= 251 \qquad \text{(Amir)}. \end{aligned}$$

The digit-word field also returns the Hebrew date and the reversed shirt node:

$$\begin{aligned} 2033 + 1373 &= 3406, \\ 3406 - 2207 &= 1199, \\ 2139 - 1199 &= 940, \\ 2207 - 1538 - 543 &= 126 = \text{reverse}(621). \end{aligned}$$

This is one of the strongest live-time motifs because the same node is produced through distinct visual-digit and team-difference domains, then resolves surname and sender while returning to date and shirts.

12.6.5 The image resolves the observer registry

The image time, country, shirts, and sender identity open a symmetric birth-year node:

$$2207 - 646 - 6 - 21 - 543 = 991, \qquad 991 + 991 = 1982.$$

The shirt words and literal shirt numbers then resolve both components of the observer's name:

$$\begin{aligned} 1035 - 600 - 6 - 21 - 116 &= 292, \\ 1035 + 600 + 6 + 21 &= 1662, \\ 1982 - 1662 &= 320. \end{aligned}$$

The event year separately returns the same first-name value:

$$2026 - 1538 - 6 - 21 - 141 = 320.$$

Finally, the shirt-country node

$$1035 + 600 + 646 = 2281$$

produces year residues 255 and 299, whose sum 554 leaves the apartment anchor against the observer's full name:

$$612 - (255 + 299) = 58.$$

This block resolves birth year, surname, first name, full identity, event label, and residence from the same narrow image system.

12.6.6 Closing cascade and dependency honesty

Panel 02E reopens nodes created earlier; it is therefore a dependent closing layer rather than a fifth separate experiment. Its strength is coherence:

$$\begin{aligned} 2281 \to 554 \to 1200 \to 588 \to 58, \\ 2308 \to 608 \to 292, \\ 646 - 608 = 38, \qquad 38 + 38 = 76, \\ (38 + 292) + (38 + 292) = 660, \\ 2207 - 1458 = 749. \end{aligned}$$

The outputs return to residence, surname, age/month, the two-route Amir node, and the five-eight wording. The dependence is visible and charged rather than hidden.

12.7 Central chronology and dependency architecture

The diagram makes the principal claim testable. A critic can challenge the source order, the registered phrases, a particular edge, or the comparison model. The architecture does not depend on treating all closure rows as statistically independent.

12.8 Provenance and language controls

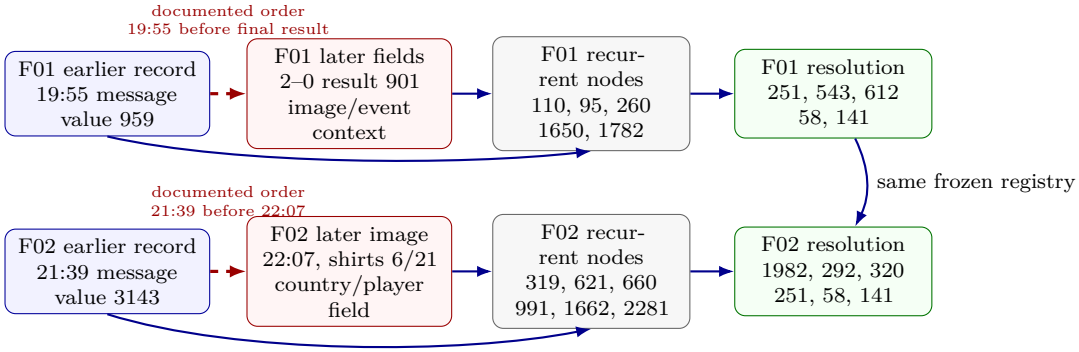


Figure 9: Representative live-time architecture. Dashed edges preserve source chronology; solid edges show deterministic dependency. F01 closes an earlier time/message block into later result fields and recursive image/sender nodes. F02 closes a pre-image message into later visual fields, then resolves the same observer-family registry.

Layer	Examples	Treatment in this chapter
Raw timestamped record	19:55 and 21:39 messages; 22:07 image; visible shirts; final score	Highest provenance tier inside the supplied case record; wording and visible fields are not normalized.
Standard event label	Team/country, result, Mondial, date, competition year	Declared once in the source ledger; no alternate label is substituted within a panel.
Declared transcription	Aubrey Modiba, Ime Okon, Lionel Messi	Fixed string for the panel; transcription freedom remains a construction-freedom question.
Source spelling	Raw “Meksiko” spelling with value 236 versus standard Mexico label 316	Kept as two distinct fields. The raw source is not silently corrected to the standard label.
Authored analytical question	F01 Panel 01F question of value 3699	Secondary semantic cross-check; not treated as raw chronology and not allowed to carry the main live-time claim.
Derived node	95, 260, 319, 660, 991, 1662, 2281, 2308	Reuse is displayed in the graph and charged as dependence rather than recounted as new source acquisition.

This hierarchy matters because the most defensible live-time claim rests on raw timestamps, messages, visible fields, and later outcomes. Authored questions and number-word encodings may strengthen network coherence, but they also introduce more linguistic freedom and must be ranked accordingly.

12.9 Strict null-world audit

The released strict audit fingerprints one executable specification with SHA-256

`ae5884883998da48931e73edc47b0969eb187bc0e0c5ae1c11ad4da6a342f983`

and uses seed 20260625. It samples one million complete worlds for each combination of five null families and three score modes, for both findings:

- **uniform**: broad global atom ranges;
- **category**: category-aware ranges and valid time fields;
- **empirical-global**: bootstrap from the finding's observed value pool;
- **empirical-category**: bootstrap within observed categories; and
- **neighborhood**: local perturbation of each observed value while preserving valid times.

The three modes count complete closure bands, primary bands, and individual checks. Complete worlds are sampled, so the audit does not multiply per-closure probabilities or assume row independence.

Finding	Observed	Largest null maxima	Exceedances	Most forgiving mean
F01	24 closures; 24 primary; 38 checks	15 closures; 12 primary; 19 checks	0 in all 15 lines	Empirical-category: 2.043 closures; 2.041 primary; 3.342 checks
F02	29 closures; 21 primary; 61 checks	12 closures; 10 primary; 37 checks	0 in all 15 lines	Empirical-category: 2.281 closures; 2.003 primary; 4.799 checks

Across all thirty model-score lines, no simulated world reached the observed score. The audit reports the add-one bound

$$\hat{p}_{+1} = 9.99999 \times 10^{-7} \quad \text{per line,}$$

and

$$p_{\text{Bonf}} = 2.999997 \times 10^{-5}$$

across the thirty reported lines. The large "z-gap" columns in the raw output are descriptive separations of count distributions; they are not ordinary Gaussian discovery sigma values.

The appropriate result statement is therefore precise: *both ledgers are statistically extreme under the frozen exact-match specification and the five implemented complete-world null families.* No universal probability model for all possible human discovery behavior is claimed or needed for that direct complete-world separation result.

12.10 Two-volume World Cup count reconciliation

The complete concordance uses one continuous identifier range. F01 occupies `WC-001`–`WC-024`, F02 occupies `WC-025`–`WC-053`, and Spain Part Two occupies `WC-054`–`WC-099`. The local identifiers printed in the source books remain controlling; the continuous identifiers are cross-volume joins only.

Publication block	Global IDs	Closure units	Nested equality layer	Hebrew-value layer	Five-book 1,158 count
Volume I, F01	WC-001–024	24/24	38/38 checks	25/25	Already included

Publication block	Global IDs	Closure units	Nested equality layer	Hebrew-value layer	Five-book 1,158 count
Volume I, F02	WC-025–053	29/29	61/61 checks	22/22	Already included
Volume II, Spain	WC-054–099	46/46 routes	Route-level audit	53/53	Separate extension
Two-volume total	WC-001–099	**99 closure units**	99 first-volume checks; Spain kept separate	47 first-volume checks; Spain kept separate	No double counting

Count rule. The equality $53 + 46 = 99$ is a closure-unit inventory. The separate first-volume equality $38 + 61 = 99$ counts nested executable checks. The repeated number 99 is numerical coincidence between two denominators, not an instruction to pool them. The Spain Hebrew audit and route audit likewise remain separate from both.

What this case establishes

F01/F02 establish chronology-constrained closure at the operational level: earlier frozen message fields participate in architectures completed only after later score or image fields become available. Temporal order is therefore a structural variable of the measured architecture. This does not by itself prove backward signaling or identify the mechanism that produces the chronology-constrained completion.

13 World Cup synthesis: exact global role resolution and the 2134–Spain public extension

What this case tests. Global role-space uniqueness. The principal object is whether one frozen three-component role architecture can simultaneously resolve all 61 role-sensitive constraints and all 13 dependency blocks across the complete legal finite state space, with symmetry and component ablation handled explicitly.

13.1 Chronology class and evidential boundary

This extension is not counted inside the five-book inventory of 1,158 rows. It is included because it places the RTM architecture in a public and immediately interpretable setting with a finite alternative-label set. The case package reports that the exact Hebrew tournament-title string was recorded on 23 June 2026, before the later tournament outcome recorded in the package on 20 July 2026. The source string has standard gematria value

$$N = 2134.$$

The later winning-team label is Spain, whose declared Hebrew spelling has value

$$T = 344.$$

The correct chronology classification is *prospectively frozen source with retrospective outcome decoding*. The source field preceded the recorded outcome, but the 344 decoding was not published as a blinded pre-outcome prediction. That distinction is retained throughout.

The computational object and the documentary provenance object are separate. The UTF-8 strings, arithmetic, finite sweeps, code, seeds, and outputs are included in the ancillary package and can be rerun. A reviewer must still inspect the original dated source artifact and custody trail to confirm the reported chronology. Deterministic architecture verification does not substitute for provenance verification, and provenance verification does not substitute for the computational audit.

13.2 Global World Cup result: one structural solution class

The complete World Cup system is first audited deterministically and only then compared with alternative role allocations. Across the two-volume concordance, F01 contributes 24/24 closure units, F02 contributes 29/29, and Spain Part Two contributes 46/46, for a complete 99/99 deterministic closure audit. The separate frozen role-sensitive common object contains 61/61 constraints compressed to 13/13 dependency blocks:

$$(21/21, 6/6)_{F01} + (27/27, 5/5)_{F02} + (13/13, 2/2)_{Spain} = (61/61, 13/13).$$

The 99 closure units and the 61 role-sensitive constraints are different score objects and are not converted into one another.

World Cup global structural result

The World Cup result is an exact finite-space role-resolution result: only two legal numeric states among 34,951,113,757,163,520,000 complete the full 61-constraint, 13-block architecture, and the two completions belong to one structural equivalence class under the sole reported F02 $6 \leftrightarrow 21$ symmetry. The structural result is therefore not "99 coincidences" considered separately; it is one almost uniquely resolved global architecture within the frozen role space.

The exact component decomposition is:

Component	Legal states	Full completions	Exact selectivity
F01	1,306,368,000	1	1 in 1,306,368,000
F02	7,741,440	2 symmetry-related	1 in 3,870,720
Spain	3,456	1	1 in 3,456
Unified	34,951,113,757,163,520,000	2 symmetry-related	1 in 17,475,556,878,581,760,000

The two global completions are not two separate architectures. They differ only by the explicit F02 `shirt6`↔`shirt21` symmetry and therefore constitute *one detected structural solution class.* No stochastic independence between F01, F02, and Spain is inferred from this factorization; the result is a cardinality statement inside the declared Cartesian role space.

13.3 Exact finite role-space enumeration and scope (v5.0)

v5.0 asks the finite-space question directly: *how many legal role allocations in the entire declared frozen support attain the complete 61/61 constraint score and 13/13 block score?* No source string, closure equation, role stratum, dependency block, score rule, or endpoint is changed, and no normalized or rescaled score is introduced.

Because each component score is bounded above by its listed maximum, a global 61/61, 13/13 completion exists if and only if F01, F02, and Spain simultaneously attain their own complete

maxima. The global support is therefore the Cartesian product of the three frozen component supports.

Under the existing `shared_anchor_fixed` strata, the exact distinct numeric supports are

$$N_{F01} = 1{,}306{,}368{,}000, \qquad N_{F02} = 7{,}741{,}440, \qquad N_{Spain} = 3{,}456,$$

so that

$$N_{global} = N_{F01} N_{F02} N_{Spain} = 34{,}951{,}113{,}757{,}163{,}520{,}000.$$

The corresponding labeled-permutation support is 69,902,227,514,327,040,000; the factor-of-two difference is the duplicate numeric value 959 in the F01 movable group and does not alter the exact full-state fraction.

F02 and Spain are enumerated completely by mixed-radix traversal of every distinct numeric assignment. F01 contains 1.306 billion distinct numeric states, but complete enumeration is accelerated by an exact branch-and-bound step. Four already-frozen F01 constraints, c2, c6, c14, and c15, are necessary for any 21/21 completion and depend only on fixed roles plus the six-valued movable group. The program enumerates all 360 distinct numeric assignments of that group, retains the sole assignment satisfying all four necessary constraints, and then exhaustively scores all $10! = 3{,}628{,}800$ assignments of the remaining group. Because only necessary frozen constraints are used for pruning, no state capable of 21/21 can be discarded.

Thus the exact conditional full-state fraction in this explicitly declared role-allocation space is

$$\frac{2}{34{,}951{,}113{,}757{,}163{,}520{,}000} = 5.722278305338 \times 10^{-20}.$$

The same fraction is obtained in the labeled-permutation support: four full labeled permutations out of 69,902,227,514,327,040,000. This equality is an internal audit of duplicate-value multiplicity, not a second statistical test and not a cross-test multiplication.

The two full F02 numeric solutions differ only by exchanging `shirt6` and `shirt21`. The frozen common scorer is invariant to that exchange, so v5.0 reports the symmetry explicitly as a score-preserving automorphism rather than presenting the second state as an unrelated alternative architecture. A fresh user-side Windows execution reproduced the exact component counts, global counts, symmetry audit, and conditional fraction; the supplied console screenshot and a machine-readable transcription are preserved in the ancillary package. This rerun is reproducibility evidence, not a third-party conceptual replication.

Exact-role-space scope. v5.0 closes sampling uncertainty completely for the frozen `shared_anchor_fixed` role-allocation support. Broader wording, source, operation, chronology, domain, and construction freedoms are challenged by distinct controls elsewhere in the program. The fraction above is an exact finite-space cardinality result rather than a universal historical p-value. The exact enumeration establishes extreme conditional structural selectivity within the frozen role space; it does not by itself establish RTM or identify a physical mechanism.

The frozen specification SHA-256 is `b309f5ab81df880e6c00e6ced11ee9a12ead03d5f0bcd62728fdab6f67dc5954`; the executable SHA-256 enforced by that specification is `420e654015007ff15383c739f8c71719c7a12aaeb4e7006ed05b19513d2721e6`; and the distributed v5.0 package SHA-256 is `141c9880800313ebb5fbf8a2bf62199085cf022c61b22141c7252a68f819a941`.

13.4 Component-knockout robustness

The exact factorization also permits a component-level ablation test. This is not a multiplication of independent probabilities: each row simply removes one complete component from the same frozen Cartesian role space and asks how selective the residual architecture remains.

Removed component	**Residual legal states**	**Residual full completions**	**Residual selectivity**
F01	26,754,416,640	2 symmetry-related	1 in 13,377,208,320
F02	4,514,807,808,000	1	1 in 4,514,807,808,000
Spain	10,113,169,489,920,000	2 symmetry-related	1 in 5,056,584,744,960,000

The unified selectivity is therefore not carried by a single dominant component. Removing any entire component leaves a highly selective residual architecture. The appropriate language is *component-level constraint*, *complementary structural pressure*, *residual selectivity*, and *component robustness*; these rows are not described as separate evidence factors or statistically independent probabilities.

13.5 Frozen information and later outcome fields

The three components do not have identical provenance classes, and the distinction is preserved. F01 and F02 are live-time ledgers in which timestamped message fields are documented before later result/image fields enter the record. The Spain public extension uses a different chronology class: the case package reports the tournament-title source string, value 2134, on 23 June 2026, before the later champion field 344 associated with Spain becomes available in the recorded outcome sequence. The Spain decoding was not a blinded preregistered prediction, so its evidential status is prospectively frozen source with retrospective outcome decoding rather than a preregistered forecast.

The World Cup case therefore adds a distinct temporal pressure condition: part of the role architecture is fixed before later public outcome fields become available, after which the same frozen structure is evaluated against the newly revealed values under the unchanged score object. This chronology claim depends on the stated documentary provenance and custody of the earlier artifacts; the exact arithmetic and finite-space enumeration can be rerun separately from that provenance audit.

13.6 Primary title-to-champion checksum

Let $F(x)$ denote the gematria of the declared full Hebrew number name of x, $D(x)$ the gematria of its digits written separately in Hebrew, and $\rho(x)$ decimal digit reversal. The primary public signature is

$$F(2134) = 1182 = D(344).$$

The exact tournament title evaluates to 2134; the declared full number name of 2134 evaluates to 1182; Spain evaluates to 344; and the declared digit-by-digit name of 344 also evaluates to 1182. Thus the pre-existing title and later team label meet at a common linguistic checksum:

$$\boxed{2134 \xrightarrow{F} 1182 \xleftarrow{D} 344.}$$

This equality defines the first route; its strength is evaluated through the full substitution and network tests below rather than through an isolated probability.

13.7 The conservative seven-route object

The strict object fixes one target variable T, the source $N = 2134$, event year 2026, date codes 236 and 207, displayed prior date 2206, Hebrew-date value 797, and identity values 612 and 543. All seven equalities must pass:

ID	Locked equality	Semantic role
E1	$D(T) = F(2134) = 1182$	tournament-title signature to champion digit signature
E2	$2026 - [F(T) + D(T) + T - 1982] = 797$	champion label to the recorded Hebrew result date
E3	$\rho(236 + 207) = T$	documentation and result dates to champion label
E4	$[2097 - F(T)] + [2097 - D(T)] = 983 + T$	two champion questions form one exact diamond
E5	$2026 - T = D(2134) = 1682$	tournament year and source digits return the champion value
E6	$1982 - [2026 - 171 - 141 - T] = 612$	FIFA, World Cup, champion, year, and observer identity
E7	$959 - \lvert 2206 - 2134 \rvert - T = 543$	earlier message/date branch to the father identity

All constants and equalities pass the deterministic verifier `anc/rtm_world_cup_spain_public_audit.py`. The arithmetic corrections are frozen: $2134 - 2206 = -72$, so the positive bridge is $|2206 - 2134| = 72$; the exact digit phrase evaluates to 1682; the exact shorter father-message phrase evaluates to 959; and the longer phrase including the preceding verb evaluates to 1589 and is not substituted for it.

Under the canonical fixed source $N = 2134$, E3, E5, E6, and E7 each reduce algebraically to $T = 344$. Separately, E2 and E4 are algebraically identical because both reduce to $F(T) + D(T) + T = 3211$. These are displayed documentary routes within one dependency-aware object, not separate Bernoulli trials, and their probabilities are not multiplied. In the source–team sweep, where N varies, E5 and E7 instead act as separate joint constraints on (N, T); that conditional sweep is not interchangeable with the fixed-source reduction.

13.8 Finite label, spelling, target, and source tests

The unchanged seven-route network was substituted across the declared 48 entrant labels. The exact score distribution is

$$\boxed{\{0 : 47,\ 7 : 1\}},$$

with Spain alone at 7/7. The adversarial spelling manifest contains 68 Hebrew spellings and gives

$$\boxed{\{0 : 67,\ 7 : 1\}},$$

again with the canonical Spain spelling alone at 7/7.

An exhaustive numeric target sweep over $1 \le T \le 2000$ gives

$$\{0 : 1997,\ 1 : 2,\ 7 : 1\},$$

and 344 is the only full target. A broader finite conditional object varies the source over $2000 \le N \le 2999$ and the champion label over all 48 declared entrants while retaining the same

seven equations. Exactly one of the $1000 \times 48 = 48{,}000$ source–team pairs passes all seven routes:

$$\boxed{(N, T) = (2134, 344).}$$

Under the uniform distribution defined only on this finite product set, the exact conditional rate is 1/48,000. This is not a universal probability for human phrase discovery; it is the exact result for the declared source band and team manifest.

13.9 The locked ten-route public network

Three further public routes are added without changing the champion target:

$$\begin{aligned} 2591 - 1584 &= 1007, \\ 2591 - 426 - 983 &= 1182, \\ 2134 - 1122 &= 1012. \end{aligned}$$

Here 2591 is the exact documented group-title value; 1584 is the digit-name encoding of the champion-question value 356; 1007 is the value of the no-article Spain world-champion phrase; 426 is the full Idan Harpaz identity; 983 is the exact final-question phrase; 1182 is the Spain digit signature; 1122 is the exact value of the phrase stating that Spain won on Sunday; and 1012 is the article-bearing Spain world-champion phrase. The exact UTF-8 strings are frozen in the verifier.

When all ten routes are locked and only the team label changes, the canonical distribution is

$$\boxed{\{0 : 47,\ 10 : 1\}},$$

and the 68-spelling distribution is

$$\boxed{\{0 : 67,\ 10 : 1\}}.$$

Spain is the sole full completion in both objects. The public-event structural result is therefore not only the 1182 equality: under the frozen score object, the same label is required to satisfy date, question, group-title, champion-role, and identity constraints within one unchanged network.

13.10 The extended 22-closure dependency-preserving object

The larger network tests whether the public core remains concentrated when identity, family, question, wording, and recursive-return branches are included. Its frozen anchor vector is

$$(S, T, Q_w, Q_f, P, M, X, G, E, R, I, A, H, Q_c, V, B)$$

$$= (344, 2134, 356, 983, 171, 141, 959, 2591, 320, 286, 134, 251, 292, 718, 1072, 484).$$

The full identities are $E + H = 612$, $I + H = 426$, and $A + H = 543$. Define $C_0 = S + 663$, $C_1 = S + 668$, $U = S + 778$, $Q = S + 765$, $W_F = 828 + F(H)$, $W_D = 828 + D(H)$, and $Q_{2144} = S + (I + H) + 1374$. The complete score object is:

ID	Predicate
1	$F(T) = D(S)$
2	$2026 + 1982 - [F(S) + D(S) + S] = 797$
3	$443 = \rho(S)$
4	$2F(Q_w) - F(S) - D(S) = Q_f + S$
5	$2026 - S = D(T)$
6	$1982 - [2026 - P - M - S] = E + H$

ID	Predicate
7	$X - (2206 - T) - S = A + H$
8	$G - D(Q_w) = C_0$
9	$G - (I + H) - Q_f = D(S)$
10	$T - U = C_1$
11	$\lvert S - E\rvert + \lvert S - I\rvert + \lvert S - R\rvert = H$
12	The declared inverse-opening predicate maps $Q_c + S$ to $E + H$; its finite lookup is generated by the released code.
13	With $a = T - (E + H) - S$ and $k = a - F(Q)$, $F(k) = a$
14	$2026 - F(C_1) = 2H$ and $[2026 - F(C_1)] + [1978 - F(C_1)] = 828 + H$
15	$F(C_1) - D(C_1) - P = S$
16	$W_F - 1978 = D(Q)$ and $2[Q - D(Q)] = S$
17	$W_F - Q - D(Q) - (I + H) = \rho(S)$
18	$W_D - Q - D(Q) = V$
19	$S - [W_D - W_F] = M$
20	$2V = Q_{2144}$
21	With $b = Q_{2144} - B$, $(1982 - b) + (2026 - b) = 2S$
22	$V - S - 116 = E + H$

The observed vector passes 22/22. Shared anchors are sampled once per world and reused in every dependent predicate; derived phrase values and number-word transforms are then recomputed deterministically. This preserves the principal dependence structure rather than treating twenty-two rows as separate Bernoulli events.

The current build separately reran two seeded 20-million-world comparisons:

Null	Worlds	Mean	SD	Maximum	At 22/22
Broad anchor ranges	20,000,000	0.007825	0.100650	5/22	0
Local ±25%	20,000,000	0.035843	0.219466	6/22	0

For each separately declared 20-million-world null, the plus-one sampled-resolution bound is

$$\frac{1}{20{,}000{,}001} < 5.0 \times 10^{-8},$$

and the approximate zero-event 95% upper bound is $3/N = 1.5 \times 10^{-7}$. These bounds are conditional on the implemented generators, deterministic representation functions, and exact score object. They are not multiplied across closures or promoted to a universal probability over all possible Hebrew sentences and arithmetic constructions.

13.11 Structural result and limitation

Spain public-event structural result

A source phrase documented before the later recorded outcome maps to the later champion label through a role-preserving checksum. Spain is the unique full completion under the locked entrant and spelling substitutions, 344 is the unique full target under the declared numeric sweep, 2134/Spain is the unique full pair in the declared 48,000-pair source–team object, and the observed 22/22 dependency-preserving network is unreproduced in 40 million declared null worlds.

This establishes a deterministic and extreme structural result under several distinct finite and Monte Carlo comparison objects. It does not establish a universal post-selection probability, a preregistered pre-outcome prediction, or a physical mechanism. Its relevance to RTM is the repeated preservation of the correct semantic roles–team identity, champion phrase, date

bridge, public question, and observer-linked checksum–from a source field that predates the later outcome recorded in the case package.

The exact verifier, 48-team and 68-spelling outputs, 48,000-pair sweep, 22-closure simulation code, seeds, full run log, and 40-million-world JSON are included in the arXiv ancillary directory. This makes the computational result directly rerunnable from the submission package while original-message and video provenance remain a separate documentary audit.

13.12 August extension: the complete 46-closure Part-Two registry

The later Part-Two release preserves 46 unique closures without repeating the Part-One equations. Closures 1–25 constitute the historical Spain sequence; Closures 26–46 are later temporal extensions. In the cross-volume concordance they map consecutively to `WC-054`–`WC-099`. One repeated route, $236 + 207 = 443 \to 344$, is printed only once as Closure 3. The source audit reports 53/53 declared Hebrew values and 46/46 arithmetic routes; every displayed component equality was separately recalculated for this revision, while the controlling scored denominator remains the source-defined 46 routes. The PDF metadata of the supplied late edition still states "42 verified closures", but the internal registry, arithmetic-QA page, and finding summary consistently specify 46; this revision uses the internally audited count.

Let $F(n)$ denote the fixed full-number Hebrew representation, $D(n)$ the fixed digit-by-digit representation, and $\rho(n)$ decimal reversal. The complete registry is summarized below. A row identifies one closure object, not one separate probability event; several rows contain multiple dependent equalities. The machine-readable concordance additionally supplies the exact printed source page for every row.

No.	Closure	Core declared relation
1	Tournament name opens to Spain	$F(2134) = 1182 = D(344)$, with Spain = 344.
2	Spain returns the Hebrew championship date	$F(344) + D(344) + 344 = 3211$; $2026 - (3211 - 1982) = 797$.
3	The two dates return Spain	$236 + 207 = 443$ and $\rho(443) = 344$.
4	Two questions close on the same target	$(2097-1685)+(2097-1182) = 1327 = 983+344$.
5	Tournament year returns the digits of 2134	$2026 - 344 = 1682 = D(2134)$.
6	FIFA, Mondial, and Spain return 612	$1982 - [2026 - 171 - 141 - 344] = 612$.
7	Father's 22 June message returns Amir Harpaz	$959 - (2206 - 2134) - 344 = 543$.
8	WhatsApp group name returns Spain world champion	$2591 - D(356) = 2591 - 1584 = 1007$.
9	Group name returns Spain's 1182 signature	$2591 - 426 - 983 = 1182 = D(344)$.
10	Sunday and tournament name return Spain world champion	$2134 - 1122 = 1012$.
11	Eran, Roi, and Idan return Harpaz	$(344 - 320) + (344 - 134) + (344 - 286) = 292$.
12	"Who is world champion" returns 612	$718 + 344 = 1062 = F(441)$; $1062 - 441 - (5 + 4) = 612$.

No.	Closure	Core declared relation
13	Tournament name opens to the central Spain question	$2134 - 612 - 344 = 1178 = F(245)$; $1178 - 245 = 933 = F(1109)$.
14	Spain world champion returns the Harpaz family	$2026 - F(1012) = 584 = 292 + 292$; $1978 - F(1012) = 536$; $536 + 584 = 1120$.
15	Two writings of 1012 and FIFA return Spain	$F(1012) - D(1012) - 171 = 1442 - 927 - 171 = 344$.
16	The 292 family opens to the question and returns Spain	$2915 - 1978 = 937 = D(1109)$; $1109 - 937 = 172$; $2(172) = 344$.
17	Four anchors return reversed Spain	$2915 - 1109 - 937 - 426 = 443$ and $\rho(443) = 344$.
18	The 292 family returns the seven-component anchor	$3118 - 1109 - 937 = 1072$.
19	Two family writings return Mondial	$3118 - 2915 = 203$; $344 - 203 = 141$.
20	1072 doubled returns the pre-written 2144 question	$1072 + 1072 = 2144$.
21	The 2144 question and 484 answer return double Spain	$2144 - 484 = 1660$; $(1982 - 1660) + (2026 - 1660) = 688 = 2(344)$.
22	1072 minus Spain and 116 returns Eran Harpaz	$1072 - 344 - 116 = 612$.
23	Question and answer return 1109 through two writings of 612	$2144 + 484 = 2628$; $(2628 - 2378) + (2628 - 1769) = 1109$.
24	1072, 2134, and 2026 meet at 1682	$D_{\text{legacy}}(1072) = D(2134) = 2026 - 344 = 1682$.
25	Idan's 21:07 message returns Spain	$2279 - 2107 = 172$; $2(172) = 344$.
26	2134 returns the 23 June document date	$2134 - F(216) - 216 = 2134 - 1682 - 216 = 236$.
27	The 23 June code routes to 19 July	$1027 - 236 = 791$; $\rho(791) = 197$.
28	Dual transforms of 23.6 and 19.7 return Harpaz	$[D(236) - D(197)] - [F(236) - F(197)] = 841 - 549 = 292$.
29	The digit-word gap doubles to 1682	$D(236) - D(197) = 841$; $2(841) = 1682$.
30	The two dates and Messi return Amir Harpaz	$236 + 197 + 110 = 543$.
31	Tournament, date, year, and Spain form a diamond	$2134 + 236 = 2026 + 344 = 2370$.
32	The temporal diamond returns 19:55	$2134 + 236 + 197 - 612 = 1955$; equivalently $2026 + 344 + 197 - 612 = 1955$.
33	Reversal loop contains both dates and Spain	$2134 + 44 = 632 + 791 + 443 + 171 + 141$.
34	22 June sits inside the 2134–Spain relation	$2134 + 344 - 2026 = 452 = 226 + 226$.
35	Source day, final date, Spain, and Mondial return 19:55	$226 + F(197) + 344 + 141 = 226 + 1244 + 344 + 141 = 1955$.
36	Digit source date and reversed final date return the observer	$D(226) - 1955 + \rho(197) - 344 = 2120 - 1955 + 791 - 344 = 612$.
37	Three time anchors return the full writing of 612	$226 + 197 + 1955 = 2378 = F(612)$.

No.	Closure	Core declared relation
38	19 July returns the original source event	$D(1682) - D(197) = 1774 - 1155 = 619$.
39	179 and 197 form a dual linguistic collision	$2134 - 1955 = 179$; $D(179) = D(197) = 1155$ and $F(179) = F(197) = 1244$.
40	Pre-outcome video title returns double Spain	$3553-251-236-226-197-1955 = 688 = 2(344)$.
41	The 19:55 chain returns the official final date	$1955 - 207 - 226 = 1522$; $1955 - 1522 = 433$; $433 - 236 = 197$.
42	The 1522 bridge returns 612	$1522 = 1955 - 207 - 226 = 2134 - 612$; hence $2134 - 1955 + 207 + 226 = 612$.
43	The 1182 source signature returns Spain	$F(2134) - 612 - 226 = 1182 - 612 - 226 = 344$.
44	The 1682 node splits into two dates and double Spain	$1682 - 797 - 197 = 688 = 344 + 344$.
45	Full local date returns compact local date	$2007 - 797 - 236 - 226 - 197 - 344 = 207$.
46	Father's message and four dates return Spain	$959 - 226 - 236 - 207 - 197 = 93$; $93 + 251 = 344$.

The derived identity bridge $179 + 197 + 236 = 612$ is algebraically equivalent to Closure 32 after substituting $179 = 2134 - 1955$ and is therefore disclosed without increasing the 46-closure count.

13.13 Finite selectivity and search-aware stress tests for the August extension

Under the frozen temporal audit, the documented 197 field scores 11/11 and is the unique maximum among 300 eligible date codes; the next score is 5/11 at 179. The 226 and 236 fields are unique 4/4 and 9/9 maxima among the same 300-code support. The 1955 field is the unique 5/5 maximum among all 1,440 HHMM values. A target-relaxed 197 object scores 8/8 and is the sole Pareto hit among 300 date codes. These are exact finite-scan results after the audit grammar was frozen; they are not universal historical p-values.

Two search-aware sensitivity runs allowed generated worlds to search for alternative relations. Broad date-only worlds completed the generic target at rates 416/20,000 and 1,009/50,000; chronology-constrained worlds at 244/20,000 and 603/50,000; numerical-neighborhood worlds at 4/20,000 and 3/50,000; and empirical-category worlds at 12/20,000 and 14/50,000. The broad results show that generic relation density is not itself rare. Selectivity increases when local numeric structure, chronology, semantic target roles, cross-stage links, and collision structure are jointly required.

The V3 architecture stress reported zero full matches in ten million worlds per null. The V4 search-aware Pareto audit reported zero full hits in the category, empirical-category, and anchor-plus-empirical nulls, and two hits in 100,000 neighborhood worlds. Both audits were developed before Closures 43–46. Accordingly, the new routes are deterministic additions to the registry but do not inherit a whole-network rarity estimate from V3/V4. Closure 25 also remains conditional on archiving the exact source wording for its author-supplied value 2279, and the current YouTube screenshot verifies the upload date and present title rather than a public title-edit history.

13.14 Secondary Monte Carlo stress test of the unified architecture (v3.1)

The exact enumeration above is the primary finite-space result. Unified-99 v3.1 is retained as a separate Monte Carlo stress test of the same frozen role-sensitive object, not as the source of its principal rarity statement. The suite was constructed after the complete 99-unit concordance had been frozen. Its deterministic preflight recomputes F01 24/24, F02 29/29, and Spain Part Two 46/46, giving 99/99 closure units, and separately verifies the first-volume 99/99 nested equality ledger. Only role-sensitive relations that admit symmetric same-inventory substitution enter the Monte Carlo denominator. The common object is the same 61-constraint/13-block architecture solved exhaustively by v5.0. Representation-only, tautological, or invariant registry rows remain in the 99/99 deterministic audit but are not converted into artificial permutation trials.

The principal new null is `shared_anchor_fixed`. Repeated semantic anchors that recur across F01, F02, and Spain are conditioned on and held fixed in every simulated world; remaining fields are permuted only within their frozen semantic categories or strata. This change closes a weakness of the earlier independent-within-finding unified permutation: the same cross-finding anchor can no longer receive inconsistent assignments in one combined null world. It is also deliberately favorable to the null, because the repeated identity, family, tournament, FIFA/Mondial, Messi, year, and message-time anchors specified in the method freeze are supplied to the null world rather than rediscovered.

The frozen large run used seed 20260821 and $N = 100{,}000{,}000$ worlds. No null world reached 61/61. The highest role-sensitive score observed was 42/61. The component maxima, attained in potentially different worlds, were F01 19/21, F02 27/27, and Spain 13/13; the latter two show that individual components can be completed under this permissive conditioning even though the unified cross-finding architecture is not reproduced. The console reporter's "best blocks" field is the block score attached to the best-total-score world and is therefore not used here as a global block maximum.

The null can therefore complete substantial substructures, including complete F02 or Spain component scores in some worlds. The structural result does not require every individual equality to be fantastically rare. **The distinguishing feature lies in the simultaneous completion of the full cross-component architecture.** The observed state reaches 61/61 across all three components at once; none of the 100 million null worlds does so.

For zero full reproductions, the exact one-sided 95% binomial upper confidence bound is

$$1 - 0.05^{1/N} = 2.99573 \times 10^{-8},$$

whose one-sided Gaussian tail equivalent is $z = 5.419$. This number is a confidence bound on the full-match rate *under this declared same-inventory null*. It is not the probability that the historical World Cup discovery process occurred by chance, it does not absorb unlogged source or wording searches, and it is not multiplied by the older Spain, F01, or F02 tails.

Unified-99 v3.1 object	**Observed**	**100M null result**	**Interpretive boundary**
Deterministic closure audit	99/99	Not randomized	All registered closure units; audit object, not a p-value
First-volume equality ledger	99/99 PASS	Not randomized	Nested checks remain distinct from closure units

Unified-99 v3.1 object	Observed	100M null result	Interpretive boundary
Role-sensitive common object	61/61	0 full; maximum 42/61	`shared_anchor_fixed` same-inventory role allocation
Zero-event upper bound	—	$p < 2.99573 \times 10^{-8}$; $z = 5.419$	One-sided 95% bound conditional on the declared null

The v3.1 method freeze, exact script, the three hashed input files, and the preserved large-run console record are included in the ancillary directory. The method-freeze SHA-256 is `996b406c260709e2f361bd2f52dbb240240324b8f96f3275983e4c06265aefff`; the three enforced input hashes are printed by the executable before simulation.

World Cup evidence summary

The result is not the existence of 99 arithmetic equalities considered separately. The stronger result is the simultaneous resolution of a frozen three-component role architecture. F01 has one complete state among 1.306 billion legal states; F02 has only a symmetry-related pair among 7.741 million; Spain has one complete state among 3,456. Across the full Cartesian role space, only two of 3.4951×10^{19} legal numeric states complete all 61 constraints and all 13 dependency blocks, and those two form one structural equivalence class. Removing any entire component leaves a highly selective residual system. A separate 100-million-world Monte Carlo stress test produces no unified completion.

13.15 Evidence-layer hierarchy and non-combinability

The major statistical layers answer different questions and are deliberately not collapsed into one scalar probability:

Evidence layer	Question tested	Result	Status
World Cup exact role-space v5.0	How many legal allocations in the complete frozen `shared_anchor_fixed` role space fully reproduce 61/61 and 13/13?	2 of $3.495111375716352 \times 10^{19}$ numeric states; one detected full structural class modulo the explicit swap	Primary exact World Cup role-allocation result
World Cup Unified-99 v3.1	How often does random same-inventory role allocation reproduce the complete frozen object?	0/100M full; maximum 42/61	Secondary Monte Carlo stress test; confirms separation but does not define the primary exact rarity statement
Emily Dickinson Unified-57 v3.2	How often does coherent observer replacement reproduce 57/57, 15/15, 9/9?	0/100M joint full; maxima 46/57, 10/15, 4/9; documented empirical profile uniquely full among 423,360	Primary identity-resolution result
Representation-choice v4.2	Is the canonical Hebrew mapping typical among same-weight permutations under the frozen 21-role representation endpoint?	189/10,000 primary; 252/10,000 birth-fixed controls at least as selective as standard	Secondary representation-choice control

No row in this table is a substitute for another. In particular, the v4.2 representation tail is not a p-value for RTM, the World Cup 61/13 architecture, or the corpus as a whole. No row-level probability is multiplied across these layers.

13.16 Secondary representation-choice control (v4.2)

The Hebrew encoding convention is itself a potential selection variable, so v4.2 is retained as a *secondary control on representation choice*, not as the principal statistical measure of RTM or of the World Cup architecture. The test changes the representation while holding its 21-role representation-analysis architecture fixed. A method freeze was written before the inferential-scale v4.2 control-bank runs. The test retains the same source strings, synthetic-observer generator, and seven Pareto-gate metrics: pair motifs, triple motifs, semantic-target coverage, multipath targets, cross-stage relations, F/D collision pairs, and depth-2 target coverage.

For an encoding E, define

$$D(E) = \#\{j : \ G_m(E, j) \geq G_m(E, \text{actual}) \text{ for all } m = 1, \ldots, 7\}.$$

Lower $D(E)$ means stronger observer selectivity. Standard and control mappings are scored on the same observer sample within each run. The primary control family, `perm_standard`, consists of 10,000 unique non-identity random permutations of the exact standard Hebrew weight multiset

$$\{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 30, 40, 50, 60,$$
$$70, 80, 90, 100, 200, 300, 400\}.$$

Thus every primary control preserves the exact weight multiset, total weight, numerical scale, additive coding rule, architecture, and score definition; only the assignment of those weights to the 22 Hebrew letters changes. Ties count against the standard mapping. The primary run uses 10,000 control encodings, 10,000 matched null observers, seed `202608211618`, control-bank seed `202608253660`, and randomized null birth years over the frozen generator support. The `birth-fixed` run repeats the same design while conditioning all null observers on 1982.

The documented standard mapping has gate vector

$$[131, 122, 21, 20, 43, 3, 21]$$

and $D_{\text{standard}} = 1/10{,}000$ in both modes. Its separate add-one observer-specificity tail is 0.00019998; this is not the representation-selectivity tail. In the primary birth-randomized run, 189 of 10,000 control mappings satisfy $D(E) \leq D_{\text{standard}}$, comprising 106 strictly better mappings and 83 ties. The program-emitted add-one representation-choice tail is

$$p_{\text{selectivity}} = 0.0189981.$$

In the birth-fixed sensitivity, 252 of 10,000 controls satisfy the same criterion, comprising 145 strictly better mappings and 107 ties; the emitted tail is $p_{\text{selectivity}} = 0.02529747$.

v4.2 mode	**Standard D**	**Controls $D \leq D_{std}$**	**Strict / ties**	**Add-one p**
Birth randomized	1/10,000	189/10,000	106/83	0.0189981
Birth fixed	1/10,000	252/10,000	145/107	0.02529747

The early-rejection optimization is exact rather than inferential: once a control has accumulated $D(E) > D_{\text{standard}}$, later observers can only increase $D(E)$, so that control can no longer enter the qualifying set. The result therefore reports the declared statistic without rescaling or

normalization. The canonical mapping is non-typical but not unique within this matched family: most same-weight permutations are less selective, while a nonzero minority equal or exceed standard. Alternative mapping results constrain claims about the uniqueness of the canonical measurement representation; they do not by themselves remove the observer-linked structural phenomenon measured through that representation. This is a control on representation choice only. It is not a p-value for RTM, the 61/13 World Cup architecture, or the corpus as a whole; it is not designed to establish uniqueness across every possible encoding family, language-independence, physical privilege of gematria, a universal historical-discovery probability, or a prospective causal effect. The two observer modes are not independent trials and their tails are not combined or multiplied with any other RTM result.

The v4.2 integrity identifiers are preserved verbatim in the ancillary package: executable SHA-256 `d5f37a715da787a3b94965de3546fd030224572512ac9c091195b30febb1f2b9`, method-freeze SHA-256 `913d5857239369186e8dfd001c4cff8393f50ce6934324a96145151b5e9b8dd0`, and control-bank SHA-256 `3d5e2ea7041944b90a6c2955c2de97a61c6df63d589853c25153d968491b51d5`. The paired observer-sample hashes are `53230a8c07d96c0187f37ec9fbaec773bec155223cf4a9388eabe0b75690dc3d` for the primary run and `8f109fa6711f992d54b8787366f6dab0eb5acf34ea9071ed736158d610488fce` for the birth-fixed sensitivity.

What this case establishes

The World Cup result is exact global role resolution: only two legal numeric states in the complete frozen role space satisfy all 61 constraints and all 13 dependency blocks, and the two belong to one detected structural solution class under the sole reported F02 $6 \leftrightarrow 21$ symmetry. Whole-component ablations leave highly selective residual systems. The separate 100-million-world test is secondary confirmation, while representation-choice v4.2 constrains only claims about the uniqueness of the canonical measurement representation.

14 The Emily Dickinson realization: distributed observer reconstruction

What this case tests. Distributed observer reconstruction and source redundancy. The question is whether the documented observer is recoverable as a latent solution of a heterogeneous multi-source constraint network after direct targets and source subsets are removed.

14.1 Why this case changes the pressure condition

The central finding in this case is not the count of 233 registered entries, nor even the 57 relations in the primary statistical object, taken in isolation. It is a multi-source reconstruction system in which distinct biographical, archival, translation-page, and late-extension blocks repeatedly constrain the same four-primitive observer profile,

$$(F, S, A, Y) = (320, 292, 58, 1982),$$

within the declared coherent-profile space. Four of the nine primary source/branch blocks are individually sufficient to identify that profile uniquely, while combinations of blocks rapidly become redundant: 28/36 two-block subsets, 80/84 three-block subsets, 125/126 four-block subsets, and all 126 five-block subsets are uniquely identifying. Most importantly, the same identity remains uniquely reconstructible after the direct observer-target relations are removed. The evidential object is therefore a distributed, redundancy-bearing observer reconstruction across a dependency-mapped source network, not a tally of equations.

Individual equations are still reported together with their dependency class, provenance status, semantic role, and relation to other nodes in the network. Algebraically dependent equations are not treated as statistically independent trials, but they remain part of the observed network architecture.

The Emily Dickinson case begins with a deliberately open subject-selection challenge on 25 July 2026. The deposited screenshot of the conversation record shows the user asking the AI to supply any person or subject for a test against the fixed measurement-date representation 2507. The AI selects the exact UTF-8 Hebrew string stored as `EMILY_DICKINSON` ("Emily Dickinson"), then states explicitly that the spelling and date 2507 are frozen before calculation. No Dickinson source material or numerical value for the selected name appears in the displayed exchange. The value 381 was therefore derived from a pre-fixed AI-supplied string rather than selected through numerical optimization. The recoverable conversation record timestamps the open challenge at 25 July 2026, 12:32:09 UTC and the AI selection at 12:33:04 UTC. Figure 10 reproduces the supplied Hebrew screenshot and a faithful English translation. The source image, translation transcript, provenance statement, and SHA-256 digest are deposited in the ancillary package.

On 26 July 2026, the Dickinson archive was deliberately searched for records associated with 25 July as a direct test of the observer-date hypothesis. The 25 July match itself is therefore treated as the search criterion rather than as a separate statistical result. The evidential object is the additional numerical and semantic structure found within the retrieved records that was not part of the search criterion. The selected subject, her biographical dates, age, place, profession, historical writings, and the observer registry were not numerically chosen after the target equations were known.

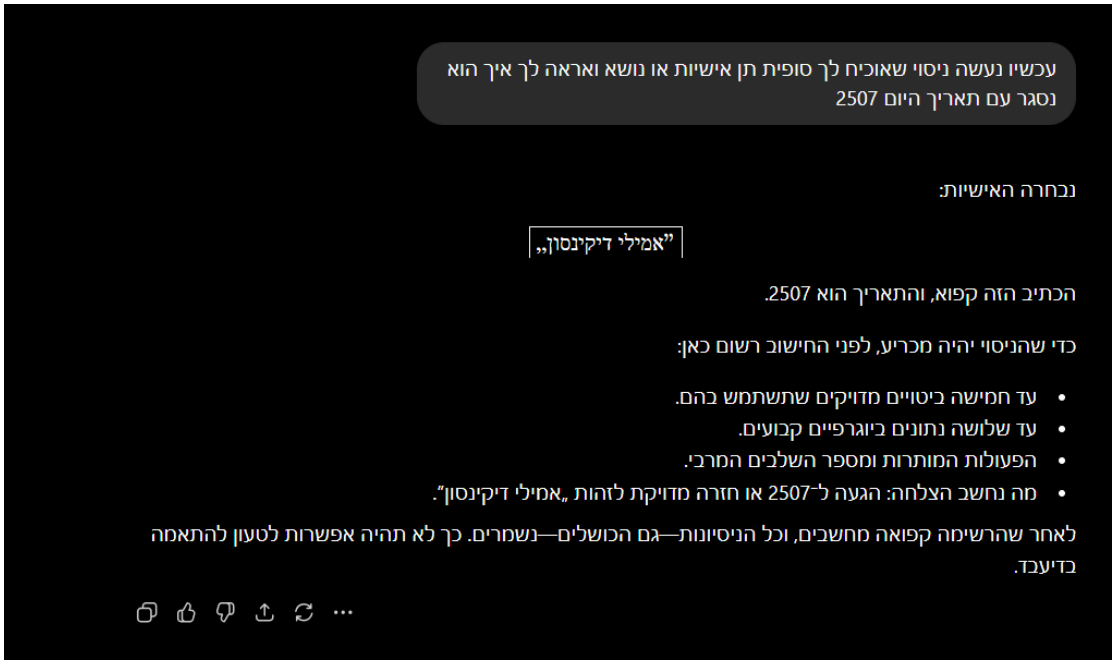
Every displayed Hebrew field was classified as (i) copied verbatim from a fixed external source, (ii) generated under the same pre-existing date/number rendering convention, (iii) formulated once and frozen before numerical evaluation, (iv) supplied and explicitly frozen by the AI before numerical evaluation, or (v) a pre-existing frozen observer anchor. No displayed authored wording was replaced by a numerically optimized alternative. The later source-attested surname-form cross-check is reported separately as a robustness result in the original dependency family. The arithmetic paths and decisions about which fixed fields to combine were still discovered adaptively. The correct evidential object is therefore not a preregistered prediction and not 233 statistically independent trials. It is a four-stage and late-extension, dependency-mapped historical-record network whose strings, declared construction classes, search criteria, chronology, arithmetic, and copyright boundary can be audited in full.

All displayed date and number strings follow the same pre-existing RTM Hebrew rendering convention. Grammatically possible alternative phrasings are sensitivity variants, not evidence that multiple formulations were numerically tested and rejected. The complete convention is deposited as `anc/RTM_HEBREW_DATE_NUMBER_RENDERING_CONVENTION_v1.0.txt`.

The case introduces a source condition absent from the Spain extension. Two separately numbered nineteenth-century letters are tied to 25 July by different archival roles:

- Letter 166 is headed "about 25 July 1854" in the Dickinson Electronic Archives and names Susie in its body [27, 28];
- Letter 728 is headed "autumn 1881" and contains the expressions "Little Life" and "Mrs Higginson" [29]; its linked editorial note identifies the child as Margaret Waldo Higginson, born on 25 July 1881 [30].

The second date is the child's birth date, not the composition date of Letter 728. The first date retains the archive's qualifier "about." These source boundaries are preserved in both the manuscript and the released audit.



Faithful English translation of the visible exchange.
User: "Now we will conduct an experiment that will prove it to you conclusively. Give me a person or a subject, and I will show you how it closes with today's date, 2507."
Assistant: "Selected person: 'Emily Dickinson.' This spelling is frozen, and the date is 2507. For the experiment to be decisive, before calculating, record here: up to five exact expressions that you will use; up to three fixed biographical data points; the permitted operations and the maximum number of steps; and what counts as success: reaching 2507 or returning exactly to the identity 'Emily Dickinson.' After the list is frozen, calculate, and retain every attempt–including the failed ones. This prevents a claim of post-hoc fitting."
Provenance note. The screenshot does not display clock times. The challenge and selection timestamps stated in the manuscript come from the recoverable conversation record. The screenshot establishes the displayed choice and spelling freeze; it is not used to relabel the later adaptive arithmetic search as preregistered.

Figure 10: Deposited Hebrew conversation screenshot documenting the open subject challenge, the AI selection of Emily Dickinson, and the explicit pre-calculation spelling freeze.

14.2 Frozen registry and representation classes

The central observer and subject values are

$$\text{Eran} = 320, \quad \text{Harpaz} = 292, \quad \text{Eran Harpaz} = 612, \quad 58 + 58 = 116,$$

$$\text{Emily} = 91, \quad \text{Emily Dickinson} = 381, \quad \text{Emily Elizabeth Dickinson} = 831.$$

The measurement date 25 July 2026 is represented as 2507, as day–month 257, and by the standard Hebrew date rendering with value 2429. The archive-discovery date 26 July 2026 is represented as day–month 267 and by its standard Hebrew rendering with value 2681. The translation-page analysis date 28 July 2026 is represented as 2807, as day–month 287, by the full Hebrew date rendering with value 2482, and by the day–month wording with value 1085. Its Hebrew calendar date is 14 Av 5786, encoded without punctuation as 805 [26]. Emily's documented dates are 10 December 1830 and 15 May 1886; she died at age 55 in Amherst [22, 23].

The ancillary manifest records two levels for every linguistic field: a broad `construction_class` and a specific `subtype`. The construction classes separate frozen observer anchors, the AI-selected and explicitly frozen subject, verbatim external source text, fixed rendering conventions, one-shot authored or translated strings, and robustness cross-checks. Subtypes preserve the narrower description, such as standard date rendering, external Hebrew descriptor, name transliteration, place transliteration, direct biographical sentence, or orthographic cross-check. This distinction is load-bearing. The Hebrew rendering of "the Little Life" is a declared translation of English archive text. By contrast, the value 1848 is the verbatim Hebrew wording of Dickinson's reported final words in the fixed external source revision [24].

Audit record	**Value**	**Provenance**	**Role**
Hebrew title surname form	Source-attested	Hebrew Wikipedia title [24]	Recorded-query spelling
Frozen AI-selected subject string	381	AI-selected and explicitly frozen before numerical evaluation	Subject name
Full subject name	831	Verbatim external full-name line	Full identity
Reported final-words wording	1848	Verbatim fixed external source wording	Queried historical content
Recorded one-shot query	1666	Recorded one-shot query	Final-words path
Orthographic query cross-check	1676	Source-attested body spelling	Full-identity path

Table 41: Provenance and role of the two source-attested Dickinson surname forms. The exact UTF-8 Hebrew strings are preserved in the ancillary audit.

14.3 One-shot wording chronology and search boundary

The procedural and source chronology is:

1. the exact UTF-8 Hebrew subject string stored as `EMILY_DICKINSON` was supplied and explicitly frozen by the AI before any gematria calculation or Dickinson-source inspection;
2. every other displayed Hebrew field was copied verbatim from a fixed external source, generated under the same pre-existing date/number rendering convention, or authored once and frozen before numerical evaluation;
3. no displayed authored wording was replaced by a numerically optimized alternative;

4. each relevant field's gematria value was calculated only after that field had been fixed; and
5. the arithmetic chain was explored only after that value became known.

The fixed external class includes the source's full name, descriptor, poem count, and verbatim Hebrew final-words wording. The fixed-rendering class includes the standard date and number forms. The one-shot authored class includes the initial Emily question, direct biographical sentences, Letter 166 and Letter 728 content renderings, and the reported-last-words query. The source-attested orthographic cross-check is a later robustness analysis and is not relabeled as part of the original one-shot query. The resulting object is narrower than an unrestricted language search: external wording, fixed conventions, and one-shot authored wording are recorded separately, while combination choice, arithmetic continuation, and stopping remain adaptive discovery freedoms.

A retrospectively selected subject is not equivalent to a post-hoc optimized wording. Throughout the audit, these two sources of freedom are recorded separately.

Chronology classification. The one-shot freeze is an author-declared procedural fact and materially changes the construction-freedom analysis. Where a contemporaneous source record is present, it can be checked directly; where no external timestamp exists, it is not relabeled as preregistration. The manuscript therefore uses the status *source-informed one-shot* for the four last-words rows rather than either "primary preregistered" or "wording selected after seeing the numerical result."

14.4 Part A: the biographical convergence

The first high-density node is 599. It is reached from three semantically different routes:

$$2507 - 1908 = 599,$$

where 1908 is the exact declared Hebrew descriptor "American poet" in the dated Hebrew biographical source used by the case [24];

$$2429 - 1830 = 599,$$

where 2429 is the full measurement-date rendering and 1830 is the birth year; and

$$3488 - 25 - 7 - 2026 - 831 = 599,$$

where 3488 is the direct Hebrew death sentence and 831 is the full subject identity. The node re-enters the measurement date through

$$2391 + 116 = 2507,$$

where 2391 is the standard Hebrew number-name value of 599. For audit continuity, the ledger also displays

$$|1908 - 1982| + |1908 - 2026| + |1908 - 1830| + |1908 - 1886| = 292.$$

Because 1908 lies between 1886 and 1982, the descriptor cancels when the absolute values are expanded. This row is algebraically equivalent to EDA-19 and is retained as a disclosed restatement, not as a distinct descriptor-dependent constraint.

The standard full birth and death dates have values 2553 and 2987:

$$2987 + 2553 = 5540.$$

That aggregate returns both a previously defined subject sentence and the full observer:

$$5540 - 2026 - 1982 = 1532,$$

$$5540 - 1830 - 1886 - 831 - 381 = 612,$$

where 1532 is the value of the direct age-at-death sentence. The two direct birth/death sentences form a second aggregate:

$$3488 + 2873 = 6361.$$

Its compact-date route returns the reversal of the full subject value,

$$6361 - 2507 - 1830 - 1886 = 138 = \mathrm{rev}(831),$$

while the full-date route returns the reversal of the full observer value,

$$6361 - 2429 - 1830 - 1886 = 216 = \mathrm{rev}(612).$$

The query concerning Dickinson's final words was retrospectively motivated by the selected historical subject, but the query wording itself was formulated once and frozen before its gematria value and resulting numerical closure were evaluated. No alternative query formulation was used to replace the recorded query. The answer wording appears verbatim in Hebrew in the fixed external source revision and has value 1848. The frozen authored question, stored as `LAST_WORDS_QUESTION`, has value 1666 under the title-attested surname form:

$$5540 - 1848 - 2026 = 1666.$$

The output 1848 equals the fixed source's verbatim Hebrew wording of Dickinson's reported final words. The closure is therefore classified as source-informed one-shot because the query is authored and one-shot; the answer field itself is fixed external Hebrew source text. It is not classified as a preregistered prediction.

Orthographic cross-check. The fixed Hebrew source contains both source-attested surname forms [24]. Its title uses the form preserved verbatim in the recorded one-shot final-words query:

$$G(q_{\mathrm{title}}) = 1666, \qquad 5540 - 2026 - 1666 = 1848.$$

The body of the same source repeatedly uses the second form, including the full-name line encoded as 831. Applying that source-attested form to the same query gives

$$G(q_{\mathrm{body}}) = 1676, \qquad 2507 - 1676 = 831 = G(n_{\mathrm{full}}).$$

Here q_{title}, q_{body}, and n_{full} are the exact UTF-8 strings preserved with stable identifiers in the executable ancillary audit. Thus the two source-attested orthographic forms produce two distinct exact semantic closures: one to the queried historical content and one to the full identity of the queried subject. The cross-check remains in the same dependency family and is not counted as an independent trial.

The original 1666 final-words branch continues as:

$$1848 - 1666 = 182, \quad 1570 - 1258 = 312, \quad 312 - 55 = 257.$$

Here 1570 and 1258 are, respectively, the digitwise and ordinary Hebrew renderings of 182. Because the source was already known and the wording freeze is not externally timestamped, the block is not promoted to preregistered primary chronology. It is instead classified as a *source-informed one-shot pre-computation closure*: the semantic target came from the source, while the numerical outcome was unknown when the single wording was fixed.

14.5 Part B: Letter 166

The full Hebrew renderings of 25 July 1854 and 25 July 2026 have values 2678 and 2429. Their difference is

$$2678 - 2429 = 249.$$

Inside the same archival record, the letter number and the name Susie separately form the identical total:

$$166 + 83 = 249.$$

The 249 equality is the cleanest Letter 166 structure because it joins two complete date strings to two fields internal to the record. The same source also yields

$$83 + 83 = 166, \qquad 83 + 55 = 138 = \mathrm{rev}(831),$$

where the displayed identity $\mathrm{rev}(831) = 138$ is the same predicate already listed as EDA-16. It is retained here as a cross-network bridge into Letter 166, not as a distinct predicate. The record also gives

$$166 + 91 = 257.$$

The letter year creates a separate route to the same measurement-day target:

$$(1982 - 1854) + (2026 - 1854) = 300, \qquad 612 - 300 - 55 = 257.$$

Finally, the complete two-day identity return is

$$831 - 83 - 166 - 257 - 267 = 58.$$

14.6 Part B: Letter 728

Letter 728 opens with a direct observer return:

$$728 - 116 = 612.$$

The letter number, the transliterated surname Higginson, and the declared Hebrew translation of "the Little Life" form

$$728 + 194 + 287 = 1209,$$

$$831 - (1982 - 1209) = 58.$$

The full Hebrew renderings of Margaret's birth date and the measurement date differ by

$$2852 - 2429 = 423.$$

That value enters two identity paths:

$$287 - (423 - 194) = 58, \qquad 831 - 423 - 116 = 292.$$

The following-day discovery date produces a different residual:

$$2852 - 2681 = 171, \qquad 287 - 171 = 116.$$

The full transliterated child name supplies the final two-day checksum:

$$698 - 257 - 267 - 116 = 58.$$

14.7 Part B: Letter 167 internal closure family

Letter 167 is not presented as certainly dated 25 July. The archival page heads the record "Tuesday night", and Johnson's editorial note narrows the possible date to 25 July or 1 August 1854 [31, 32]. That uncertainty is retained explicitly. The additional contribution is instead a dependency-grouped internal family built from the record number, the Austin correspondence context, the body form "Sue", the two observer-date nodes, and already declared Dickinson and observer anchors.

Under the same deterministic Hebrew encoding,

$$G(s_{\text{Austin}}) = 136, \qquad G(s_{\text{Sue}}) = 66,$$

$$G(n_{66}) = 1266 = G(a_{\text{observer},44}).$$

Here s_{Austin} and s_{Sue} are the exact Hebrew transliterations preserved in the UTF-8 audit; n_{66} is the fixed Hebrew number-name rendering of 66; and $a_{\text{observer},44}$ is the pre-existing frozen observer-age phrase. The first return joins the two person-name fields to Dickinson's age:

$$257 - (136 + 66) = 55.$$

The complete observer/date/letter route returns the frozen apartment anchor:

$$1266 - 136 - 167 - 381 - 267 - 257 = 58.$$

The nested identity route separately evaluates to the same age target:

$$1266 - 66 - 167 - 257 = 776, \qquad 831 - 776 = 55,$$

or equivalently

$$831 - (1266 - 66 - 167 - 257) = 55.$$

The previously disclosed cross-record support row is retained:

$$831 - 249 - 66 - 166 - 58 = 292.$$

Three Letter 167 internal predicates and one previously disclosed cross-record supporting predicate are assigned to one dependency block, `EDB-L166-L167-SUPPORT`. They share Sue, Dickinson identity nodes, observer anchors, and the surrounding Letter 166/167 architecture and are therefore not treated as four independent trials.

14.8 Part C: the 28 July translation-page extension

On 28 July 2026, the author asked the AI which Emily Dickinson work was the strongest or most prominent. The AI answer identified "Because I could not stop for Death." The author reports that only after this answer was fixed did he search for the work and open a Yekum Tarbut page published on 1 August 2022. The page contains the English poem and two separately credited modern Hebrew translations, by Tova Neve and Yoav Itamar [25]. This order is recorded in the ancillary chronology, but no third-party preregistration or external server-side timestamp for the exact query is claimed. The source page and its translation headings predate the 2026 analysis; the arithmetic-path discovery remained adaptive after the page was opened.

The two short Hebrew headings are reproduced because they are necessary source identifiers for the exact calculation:

$$G(\text{"Because I could not stop for Death" – Tova Neve heading}) = 1817,$$

$$G(\text{“Because I could not stop for Death” – Yoav Itamar heading}) = 1750.$$

The exact UTF-8 Hebrew strings, translator credits, page URL, publication date, and normalization rules are deposited in the Day-3 provenance file. Their sum defines the Day-3 source node

$$1817 + 1750 = 3567.$$

The cleanest date decomposition is

$$3567 - 2482 = 1085,$$

where 2482 is the standard full Hebrew rendering of 28 July 2026 and 1085 is the same day and month without the year. Equivalently, the two heading values decompose as

$$1817 - 1085 = 732, \qquad 1750 - 1085 = 665,$$

$$732 + 665 = 1397,$$

where 1397 is the standard Hebrew year wording for 2026. These rows are one algebraic dependency family rather than independent constraints.

The year residue then joins the compact date and the two source-attested Dickinson spellings:

$$1397 - 28 - 7 - 26 - 371 - 381 = 584 = 292 + 292.$$

Here 371 is the heading form “Emily Dickinson” without the additional yod, 381 is the frozen AI-selected subject form with the additional yod, and 292 is the frozen observer surname value. A separate dual-calendar route gives

$$3567 - 28 - 7 - 2026 - 805 - 381 = 320,$$

where 805 is 14 Av 5786 and 320 is the observer first-name value. The full identity/date route is

$$3567 - 831 - 381 - 371 - 612 - 1085 = 287,$$

returning 28.7 after removing the full Dickinson identity, both short Dickinson spellings, the full observer identity, and the day–month wording.

The external source-site name supplies another separately sourced path:

$$G(\text{Yekum Tarbut}) = 1164,$$

$$1164 - 612 - 381 = 171, \qquad 171 + 116 = 287.$$

This route uses the fixed site name, subject and observer identities, the pre-existing 116 anchor, and the Day-3 compact date.

The publication date printed on the same source page supplies a further externally constrained field. Under the same standard Hebrew date-rendering convention,

$$G(\text{“first of August two thousand twenty-two”}) = 2201.$$

The value opens three linked routes. First, the full discovery-date wording differs from the source-page publication-date wording by 281,

$$2482 - 2201 = 281,$$

and the observer registry then gives

$$612 - 281 - 287 = 44,$$

where 287 is 28.7 and 44 is the observer's age in 2026. Second,

$$2201 - 1830 = 371,$$

so the publication-date value minus Dickinson's birth year returns the source-attested short spelling of her name. Third,

$$2201 - 831 = 1370, \qquad 1982 - 1370 = 612,$$

linking the full Dickinson identity to the observer's birth year and full identity. These five predicates share the single 2201 source node and are assigned to one additional dependency block, `EDC-PUBLICATION-DATE`; they are not counted as independent trials.

The two complete modern Hebrew translations are not reproduced in this submission. Under the declared Hebrew-letter-only normalization, their source totals are 29,467 and 24,202. These two totals were computed exclusively from the body text of each Hebrew translation appearing beneath its respective heading. The headings themselves, translator credits, English poem, page title, and surrounding article text were excluded. The ancillary package records the translator credits, normalized Hebrew-letter counts, SHA-256 hashes, and an optional verifier that accepts lawfully obtained local copies. All rows below that use these totals are explicitly conditional on those source totals unless local files are supplied:

$$29467 - 24202 = 5265,$$

$$5265 - 1817 - 1750 = 1698.$$

The resulting node returns the full observer through the Day-3 date,

$$2807 - 1698 - 116 - 381 = 612,$$

and the observer first name through Dickinson's life years,

$$1830 - 1698 = 132, \qquad 1886 - 1698 = 188,$$

$$132 + 188 = 320.$$

The same node returns the previously obtained 171 intermediate through the two headings,

$$1817 - 1698 = 119, \qquad 1750 - 1698 = 52,$$

$$119 + 52 = 171, \qquad 287 - 171 = 116.$$

The occurrence of 171 in both the source-site block and the complete-translation block is cross-block node re-entry; the downstream rows remain dependent on their respective upstream sources.

A final supporting route uses digit reversal and is therefore assigned lower evidential status than the direct rows:

$$3567 - 1886 = 1681, \qquad 1830 - 1681 = 149,$$

$$287 - 149 = 138, \qquad \mathrm{rev}(138) = 831.$$

The Day-3 verifier recomputes nine new short Hebrew strings and 30 displayed predicates in seven dependency blocks. Several rows are explicit algebraic decompositions, ten rows depend on the two complete-translation totals, and four are labeled as a supporting mirror bonus. The 30 rows are not presented as 30 independent trials.

Copyright and verification boundary. The complete Tova Neve and Yoav Itamar translations are modern copyrighted works and are not embedded in the TeX, source code, JSON, CSV, or ancillary text files. The package provides the source URL, translator credits, the two short headings, body-text-only totals, normalized Hebrew-letter counts, SHA-256 hashes, and an optional local-input verifier. The headings, credits, English poem, page title, and surrounding article text are excluded from those totals. This permits exact local verification without redistribution of the translations.

14.9 Complete deterministic ledger

The released verifier recomputes every exact string and every predicate below. The rows are grouped by dependency block and are not treated as mutually independent.

ID	Deterministic predicate	Status
EDA-01	$2507 - 1908 = 599$	Main
EDA-02	$2429 - 1830 = 599$	Main
EDA-03	$3488 - 25 - 7 - 2026 - 831 = 599$	Main
EDA-04	$2391 + 116 = 2507$	Main
EDA-05	$\lvert 1908 - 1982 \rvert + \lvert 1908 - 2026 \rvert + \lvert 1908 - 1830 \rvert + \lvert 1908 - 1886 \rvert = 292$	Restatement of EDA-19
EDA-06	$2873 - 25 - 7 - 2026 = 815$	Main
EDA-07	$815 - 599 = 216$	Main
EDA-08	$\mathrm{rev}(612) = 216$	Main
EDA-09	$1532 - 831 - 381 = 320$	Main
EDA-10	$381 - (2429 - 1532 - 831) = 315$	Main
EDA-11	$2987 + 2553 = 5540$	Main
EDA-12	$5540 - 2026 - 1982 = 1532$	Main
EDA-13	$5540 - 1830 - 1886 - 831 - 381 = 612$	Main
EDA-14	$3488 + 2873 = 6361$	Main
EDA-15	$6361 - 2507 - 1830 - 1886 = 138$	Main
EDA-16	$\mathrm{rev}(831) = 138$	Main
EDA-17	$6361 - 2429 - 1830 - 1886 = 216$	Main
EDA-18	$2507 - 1776 - 381 - 58 = 292$	Main, fixed external source
EDA-19	$\lvert 1830 + 1886 - 1982 - 2026 \rvert = 292$	Main
EDA-20	$\lvert 315 - 257 \rvert = 58$	Main
EDA-21	$2429 - 1886 = 543$	Main
EDA-22	$1314 + 517 + 315 = 2146$	Main
EDA-23	$612 - (2146 + 915 - 2507) = 58$	Main
EDA-24	$5540 - 1848 - 2026 = 1666$	Source-informed one-shot
EDA-25	$1848 - 1666 = 182$	Source-informed one-shot
EDA-26	$1570 - 1258 = 312$	Source-informed one-shot
EDA-27	$312 - 55 = 257$	Source-informed one-shot
EDA-28	$2507 - 1676 = 831$	Source-attested orthographic cross-check
EDB-01	$2678 - 2429 = 249$	Main, Letter 166
EDB-02	$166 + 83 = 249$	Main, Letter 166
EDB-03	$83 + 83 = 166$	Main, Letter 166
EDB-04	$83 + 55 = 138$	Main, Letter 166
EDB-05	$\mathrm{rev}(831) = 138$	Bridge restatement of EDA-16
EDB-06	$166 + 91 = 257$	Main, Letter 166
EDB-07	$(1982 - 1854) + (2026 - 1854) = 300$	Main, Letter 166
EDB-08	$612 - 300 - 55 = 257$	Main, Letter 166
EDB-09	$831 - 83 - 166 - 257 - 267 = 58$	Main, Letter 166
EDB-10	$728 - 116 = 612$	Main, Letter 728
EDB-11	$728 + 194 + 287 = 1209$	Main, Letter 728
EDB-12	$831 - (1982 - 1209) = 58$	Main, Letter 728
EDB-13	$2852 - 2429 = 423$	Main, Letter 728
EDB-14	$287 - (423 - 194) = 58$	Main, Letter 728
EDB-15	$831 - 423 - 116 = 292$	Main, Letter 728
EDB-16	$2852 - 2681 = 171$	Main, Letter 728
EDB-17	$287 - 171 = 116$	Main, Letter 728
EDB-18	$698 - 257 - 267 - 116 = 58$	Main, Letter 728
EDS-01	$831 - 249 - 66 - 166 - 58 = 292$	Supporting Letter 166/167 cross-record row [27, 31, 32]
E167-A	$257 - (136 + 66) = 55$	Supporting Letter 167 internal row [31, 32]
E167-B	$1266 - 136 - 167 - 381 - 267 - 257 = 58$	Supporting Letter 167 internal row [31, 32]

ID	Deterministic predicate	Status
E167-C	$831 - (1266 - 66 - 167 - 257) = 55$	Supporting Letter 167 internal row [31, 32]
EDC-01	$1817 + 1750 = 3567$	Main, two external headings [25]
EDC-02	$3567 - 2482 = 1085$	Main, full/short Day-3 date
EDC-03	$1817 - 1085 = 732$	Algebraic decomposition
EDC-04	$1750 - 1085 = 665$	Algebraic decomposition
EDC-05	$732 + 665 = 1397$	Algebraic decomposition
EDC-06	$1397 - 28 - 7 - 26 - 371 - 381 = 584$	Main
EDC-07	$584 = 292 + 292$	Identity definition
EDC-08	$3567 - 28 - 7 - 2026 - 805 - 381 = 320$	Main, dual calendar
EDC-09	$3567 - 831 - 381 - 371 - 612 - 1085 = 287$	Main, identity/date
EDC-10	$1164 - 612 - 381 = 171$	Main, source-site name
EDC-11	$171 + 116 = 287$	Main, source-site return
EDC-12	$29467 - 24202 = 5265$	Conditional on full-source totals
EDC-13	$5265 - 1817 - 1750 = 1698$	Conditional on full-source totals
EDC-14	$2807 - 1698 - 116 - 381 = 612$	Main conditional row
EDC-15	$1830 - 1698 = 132$	Conditional decomposition
EDC-16	$1886 - 1698 = 188$	Conditional decomposition
EDC-17	$132 + 188 = 320$	Main conditional row
EDC-18	$1817 - 1698 = 119$	Conditional decomposition
EDC-19	$1750 - 1698 = 52$	Conditional decomposition
EDC-20	$119 + 52 = 171$	Conditional decomposition
EDC-21	$287 - 171 = 116$	Main conditional row
EDC-22	$3567 - 1886 = 1681$	Supporting mirror bonus
EDC-23	$1830 - 1681 = 149$	Supporting mirror bonus
EDC-24	$287 - 149 = 138$	Supporting mirror bonus
EDC-25	$\mathrm{rev}(138) = 831$	Supporting mirror bonus
EDC-26	$2482 - 2201 = 281$	Main
EDC-27	$612 - 281 - 287 = 44$	Main
EDC-28	$2201 - 1830 = 371$	Main
EDC-29	$2201 - 831 = 1370$	Main
EDC-30	$1982 - 1370 = 612$	Main

14.10 The preserved A–C core and the transition to the complete release

The v0.27.1 A–C object remains unchanged: 46 declared short Hebrew strings and 80 displayed predicates across 26 disclosed dependency blocks. The Day-1/Day-2 package verifies 37/37 strings and 50/50 predicates across 19 blocks; Day 3 verifies 9/9 short strings and 30/30 predicates across seven blocks. The two complete modern translations are not redistributed; their declared totals, normalized Hebrew-letter counts, hashes, and optional local-file checks remain recorded separately. Algebraic decompositions, complete-translation-conditional rows, restatements, Letter 167 support, and mirror-bonus rows retain their prior labels. This 80-predicate object is a historical release layer, not the current total.

14.11 Part D: Letter 297, selected before its contents were read

On 29 July 2026 the compact rule $29.7 \to 297$ selected Letter 297 before its contents were read, according to the deposited chronology. This is an author-recorded selection order and is not upgraded to third-party preregistration. The record then supplied a new subject–date–observer system. The five declared name fields sum to

$$76 + 63 + 91 + 141 + 36 = 407.$$

Two source routes converge on 4089:

$$3411 + 381 + 297 = 4089, \qquad 407 + 2851 + 831 = 4089.$$

The same block produces observer and date returns:

$$2851 - 1029 - 831 = 991, \qquad 991 + 991 = 1982,$$

$$2907 - 1029 - 612 = 1266, \qquad 2161 - 297 = 1864, \qquad 2400 - 2161 = 239, \qquad 297 - 239 = 58.$$

A second branch gives

$$5612 - 1830 - 1886 = 1896, \quad 1982 - 1896 = 86, \quad 2026 - 86 - 831 - 381 - 116 = 612.$$

The compact-date and identity nodes then close as

$$612 - 355 = 257, \qquad 730 + 355 = 1085, \qquad 730 + 355 + 612 = 1697, \qquad 2807 - 1697 = 1110.$$

The registered digit-rendering of 5540 separately has value 1110. The complete registry labels such digit and number-name operations as representation transforms instead of silently merging them with ordinary arithmetic.

14.12 Part D representation layer

The number-name and digitwise representations of 612 give a direct representation pair:

$$F(612) = 2378, \qquad D(612) = 1769, \qquad 2378 + 1769 = 4147, \qquad 4147 - 4089 = 58.$$

The same release records

$$991 - 407 = 584, \qquad 1089 + 1089 = 2178, \qquad 2178 - 29 - 7 - 2026 = 116,$$

$$2178 - 13 - 11 - 1864 = 290, \qquad 116 + 290 = 406, \qquad 831 - 406 - 381 = 44.$$

These rows are retained in a distinct D-video stratum because their source and representation history differ from the D-core equations.

14.13 The frozen 718 and late-extension network

The later release begins from a frozen phrase with value 718. Its first compact branch is

$$718 + 44 = 762 = 381 + 381, \qquad 718 - 116 = 602,$$
$$602 - 4 - 4 - 5 - 5 = 584, \qquad 718 + 55 + 58 = 831.$$

The age and date branch reconstructs the observer:

$$718 + 762 = 1480, \quad 1830 - 1480 = 350, \quad 1886 - 1480 = 406, \quad 350 + 406 = 756,$$

$$831 - 756 = 75, \qquad 381 - 75 = 306, \qquad 306 + 306 = 612, \qquad 350 = 292 + 58.$$

The observer-year branch gives

$$1982 - 1480 = 502, \qquad 2026 - 1480 = 546, \qquad 502 + 546 = 1048,$$

$$1048 - 612 - 381 = 55, \qquad 1048 - 612 - 116 = 320.$$

A separately registered age question has value 1218 and yields

$$1830 - 1218 = 612, \qquad 1218 - 762 = 456, \qquad 602 - 456 = 146, \qquad 146 + 146 = 292.$$

The dual-representation block joins 2245, 1483, 871, and the Spain label 344. The declared number-name values of 871 and 344 are both 1685, while their digit-name values are both 1182. The identity return is

$$2245 - 762 = 1483, \qquad 1483 - 871 = 612, \qquad 1685 - 344 - 3 - 4 - 4 - 718 = 612.$$

The self-answering 2263 family contains three routes to the same observer total:

$$2263 - 831 - 762 - 58 = 612,$$

$$2263 - 871 - 344 - 55 - 381 = 612,$$

$$2263 - 831 - 381 - 439 = 612.$$

Finally, the address branch closes through

$$1256 + 947 = 2203, \qquad 2203 - 1982 = 221, \qquad 2203 - 2026 = 177, \qquad 221 + 177 = 398,$$

$$398 + 422 = 820 = G(n_{90}), \qquad 820 - 90 - 280 = 450, \qquad 422 + 28 = 450.$$

All exact UTF-8 strings behind these registered values are carried in the machine-readable registry. Pure year-difference cancellations are not displayed as evidential rows.

14.14 Complete registry ontology and arithmetic verification

The current release contains 233 registered entries distributed as follows.

Release stratum	**Entries**
Part A	27
Part B	21
Part C	28
Part D core	20
Part D representation/video	12
Exploratory Annex A	25
718 and late extensions	68
Secondary audit	24
Derived structure	8
Total	**233**

Table 43: Complete Emily Dickinson registry by release stratum.

The separate registry audit classifies 196 entries as verified arithmetic, 24 as verified exact Hebrew gematria, two as verified digit reversals, ten as source-declared representation transforms whose exact source string is compound or not fully specified in the supplied text, and one as

a non-arithmetic correspondence not separately verified from the supplied text. Among the 196 verified-arithmetic entries, 187 survive the canonical direct-rearrangement duplicate screen. There are 120 two-input and 157 at-most-three-input entries among those 187, and 115 contain no observer value. Only two use absolute value; the ordinary arithmetic grammar is otherwise addition and subtraction. The full 233-row ledger is printed in Table 46; its JSON counterpart preserves all UTF-8 strings and classifications.

14.15 Observer-information convergence across source blocks

The primary 57-relation object is divided into nine coarse source/branch blocks. A useful way to read the case is to ask how many of the 423,360 coherent empirical observer profiles satisfy every observer-sensitive relation inside each block. A count of one means that the block, by itself, identifies the documented four-primitive observer profile within that declared pool.

Primary source/branch block	Full profiles	Reconstruction consequence
A biography	1	Individually identifies the documented profile
B Letter 166	9	Narrows 423,360 coherent profiles to nine
B Letter 728	1	Individually identifies the documented profile
B Letter 167/support	252	Strong partial constraint from the supporting letter family
C translations/source page	1	Individually identifies the documented profile
D Letter 297	9	Narrows the pool to nine after the author-reported pre-content record selection
Late age (718/late branch)	1	Individually identifies the documented profile
Late semantic	27	Narrows the pool to 27
Late address	7,056	Weaker alone, but contributes additional block-level pressure in combinations

Table 44: Block-by-block observer reconstruction in the unchanged primary coherent-profile object. Counts are conditional on the declared 423,360-profile empirical pool and are not independent probabilities.

The same result appears more strongly in source ablations and block combinations. Of the $\binom{9}{k}$ possible subsets, 4/9 single blocks, 28/36 two-block subsets, 80/84 three-block subsets, 125/126 four-block subsets, and 126/126 five-block subsets uniquely identify the documented profile. Every six-, seven-, eight-, and nine-block subset is also unique. Thus the identity is not carried by one privileged equation or one privileged source block; it is a latent solution repeatedly overdetermined by different parts of the network.

Blocks retained	All subsets	Unique-profile subsets	Largest surviving profile count
1	9	4	7,056
2	36	28	84
3	84	80	9
4	126	125	9
5	126	126	1
6	84	84	1
7	36	36	1
8	9	9	1
9	1	1	1

Table 45: Redundant observer reconstruction under source-block subset retention.

14.16 Indirect observer reconstruction after target removal

The strongest identifiability control is a target knockout rather than an additional null probability. The direct-target classification removes every primary relation whose symbolic constraint is a direct return to the observer's apartment, first name, birth year, full name, or surname. This deletes 43 of the 57 primary rows. The remaining 14 indirect relations, compressed to ten logical classes, still have the unique symbolic solution

$$(A, F, S, Y) = (58, 320, 292, 1982),$$

and exactly one full empirical profile in the 423,360-profile pool. The observer identity is therefore recoverable even when the equations that directly terminate on the principal observer targets are removed.

A second knockout removes every primary relation containing the literal value 612. Thirty-five relations in eight logical classes remain, and they again reconstruct the same four primitives uniquely. These two tests answer a different question from rarity: they ask whether the observer identity is merely written into the target side of the equations or instead functions as a latent solution of the remaining cross-source constraint system. Within the declared primary object, the latter is what the audit finds.

The block-subset results provide the complementary source-ablation test. Removing any one source/branch block leaves all nine eight-of-nine systems uniquely identifying, and every five-of-nine subset is already sufficient. These are overlapping structural diagnostics, not independent evidence factors, and no knockout or ablation count is multiplied into a p-value.

14.17 Complete 233-entry closure ledger

The following table enumerates every registered closure, transform, and correspondence by stable identifier. For the 24 exact-Hebrew rows, the table prints a stable string identifier and its verified value; the accompanying UTF-8 JSON registry contains the literal source string, provenance, chronology, verification class, direct-uniqueness flag, and publication tier.

Table 46: Complete 233-entry Emily Dickinson closure registry. Exact UTF-8 strings for the 24 gematria rows are preserved under the displayed stable IDs in the accompanying JSON registry; the table prints their registered output values to remain compatible with the arXiv pdfLaTeX build.

ID	Release stratum	Registered equality or transform	Verification class
EDA-01	A	2507 - 1908 = 599	arithmetic
EDA-02	A	2429 - 1830 = 599	arithmetic
EDA-03	A	3488 - 25 - 7 - 2026 - 831 = 599	arithmetic
EDA-04	A	2391 + 116 = 2507	arithmetic
EDA-06	A	2873 - 25 - 7 - 2026 = 815	arithmetic
EDA-07	A	815 - 599 = 216	arithmetic
EDA-08	A	rev(612) = 216	reversal
EDA-09	A	1532 - 831 - 381 = 320	arithmetic
EDA-10	A	381 - (2429 - 1532 - 831) = 315	arithmetic
EDA-11	A	2987 + 2553 = 5540	arithmetic
EDA-12	A	5540 - 2026 - 1982 = 1532	arithmetic
EDA-13	A	5540 - 1830 - 1886 - 831 - 381 = 612	arithmetic
EDA-14	A	3488 + 2873 = 6361	arithmetic
EDA-15	A	6361 - 2507 - 1830 - 1886 = 138	arithmetic
EDA-16	A	rev(831) = 138	reversal
EDA-17	A	6361 - 2429 - 1830 - 1886 = 216	arithmetic
EDA-18	A	2507 - 1776 - 381 - 58 = 292	arithmetic
EDA-19	A	|1830 + 1886 - 1982 - 2026| = 292	arithmetic
EDA-20	A	|315 - 257| = 58	arithmetic
EDA-21	A	2429 - 1886 = 543	arithmetic
EDA-22	A	1314 + 517 + 315 = 2146	arithmetic

ID	Release stratum	Registered equality or transform	Verification class
EDA-23	A	612 - (2146 + 915 - 2507) = 58	arithmetic
EDA-24	A	5540 - 1848 - 2026 = 1666	arithmetic
EDA-25	A	1848 - 1666 = 182	arithmetic
EDA-26	A	1570 - 1258 = 312	arithmetic
EDA-27	A	312 - 55 = 257	arithmetic
EDA-28	A	2507 - 1676 = 831	arithmetic
EDB-01	B	2678 - 2429 = 249	arithmetic
EDB-02	B	166 + 83 = 249	arithmetic
EDB-03	B	83 + 83 = 166	arithmetic
EDB-04	B	83 + 55 = 138	arithmetic
EDB-06	B	166 + 91 = 257	arithmetic
EDB-07	B	(1982-1854) + (2026-1854) = 300	arithmetic
EDB-08	B	612 - 300 - 55 = 257	arithmetic
EDB-09	B	831 - 83 - 166 - 257 - 267 = 58	arithmetic
EDB-10	B	728 - 116 = 612	arithmetic
EDB-11	B	728 + 194 + 287 = 1209	arithmetic
EDB-12	B	831 - (1982 - 1209) = 58	arithmetic
EDB-13	B	2852 - 2429 = 423	arithmetic
EDB-14	B	287 - (423 - 194) = 58	arithmetic
EDB-15	B	831 - 423 - 116 = 292	arithmetic
EDB-16	B	2852 - 2681 = 171	arithmetic
EDB-17	B	287 - 171 = 116	arithmetic
EDB-18	B	698 - 257 - 267 - 116 = 58	arithmetic
EDS-01	B	831 - 249 - 66 - 166 - 58 = 292	arithmetic
E167-A	B	257 - (136 + 66) = 55	arithmetic
E167-B	B	1266 - 136 - 167 - 381 - 267 - 257 = 58	arithmetic
E167-C	B	831 - (1266 - 66 - 167 - 257) = 55	arithmetic
EDC-01	C	1817 + 1750 = 3567	arithmetic
EDC-02	C	3567 - 2482 = 1085	arithmetic
EDC-03	C	1817 - 1085 = 732	arithmetic
EDC-04	C	1750 - 1085 = 665	arithmetic
EDC-05	C	732 + 665 = 1397	arithmetic
EDC-06	C	1397 - 28 - 7 - 26 - 371 - 381 = 584	arithmetic
EDC-07	C	584 = 292 + 292	arithmetic
EDC-08	C	3567 - 28 - 7 - 2026 - 805 - 381 = 320	arithmetic
EDC-09	C	3567 - 831 - 381 - 371 - 612 - 1085 = 287	arithmetic
EDC-10	C	1164 - 612 - 381 = 171	arithmetic
EDC-11	C	171 + 116 = 287	arithmetic
EDC-12	C	29467 - 24202 = 5265	arithmetic
EDC-13	C	5265 - 1817 - 1750 = 1698	arithmetic
EDC-14	C	2807 - 1698 - 116 - 381 = 612	arithmetic
EDC-15	C	1830 - 1698 = 132	arithmetic
EDC-16	C	1886 - 1698 = 188	arithmetic
EDC-17	C	132 + 188 = 320	arithmetic
EDC-18	C	1817 - 1698 = 119	arithmetic
EDC-19	C	1750 - 1698 = 52	arithmetic
EDC-20	C	119 + 52 = 171	arithmetic
EDC-22	C	3567 - 1886 = 1681	arithmetic
EDC-23	C	1830 - 1681 = 149	arithmetic
EDC-24	C	287 - 149 = 138	arithmetic
EDC-26	C	2482 - 2201 = 281	arithmetic
EDC-27	C	612 - 281 - 287 = 44	arithmetic
EDC-28	C	2201 - 1830 = 371	arithmetic
EDC-29	C	2201 - 831 = 1370	arithmetic
EDC-30	C	1982 - 1370 = 612	arithmetic
EDD-01	D-core	76 + 63 + 91 + 141 + 36 = 407	arithmetic
EDD-02	D-core	3411 + 381 + 297 = 4089	arithmetic
EDD-03	D-core	407 + 2851 + 831 = 4089	arithmetic
EDD-05	D-core	2851 - 1029 - 831 = 991	arithmetic
EDD-06	D-core	991 + 991 = 1982	arithmetic
EDD-07	D-core	2907 - 1029 - 612 = 1266	arithmetic
EDD-08	D-core	2161 - 297 = 1864	arithmetic
EDD-09	D-core	2400 - 2161 = 239	arithmetic
EDD-10	D-core	297 - 239 = 58	arithmetic
EDD-12	D-core	3411 - 2851 = 560	arithmetic
EDD-13	D-core	G(digits of 560) = 1089	representation
EDD-14	D-core	2400 - 1311 = 1089	arithmetic
EDD-15	D-core	5612 - 1830 - 1886 = 1896	arithmetic
EDD-16	D-core	1982 - 1896 = 86	arithmetic
EDD-17	D-core	2026 - 86 - 831 - 381 - 116 = 612	arithmetic
EDD-18	D-core	612 - 355 = 257	arithmetic
EDD-19	D-core	730 + 355 = 1085	arithmetic

ID	Release stratum	Registered equality or transform	Verification class
EDD-22	D-core	730 + 355 + 612 = 1697	arithmetic
EDD-23	D-core	2807 - 1697 = 1110	arithmetic
EDD-24	D-core	G(digits of 5540) = 1110	representation
EDD-V01	D-video	G(number-name 612) = 2378	representation
EDD-V02	D-video	G(digits of 612) = 1769	representation
EDD-V03	D-video	2378 + 1769 = 4147	arithmetic
EDD-V04	D-video	4147 - 4089 = 58	arithmetic
EDD-V05	D-video	991 - 407 = 584	arithmetic
EDD-V07	D-video	2907 - 1311 - 117 - 381 = 1098	arithmetic
EDD-V08	D-video	G(number-name 407) = 1098	representation
EDD-V09	D-video	1089 + 1089 = 2178	arithmetic
EDD-V10	D-video	2178 - 29 - 7 - 2026 = 116	arithmetic
EDD-V11	D-video	2178 - 13 - 11 - 1864 = 290	arithmetic
EDD-V12	D-video	116 + 290 = 406	arithmetic
EDD-V13	D-video	831 - 406 - 381 = 44	arithmetic
EDE-01	Exploratory Annex A	G(author question) = 1013	representation
EDE-02	Exploratory Annex A	G(above light speed) = 1013	representation
EDE-03	Exploratory Annex A	1013 + 1013 = 2026	arithmetic
EDE-04	Exploratory Annex A	2026 - 612 = 1414	arithmetic
EDE-05	Exploratory Annex A	G(number-name 1013) = 1328	representation
EDE-06	Exploratory Annex A	1328 - 1013 = 315	arithmetic
EDE-07	Exploratory Annex A	612 - 315 = 297	arithmetic
EDE-08	Exploratory Annex A	MM1013 <-> JW750	correspondence
EDE-09	Exploratory Annex A	1328 - 750 + 532 = 1110	arithmetic
EDE-10	Exploratory Annex A	889 + 612 = 1501	arithmetic
EDE-11	Exploratory Annex A	381 + 426 = 807	arithmetic
EDE-12	Exploratory Annex A	1253 - 612 = 641	arithmetic
EDE-13	Exploratory Annex A	G(number-name 641) = 1785	representation
EDE-14	Exploratory Annex A	1785 - 1253 = 532	arithmetic
EDE-16	Exploratory Annex A	G(number-name 1253) = 1662	representation
EDE-17	Exploratory Annex A	1982 - 1662 = 320	arithmetic
GEM-01	Exploratory Annex A	4829 = 2851 + 1978	arithmetic
GEM-02	Exploratory Annex A	4829 = 2022 + 2807	arithmetic
GEM-03	Exploratory Annex A	831 - 381 - 116 = 334	arithmetic
GEM-04	Exploratory Annex A	1886 + 426 - 1978 = 334	arithmetic
GEM-05	Exploratory Annex A	2681 + 2482 - 4829 = 334	arithmetic
GEM-06	Exploratory Annex A	1982 + 2681 + 166 = 4829	arithmetic
GEM-07	Exploratory Annex A	1830 + 2482 + 517 = 4829	arithmetic
GEM-08	Exploratory Annex A	1886 + 2807 + 136 = 4829	arithmetic
GEM-09	Exploratory Annex A	1848 + 1817 + 1164 = 4829	arithmetic
B718-001	718 and late extensions	718 + 44 = 762	arithmetic
B718-002	718 and late extensions	762 = 381 + 381	arithmetic
B718-003	718 and late extensions	718 - 116 = 602	arithmetic

ID	Release stratum	Registered equality or transform	Verification class
B718-004	718 and late extensions	602 - 4 - 4 - 5 - 5 = 584	arithmetic
B718-005	718 and late extensions	718 + 55 + 58 = 831	arithmetic
B718-006	718 and late extensions	718 + 116 + 55 = 889	arithmetic
B718-007	718 and late extensions	718 + 696 = 1414	arithmetic
B718-008	718 and late extensions	718 + 762 = 1480	arithmetic
B718-009	718 and late extensions	1830 - 1480 = 350	arithmetic
B718-010	718 and late extensions	1886 - 1480 = 406	arithmetic
B718-011	718 and late extensions	350 + 406 = 756	arithmetic
B718-012	718 and late extensions	831 - 756 = 75	arithmetic
B718-013	718 and late extensions	381 - 75 = 306	arithmetic
B718-014	718 and late extensions	306 + 306 = 612	arithmetic
B718-015	718 and late extensions	350 = 292 + 58	arithmetic
B718-016	718 and late extensions	800 - 44 = 756	arithmetic
B718-017	718 and late extensions	1480 - 527 - 257 = 696	arithmetic
B718-018	718 and late extensions	1480 - 527 - 572 = 381	arithmetic
B718-019	718 and late extensions	1982 - 1480 = 502	arithmetic
B718-020	718 and late extensions	2026 - 1480 = 546	arithmetic
B718-021	718 and late extensions	502 + 546 = 1048	arithmetic
B718-022	718 and late extensions	1048 - 612 - 381 = 55	arithmetic
B718-023	718 and late extensions	1048 - 612 - 116 = 320	arithmetic
B718-024	718 and late extensions	1830 - 1218 = 612	arithmetic
B718-025	718 and late extensions	1218 - 762 = 456	arithmetic
B718-026	718 and late extensions	602 - 456 = 146	arithmetic
B718-027	718 and late extensions	146 + 146 = 292	arithmetic
B718-028	718 and late extensions	1218 - 4 - 4 - 5 - 5 = 1200	arithmetic
B718-029	718 and late extensions	G(s_B718-029) = 2245	exact gematria
B718-030	718 and late extensions	G(s_B718-030) = 2245	exact gematria
B718-031	718 and late extensions	2245 - 762 = 1483	arithmetic
B718-032	718 and late extensions	G(s_B718-032) = 1483	exact gematria
B718-033	718 and late extensions	2245 - 831 = 1414	arithmetic
B718-034	718 and late extensions	G(s_B718-034) = 871	exact gematria
B718-035	718 and late extensions	1483 - 871 = 612	arithmetic
B718-036	718 and late extensions	G(s_B718-036) = 1685	exact gematria
B718-037	718 and late extensions	G(s_B718-037) = 1685	exact gematria
B718-038	718 and late extensions	G(s_B718-038) = 1182	exact gematria
B718-039	718 and late extensions	G(s_B718-039) = 1182	exact gematria

ID	Release stratum	Registered equality or transform	Verification class
B718-040	718 and late extensions	1685 - 344 - 3 - 4 - 4 - 718 = 612	arithmetic
B718-041	718 and late extensions	G(s_B718-041) = 2263	exact gematria
B718-042	718 and late extensions	2263 - 831 - 762 - 58 = 612	arithmetic
B718-043	718 and late extensions	2263 - 871 - 344 - 55 - 381 = 612	arithmetic
B718-044	718 and late extensions	G(s_B718-044) = 439	exact gematria
B718-045	718 and late extensions	2263 - 831 - 381 - 439 = 612	arithmetic
B718-046	718 and late extensions	G(s_B718-046) = 1256	exact gematria
B718-047	718 and late extensions	G(s_B718-047) = 947	exact gematria
B718-048	718 and late extensions	1256 + 947 = 2203	arithmetic
B718-049	718 and late extensions	2203 - 1982 = 221	arithmetic
B718-050	718 and late extensions	2203 - 2026 = 177	arithmetic
B718-051	718 and late extensions	221 + 177 = 398	arithmetic
B718-052	718 and late extensions	398 + 422 = 820	arithmetic
B718-053	718 and late extensions	G(s_B718-053) = 820	exact gematria
B718-054	718 and late extensions	820 - 90 - 280 = 450	arithmetic
B718-055	718 and late extensions	422 + 28 = 450	arithmetic
B718-056	718 and late extensions	718 - 55 - 221 = 442 = 221 + 221	arithmetic
B718-057	718 and late extensions	718 - 116 - 221 = 381	arithmetic
B718-R01	718 and late extensions	G(s_B718-R01) = 718	exact gematria
B718-R02	718 and late extensions	G(s_B718-R02) = 762	exact gematria
B718-R03	718 and late extensions	G(s_B718-R03) = 381	exact gematria
B718-R04	718 and late extensions	G(s_B718-R04) = 831	exact gematria
B718-R05	718 and late extensions	G(s_B718-R05) = 602	exact gematria
B718-R06	718 and late extensions	G(s_B718-R06) = 696	exact gematria
B718-R07	718 and late extensions	G(s_B718-R07) = 1414	exact gematria
B718-R08	718 and late extensions	G(s_B718-R08) = 1480	exact gematria
B718-R09	718 and late extensions	G(s_B718-R09) = 800	exact gematria
B718-R10	718 and late extensions	G(s_B718-R10) = 1218	exact gematria
B718-R11	718 and late extensions	G(s_B718-R11) = 612	exact gematria
AUD-001	Secondary audit	762 = 407 + 355	arithmetic
AUD-002	Secondary audit	602 = 315 + 287	arithmetic
AUD-003	Secondary audit	696 = 315 + 381	arithmetic
AUD-004	Secondary audit	1048 = 728 + 320	arithmetic
AUD-005	Secondary audit	1048 + 116 = 1164	arithmetic
AUD-006	Secondary audit	1483 + 381 = 1864	arithmetic
AUD-007	Secondary audit	2026 - 1483 = 543	arithmetic
AUD-008	Secondary audit	1685 + 297 = 1982	arithmetic
AUD-009	Secondary audit	1182 + 800 = 1982	arithmetic
AUD-010	Secondary audit	2263 - 1982 = 281	arithmetic
AUD-011	Secondary audit	2263 - 355 = 1908	arithmetic
AUD-012	Secondary audit	2203 + 1886 = 4089	arithmetic
AUD-013	Secondary audit	2203 - 355 = 1848	arithmetic
AUD-014	Secondary audit	450 = 831 - 381	arithmetic

ID	Release stratum	Registered equality or transform	Verification class
AUD-015	Secondary audit	450 + 355 = 805	arithmetic
AUD-016	Secondary audit	1982 − 450 = 1532	arithmetic
AUD-017	Secondary audit	450 − 116 = 334	arithmetic
AUD-018	Secondary audit	398 = 718 − 320	arithmetic
AUD-019	Secondary audit	1483 + 334 = 1817	arithmetic
AUD-020	Secondary audit	1218 + 532 = 1750	arithmetic
AUD-021	Secondary audit	422 + 1328 = 1750	arithmetic
AUD-022	Secondary audit	820 + 1662 = 2482	arithmetic
AUD-023	Secondary audit	1483 − 398 = 1085	arithmetic
AUD-024	Secondary audit	947 + 450 = 1397	arithmetic
DER-001	Derived structure	407 + 831 − 381 − 297 = 560	arithmetic
DER-002	Derived structure	831 + 381 + 116 = 1328	arithmetic
DER-003	Derived structure	831 − 381 − 116 = 334	arithmetic
DER-004	Derived structure	1328 + 334 = 1662	arithmetic
DER-005	Derived structure	344 + 3 + 4 + 4 = 355	arithmetic
DER-006	Derived structure	1685 − 355 − 718 = 612	arithmetic
DER-007	Derived structure	381 + 55 = 320 + 116 = 436	arithmetic
DER-008	Derived structure	831 + 762 + 58 = 871 + 344 + 55 + 381 = 831 + 381 + 439 = 1651	arithmetic

14.18 Statistical selectivity: primary, adversarial, and sensitivity results

The statistical object is not all 233 rows. The unchanged primary observer-replacement specification contains 57 relations compressed to 15 logical classes and nine coarse dependency blocks. All 423,360 coherent profiles in its finite empirical pool were evaluated exhaustively. The documented profile is the only full match at all three levels: 57/57 relations, 15/15 classes, and 9/9 blocks. The best non-actual profile reaches 46/57, 10/15, and 4/9. The resulting 1/423,360 is an exact conditional finite-pool tail, not a universal probability and not a product of row-level probabilities.

A new unified adversarial suite, v3.2, reconstructs this exact 57/15/9 primary object directly from the preserved 233-entry registry and then applies a broader coherent identity-replacement null. All Dickinson, biographical, archival, translation, date, and other source constants remain fixed. Only four observer primitives are randomized:

$$F \in \{100, \ldots, 999\}, \quad S \in \{100, \ldots, 999\}, \quad A \in \{1, \ldots, 99\}, \quad Y \in \{1900, \ldots, 2005\}.$$

The derived observer values are recomputed coherently in every world, recomputed coherently rather than sampled role-by-role:

$$H = F + S, \qquad D = 2A, \qquad \text{Age} = 2026 - Y.$$

Thus a null world cannot gain or lose matches merely because full name, double-apartment, and age fields have been made internally inconsistent.

With seed 20260821, the `context_fixed_identity_randomized` run generated 100,000,000 coherent worlds. There were zero joint reproductions of 57/57 relations, 15/15 classes, and 9/9 blocks. The global maxima across the run were 46/57, 10/15, and 4/9, respectively. Notably, those maxima equal the best non-actual scores in the separate exhaustive 423,360-profile empirical pool, while the documented profile remains 57/57, 15/15, 9/9 in both comparisons.

For zero joint full hits, the exact one-sided 95% binomial upper bound is 2.99573×10^{-8}, corresponding to one-sided $z = 5.419$ under the declared Monte Carlo generator. Separately, symbolic solution of the full 15-class system over the broad primitive ranges above returns one full primitive tuple, $(F, S, A, Y) = (320, 292, 58, 1982)$, among 8,500,140,000 coherent tuples. The corresponding 1/8,500,140,000 value and $z = 6.336$ normal-tail equivalent are reported only as a conditional profile-space sensitivity result. They are not substituted for the historical headline statistic and do not model the adaptive discovery process.

Audit	Observed result	Interpretive boundary
Primary coherent profiles	Sole 57/57, 15/15, 9/9 profile among 423,360; best non-actual 46/57, 10/15, 4/9	Conditional on the frozen empirical pool and relation specification
Context-fixed identity randomized, 100M	0 joint full matches; maxima 46/57, 10/15, 4/9; 95% zero-hit upper 2.996×10^{-8} ($z = 5.419$)	Coherent observer replacement with all Dickinson/source context held fixed; not a universal discovery probability
Broad symbolic identity space	Sole full primitive tuple in 8,500,140,000 declared tuples	Conditional sensitivity result; not the headline historical p-value
Direct-target knockout	Removes 43/57 direct-target rows; the remaining 14 indirect relations / 10 classes still solve uniquely to $(A, F, S, Y) = (58, 320, 292, 1982)$	Demonstrates latent observer reconstruction after direct target removal; not a separate p-value
Literal-612 knockout	35 relations / 8 classes remain and again reconstruct the same four primitives uniquely	Removes every primary relation containing the literal full-observer value 612
Source-block ablation/redundancy	4/9 single blocks, 28/36 pairs, 80/84 triples, 125/126 four-block subsets, and all 126 five-block subsets are uniquely identifying	Distributed reconstruction within the same primary object; overlapping subsets are not separate trials
Role-set benchmark	2 full role-set matches among 8,100 alternatives	Broader and weaker than the full-profile object
Extended exploratory scope	Sole 72/72, 16/16, 11/11 profile; best non-actual 58/72, 10/16, 4/11	Explicitly exploratory, not substituted for the primary result
Local one-digit perturbation	Maxima: $F = 32/57$, $S = 28/57$, $A = 31/57$, $Y = 44/57$	Local identifiability test; no perturbed full match
Finite-choice crossover	Full 45-cell incidence reaches 5% only at 185×, or 166,500 target-directed attempts; A–D core at 163×, or 85,412 attempts	Attempt-budget sensitivity, not a measured discovery process
Random injection	At $q = 2$, 816/816 novel three-digit probes connect somewhere but 0/816 reproduce all 45 cells; at $q = 3$, 296/816 do so under a vastly larger search budget	Demonstrates both generic connectability and architecture-level separation

Table 47: Reproduced Dickinson null, knockout, and sensitivity objects.

The registry, primary, extended, finite-choice, random-injection, and local-perturbation outputs were recomputed from the preserved release and matched the supplied machine-readable results. The 233 entries form one dependent chronological network and must not be reported as 233 statistically independent discoveries. The broader symbolic count of one full completion in 8,500,140,000 formally generated profiles is retained as a conditional exploratory sensitivity result rather than the headline statistic.

Emily Dickinson: distributed observer reconstruction

The observer identity is not merely a repeated target of the Dickinson calculations. In the unchanged primary object it behaves as a latent four-primitive solution of a multi-source constraint system. Four of nine individual blocks identify the documented profile by themselves; 125/126 four-block subsets and all 126 five-block subsets do so; removing 43/57 direct-target rows leaves 14 indirect relations that still reconstruct the same profile uniquely; and removing every literal-612 relation also leaves a unique reconstruction. The full profile remains 57/57, 15/15, and 9/9 among 423,360 coherent empirical alternatives, while 100 million context-fixed identity-replacement worlds produce zero joint full reproductions and maxima 46/57, 10/15, and 4/9. This is an extreme conditional, redundancy-bearing architecture under the declared controls. It is not 233 statistically independent trials, not a universal historical probability, and not by itself a determination of the microscopic physical mechanism.

14.19 Temporal/observer-linked signature and causal interpretation

Statistical selectivity and temporal signature are separate questions. The selectivity analyses above ask how specifically the declared relation system identifies the documented observer against defined alternatives. The temporal question asks how observer-specific information is distributed across records that entered the analysis at different stages.

The chronology is asymmetric at the level of exposure: the subject string was AI-supplied and frozen on 25 July before Dickinson-source inspection; the 25-July archival search was performed on 26 July; the two-translation source page was opened in the 28-July stage; the compact $29.7 \rightarrow 297$ rule selected Letter 297 before its contents were read according to the deposited chronology; and the 718/late branches were frozen and added later. Across those stages, newly exposed source blocks do not merely add arbitrary hits. They repeatedly constrain or reconstruct the same observer profile, and later source blocks can reproduce an identity already overdetermined by earlier blocks. The block-by-block, subset-redundancy, and target-knockout results make that observer-linked convergence explicit.

Operationally, this is a *retrocausal-compatible signature*: observer-specific information available at the later analysis stage is recoverable from a multi-path relation network built from earlier historical records and successively exposed sources, and the recovery survives removal of direct observer targets and major source blocks. The phrase "retrocausal-compatible" is deliberately narrower than "retrocausal proof." The current data do not distinguish dynamic rewriting of past records from a time-symmetric/global constraint, another observer-linked organization mechanism, or a sufficiently powerful selection/construction account that can reproduce the same chronology, redundancy, and knockout robustness. The arithmetic therefore constrains what an adequate mechanism must explain without, by itself, identifying the microscopic dynamics.

The Dickinson realization is consequently best stated in two layers: *statistical selectivity* of the observer solution under declared comparison spaces, and a *temporal/observer-linked signature* in which the same solution recurs across sequentially exposed source blocks. The reconstruction results are directly auditable and show that the observer functions as a recoverable structural variable rather than only as an externally inserted target. The choice among dynamic retrocausation, time-symmetric/global constraint, selection over histories, or another observer-linked mechanism remains open.

What this case establishes

The Dickinson system does not merely encode the observer directly; the observer is reconstructible as a latent solution of the remaining distributed constraint network even after removal of the majority of direct observer-target relations. This converts the observer, within the declared operational model, from an externally supplied target into a recoverable structural variable of the documented system. Source-block redundancy and knockout survival make distributed observer reconstruction the primary signature of this realization.

15 Cross-case synthesis: pressure conditions on one structural invariant

15.1 The invariant and the changing pressure conditions

The five books are not interchangeable replications and their probabilities cannot be multiplied. They share one analyst, one evolving framework, one core registry, and partially related code families. Their cumulative force is architectural: the source environment changes radically while a stable relational registry and a stable family of network motifs recur. The Spain and Emily Dickinson extensions are also not separate probability multipliers. Spain adds a finite public-label test, a prospectively frozen source field, a later outcome role, and a 46-closure temporal/family extension. Emily adds four chronological stages, four separately numbered nineteenth-century letters, a 2022 two-translation source page, a frozen 718 phrase, late age/address branches, a complete 233-entry registry, and a 57-relation primary dependency object. Both remain outside the five-book count.

The invariant components are:

1. a frozen observer-linked registry with role relations such as

$$320 + 292 = 612, \qquad 134 + 292 = 426, \qquad 58 + 58 = 116;$$

2. exact source transcription and declared Hebrew or numeric representation;
3. constrained deterministic transformation;
4. exact rather than approximate closure;
5. repeated event-to-event, event-to-observer, and observer-to-event return;
6. dependency-aware score objects; and
7. explicit alternative-observer, role, record, wording, or construction-freedom tests.

The pressure conditions change in a deliberate sequence. The record field contracts from a very broad public archive to one vehicle and one physical card; record state becomes explicit in the Subscriber case; timestamp order becomes a primary constraint in the live-time case. The complete World Cup system then supplies a prospective/chronology-constrained structural signature: a frozen three-component role architecture has one detected structural solution class in its exact finite role space and remains selectively constrained after removal of any whole component, while later public outcome fields enter the documented record at different provenance levels. Dickinson supplies a complementary retrospective observer-reconstruction signature: heterogeneous historical source blocks repeatedly reconstruct one observer profile and retain that solution after direct-target and source-block knockouts. These are two different pressure

conditions on the framework, not statistically independent probability factors. A chance-plus-selection explanation therefore cannot rely on one single property of the 9/11 archive. It must explain recurrence as source breadth, provenance, state structure, temporal openness, finite public-label substitution, linguistic representation, adaptive historical-record search, global role resolution, and distributed identity reconstruction all change.

15.2 Cross-case pressure test matrix

The table below places the corpus on one page as perturbations of a common structural invariant. "Exact" means an exhaustively evaluated finite or solver-defined comparison object; "MC" means a sampled stress test. A dash means that the listed control is not the defining test of that case, not that no related analysis exists.

Case	Source regime	Main freedom tested	Exact / MC	Observer test	Role test	Chronology	Knockout / ablation	Structural result
9/11	Large historical archive	Archive breadth / observer substitution	Deterministic + MC + optimizer	365/365 and 324/324 matched; alternatives separated under declared searches	Role-sensitive catalogue	Retrospective	Targeted construction and observer alternatives	Archive-scale self-reconstruction, recursive re-entry, and multi-anchor observer resolution.
Titanic	Historical event archive	Semantic-role arbitrariness	**Exact** 11! + MC	Observer alternatives also tested	**Unique global maximum** over all 11! assignments	Retrospective	Same inventory, roles reassigned	Semantic-role specificity: the values do not complete equivalently under arbitrary role reassignment.
Ford Capri	One bounded vehicle / photograph	Source richness	Exact solver + MC	Encoded-family solution unique in declared support	Family roles preserved	Retrospective	Severe source contraction	Source-contracted architecture survives with one full family solution in the declared support.
Subscriber	One artifact in two preserved states	Static-record limitation	Deterministic + MC	Matched registry in the declared objects	Role and state labels preserved	Ordered before/after states	State-preserving decomposition; authored language separated	Physical record-state transition itself becomes part of the measured architecture, including non-linguistic paths.
F01/F02	Compact live message/image/result ledgers	Temporal order	Deterministic + MC	Observer-family fields resolved	Event/person roles preserved	**Earlier fields frozen before later fields**	Separate ledger and dependency objects	Chronology-constrained closure: temporal order is a structural variable, without a backward-signaling claim.
World Cup	Frozen F01+F02+Spain role space	Global role allocation	**Exact** finite enumeration + secondary MC	Observer-linked constraints inside global role object	61/61 constraints, 13/13 blocks	Mixed provenance; earlier and later fields explicitly classified	**Whole-component knockouts**	Two full numeric states in 3.4951×10^{19} legal states, one structural solution class modulo F02 symmetry; residual selectivity survives removal of any component.
Dickinson	AI-selected subject + heterogeneous historical blocks	Observer reconstruction / source redundancy	Exact coherent-profile + symbolic + MC	**One profile among 423,360**; indirect reconstruction survives target removal	Source/branch roles compressed into 9 blocks	Sequential source exposure	**Direct-target, literal-612, and block ablations**	Distributed latent reconstruction of the same observer identity across heterogeneous source blocks.

15.3 Comparative architecture table

Case	Record environment and score objects	Architecture, separation, and unique contribution
9/11	Large heterogeneous public archive. The case contains 100 Evidence Units and 659 documented closures. The 365/365 extended and 324/324 conservative catalogues are separate valid objects.	**Architecture:** event self-reconstruction, family-role resolution, recursive linguistic chains, nested Flight 93 networks, and cross-unit node re-entry. **Separation:** random-observer maxima 59/365 in 10M and 174/324 in 20M, with zero full-score alternatives; a targeted genetic optimizer found 320/324 after 17.58M evaluations without reaching equality. **Contribution:** maximum architectural depth and source diversity.
Titanic	Historical maritime archive. Current target-aware objects are 190/190 closure chains, 85/85 closure-bearing units, and 89/89 strict-unique tests.	**Architecture:** event-person-vessel reconstruction, identity-time checksums, mirror and rescue loops, and physical-artifact decomposition. **Separation:** the real role assignment is the sole global maximum among 39,916,800 assignments; the best wrong strict assignment is 82/89 and the broad-random maximum is 20/89. **Contribution:** historical replication plus exact semantic-role specificity.
Ford Capri	One family vehicle, one photograph, and bounded production facts. The current principal layer is 123/123. Density and the two historical 109/109 suites remain separate objects.	**Architecture:** family circuit, ownership self-answer, plate recursion, production fixed point, and end-of-production reconstruction. **Separation:** the 100M principal-layer maximum is 60 against 123; no full or joint match occurred; the exact encoded family solution is unique. **Contribution:** the architecture survives severe contraction to one object.
Subscriber	One physical card preserved in two observed textual states. The first layer 76, event layer 57, full manifest 133, nontrivial core 128, and 31 dependency blocks are non-interchangeable.	**Architecture:** identifier-time loop, dense telephone field, displaced-state return, four-state/day-count checksum, and macro-return to the opening node. **Separation:** reported maxima are 11/128, 11/133, 14/133, and 2–4/31. **Contribution:** record-state transition itself becomes measurable.
Live-time	Two compact timestamped message, image, and result ledgers. F01 has 24/24 closures and 38/38 checks; F02 has 29/29 closures and 61/61 checks.	**Architecture:** earlier message to later result, antecedent-message return to later image fields, event self-reconstruction, and dual-route identity nodes. **Separation:** zero exceedances across thirty one-million-world model-score lines; largest closure maxima are 15/24 and 12/29. **Contribution:** chronology becomes part of the evidence object.

Case	Record environment and score objects	Architecture, separation, and unique contribution
Spain public event	One pre-existing tournament-title field, one later champion label, a finite entrant manifest, and public date/question/group/time fields. Strict, public, and extended objects score 7/7, 10/10, and 22/22; the August registry contains 46 unique Part-Two closures.	**Architecture:** the complete World Cup object is a three-component 61-constraint/13-block role system, with the Spain branch adding a title-to-champion checksum, date and question diamonds, champion-role phrases, dual 179/197 representation collision, title-to-688, 1522, 1182, 1682, full-date, and identity returns. **Separation:** v5.0 finds only 2 full numeric states among 34,951,113,757,163,520,000 legal states, one detected structural solution class modulo the explicit F02 `shirt6`↔`shirt21` automorphism. Whole-component knockouts remain selective at 1 in 13,377,208,320, 1 in 4,514,807,808,000, and 1 in 5,056,584,744,960,000. Unified-99 then supplies a secondary 0/100M stress test with maximum 42/61. Spain alone also completes the 48-label and 68-spelling objects and the sole 2134/Spain pair among 48,000 source–team assignments. The secondary v4.2 representation-choice control gives 189/10,000 qualifying mappings in the primary mode and 252/10,000 in the birth-fixed sensitivity. **Contribution:** exact global role resolution, component robustness, a universally legible later outcome, and a chronology-constrained structural signature with explicit provenance boundaries.
Emily Dickinson	One AI-selected and explicitly frozen historical person, four dated analysis stages, direct biographical sentences, two complete life-date renderings, Letters 166, 167, 728, and 297, two modern translations, a frozen 718 phrase, and late age/address branches. The release preserves 233 classified entries.	**Architecture:** triple 599 convergence; 5540 and 6361 subject–observer returns; Letter 166/728/167 systems; Day-3 translation/date returns; Letter-297 dual 4089 convergence; $F(612)+D(612)$ return; 718, 1218, 2245/1483/871, 2263, and address families. **Separation:** the unchanged primary object has a sole 57/57, 15/15, 9/9 match among 423,360 coherent profiles; four individual blocks and all five-block subsets are uniquely identifying; direct-target and literal-612 knockouts still reconstruct the same four primitives; a 100M coherent identity-replacement null has 0 joint full matches with maxima 46/57, 10/15, 4/9. **Contribution:** distributed observer reconstruction, source-ablation robustness, complete UTF-8 registry, chronological provenance, dependency compression, adversarial identity replacement, and search-budget sensitivity.

15.4 Motif recurrence matrix

The matrix below does not score the books. It states where a motif is case-defining (P), present but secondary (S), or not claimed (–). The purpose is to expose recurrence without pretending that all motifs or instances are statistically independent.

Motif	9/11	Titanic	Capri	Subscriber	Live
M01 Exact identity convergence	P	P	P	P	P
M02 Multi-anchor identity resolution	P	P	P	P	P
M03 Event/object self-reconstruction	P	P	P	S	P
M04 Cross-path convergence	P	P	P	P	P
M05 Recursive linguistic chain	P	P	P	P	S
M06 Loop or fixed-point return	P	P	P	P	P
M07 Observer-centered symmetry	P	S	S	S	S
M08 Semantic question-answer loop	P	P	P	P	S
M09 Role-specific family resolution	P	P	P	P	P
M10 Preserved record-state transition	–	–	–	P	–
M11 Timestamped carryover	–	–	–	–	P
M12 Live external-input closure	–	–	–	–	P
M13 Cross-unit or cross-panel node re-entry	P	P	P	P	P
M14 Observer-linked checksum architecture	P	P	P	P	P

The recurrence of M01, M02, M04, M06, M09, M13, and M14 across all five environments is the main cross-case observation. M10–M12 are not universal requirements; they are additional constraints introduced by the final two books. The synthesis is therefore cumulative without being homogeneous.

15.5 Unified pressure-space figure

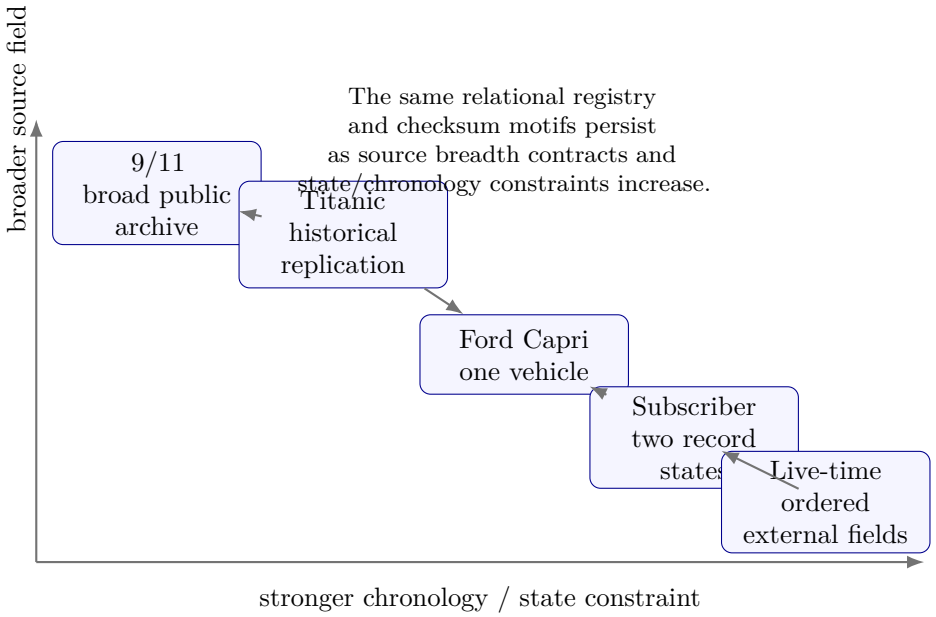


Figure 11: Cross-case pressure space. The cases are complementary constraints, not independent probability factors.

15.6 A unified operational proposition

Let R_i denote the record environment for case i, A the frozen relational observer registry, and $\mathcal{M}$ the declared motif family. Define

$$\mathcal{A}(R_i, A) = (C_i, B_i, M_i, H_i),$$

where C_i is exact closure integrity, B_i is dependency-block success, M_i is motif realization, and H_i is separation from the declared comparison family. The cross-case proposition is not that a universal scalar score exists. It is:

Cross-case RTM proposition

Across materially heterogeneous record environments, the matched observer registry repeatedly participates in exact event/record reconstruction, multi-anchor role resolution, recursive re-entry, and checksum motifs, while the complete declared case-specific objects remain separated from implemented observer, role, record, or construction-freedom alternatives.

This proposition can fail without any arithmetic error. It fails empirically if independent reconstruction cannot reproduce the graphs, if matched observers do not outperform mismatched observers prospectively, if realistic controls reproduce the architectures at comparable rates, or if the apparent recurrence collapses after fair dependency and construction-freedom accounting.

15.7 Why there is no pooled RTM probability

The five rows use different sources, targets, score grammars, dependency reductions, null generators, and discovery histories. A product such as

$$p_{9/11} p_{Titanic} p_{Capri} p_{Subscriber} p_{Live}$$

would assert independence that has not been established and would obscure the single-program dependence. The analysis therefore uses three separate inferential statements:

- **deterministic**: a printed ledger passes or fails;
- **model-conditioned**: a complete score is separated under a specified finite, exhaustive, or Monte Carlo comparison;
- **cross-case architectural**: the same relational motifs recur under materially different pressure conditions.

The third statement is not a hidden probability claim. The cumulative argument is architectural and constraint-based rather than a product of nominal casewise probabilities. It is the cumulative empirical pattern that the prospective program must test directly. The v5.0 exact role-space fraction is likewise confined to one finite, already-frozen World Cup role-allocation support. The v4.2 representation-choice tails are secondary and condition on a different 21-role representation endpoint, observer generator, seven-metric gate, and matched encoding family. None of these quantities is pooled with another case or layer.

16 Skeptical challenge matrix

A rigorous analysis should not ask only whether a critic can explain one equality. It should state exactly which objection is addressed by which implemented control, what the result was, and which scope condition or generalization test remains. An untested extension is not treated as evidence for the null unless a corresponding generative model actually reproduces the observed architecture.

Challenge	**Implemented response and current result**	**Scope / next extension**
Arithmetic or transcription error	Line-by-line deterministic audits, exact-string registers, executable manifests, and version reconciliation. The representative chapters and reported score objects recompute, and known mistakes were corrected without hiding prior versions.	Third-party source acquisition and complete external reconstruction remain incomplete.
Targets were chosen after the fact	One relational registry is reused across cases, while first name, surname, full name, family role, age, birth year, and residence remain semantically distinct. Multiple cases resolve several slots rather than one selected number, and later cases add externally constrained or prospectively frozen fields.	External preregistration was absent for most early historical discoveries. This limits any universal discovery-process probability, but it does not alter the deterministic equations or the case-specific observer, role, and finite-space separations.
The rows are algebraically dependent	Dependency graphs, block scores, derived-node labels, separate score objects, and explicit refusal to treat row counts as independent trials. The Subscriber 31-block layer and all five chapters expose shared nodes and cascades.	Residual cross-block structure can be modeled more finely, but the current conservative block objects already prevent row-count inflation from being treated as independent evidence.
Hebrew wording creates unlimited freedom	Exact strings are printed; authored fields are labeled; phrase variants, ablations, alternate spellings, deep authored-stress, and complete authored-family removal are used in selected cases. Several networks survive ablation or contain strong non-linguistic blocks.	A universal probability distribution over "all natural Hebrew phrasings" is not well-defined and is not assumed. Broader separately frozen phrasing families remain a useful extension; the implemented wording and ablation controls already test substantial linguistic freedom.
The standard Hebrew letter-value mapping was itself a selected representation	Secondary control v4.2 holds its 21-role representation endpoint and seven score metrics fixed and compares the canonical mapping with 10,000 unique permutations of the exact same 22-weight multiset. The primary run has 189/10,000 controls at least as selective as standard; the birth-fixed sensitivity has 252/10,000. Ties count against standard.	This is a representation-choice control, not the p-value of RTM or the 61/13 World Cup architecture. It establishes conditional selectivity only inside the declared matched-permutation family; it does not establish uniqueness among all deterministic encodings, language-independence, or physical privilege.
A large archive makes matches inevitable	Ford Capri contracts the field to one vehicle, Subscriber to one card, and the live case to two compact ledgers. Full architectures persist under bounded source fields, while Spain and July add finite or timestamped external constraints.	Historical domain selection is not randomized in every case, but archive choice alone cannot explain recurrence after source contraction to one vehicle, one card, compact live ledgers, and finite public-outcome spaces. External or randomized domain assignment is a generalization test, not a prerequisite for the existing bounded-case results.

Challenge	Implemented response and current result	Scope / next extension
Any observer would fit	Observer-substitution batteries, exact role searches, and the Capri solver test alternative registries. The real profiles are fully separated in the declared objects, and the encoded Capri support returns one family solution.	Broader separately sampled populations and a blinded multi-observer study would test generality beyond the present registries. They extend, rather than create, the existing matched-observer separation.
The numeric inventory fits many semantic roles	Titanic tests all 11! role assignments; Subscriber and July include role permutations. World Cup v5.0 exhaustively solves the entire frozen `shared_anchor_fixed` role space and finds 2 full numeric states among 34,951,113,757,163,520,000, with the two differing only by one score-preserving F02 swap.	Role schemas and eligible slots were defined within a single research program; the exact v5.0 fraction therefore remains conditional on that frozen role schema.
Record changes are merely transcription corrections	Subscriber preserves 1777/4027 and 1782/4037 as separate states and scores their transition. The later state returns to the displaced earlier state and closes the four-state architecture.	Third-party physical custody, imaging, and acquisition history remain incomplete.
Later information leaked into earlier fields	The live chapter separates raw messages, timestamps, image fields, labels, transcriptions, and authored questions; July uses public timestamp order. Earlier message-derived nodes return later result and image fields under the registered chronology.	Stronger server-side custody and third-party timestamping are needed prospectively.
The null models are too weak	The project uses exact finite scans, exhaustive assignments, multiple observer generators, role permutations, source ablations, neighborhood controls, wording stress, optimization, representation-choice controls, and max-over-choice searches. World Cup v5.0 removes sampling uncertainty altogether for the frozen `shared_anchor_fixed` role-allocation dimension by solving the complete finite support exactly. v0.28.23 additionally adds a frozen integrated max-over-family omnibus sensitivity: 10,000 researcher trajectories, 512 draws in each of 55 implemented families, and 281.6 million candidate evaluations, with 0 primary and 0 strict joint reproductions.	Different freedoms still require different fair comparators. The new omnibus result is finite and conditional on its implemented family grid; it does not enumerate arbitrary natural-language invention, every external archive, every semantic ontology, or unbounded formula invention, and it is not a universal historical-discovery probability.
Multiple testing and stopping inflate the result	Versioned manifests, negative diagnostics, plus-one Monte Carlo reporting, explicit score-object separation, max-over-choice search, optimization diagnostics, and prospective freeze protocols are used. The analysis does not multiply equation probabilities or pool incompatible objects.	A literal log of every early abandoned source, phrase, branch, and stopping decision is unavailable. That limits a universal historical search-budget probability; it is not itself a generative model of the findings. Prospective automatic logging can extend this control directly.
One analyst built the corpus and controls	Books, code, outputs, hashes, and support packages are public or preserved. Deterministic objects are inspectable and selected suites are rerunnable.	External conceptual replication and adversarial reimplementation remain absent.

Challenge	Implemented response and current result	Scope / next extension
The physical interpretation is overreach	The claim hierarchy separates the empirically established phenomenological law in the tested operational domain from the stronger Physical-RTM explanation. The former is the recurrent measured observer–record relation; the latter concerns coupling, actualization, and ontology.	The microscopic or macro-scale coupling equation and ontology remain open. Their absence is a mechanism question, not a negation of the phenomenological law already measured in the corpus.

16.1 Freedom dimensions and distinct controls

The phrase "the null model" can obscure the fact that different tests target different freedoms. The present program therefore uses a distinct-control map: each implemented test changes a specified dimension while retaining others. "Distinct" here does not imply statistical independence; the final column identifies a scope condition or the next fair generalization test, not an automatically successful null explanation.

Table 51: Freedom dimensions, implemented controls, and remaining extensions.

Freedom dimension	Already tested or constrained	Generalization / next extension
Observer identity	Millions of alternative observer profiles in the 9/11, Titanic, Capri, Subscriber, live-time, and July suites; case-specific exact or Monte Carlo comparisons retain the declared score object.	Additional empirically sampled populations and separately assembled observer registries.
Semantic roles	Exhaustive 11! assignment in Titanic; role permutations in Subscriber and July; correct person/relationship slots are scored separately from any-target hits. World Cup v5.0 exactly enumerates the complete frozen `shared_anchor_fixed` role-allocation support and finds only two full numeric states, one structural class modulo the explicit F02 automorphism.	Externally defined role schemas and external preregistration of eligible slots; exact v5.0 coverage does not extend beyond its frozen strata.
Authored wording	Exact strings are printed and labeled; selected variants, source ablations, deep authored-stress, and complete authored-family removal are implemented, including the July 8/8 residual object.	Broader separately sampled and frozen formulation families for defined query classes; no universal distribution over all possible natural-language phrasings is assumed.
Operation grammar	Finite declared grammars, neighborhood tests, adaptive sign families, construction-freedom diagnostics, and max-over-choice searches are implemented in selected cases.	A common preregistered grammar and equal search budget applied across the full corpus and all controls.
Number representation	Digit, cardinal, raw-source, standardized-label, reversal, and related conventions are explicitly named; alternate spellings and representation-dependent paths are grouped into dependency blocks rather than counted as separate evidence items. Secondary control v4.2 compares the canonical Hebrew mapping with 10,000 unique permutations of the exact same 22-weight multiset under a paired observer design: 189/10,000 controls qualify in the primary mode and 252/10,000 in the birth-fixed sensitivity.	Separately frozen control families covering other deterministic encodings, languages, and realistic linguistic representations, plus prospective source acquisition before outcome revelation.

Freedom dimension	Already tested or constrained	Generalization / next extension
Relational algebra	The Titanic 11! test retains the same eleven values and therefore preserves every internal numerical relation while changing semantic assignment; family-role identities are also tested in other suites.	Newly generated realistic registries that are isomorphic to the declared family-relation graph while preserving value-range and language constraints.
Chronology and custody	Live-time records preserve message/image/result order; the July sequence preserves a Day-1 public value before its Day-2 documentary role; source/order challenges are separated from arithmetic checks.	Automatic server timestamping, hash deposit, and protocol freeze before outcome revelation in prospective studies.

This map prevents two opposite inferences. The existence of an unimplemented extension does not erase uniqueness or extremity already established in a declared comparison space. Conversely, success under one control dimension does not license a universal probability statement about every possible discovery process. A universal omnibus null is not a methodological prerequisite for a phenomenological-law claim. v0.28.23 nevertheless adds one explicitly frozen finite omnibus sensitivity whose generator, family grid, and per-researcher search budget are stated below; its scope remains the implemented grid rather than every conceivable historical choice.

The matrix therefore prevents both dismissal and overstatement. It prevents the corpus from being dismissed as though no controls existed, while preventing case-specific results from being mislabeled as one universal historical p-value. Unlogged historical choices are treated as scope conditions on universal probability claims, not accepted as a causal explanation unless a competing generative model can reproduce the observed role-preserving recurrence at comparable levels. Retrospective flexibility, post-selection, and multiplicity are addressed by distinct controls, construction-search tests, explicit score separation, and prospective extensions rather than by one nominal correction [2, 3, 5, 6, 12].

Burden of a selection-only explanation. An unlogged degree of freedom is a methodological uncertainty, not by itself a demonstrated generative explanation of the observed architecture. To explain the established phenomenological law in the tested domain as Adaptive Search or post-selection, a competing model must specify comparable source, wording, representation, operation, role, chronology, and stopping freedoms and then reproduce the observed combination of observer specificity, role specificity, dependency structure, loops, chronology, exact uniqueness, and cross-case recurrence at comparable levels. None of the implemented adversarial controls does so.

16.2 Joint max-over-K search-budget stress test (Stage 1)

To address the narrower objection that a target-aware analyst could examine many candidate assignments and retain only the strongest, a joint max-over-K search-budget stress test was run across the already frozen World Cup Unified-99 v3.1 and Dickinson Unified-57 v3.2 objects. This does not introduce a new candidate-world family: World Cup candidates are drawn from the existing `shared_anchor_fixed` same-inventory role-allocation null, and Dickinson candidates from the existing `context_fixed_identity_randomized` coherent observer-replacement null. Instead, the inferential unit is a simulated researcher trajectory. Each trajectory receives K candidate worlds per case, retains the strongest candidate in each case, and is counted as a full reproduction only if the complete declared objects are satisfied in both cases. The internal search score is used only to select the best candidate. Dickinson's direct-target and literal-612

knockout subsets are retained as structural diagnostics; because they are subsets of the full 57-relation object, they are not treated as independent probability factors.

A STANDARD implementation run used 25,000 trajectories with $K = 128$, or 3.2 million raw candidate worlds per case, and produced zero full World Cup, Dickinson, or joint reproductions. In the STRONG run, 100,000 researcher trajectories with $K = 256$ generated 25.6 million raw candidate worlds per case. No World Cup trajectory reproduced 61/61 constraints and 13/13 blocks; the best alternative reached 39/61 and 5/13. No Dickinson trajectory reproduced 57/57 relations, 15/15 classes, and 9/9 blocks; the best alternative reached 44/57, 10/15, and 2/9. Consequently there were zero joint full reproductions. The exact one-sided 95% zero-hit upper bound on the per-trajectory joint reproduction rate under this declared Stage-1 null is 2.99569×10^{-5}. This quantity is not compared, normalized, or combined with the 100-million-candidate bounds because its denominator is different: one simulated researcher trajectory already includes max-over-K selection. Stage 1 rejects the declared max-over-K adaptive construction null at the trajectory level. It is not intended as a universal simulation of every conceivable historical researcher degree of freedom. Its role is to test whether an explicitly modeled search process can reproduce the observed architecture at comparable completeness.

16.3 Integrated omnibus historical-search sensitivity (v2.0)

Stage 1 varies search budget while retaining one already-frozen candidate generator per case. The v2.0 omnibus sensitivity asks a broader but still finite question: if each simulated researcher is allowed to search *every implemented family* across role allocation, coherent observer replacement, generic source/value and wording envelopes, target choice, chronology handling, low-complexity operation grammar, and stopping, while representation choice is left unpenalized, does the declared cross-case architecture become reproducible?

The method was frozen on 25 August 2026 against the v0.28.22 release before the reported run. Every researcher searches four World Cup Unified-99 families (`global`, `stratified`, `fixed_identity`, `shared_anchor_fixed`), three Dickinson Unified-57 families (`context_fixed_identity_randomized`, `birthyear_fixed`, `apartment_birthyear_fixed`), and 48 generic adaptive families formed by crossing eight source/value generators with three target spaces and two date modes. The generic layer includes deliberately permissive `phrase_free_9999`, `source_wording_free_9999`, and `all_numeric_free_9999` envelopes, which allow arbitrary integer outcomes in the declared 1–9999 representation domain for relevant fields and therefore include many values that need not correspond to natural Hebrew wording. Its scorer exhaustively searches the frozen low-complexity grammar of raw values, full-number and digit-word representations, decimal reversal, pair sums and absolute differences, signed raw triples after global-sign symmetry, dual representation collisions, and one depth-2 pair-derived construction. Representation freedom is granted without multiplying the separate v4.2 representation tail. Stopping freedom is absorbed by retaining the best-so-far candidate over the complete search budget.

The inferential unit is one simulated researcher trajectory, not one candidate evaluation. In the reported run, $T = 10{,}000$ trajectories each receive $K = 512$ draws in every one of the 55 families. The resulting accounting is:

Layer	Families	Draws per trajectory	Candidate evaluations
World Cup	4	4×512	20,480,000
Dickinson	3	3×512	15,360,000
Generic adaptive	48	48×512	245,760,000
Total	55	$55 \times 512 = 28{,}160$	281,600,000

A **primary full hit** requires that, somewhere within the same researcher's exhaustive family search, World Cup reaches 61/61 constraints and 13/13 dependency blocks and Dickinson reaches 57/57 relations, 15/15 classes, 9/9 blocks, the complete 14/14 direct-target-knockout remainder, and the complete 35/35 no-literal-612 remainder. A **strict full hit** additionally requires at least one generic adaptive candidate to meet or exceed the observed world on every frozen Pareto-gate metric. These are researcher-level max-over-family endpoints: they do not mean that one single candidate world simultaneously mutates every freedom dimension.

The 96-core execution completed all 10,000 trajectories and all 281,600,000 candidate evaluations. The merged result is:

Endpoint / diagnostic	Result
Primary joint full hits	0 / 10,000
Strict all-layer full hits	0 / 10,000
World Cup full hits	0 / 10,000
Dickinson full hits	9 / 10,000
Generic adaptive full-gate hits	3,577 / 10,000
Maximum World Cup constraint score	40/61
Maximum World Cup block score	5/13
Maximum Dickinson score	57/57, 15/15, 9/9, 14/14, 35/35

The zero primary count gives the exact one-sided 95% zero-event upper bound $1 - 0.05^{1/10{,}000} = 2.9952836 \times 10^{-4}$ on the per-trajectory primary reproduction rate under this declared omnibus null (one-sided normal equivalent $z \approx 3.432$ if expressed on that scale). The same numerical bound applies to the strict endpoint because it also has zero hits, but the strict result is not an independent event: primary success is a prerequisite for strict success. Candidate evaluations are likewise not treated as independent Bernoulli trials and 281.6 million is therefore not used as the probability denominator.

The component results are informative about null permissiveness. Dickinson can be fully reconstructed under this broader search in 9 trajectories, and the generic adaptive Pareto gate is reached in 3,577 trajectories; the omnibus generator therefore does not make all strong sub-results impossible by construction. The closest recorded trajectory simultaneously achieved a full Dickinson reconstruction and a qualifying adaptive gate, but only 24/61 World Cup constraints and 2/13 World Cup blocks. World Cup itself had no full trajectory; the maximum retained constraint score was 40/61 and the maximum retained block score was 5/13 (reported as separate maxima and not assumed to come from the same candidate). The primary 0/10,000 result therefore states that the declared max-over-family historical-search process did not reproduce the joint architecture at full completeness.

Omnibus interpretation boundary. v2.0 is exhaustive over the declared implemented family grid for each simulated researcher and deliberately permissive in several numerical wording/source dimensions. It is not exhaustive over arbitrary natural-language invention, every possible external archive, every semantic ontology, or unbounded formula invention. The result is therefore reported as "0/10,000 primary reproductions under RTM Omnibus Historical-Search Null v2.0," not as a universal probability of the entire historical discovery process.

16.4 Control encodings

The encoding convention is itself testable as a nuisance factor. v4.2 is therefore retained as a secondary matched control for the canonical Hebrew letter-value assignment: every primary control is a unique non-identity permutation of the exact standard 22-weight multiset, with the additive coding rule, representation-analysis score object, and observer sample held fixed. The standard mapping gives $D = 1/10{,}000$ in both observer modes. In the primary birth-randomized run, 189/10,000 control mappings are at least as selective as standard, yielding the emitted add-one tail $p = 0.0189981$; in the birth-fixed sensitivity, 252/10,000 qualify, with $p = 0.02529747$. This is not a p-value for RTM, for Unified-99, or for the corpus as a whole. The tails are not normalized, combined, or substituted for the case-level architecture tests. Other appropriate controls remain alternative deterministic character encodings, label permutations, date substitutions, observer substitutions, and matched linguistic controls.

17 The Observer Matrix: empirical constraint and bounded physical interpretation

17.1 A. Empirical constraint

The Observer Matrix [33] is used here first as an operational measurement framework. An "observer" is represented by a frozen relational data registry—names, family roles, dates, ages, and residence fields under declared encodings—rather than by introspection, intention, or belief intensity. A "record" is an accessible informational state such as a public historical datum, physical artifact, photograph, message, timestamp, score, or printed field.

The empirical constraint any adequate theory must explain is the complete architecture: heterogeneous record systems repeatedly exhibit exact, role-preserving and dependency-aware organization around the matched observer registry, including semantic-role specificity, recursive re-entry, physical record-state dependence, chronology-constrained completion, global finite-space resolution, and knockout reconstruction. An explanation that merely establishes that numerical coincidences are common in flexible encodings does not address these combined properties.

The proposed measurable relation is therefore between

$$\text{record state } R_i \quad \text{and} \quad \text{observer registry } A_j,$$

with the strongest prospective discriminator given by matched-versus-mismatched architecture scores,

$$S(R_i, A_i) > S(R_i, A_j) \qquad (j \neq i).$$

The present historical corpus establishes the bounded law in its tested operational domain; a blinded multi-observer matrix tests portability and generalization beyond that domain.

17.2 B. Minimum Empirical Implication

Minimum empirical implication

Within the tested domain, the complete measurable organization of the relevant records cannot be adequately treated as statistically and structurally independent of the matched observer-linked information relation under the declared comparison spaces. The minimum implication is observer-linked record organization; it does not require a claim that consciousness creates reality, that numbers are causal agents, or that backward signaling has been demonstrated.

RTM therefore reports not merely observer specificity but observer-linked organization distributed across records associated with distinct times. The complete architecture is detectable only at the level of the temporally extended observer–record system. This is the minimum cross-temporal empirical constraint that a competing model must reproduce.

17.3 C. Candidate mechanism families

The phenomenological law does not uniquely determine its microscopic realization. Candidate mechanism families remain open and include:

- dynamic retrocausation without controllable backward signaling;
- time-symmetric or history-level global constraint;

- relational consistency among observer-linked record states;
- selection over globally consistent histories; and
- another observer-linked physical or informational mechanism capable of reproducing the measured specificity, chronology, and robustness.

RTM's stronger physical proposal is one candidate realization within this open mechanism problem; the measured phenomenology is logically prior to choosing among these families.

The observed cross-temporal organization is naturally compatible with history-level or global-consistency descriptions in which the physically relevant object is a temporally extended solution rather than a sequence of mutually independent record states. The corpus does not yet uniquely select this ontology over other observer-linked mechanisms. If the measured law is ultimately generated by a global or time-symmetric consistency principle, the familiar forward causal arrow may represent an effective description within a deeper history-level constraint structure; this is a theoretical implication to test, not an empirical conclusion already forced by the arithmetic.

17.4 D. Open microscopic theory

A physical theory of RTM still requires explicit state variables, a coupling equation, a scaling law, boundary conditions, conservation and no-signaling consistency, and predictions that discriminate among the candidate mechanism families. Physical RTM is therefore the open mechanism problem behind an already defined operational phenomenology, not a mathematical derivation from gematria or quantum theory alone. The absence of a microscopic equation limits mechanism claims; it does not retroactively turn exact finite-space or reconstruction results into unmeasured observations.

17.5 Relevant observer-record physics

The connection between RTM and modern observer-record physics is operational rather than merely thematic. Three features of the Wigner's-friend literature are directly relevant: the functional definition of an observer, the nontrivial status of observer-independent recorded facts, and the physical treatment of memory persistence and change.

17.5.1 A functional observer is an information-extracting memory system

Proietti et al. define an observation as the extraction and storage of information about a physical system, and define an observer as any physical system able to perform that interaction and store the result in physical memory [11]. Their definition does not require biological consciousness, introspective report, or human-scale complexity. It includes human observers, classical or quantum computers, measurement devices, and simpler physical systems that satisfy the extraction-and-storage requirements. The same work emphasizes that the relevant conflict is between recorded facts, not between private conscious experiences, and that standard quantum formalism does not impose a fundamental distinction between information recorded in microscopic and macroscopic memory systems.

This point requires one boundary. A passive inscription, photograph, or database entry is not automatically an observer merely because it stores information. The operational observer is the physical measurement-and-storage system that extracted and retained the information; the accessible document is its record state. RTM therefore does not equate a printed card with a conscious subject. It studies the relation between a documented record state and a frozen

registry identifying the observer-linked system under which that record becomes accessible and analytically integrated.

17.5.2 Observer-independent facts are a physical assumption, not a default

In the extended Wigner's-friend experiment, Proietti et al. test a Bell-type constraint derived from locality, free choice, and observer-independent facts, obtaining a reported violation above five standard deviations [11]. The result does not identify which assumption must fail, and it does not by itself establish a macroscopic record mechanism. It does establish that the joint availability of observer-independent facts is a testable physical assumption rather than an automatic premise.

Bong et al. sharpen this issue through the Local Friendliness framework [4]. Their Absoluteness of Observed Events assumption states that an observed event is a single real event whose existence is not relative to anything or anyone. Their theorem shows that, if coherent quantum control is possible on the scale of an observer, no physical theory can satisfy Local Friendliness, the conjunction of No-Superdeterminism, Locality, and Absoluteness of Observed Events. Their photonic implementation is a proof of principle rather than a completed macroscopic-observer experiment, and the authors explicitly leave open objective-collapse or other limitations on observer-scale coherent control. The conceptual consequence is nevertheless precise: the absoluteness of observed events is one of the assumptions placed under direct physical pressure.

RTM tests a distinct but structurally related proposition. It does not measure a Local Friendliness inequality. It asks whether accessible macro-records behave as fully observer-independent inventories under a frozen computational protocol, or whether their complete architectures show matched-observer specificity:

$$S(R_i, A_i) > S(R_i, A_j) \qquad (j \neq i).$$

A reproducible diagonal advantage would not reproduce the Wigner's-friend theorem, but it would constitute a macroscopic record-level signature consistent with failure of a fully observer-independent description of the scored record architecture.

17.5.3 Memory persistence and record-state change are physical variables

Baumann and Brukner analyze the friend's memory before and after Wigner's measurement [1]. In their model, the measurement can alter the record stored in the friend's memory register. They then show that even limited awareness of the aggregate change can conflict with the no-signaling condition in an extended Wigner's-friend setting. Guérin et al. similarly analyze the persistent reality of the friend's perception [7]. These works do not treat memory as a passive philosophical metaphor: the before-state, after-state, accessibility, and persistence of a stored record are physical variables constrained by the theory.

The Living Subscriber case is relevant at this exact operational level, while remaining mechanistically distinct. It preserves multiple states of one macroscopic record, including the before and after values of two documented edits, and scores the complete transition architecture rather than only one final inscription. RTM does not infer that a Wigner measurement produced those edits. Its empirical contribution is narrower: record-state transition, temporal persistence, and observer specificity are jointly measurable in a macro-record corpus.

17.5.4 Relative facts, diachronic observers, and timelike constraints

Recent work extends the observer-record discussion in three directions. Di Biagio and Rovelli define information and relative facts quantitatively through probability distributions and correlations, without assigning a fundamentally special physical role to human observers [17]. On their account, knowledge and records are physically embodied correlations, and a variable may be a fact relative to another variable even when it is not an absolute fact.

Terris argues that the minimalist RQM observer-as-interacting-system is insufficient for empirical confirmation across time [18]. The proposed informational observer must be able to record outcomes, retain records, and relate records from different times into one coherent diachronic informational thread. This is conceptually close to the RTM observable, which scores not an isolated interaction but an architecture assembled from records attributed to different event-times around one frozen relational registry.

Zwirn develops an explicitly perspectival interpretation of extended Wigner-friend results and argues that scientific objectivity can be grounded in the internal coherence of perspectival structures rather than in a single global inventory of observer-independent facts [19]. This is an interpretive proposal, not an experimental derivation of RTM, but it supplies a direct conceptual vocabulary for observer-linked macro-record coherence.

Mukherjee and Hance construct a timelike analogue of Local Friendliness [20]. Under their stated assumptions–Axiological Time Symmetry, Absoluteness of Observed Events, No Retrocausality, and Screening via Pseudo Events–they derive an inequality violated by quantum predictions, including under a weakened operational form of absoluteness. The theorem does not determine which assumption fails and does not by itself demonstrate macroscopic retrocausality. It does establish that No Retrocausality can appear as one explicit member of a jointly testable assumption set rather than as an untouchable background axiom.

Adlam argues, conditionally on a proposed analogy between black-hole paradoxes and Wigner-friend scenarios, that the comparison favors intrinsic rather than merely emergent relationality and some form of retrocausality [21]. The argument is explicitly conditional on substantive assumptions about black-hole physics and is best treated as theoretical motivation.

Together these works sharpen the bounded RTM bridge. Relative facts provide the information-theoretic relation; the informational observer provides diachronic record integration; perspectival objectivity provides a coherence criterion without a privileged global viewpoint; and timelike no-go work places event absoluteness and No Retrocausality inside one formal pressure set. None of these papers predicts Hebrew encoding or proves the RTM mechanism. RTM contributes a distinct macroscopic empirical proposal: test whether frozen, heterogeneous records form reproducible, dependency-aware architectures preferentially around their matched observer-linked registries and whether earlier frozen fields systematically acquire later roles under prospective controls.

17.5.5 Direct correspondence and evidential boundary

Operational issue	Observer-record literature	RTM relation and evidential boundary
Observer definition	A physical system extracts information through interaction and stores the result in physical memory; consciousness is not required [11].	A frozen observer registry labels the matched relation tested against accessible record states. The registry is not itself claimed to be the physical observer. The alignment is direct at the level of information extraction, storage, record, and observer relation.
Scale and complexity	Standard quantum formalism does not distinguish information merely by whether the memory is microscopic or macroscopic, although observer-scale coherent control remains experimentally unresolved [11, 4].	RTM tests public archives, photographs, physical objects, institutional fields, messages, timestamps, and preserved transitions. It is a macroscopic extension test, not evidence that those records underwent the same quantum laboratory dynamics.
Absoluteness of facts	Observer-independent facts and Absoluteness of Observed Events are assumptions constrained by Bell-Wigner and Local Friendliness results under their stated premises [11, 4].	RTM compares matched and mismatched observer registries against the same declared architecture. A matched-observer advantage would be consistent with observer-linked record organization; it is not itself a Local Friendliness violation.
Record persistence	The content and persistence of a memory register before and after a superobserver interaction are physical variables; awareness of change is constrained by no-signaling [1, 7].	The Living Subscriber preserves and scores multiple before/after states of one documentary record. The measured object corresponds directly at the record-state level, without claiming that the underlying mechanism is already identified.
Diachronic and timelike structure	Relative-fact and informational-observer work treats records and perspectives as physical correlations extended across time; timelike no-go work places event absoluteness and No Retrocausality inside an explicit joint assumption set [17, 18, 20].	RTM scores architectures joining records attributed to different times around one matched registry. This places the RTM cross-temporal relation inside a physically nontrivial observer–record problem rather than a purely philosophical analogy; the microscopic derivation connecting the two levels remains open.
Empirical discriminator	The quantum works use inequalities, controlled settings, and quantum correlations.	RTM uses exact architecture scores, dependency reduction, observer substitution, role permutation, exhaustive assignment, max-over-choice controls, and prospective diagonal tests. The formalism differs, while the empirical question of fully observer-independent recorded facts is shared.

The correspondence supports the following bounded bridge claim:

Macroscopic observer-record extension tested by RTM

The Wigner's-friend literature establishes that an observer can be defined through physical information extraction and storage, that the joint absoluteness of recorded facts is a substantive physical assumption, and that memory-state persistence can be altered or constrained under observer interactions. RTM tests whether these principles have a reproducible macroscopic record-level signature: exact, dependency-aware organization that is preferentially expressed by the matched observer registry across heterogeneous accessible records.

The relation is therefore not merely analogical, but neither is it a mathematical derivation of RTM from quantum theory. The definitions of observer, record, stored fact, persistence, and observer relativity align at the operational level, while Wigner-friend and Local-Friendliness results separately establish that observer-independence and the absoluteness of recorded facts are physically nontrivial assumptions. RTM tests a distinct macroscopic phenomenological law in precisely this observer–record domain. The quantum papers do not predict Hebrew encoding, the RTM target registry, or the observed closure architectures; RTM does not reproduce their inequalities or demonstrate coherent quantum control of macroscopic observers. What remains open is the microscopic bridge: the coupling principle, if any, that would derive the RTM record law from a deeper physical theory and identify which foundational assumptions are responsible.

17.6 Algorithmic idealism and the observer-state starting point

M. P. Müller's observer-state program supplies a closer formal comparison because it does not begin by postulating an observer-independent external world. In *Law without law*, the primitive object is an observer's present state x, understood as the complete finite information constituting that observer-moment. Probabilities for a possible next state y are assigned by universal algorithmic induction conditional on x [14]. In schematic notation,

$$P(y \mid x) \propto M(y \mid x),$$

where M is a universal algorithmic semimeasure, with the usual machine-dependence controlled only up to multiplicative constants. Persistent simple regularities then make experience appear to the observer *as if* there were a stable external world. The external world is therefore emergent in the model rather than a primitive assumption.

The 2026 algorithmic-idealism formulation develops the same first-person starting point as a rule for rational credence about what an observer should expect to experience next [15]. The adversarial-collaboration paper with McQueen then places this view against realist alternatives and makes the external-world issue explicit [16]. These works are mathematically stronger than the generic statement that "information is physical": the observer's informational self-state is the conditioning object from which experiential transition probabilities are defined.

The structural correspondence with RTM is direct but bounded:

$$\underbrace{x \longrightarrow P(y \mid x)}_{\text{Müller: next observer state}} \qquad \text{and} \qquad \underbrace{\mathcal{I}_O(t), \mathcal{S} \longrightarrow \mathcal{R}_O(t)}_{\text{RTM: accessible record organization}} \quad .$$

Both programs make observer-linked information prior to the experienced world-description. Müller supplies a formal transition principle and an emergent-world theorem program; RTM supplies a proposed macroscopic record observable and case-specific controls. The Dickinson coherent-profile test is especially relevant because it asks whether the complete observed record architecture is preferentially reconstructed by one observer-linked information state rather than by coherent replacements.

Precise Müller–RTM bridge

Müller shows how a stable world-like experience can emerge statistically when possible next observer states are conditioned on the current informational self-state. RTM tests a different proposition: whether heterogeneous accessible records form exact, role-preserving architectures preferentially around their matched observer registry. The common structure is observer-state conditioning; the difference is that Müller's work does not predict Hebrew encoding, the RTM closures, or conscious control of arbitrary macroscopic outcomes, while RTM does not derive its phenomenological record law from universal induction. The correspondence is formal and operational, not a claim that one theory has already been mathematically reduced to the other.

17.7 Candidate mechanism: participatory record organization

One candidate, placed in the broader participatory-observer tradition [13], is that the accessible record network is not merely a passive archive interpreted after the fact. It may be an informational state whose realized organization is partly relational to the observer-linked information system under which it is stored, accessed, and integrated:

$$\mathcal{R}_O(t) = \Phi(\mathcal{I}_O(t), \mathcal{S}) \,,$$

where $\mathcal{S}$ denotes the external source environment and Φ is an unknown organizing relation rather than a specified microscopic dynamics.

Bidirectional participatory record-organization hypothesis

The displayed past and emerging future are two domains of one accessible information network. Information already frozen in an observer-linked state may reappear in later external records, while information that becomes active later may form exact, role-preserving relations with records attributed to earlier times. The numerical layer functions as an audit checksum of that organization, not as the proposed causal agent.

Nothing in the present framework requires gematria to possess a privileged or fundamental physical status. If the reported phenomenology is genuine, the central question is why frozen, externally sourced, and explicitly provenance-classified records become unusually organized under a deterministic representation—not why a particular numerical alphabet should exert causal power.

The forward arm is operationally strongest when an earlier frozen message, value, or timestamp returns a later score, image field, date role, or event result. The retrospective arm is operationally expressed when current information and older records form a dense, role-correct architecture that was not present as an explicit analytic object at the time the older record was produced. RTM interprets the two arms as one cross-temporal information relation.

This hypothesis does not require that a controllable message be sent into the past, that an analyst consciously causes a historical event, or that an earlier record be observed changing in front of a camera. A coherent update model could, in principle, preserve one mutually consistent set of present records, memories, and histories. The current corpus does not prove that such a global update occurred; it reports the structured dependence that motivates the model. A mature physical theory would still require state variables, a coupling rule, scaling conditions, conservation and no-signaling constraints, and predictions that distinguish genuine observer-linked organization from adaptive search.

17.8 Distinct predictions of the physical layer

A useful physical hypothesis must generate observations not already guaranteed by retrospective construction:

P1: matched-observer dominance
: Under one blinded protocol, records score higher against their matched observer registries than against mismatched registries.

P2: role specificity
: Preserving the numeric inventory while permuting semantic identity roles reduces the complete score.

P3: prospective chronology
: Pre-registered earlier fields return later external fields more often for matched observers than for controls.

P4: source-contraction persistence
: The matched advantage survives when source inventories are small and fixed rather than broad historical archives.

P5: negative-case calibration
: Most predeclared windows may be null, but the full distribution of scores differs from the corresponding control distribution without selective retention.

P6: cross-temporal role preservation
: When an earlier field and a later external field are linked, matched-observer architectures preserve the declared temporal and semantic roles more often than shuffled-time, shuffled-role, and mismatched-observer controls.

Failure of P1 across adequately powered, separately run studies would directly weaken observer specificity even if the historical arithmetic remains correct.

17.9 Falsification boundary

The physical interpretation is materially weakened if:

- independent teams cannot reproduce the source strings, graphs, or executable scores;
- matched observer-record pairs show no diagonal advantage;
- realistic control observers and records reproduce complete architectures at comparable rates;
- phrase and construction-freedom controls erase the effect;
- prospective negative cases dominate without a predeclared distributional signal; or
- the apparent cross-case recurrence reduces to one correlated numeric inventory after dependency analysis.

The arithmetic corpus would remain a historical object under some of these failures, but the observer-conditioned physical hypothesis would not.

18 The 14–15 July sequence as a compact prospective bridge

18.1 Why it belongs after the core and public-event synthesis

The 14–15 July 2026 sequence is methodologically useful because two separately timestamped records are joined by a value archived on Day 1 and assigned a new documentary role on Day 2 [46, 47, 45]. It should not dominate the paper: the five books establish the breadth of the architecture, the Spain extension adds a finite public-outcome test, and July supplies a compact bridge toward prospective design.

On 14 July, the archived network contained two declared renderings with value 2378:

$$g(H(1359)) = 2378, \qquad g(H(612)) = 2378.$$

On 15 July, the exact full Hebrew Gregorian-date phrase also had value 2378. The chronological relation is therefore

$$\text{Day-1 archived node } 2378 \longrightarrow \text{Day-2 date phrase } 2378.$$

The arrow records public timestamp order; it does not by itself prove a causal direction.

18.2 Deterministic and finite-space objects

The locked Day-2 core contains 16 exact string checks and 19 arithmetic checks:

$$35/35 \text{ PASS}.$$

The full Day-1 and Day-2 daily gates each score 9/9. Across the declared calendar support from 1 January 1900 through 31 December 2100:

- Day 1 is the sole complete hit among 73,414 dates;
- Day 2 is the sole complete hit among 73,414 dates; and
- the adjacent 14–15 July pair is the sole complete pair among 73,413 adjacent pairs.

Under the released transparent uniform-letter finite support, the fixed-date observer prevalence is

$$p_{\text{fixed,letters}} = 3.3610099353 \times 10^{-8}.$$

The complete Day-2 and sequential prevalences are

$$p_{\text{Day2}} = 4.5781593910 \times 10^{-13},$$

$$p_{\text{seq}} = 3.8151847939 \times 10^{-15}.$$

These values are exact within the declared supports. They are not empirical frequencies of natural Hebrew names or a universal probability of the discovery process.

18.3 Adversarial extensions

Three additional results are important because they target different freedoms:

1. **Authored-language ablation.** Complete removal of the authored theoretical family leaves an exact 8/8 Day-2 structure.

2. **Semantic-role permutation.** The observed assignment is the sole 9/9 arrangement among all $8! = 40,320$ assignments of the retained values to the declared roles.

3. **Architecture-aware observer profiles.** Across 30,000,000 profiles, no profile reproduced the complete Day-1 architecture or the complete 15/15 sequential architecture. One profile reproduced the isolated Day-2 6/6 observer architecture, at a raw frequency consistent with the exact fixed-date observer prevalence; its apartment value was 2 rather than 58, so it did not reproduce the cross-day architecture.

The isolated Day-2 match is scientifically useful. It demonstrates that the daily observer-only architecture is rare but not metaphysically impossible under the declared generator. The stronger cross-day conjunction supplies the additional constraint.

18.4 What July contributes

The July sequence contributes four design principles for future work:

- timestamp the object before the later field is evaluated;
- define the complete gate rather than multiply individual equations;
- remove authored theoretical language as a full family rather than merely rewording it; and
- preserve null profiles that partially match, including the fields that prevent full architectural reproduction.

The case is extreme under its declared finite and architecture-aware models. Its exact and simulated claims remain conditional on the locked strings, supports, roles, and templates. The incomplete early search log limits a universal discovery-process probability; it is not treated as a competing generative explanation unless such a model is specified and shown to reproduce the architecture.

19 Prospective generalization and independent replication program

Prospective blinded studies test external generalization, laboratory independence, observer specificity, scaling, and portability beyond the existing corpus. They are replication/generalization tests of the bounded phenomenological law, not a first validation required to make the present operational results exist. The critical design features are independent analysts, independent custody, blinded observer identities, a frozen protocol, preregistration, independent source acquisition, and predetermined stopping rules.

19.1 Study A: independent reconstruction of the existing corpus

To extend the phenomenological law beyond the present author-led corpus and to test the stronger physical hypothesis, an independent team should receive frozen source inventories, exact strings, anchor registries, dependency definitions, executable manifests, and version hashes. The team should, under separate custody and blinding:

- authenticate a defined sample of public and private-source records;
- recompute all selected Hebrew values and arithmetic;
- reimplement the score objects without using the original code;
- reproduce finite scans and selected Monte Carlo batteries; and
- publish every discrepancy under a new persistent record.

This study tests correctness and reproducibility, not observer specificity.

19.2 Study B: blinded multi-observer diagonal test

Study B prospectively tests the generalization of the already observed phenomenological law under a fully frozen and blinded protocol, while sharply discriminating against explanations based on adaptive discovery. Its role is generalization and discrimination, not first establishment of the phenomenon documented in the present corpus.

Recruit n consenting participants. Freeze a common-schema registry A_i for each participant, with privacy-preserving hashes or independent escrow. Acquire one matched record R_i per participant under a common protocol while the scoring analyst is blinded to participant identity. Compute the complete matrix

$$S_{ij} = S(R_i, A_j).$$

Following the logic of prospective preregistration [9], the preregistered primary statistic is the mean diagonal advantage

$$D = \frac{1}{n}\sum_{i=1}^{n}\left[S_{ii} - \frac{1}{n-1}\sum_{j\neq i} S_{ij}\right].$$

Participant labels are permuted exactly when feasible or with a plus-one Monte Carlo test [10]. The analysis must freeze:

- eligibility and common registry fields;

- source acquisition and observation windows;
- exact language and date conventions;
- permitted operations, branch budget, and maximum depth;
- primary motifs, dependency blocks, and score;
- null generators, seeds, stopping rule, and multiplicity treatment; and
- automatic retention of every negative record and failed path.

RTM predicts $D > 0$. A result centered near zero with adequate precision would falsify or materially constrain the preregistered prospective generalization claim and weaken matched-observer specificity beyond the present corpus; it would not, by itself, demonstrate that Adaptive Search generated the existing corpus.

19.3 Study C: prospective source-contraction test

Assign each participant a small, externally selected object or record packet with a fixed field schema. The analyst cannot choose the object after seeing its fields. The primary question is whether matched-registry advantage persists under a bounded source inventory. This study directly extends the Ford Capri contribution without relying on one historically selected vehicle.

19.4 Study D: automated live external-input test

An external contributor or automated system supplies a message, image, score, or other field under a predeclared prompt. Server time, raw payload, and freeze hash are deposited automatically before outcome revelation. Authored follow-up questions are excluded from the primary score. This study tests the live-time architecture while reducing custody and leakage ambiguity.

19.5 Study E: preregistered record-state transition

A record with externally controlled state updates is captured before and after a scheduled external change. Both states, the exact edit kernel, and every unchanged field are frozen. The primary score is defined before the update. This design tests whether the Subscriber-style transition architecture generalizes beyond one historical artifact.

19.6 Decision rule

For prospective generalization to count as strong independent confirmation and to test the domain and portability of the law, the program should require all of the following:

1. deterministic reconstruction by an independent team;
2. a preregistered positive diagonal advantage after multiplicity control;
3. separation from matched construction-freedom and realistic observer/record controls;
4. replication in more than one source environment; and
5. transparent retention of negative windows and partial matches.

Repeated failure of diagonal dominance, comparable matched-control scores, or collapse under separately specified language and search freedom would materially constrain the prospective generalization domain and weaken the stronger observer-linked physical model. The deterministic and comparative results of the present corpus would remain measured evidence within their tested operational domain.

19.7 Ethics, privacy, and governance

Observer registries contain personal and family-linked information. Prospective work requires informed consent, minimization of released identifiers, independent escrow or salted hashes, predeclared deletion policies, and appropriate ethics review. The author has commercial and reputational interests in the books; independent governance is therefore not optional.

20 Claim discipline and evidential language

Zero-exceedance Monte Carlo results are reported at sampled resolution, using plus-one logic and the standard approximate $3/N$ upper-bound interpretation where relevant [10, 8].

The claim hierarchy remains explicit: L1 documentary/source status; L2 deterministic encoding and exact relations; L3 architecture and dependency structure; L4 selectivity under declared alternatives; L5 bounded phenomenological law; L6 microscopic physical mechanism or ontology. A statement at L6 must not rhetorically cancel a result already established at L5, and a result at L5 must not be inflated into a solved L6 mechanism.

This paper uses four explicit descriptive strength levels:

Exact isolated An exact closure with transparent inputs, clear wording, and limited transformation depth.

Structurally strong Multiple paths or anchors, an external source, or a constrained semantic relation within a bounded dependency block.

Architecturally unusual Dense organization involving recursion, event self-reconstruction, symmetry, role resolution, state transition, chronology, or repeated cross-path return.

Extreme under declared controls An architecturally unusual object that is globally unique or completely separated under a specified finite, exhaustive, or Monte Carlo comparison, with dependencies and construction freedom explicitly bounded.

The current corpus supports different statements at different levels:

1. The declared strings, equations, and representative architectures are deterministic research objects.
2. Several complete case-specific structures are extreme under their declared models.
3. The same frozen relational registry and motif family recur across five materially different core record environments and the major extensions within one research program; taken cumulatively, this recurrent matched-observer relation is the phenomenological law established in the tested operational domain.
4. Observer and role specificity are strongly supported inside several declared comparison spaces; World Cup v5.0 exactly solves one complete frozen role-allocation support, while v4.2 supplies only a secondary conditional control on the canonical Hebrew weight assignment. A blinded prospective multi-observer matrix is the strongest independent test of generality and matched-observer specificity beyond the present corpus.
5. Participatory record-actualization is a bounded physical hypothesis, not an established mechanism.

20.1 Encoding-specific limitation and direct falsification route

Alternative mapping results constrain claims about the uniqueness of the canonical measurement representation; they do not by themselves remove the observer-linked structural phenomenon measured through that representation. The present results do not establish that the Hebrew encoding is unique or physically privileged. Secondary control v4.2 narrows one representation-choice concern by testing the canonical mapping against 10,000 same-complexity reassignments of the exact standard weight multiset. Most matched mappings are less selective under the declared endpoint, but a nonzero minority equal or exceed standard. This result does not summarize the evidential strength of RTM and does not modify the exact v5.0 role-space result, which is conditioned on the canonical representation. Determining whether representation selectivity survives separately frozen alternative families, other languages, new observers, and prospectively acquired records remains an empirical question and a direct falsification route.

21 Claim-source audit and verification maturity

Every load-bearing numerical statement is assigned a stable claim-family identifier in the companion concordance or an extension-specific claim map. Four audit states are deliberately kept separate:

Source reconciled
: The statement has been checked against the current book, research note, or locked ledger.

Executable located
: A deterministic or comparative software object has been identified and its scope matched to the manuscript claim.

Frozen output
: Code, inputs, seeds, environment metadata, outputs, and checksums are preserved together.

Separate rerun
: A separately documented execution reproduces the same frozen object.

Table 53: Claim-family verification maturity (v0.24.1 core statuses retained; extension maps added separately); full registers supplied in JSON and CSV.

Family	Claim IDs	Highest justified state	Reporting consequence and remaining requirement
9/11	`Q911-*`	Source reconciled; public executable located	The 659, 365, and 324 objects may be reported as distinct source-reconciled results. The full raw observer outputs, exact generators, immutable tag, and unified 659-row membership map remain to be frozen.

Family	Claim IDs	Highest justified state	Reporting consequence and remaining requirement
Titanic	`QTIT-*`	Source and current score ontology reconciled; executable located	The 190/85/89 and exhaustive 11! results may be reported as source-reconciled. The immutable output bundle and current-environment rerun are deferred; all such comparisons remain labeled source-reported.
Ford Capri	`QCAP-*`	123-row deterministic object and analytical solver separately rerun	The current 123/123 and one-solution statements have the strongest internal maturity. The original 100M outputs and exact legacy 109-row memberships are deferred and retained only as separately labeled reported objects.
Living Subscriber	`QSUB-*`	Source reconciled; representative chapter ledger rerun	The 76/57/133/128/31 ontology and reported controls remain source-reconciled. A consolidated executable 133-row manifest, block DAG, and raw comparative outputs are deferred; comparison claims remain source-reported.
Live time	`QLIVE-*`	Locked ledgers and executable located; representative deterministic audit rerun	The 24/24 and 29/29 ledgers are deterministic objects. The thirty comparative output lines remain source-reported; raw JSON and a frozen current-environment rerun are deferred to a repository release.

Family	Claim IDs	Highest justified state	Reporting consequence and remaining requirement
World Cup / Spain public event	`QESP-*` plus August closure registry, exact role-space v5.0, component-knockout audit, Unified-99 v3.1, and secondary representation-choice v4.2	Core deterministic verifier, finite sweeps, code, seeds, run log, and 40M outputs frozen and rerun; August arithmetic and finite time/date scans separately checked; v5.0 frozen specification, exact executable, local reference output, package hashes, and fresh user-side run screenshot preserved; v0.28.19 component-knockout arithmetic derived from the unchanged exact component counts; post-registry 99/99 audit and 100M shared-anchor-fixed run preserved; v4.2 method freeze, executable, JSON, and both 10,000-control logs preserved	Exact v5.0 is primary: 2 / 34,951,113,757,163,520,000 full numeric states, one detected structural class modulo the F02 swap; removing any complete component leaves a highly selective residual architecture. Unified v3.1 is secondary: 0/100M full, maximum 42/61. v4.2 reports 189/10,000 primary and 252/10,000 birth-fixed qualifying mappings. These quantities answer different questions and are not combined. Older V3/V4 retain their pre-43–46 scope.
Emily Dickinson	`EDA-*`, `EDB-*`, `EDS-*`, `E167-*`, `EDC-*`, `EDD-*`, `EDE-*`, `GEM-*`, `B718-*`, `AUD-*`, `DER-*`, plus Unified-57 v3.2	Complete registry integrity verified; primary, extended, finite-choice, random-injection, and local-perturbation suites rerun; new 100M context-fixed coherent identity-replacement output preserved	The primary 57/15/9 object remains the headline dependency object. Unified v3.2 gives 0/100M joint full matches, maxima 46/57, 10/15, 4/9, with $p < 2.996 \times 10^{-8}$ as a 95% upper bound under that null; the 8.5B symbolic profile space is sensitivity only.
Integrated omnibus search	Cross-case v2.0 sensitivity	Method freeze, base executable, exact 96-core wrapper as run, merged JSON, full aggregate log, per-artifact SHA-256 file, frozen v0.28.22 input hash, and complete 10,000-trajectory execution metadata preserved	0/10,000 primary and 0/10,000 strict trajectories under the declared 55-family max-over-search grid; 281.6M candidate evaluations are nested search opportunities, not the inferential denominator. This is a finite conditional sensitivity, not a universal historical-discovery probability.

Family	Claim IDs	Highest justified state	Reporting consequence and remaining requirement
14–15 July	`QJUL-*`	Frozen public package; separate deterministic and role implementations	The daily gates, role assignment, finite counts, and sequential architecture may be tied to public DOI/repository objects. The exact statements remain conditional on the declared supports and templates.

Audit rule. A source-reported result is never called an independent replication merely because code exists. A deterministic rerun of representative equations is not substituted for a rerun of a full comparative score. Missing freeze objects narrow wording; they do not erase correctly recomputed arithmetic.

22 Scope and deferred output freezes

The core claim concordance contains 25 load-bearing quantitative families. Nine have a frozen output bundle, seven of those also have a separately documented rerun, and sixteen remain source-reconciled or source-reported without a complete immutable raw-output package in the present release. The Spain and Emily extension maps are additional objects outside that count. The sixteen deferred core families are not silently promoted. Their disposition is *deferred with qualified wording*: they may remain in the paper because their exact scope, source, and limitation are stated, but they are not described as independent replications.

This reporting rule separates the evidential status of a claim from the completeness of its repository bundle. The article can state what the current books and public executable suites report, provided that it also states the verification level. A later repository release may promote a deferred family only by preserving the exact input catalogue, generator, seed or exhaustive support, environment, output, and checksum together. Until then, the qualified wording in Table 53 is binding.

Reporting rule. No source-reported comparison is paraphrased as third-party reproduced. No historical score object replaces a current object. No probability is pooled across cases.

This revision preserves the complete two-volume World Cup concordance and the Spain and Emily Dickinson extensions without altering any locked five-book object or the five-book total of 1,158 rows. It retains Unified-99 v3.1, Unified-57 v3.2, the v4.2 representation-choice control, and the exact v5.0 finite role-space solution for the already-frozen World Cup `shared_anchor_fixed` 61/13 object, and adds the frozen v2.0 integrated omnibus historical-search sensitivity as a separate researcher-trajectory layer. The 53 first-volume live-time closures are already included in the five-book total; the 46 Spain Part-Two routes remain a separate extension. The earlier Spain 7/10/22 score objects and Emily A–C release remain unchanged historical layers. The exact v5.0 fraction is a direct finite-space cardinality ratio; Monte Carlo, representation-choice, Stage-1, and omnibus tails remain conditional on their own generators, score objects, and inferential units. None is pooled with another case or layer.

23 Supplementary boundary and audit materials

The main paper presents representative architectures, score ontologies, dependency cautions, comparison results, and falsification logic. It now reproduces every World Cup closure unit and every first-volume equality check, but it does not reproduce every row of every other case ledger. The accompanying audit materials preserve a second level of inspection:

1. the claim-source dossier records quantitative provenance, verification maturity, and unresolved freeze requirements; and
2. the machine-readable concordance records stable core claim identifiers, score objects, allowed wording, and disposition; and
3. the complete World Cup package records all 99 cross-volume closure units, the exact 99-check first-volume ledger, printed-page mappings, the frozen F01/F02 executable and specification fingerprint, the Spain 46-route scope boundary, Unified-99 v3.1 with its preserved 100M run record, and exact role-space v5.0 with its frozen specification, exact executable, full finite-space reference JSON, hashes, and user-side rerun record; and
4. the Spain ancillary materials preserve the v0.25.1 public-event verifier, finite sweeps, exact output JSON, 22-closure simulation code, seeds, full run log, and 40-million-world JSON, together with the August 46-closure source, complete registry table, finite date/time audits, the explicit V3/V4 scope boundary, the exact v5.0 role-space package, and the secondary v4.2 representation-choice method freeze, executable, emitted JSON results, and both inferential run logs; and
5. the Emily Dickinson materials preserve the A–C source/provenance and copyright-bounded translation audit, and add the complete 233-entry UTF-8 registry, the Part-D/718/late-extension source, integrity hashes, executable primary and extended structural audits, local perturbation, finite-choice, and random-injection suites, together with the Unified-57 v3.2 method freeze, executable, registry hash, and preserved 100M context-fixed identity-randomized run record; and
6. the Stage-1 search-budget materials preserve the exact `RTM_MEGA_ADVERSARIAL_STAGE1_v1_1.py` executable, the supplied STANDARD/STRONG console transcript, and machine-readable STANDARD and STRONG validation JSON. The Stage-1 executable reuses the already bundled World Cup v3.1 and Dickinson v3.2 engines and frozen inputs rather than defining a new candidate-world family.
7. the v0.28.23 omnibus materials preserve the frozen v2.0 method specification, base executable, exact 96-core wrapper as run, 10,000-trajectory merged result JSON, full execution log, and artifact hashes. The omnibus test searches all 55 implemented families per researcher with an explicit 512-draw budget per family and retains the researcher trajectory as the inferential unit.

Case-specific code repositories provide the third level, including executable objects and available manifests. The absence of a frozen raw-output bundle for a comparative claim is stated explicitly rather than inferred from the existence of code.

24 Data, code, and material availability

The public RTM code organization and case repositories are listed in the bibliography [39, 40, 41, 42, 43, 44, 45]. The framework volume and all five case books are listed individually

with full titles and bibliographic identifiers [33, 34, 35, 36, 37, 38]. Where Amazon assigns different identifiers by format, the bibliography states the format explicitly rather than treating print and Kindle ASINs as interchangeable. The 14 and 15 July notes are preserved under separate Zenodo DOIs [46, 47]; an earlier four-domain record is also archived on Zenodo [48]. The ancillary files accompanying this submission contain the claim-source dossier, the core machine-readable concordance, a complete two-volume World Cup closure/check package, a self-contained Spain public-event package, a self-contained Emily Dickinson research package, the exact v5.0 role-space artifacts, and the secondary v4.2 representation-choice artifacts. The World Cup package contains a 99-row closure concordance in CSV and JSON, a 99-row first-volume equality-check ledger, source-page mappings, the frozen F01/F02 executable, an audit JSON, and the exact TeX registry printed in this article. It also contains Unified-99 v3.1: the method freeze, exact executable, three hash-enforced input files, and a preserved console record for the 100-million-world `shared_anchor_fixed` run. The v5.0 ancillary layer preserves the frozen specification, method freeze, exact executable, hash-enforced v3.1 baseline and inputs, local exact reference JSON, the original frozen package, and the user-side Windows rerun screenshot plus machine-readable transcript. v0.28.22 retains the derived v0.28.19 component-knockout audit note showing the exact residual support/completion arithmetic from those unchanged v5.0 component counts. The frozen specification SHA-256 is `b309f5ab81df880e6c00e6ced11ee9a12ead03d5f0bcd62728fdab6f67dc5954`; the v5.0 package SHA-256 is `141c9880800313ebb5fbf8a2bf62199085cf022c61b22141c7252a68f819a941`; and the user-run screenshot SHA-256 is `07bc9c6114c18f7d088c1a215a209867b961412a20fd73adc6546f088e34023d`. Spain retains the original 7/10/22 executable objects and 40-million-world outputs plus the August 46-closure source and registry; the older V3/V4 scope boundary is retained explicitly. The v4.2 ancillary layer preserves its unmodified method freeze, selectivity executable, primary and birth-fixed emitted JSON files, both full inferential console logs, and original final-results archive. v4.2 remains a secondary representation-choice control. The manuscript applies no score normalization, rescaling, cross-run combination, or cross-case multiplication. Emily includes the preserved A–C audit and copyright boundary plus the complete 233-entry registry, Part D and later source, SHA-256 manifest, the prior rerun analysis suites, and Unified-57 v3.2 with its method freeze, exact executable, registry, and preserved 100-million-world `context_fixed_identity_randomized` run record. The Stage-1 ancillary folder preserves the exact max-over-K executable, original supplied STANDARD/STRONG console evidence, and machine-readable rerun validation. Its candidate generators are the same frozen World Cup v3.1 and Dickinson v3.2 null engines already present in the submission; the new inferential object is the simulated researcher trajectory with explicit search budget. The v0.28.23 omnibus ancillary folder preserves the v2.0 method freeze, exact base executable, 96-core execution wrapper as actually run, merged 10,000-trajectory JSON result, full execution log, and SHA-256 result manifest. The merged JSON records the v0.28.22 release hash, base-script hash, wrapper hash, 96 worker seeds and trajectory split, candidate accounting, endpoint counts, maxima, closest trajectory, and wall-clock execution metadata. User-run console records are preserved as run evidence; a user-side rerun is not described as third-party replication. Where other original large-run output bundles are not frozen in an immutable public release, the claim-maturity table and concordance state that limitation explicitly.

25 Ethics, privacy, authorship, and competing interests

Ethics and privacy. The present corpus uses public historical records, author-owned artifacts, and family-linked records. No prospective human-subject experiment is reported here. Future multi-observer work must use informed consent, data minimization, blinded scoring, independent escrow or salted identifiers, deletion rules, and appropriate ethics review. Family names and

biographical anchors already published in the case books are repeated only where necessary to define the frozen registry.

Author contributions. Eran Harpaz conceived RTM, assembled the source corpus, authored the case books, defined the registered transformations and score objects, and directed the computational validation and manuscript synthesis. This concentration of roles is an evidential limitation and motivates independent reconstruction and blinded prospective testing.

Competing interests. The author has commercial, reputational, and intellectual interests in the independently published RTM books and associated framework. No external funder is reported for this manuscript. These interests do not alter deterministic arithmetic but strengthen the need for independent source verification, code review, preregistration, and governance of future studies.

26 Version and correction statement

Revision v0.28.23 supersedes v0.28.22 as an integrated adversarial-search sensitivity release. It changes no locked source string, deterministic closure, score ontology, exact finite support, prior Monte Carlo result, v4.2 representation-control result, v5.0 exact-enumeration result, knockout result, chronology classification, or physical-mechanism conclusion. It adds RTM Omnibus Historical-Search Null v2.0, frozen on 25 August 2026 against the v0.28.22 package. The reported execution evaluates 10,000 simulated researcher trajectories, each receiving 512 draws in all 55 implemented families (4 World Cup, 3 Dickinson, 48 generic adaptive), for 281,600,000 candidate evaluations. The primary World-Cup-plus-Dickinson endpoint and the strict all-layer endpoint both produce 0/10,000 trajectories; World Cup full completion is 0/10,000, Dickinson full completion is 9/10,000, and the generic adaptive gate is reached in 3,577/10,000. The exact one-sided 95% zero-event upper bound for the trajectory-level primary endpoint is 2.9952836×10^{-4} under this declared omnibus null. The candidate count is not used as a probability denominator, the strict zero is not treated as independent of the primary zero, and the result is not represented as a universal probability over every conceivable historical research decision.

Revision v0.28.22 supersedes v0.28.21 as a provenance-transcription correction release. It changes no numeric source value, arithmetic relation, closure count, score object, finite support, null generator, simulation output, exact-enumeration result, knockout result, subset-redundancy result, chronology classification, or physical-mechanism conclusion. It corrects the displayed F02 raw father-message transcription to the photographed Kaf spelling of Mexico, restores the declared Aubrey Modiba / Ime Okon transcription forms in the supplied Volume-I source PDF, aligns the executable source-string literal with that raw record, and explicitly separates the raw source spelling from the standard Mexico event-label value 316. The deterministic F01/F02 audits, the 61/61 role-sensitive object, and the exact v5.0 global counts are unchanged.

Revision v0.28.20 supersedes v0.28.19 as a corpus-wide evidential-architecture and claim-hierarchy clarification release. It changes no locked source string, arithmetic relation, closure count, score object, finite support, null generator, simulation output, exact-enumeration result, provenance classification, or physical-mechanism conclusion. The revision reframes the corpus around structural overdetermination, adds an explicit Operational Law Statement and Minimum Empirical Implication, makes the pressure ladder and case-specific test logic explicit, distinguishes exact enumeration from Monte Carlo and representation controls, replaces post-L5 legacy terminology with law-realization/structural-result language, and reorganizes the physical discussion from empirical constraint to candidate mechanism families and open microscopic theory. The phenomenological-law claim remains bounded to the explicitly tested operational domain.

Revision v0.28.19 supersedes v0.28.18 as a World Cup evidential-architecture clarification

release. It changes no locked source string, closure equation, closure count, role constraint, dependency block, finite support, null generator, Monte Carlo output, exact-enumeration result, representation-choice result, chronology classification, or physical claim. The World Cup presentation is reorganized around exact global role resolution: the 99/99 deterministic audit and 61/61, 13/13 role object lead to the exact v5.0 finite-space result, its component decomposition, and new whole-component knockout reporting before the 100-million-world Monte Carlo stress test. The component-knockout figures are exact algebraic consequences of the already frozen component supports and completion counts, not new stochastic tests. The chapter also distinguishes the World Cup prospective/chronology-constrained structural signature from Dickinson's distributed retrospective observer reconstruction. No independence claim, probability multiplication, or stronger physical-mechanism conclusion is introduced.

Revision v0.28.18 supersedes v0.28.17 as a Dickinson evidential-architecture clarification release. It changes no locked source string, closure equation, registry entry, score denominator, null generator, finite support, simulation output, exact-enumeration result, chronology classification, or numerical result. The Dickinson chapter is reorganized so that its central evidential object is explicit: distributed reconstruction of the same observer profile across source blocks, with quantified block redundancy, direct-target knockout survival, literal-612 knockout survival, and source-ablation robustness presented before the null-model discussion. The abstract and case summary now distinguish statistical selectivity from the temporal/observer-linked signature and describe the latter as retrocausal-compatible without claiming that arithmetic alone distinguishes dynamic record rewriting from time-symmetric/global constraint or another observer-linked mechanism. No pooled p-value, probability multiplication, or broader physical-law claim is introduced.

Revision v0.28.17 supersedes v0.28.16 by adding one joint max-over-K search-budget stress-test layer and its reproducibility artifacts. The Stage-1 test reuses the already frozen World Cup v3.1 and Dickinson v3.2 candidate generators but changes the inferential unit to a simulated researcher trajectory that receives multiple candidate attempts and retains the strongest. The STRONG run evaluates 100,000 trajectories with $K = 256$ (25.6 million raw candidate worlds per case), produces zero full World Cup, Dickinson, or joint reproductions, and yields maxima of 39/61 and 5/13 for World Cup and 44/57, 10/15, and 2/9 for Dickinson. The per-trajectory joint zero-hit 95% upper bound is 2.99569×10^{-5} under this declared Stage-1 null. This result is not pooled with, normalized against, or substituted for the existing 100M or exact finite-space results, and it is not an omnibus historical-discovery probability. No previously frozen equation, registry, score object, case result, evidence hierarchy, phenomenological-law statement, Study B design, or physical interpretation is changed.

Revision v0.28.16 supersedes v0.28.15 with two clarity edits only. It defines the empirical object as the complete role- and chronology-dependent self-reconstructing architecture, not mere arrival at observer identity, and clarifies that discovery history bears on full-process or discovery-conditioned surprise quantification without altering within-space uniqueness, selectivity, or extremity. No numerical, statistical, evidential, case, table, or physical claim changes.

Revision v0.28.15 supersedes v0.28.14 as a two-sentence reviewer-facing clarification of known-target construction and historical-discovery scope. It adds no evidence object, equation, registry, score denominator, null model, simulation, frozen specification, case analysis, chronology classification, or numerical result. It states explicitly that known-target construction is already stress-tested by Dickinson knockouts, Titanic same-inventory exhaustive role reassignment, and Subscriber same-inventory/max-over-choice controls, and that historical discovery route is relevant to a separate total-discovery probability claim rather than the denominator of the exact or model-conditioned comparison results.

Revision v0.28.14 supersedes v0.28.13 with four deletion-only de-duplication edits to repeated

future-test framing. No registry, equation, score object, simulation, frozen specification, code artifact, evidence hierarchy, case analysis, chronology classification, or numerical result is changed.

Revision v0.28.12 supersedes v0.28.11 as a narrowly targeted provenance editorial cleanup. It removes the generic front-end tool-assistance box and the broad manuscript-assistance disclosure, leaving only case-specific Dickinson provenance where documented selection events are part of the preserved experimental record. It changes no locked source string, closure equation, score denominator, null definition, finite support, Monte Carlo output, exact-enumeration result, chronology classification, evidence hierarchy, case analysis, code artifact, hash-bearing historical ancillary, or numerical result. All L5/L6, World Cup v5.0, Dickinson, Adaptive-Search, chronology, negative-control, and Study B wording from v0.28.11 remains unchanged.

Revision v0.28.11 supersedes v0.28.10 as a skeptic-first front-end clarity release. It changes no locked source string, closure equation, score denominator, null definition, finite support, Monte Carlo output, exact-enumeration result, chronology classification, evidence hierarchy, case analysis, code artifact, hash-bearing historical ancillary, or numerical result. The revision replaces the former simulation-heavy front summary with a compact technical map of the exact and deterministic core, makes the burden of an alternative generative explanation explicit, surfaces chronology-constrained and negative-control evidence early, and visually separates observation, the established L5 phenomenological law in the tested operational domain, and the still-open L6 physical/mechanistic layer. World Cup v5.0 remains exactly 2 / 34,951,113,757,163,520,000 full numeric completions in the frozen role-allocation space, one structural class modulo the reported F02 6↔21 scorer symmetry. Dickinson remains 57/57 relations, 15/15 classes, and 9/9 blocks for the sole full documented profile among 423,360 coherent profiles, with its stated knockout and symbolic-space results unchanged. Study B remains a prospective generalization/discrimination test of the already observed law. No score normalization, rescaling, pooled corpus p-value, cross-test probability multiplication, or broader universality claim is introduced.

Revision v0.28.10 supersedes v0.28.9 as the final conceptual-consistency cleanup release. It changes no locked source string, closure equation, score denominator, null definition, finite support, Monte Carlo output, exact-enumeration result, chronology classification, evidence hierarchy, case analysis, or numerical result. The edits preserve L5 as the established phenomenological law in the tested operational domain while keeping L6—physical coupling, ontology, microscopic mechanism, and unrestricted generality—open. They replace manuscript-wide labels that incorrectly described the entire corpus as retrospective with scope-accurate language, make Study B explicitly a prospective generalization/discrimination test of the already observed law, and state the Adaptive-Search burden in generative rather than merely possibility-based terms. The measurement hierarchy remains explicit: gematria is the deterministic measurement representation; closure architecture is the observation; the recurrent matched-observer record relation is the phenomenological law. Exact v5.0 remains exact within the frozen role-allocation space, with 2 / 34,951,113,757,163,520,000 full numeric completions forming one structural class under the reported F02 6↔21 symmetry. No score normalization, rescaling, pooled corpus p-value, cross-test probability multiplication, or new scientific claim is introduced.

Revision v0.28.9 supersedes v0.28.8 as the final arXiv adversarial-framing and control-scope clarification release. It changes no locked source string, closure equation, score denominator, null definition, finite support, Monte Carlo output, exact-enumeration result, chronology classification, or numerical result. It clarifies a narrow but important inferential point: unlogged historical flexibility limits the assignment of a universal discovery-process probability, but it is not itself a demonstrated null explanation. The manuscript now states explicitly that different freedom dimensions are tested by distinct fair comparators; a single omnibus generator is neither claimed nor treated as a prerequisite for the case-specific separation results or the phenomenological-law statement. The 9/11 optimization, Subscriber max-over-choice, role-permutation, wording-

stress, ablation, representation-choice, finite-space, and chronology controls are presented as direct adversarial tests of the corresponding selection mechanisms. The prospective program is framed as the strongest test of generality and independent confirmation beyond the present author-led corpus, not as the event that first establishes the phenomenological relation. Frozen historical ancillary subpackages retain their original filenames, readmes, and earlier boundary wording byte-for-byte for provenance; those preserved historical notes do not override the current manuscript's claim hierarchy. No score normalization, rescaling, pooled corpus p-value, or cross-test probability multiplication is introduced.

Revision v0.28.8 supersedes v0.28.7 as the claim-hierarchy and front-matter clarity release. It changes no locked source string, closure equation, score denominator, null definition, finite support, Monte Carlo output, exact-enumeration result, chronology classification, or numerical result. It states the cross-case operational relation explicitly as a phenomenological law within the tested domain, expands the front-matter evidence table to all five core case books and major extensions, adds the 9/11 purpose-built genetic-optimizer comparator (320/324 after 17.58 million evaluations, explicitly best-found rather than a proven global optimum), clarifies that the quantum-foundations relation is operationally substantive rather than merely analogical while no microscopic derivation is claimed, and reframes prospective multi-observer testing as a test of generality and independent confirmation.

Revision v0.28.7 supersedes v0.28.6 as the final arXiv reproducibility-cleanup release. It changes no locked source string, closure equation, score object, null definition, finite support, simulation output, exact-enumeration result, chronology classification, evidence hierarchy, or physical claim. Two reviewer-facing reproducibility ambiguities are removed: the exact frozen implementation dependencies required by the top-level v4.2 representation-selectivity executable are now present beside that executable in the ancillary package, without changing the v4.2 script or its hash; and the Titanic chapter now states explicitly that the legacy 87-equation hyper-adversarial script belongs to the older strict-direct score object and is distinct from the current 89-item strict-unique score. The current-release SHA-256 manifest is regenerated after these packaging and clarification edits.

Revision v0.28.6 supersedes v0.28.5 as an arXiv submission-hygiene and editorial release. It changes no locked source string, closure equation, score object, null definition, finite support, simulation output, exact-enumeration result, chronology classification, evidence hierarchy, or physical claim. The revision shortens the article abstract, adds a compact evidence-at-a-glance table, limits the table of contents to sections and subsections, standardizes presentation terminology, moves TeX registry files out of the ancillary directory into a compilation-only `includes/` directory, renames release metadata so that no user-authored `00README.json` conflicts with arXiv compiler metadata, relocates changelogs to the ancillary package, and expands the computational-assistance disclosure without adding unpreserved model metadata. All current-release hashes are regenerated after these packaging edits.

Revision v0.28.5 supersedes v0.28.4 as an exact finite role-space and evidence-hierarchy update. It changes no locked source string, closure equation, World Cup count ontology, Unified-99 v3.1 score rule, `shared_anchor_fixed` stratum, Dickinson registry entry, chronology classification, prior Monte Carlo result, or physical claim. v5.0 solves the complete frozen World Cup role-allocation support exactly: F01 has 1 full state among 1,306,368,000; F02 has 2 among 7,741,440; Spain has 1 among 3,456; and the Cartesian product therefore has exactly 2 full 61/61, 13/13 numeric states among 34,951,113,757,163,520,000. The two full global states differ only by the score-preserving F02 exchange `shirt6`↔`shirt21`, yielding one detected full structural class modulo that automorphism. The direct conditional finite-space fraction is $5.722278305338 \times 10^{-20}$. No normalization or rescaling is used. The revision also reorders the evidential hierarchy so that v4.2 is explicitly presented as a secondary representation-choice control rather than a headline

rarity measure; its underlying counts and tails are unchanged. No v5.0 or v4.2 quantity is multiplied with another RTM result.

Revision v0.28.4 supersedes v0.28.3 as a representation-choice-control update. It changes no locked source string, closure equation, World Cup count ontology, Dickinson registry entry, chronology classification, prior Monte Carlo result, or physical claim. It adds the frozen v4.2 same-weight mapping control. The standard mapping has $D = 1/10{,}000$ in both observer modes; 189/10,000 primary controls and 252/10,000 birth-fixed controls are at least as selective as standard, with add-one tails 0.0189981 and 0.02529747. Ties count against standard. These values are conditional on the declared matched-permutation family and are not a p-value for RTM or the World Cup 61/13 architecture.

Revision v0.28.3 supersedes v0.28.2 as a statistical-validation update. It changes no locked source string, closure equation, World Cup count ontology, Dickinson registry entry, chronology classification, or physical claim. It adds two method-frozen adversarial suites constructed against the already preserved objects. World Cup Unified-99 v3.1 recomputes 99/99 closure units and the 99/99 first-volume check ledger, defines a 61-constraint/13-block symmetric role object, and records zero 61/61 matches in 100 million `shared_anchor_fixed` worlds, with maximum 42/61 and a one-sided 95% zero-event upper bound 2.99573×10^{-8} ($z = 5.419$ under that null). Dickinson Unified-57 v3.2 reconstructs the unchanged 57/15/9 primary object from the 233-entry registry and records zero joint full matches in 100 million coherent context-fixed identity-replacement worlds, with maxima 46/57, 10/15, and 4/9 and the same zero-event upper bound. Its unique solution in the declared 8.5-billion broad profile space is retained as conditional sensitivity only. Neither new bound is a universal probability for the adaptive historical discovery process, and the two are not multiplied.

Revision v0.28.2 supersedes v0.28.1 as a reader-accessibility revision only. It changes no locked source, equation, count, dependency boundary, comparison result, chronology classification, or physical claim. It adds the unnumbered Reader Guide before Section 12 so that the World Cup closure tables and the Dickinson registry can be decoded by a reader with no prior RTM background. The v0.28.1 scientific and audit layer is otherwise preserved in full.

Revision v0.28.1 supersedes v0.28.0. It preserves every locked five-book source, equation, score ontology, comparison result, dependency boundary, and the five-book inventory total of 1,158 rows. Its new contribution is a complete, continuous, source-page-mapped World Cup concordance: `WC-001`–`WC-053` cover all 53 first-volume closure bands, and `WC-054`–`WC-099` cover all 46 nonduplicate Spain Part-Two routes. The first-volume 38+61=99 equality checks are printed individually and kept distinct from the 53+46=99 closure-unit inventory. This revision also corrects the F01 Hebrew audit from the erroneous 30/30 wording in v0.28.0 to the executable result 25/25; together with F02 22/22, the first-volume Hebrew layer is 47/47.

For Spain, v0.28.1 preserves every v0.25.1 strict/public/22-route object and the complete August Part-Two registry: 46 unique routes, 53/53 declared Hebrew values, and 46/46 arithmetic closures. The supplied late PDF's Subject metadata still says 42 closures, while its internal registry, QA page, and finding summary say 46; the latter internally audited count is controlling. The final four closures postdate the V3/V4 whole-network audits and are not included in those simulations.

For Emily Dickinson, v0.28.1 preserves the complete v0.28.0 update: the A–C 80-predicate historical layer, Part D, the D representation/video layer, exploratory annex, frozen 718 and late extensions, secondary audit, and derived structure. The complete registry contains 233 entries and is printed in this article by stable identifier. Its supplied integrity manifest was verified; 196 arithmetic, 24 exact-Hebrew, and two reversal entries recompute, while ten representation transforms and one non-arithmetic correspondence remain explicitly bounded by their source status. The unchanged primary 57-relation object and the extended, finite-choice, random-

injection, and local-perturbation suites were rerun from the preserved registry and reproduce the supplied machine-readable results. The bounded comparison with M. P. Müller's observer-state and algorithmic-idealism program is unchanged. Structural alignment is stated explicitly; neither Müller's work nor the quantum-foundational literature is represented as predicting Hebrew encoding or proving RTM.

The chronology wording remains bounded. The Spain source is classified as prospectively frozen according to its case package, while champion decoding and later closure discovery are retrospective. Emily Part A was measured on 25 July, the archival layer was assembled on 26 July, the translation-page layer was analyzed on 28 July, and the author-recorded $29.7 \rightarrow 297$ rule selected Letter 297 before its contents were read; 718 and address branches are labeled 7–9 August post-core extensions. The exact subject string was AI-supplied and explicitly frozen before numerical evaluation. The Day-3 work-selection and Part-D record-selection orders are author-reported, while the external sources are inspectable. No displayed authored wording is reported as having been replaced by a numerically optimized alternative, but arithmetic combination, continuation, and stopping remained adaptive. These distinctions are not converted into external preregistration without externally verifiable timestamps. Neither extension is called a preregistered prediction, no row-level probabilities are multiplied, and the physical mechanism remains open. The v0.24.1 dossier and concordance remain controlling for the five-book corpus; the earlier extension maps remain historical layers; the v0.28.1 concordance and preserved v0.28.0 Spain/Emily registries remain the controlling source inventories; v0.28.3 adds the explicitly bounded Unified-99 v3.1 and Unified-57 v3.2 statistical layers; v0.28.4 adds the secondary matched representation-choice v4.2 layer; and v0.28.5 adds the exact v5.0 finite role-space solution without changing those source inventories or score objects; v0.28.23 adds the frozen Omnibus Historical-Search Null v2.0 sensitivity without altering those earlier objects.

27 Conclusion

RTM establishes, within the explicitly tested operational domain, a recurrent phenomenological law of observer-linked cross-temporal record organization. The result is stronger than the presence of numerous exact equalities because the same architecture is repeatedly overdetermined under heterogeneous source conditions and survives declared observer, semantic-role, source, chronology, knockout, and finite-space alternatives where those controls are implemented.

The pressure ladder matters. The 9/11 system supplies archive-scale architectural breadth; Titanic shows exact semantic-role specificity by making the documented assignment the unique global maximum over all 11! assignments; Ford Capri contracts the source environment to one bounded object while retaining one full encoded-family solution; Subscriber makes a preserved physical record-state transition part of the measured network; and F01/F02 make temporal order a structural variable through earlier frozen fields and later-completing records. The World Cup synthesis then supplies exact global role resolution: only two legal numeric states among 34,951,113,757,163,520,000 complete all 61 constraints and 13 dependency blocks, and those two form one detected structural solution class under the sole reported F02 $6 \leftrightarrow 21$ symmetry. Removing any complete World Cup component leaves a highly selective residual architecture. Dickinson supplies the complementary signature: one observer profile is reconstructed from a distributed multi-source constraint network and remains uniquely recoverable after removal of 43 direct-target relations, after removal of every literal-612 relation, and across extensive source-block ablations.

The cumulative argument is architectural and constraint-based rather than a product of nominal casewise probabilities. The cases and controls are not treated as statistically independent, and no astronomical joint probability is constructed by multiplying unrelated denominators.

Exact enumeration remains exact enumeration; Monte Carlo remains sampled stress testing; representation-choice controls constrain the measurement representation; and adaptive-search controls constrain only the explicitly modeled search process. A conventional explanation must reproduce the complete architecture, not merely demonstrate that isolated numerical coincidences can occur. The v0.28.23 omnibus layer strengthens this last point at the researcher-trajectory level: 10,000 simulated researchers, each granted 512 draws in every one of 55 implemented search families, generate 281.6 million candidate evaluations without a single primary World-Cup-plus-Dickinson reproduction. Dickinson full completion and the generic adaptive gate do occur separately under the null, so the zero joint result is not produced by making every strong component impossible. This remains a result under the frozen omnibus family grid, not a universal historical-discovery probability.

Across the corpus, the recurring object is not an isolated numerical equality but a constrained observer-linked dependency architecture that survives progressively stronger pressure conditions. World Cup supplies an exact finite-space global role-resolution result; Dickinson supplies a distributed, overdetermined reconstruction of a specific observer profile that survives direct-target and block-level ablations. These results establish the bounded phenomenological regularity defined in this work. The minimum empirical implication is correspondingly bounded but strong: within the tested domain, the complete measurable organization of the relevant records cannot be adequately treated as statistically and structurally independent of the matched observer-linked information relation.

Gematria is the deterministic measurement representation, not a proposed causal mechanism. The cross-temporal character is part of the measured organization because records associated with distinct times participate in one role-preserving architecture, but the corpus does not by itself decide between dynamic retrocausation, time-symmetric or global consistency, relational organization, selection over histories, or another observer–record mechanism.

Phenomenology–mechanism boundary. The bounded law concerns the recurrent measured observer–record architecture. The open problem concerns its microscopic realization, scaling, boundary conditions, no-signaling consistency, and ultimate domain of validity.

RTM therefore leaves a sharply defined theoretical problem: what physical or informational principle can generate an exact, temporally distributed, role-preserving record architecture that repeatedly resolves around the matched observer-linked information state across heterogeneous documentary environments while preserving ordinary no-signaling constraints? The present corpus establishes the operational phenomenon within its tested domain; the next task is to determine the law's microscopic realization, scaling behavior, and ultimate domain of validity.

References

[1] V. Baumann and C. Brukner, "Wigner's friend's memory and the no-signaling principle," *Quantum* 8, 1481 (2024). doi:10.22331/q-2024-09-25-1481.

[2] Y. Benjamini and Y. Hochberg, "Controlling the false discovery rate: A practical and powerful approach to multiple testing," *Journal of the Royal Statistical Society B* 57, 289–300 (1995). doi:10.1111/j.2517-6161.1995.tb02031.x.

[3] R. Berk, L. Brown, A. Buja, K. Zhang, and L. Zhao, "Valid post-selection inference," *The Annals of Statistics* 41, 802–837 (2013). doi:10.1214/12-AOS1077.

[4] K.-W. Bong et al., "A strong no-go theorem on the Wigner's friend paradox," *Nature Physics* 16, 1199–1205 (2020). doi:10.1038/s41567-020-0990-x.

[5] C. Dwork, V. Feldman, M. Hardt, T. Pitassi, O. Reingold, and A. Roth, "The reusable holdout: Preserving validity in adaptive data analysis," *Science* 349, 636–638 (2015). doi:10.1126/science.aaa9375.

[6] A. Gelman and E. Loken, "The garden of forking paths," unpublished manuscript (2013), `http://www.stat.columbia.edu/~gelman/research/unpublished/p_hacking.pdf`.

[7] P. A. Guérin, V. Baumann, F. Del Santo, and C. Brukner, "A no-go theorem for the persistent reality of Wigner's friend's perception," *Communications Physics* 4, 93 (2021). doi:10.1038/s42005-021-00589-1.

[8] J. A. Hanley and A. Lippman-Hand, "If nothing goes wrong, is everything all right? Interpreting zero numerators," *JAMA* 249, 1743–1745 (1983). doi:10.1001/jama.1983.03330370053031.

[9] B. A. Nosek, C. R. Ebersole, A. C. DeHaven, and D. T. Mellor, "The preregistration revolution," *Proceedings of the National Academy of Sciences* 115, 2600–2606 (2018). doi:10.1073/pnas.1708274114.

[10] B. Phipson and G. K. Smyth, "Permutation p-values should never be zero," *Statistical Applications in Genetics and Molecular Biology* 9, Article 39 (2010). doi:10.2202/1544-6115.1585.

[11] M. Proietti et al., "Experimental test of local observer independence," *Science Advances* 5, eaaw9832 (2019). doi:10.1126/sciadv.aaw9832.

[12] J. P. Simmons, L. D. Nelson, and U. Simonsohn, "False-positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant," *Psychological Science* 22, 1359–1366 (2011). doi:10.1177/0956797611417632.

[13] J. A. Wheeler, "Law without law," in J. A. Wheeler and W. H. Zurek (eds.), *Quantum Theory and Measurement*, Princeton University Press, pp. 182–213 (1983).

[14] M. P. Müller, "Law without law: from observer states to physics via algorithmic information theory," *Quantum* 4, 301 (2020). doi:10.22331/q-2020-07-20-301.

[15] M. P. Müller, "Algorithmic Idealism: What Should You Believe to Experience Next?" *Foundations of Physics* 56, 11 (2026). doi:10.1007/s10701-026-00913-1; arXiv:2412.02826.

[16] K. J. McQueen and M. P. Müller, "Realism about the external world: an adversarial collaboration," arXiv:2607.16379 (2026), `https://arxiv.org/abs/2607.16379`.

[17] A. Di Biagio and C. Rovelli, "Relative Information, Relative Facts," arXiv:2510.11349v2 [quant-ph] (2026), `https://arxiv.org/abs/2510.11349v2`.

[18] B. Terris, "The Informational Observer in Relational Quantum Mechanics," arXiv:2603.02978v2 [physics.hist-ph] (2026), `https://arxiv.org/abs/2603.02978v2`.

[19] H. Zwirn, "Is Quantum Mechanics Universal? Extended Wigner's Friend Experiments and Non Absoluteness of Events," arXiv:2606.01349v1 (2026), `https://arxiv.org/abs/2606.01349v1`.

[20] S. Mukherjee and J. R. Hance, "Limits of Absoluteness of Observed Events in Timelike Scenarios: A No-Go Theorem," arXiv:2510.26562v3 [quant-ph] (2026), `https://arxiv.org/abs/2510.26562v3`.

[21] E. Adlam, "What Do Black Holes Teach Us About Wigner's Friend?" arXiv:2604.17839v1 [quant-ph] (2026), https://arxiv.org/abs/2604.17839v1.

[22] Emily Dickinson Museum, "Emily Dickinson," biographical and publication resources, accessed 27 July 2026, https://www.emilydickinsonmuseum.org/emily-dickinson/.

[23] Emily Dickinson Museum, "1865–1886: The Later Years," accessed 27 July 2026, https://www.emilydickinsonmuseum.org/emily-dickinson/biography/emily-dickinson-the-later-years-1865-1886/.

[24] Hebrew Wikipedia, "Emily Dickinson," permanent revision 43577306, 07:45, 12 July 2026; the revision contains the title/body surname forms, the full Hebrew name, the "American poet" descriptor, the 1,776-poem field, and the verbatim Hebrew final-words wording, https://he.wikipedia.org/w/index.php?oldid=43577306&title=%D7%90%D7%9E%D7%99%D7%9C%D7%99_%D7%93%D7%99%D7%A7%D7%A0%D7%A1%D7%95%D7%9F.

[25] Yekum Tarbut, "Because I could not stop for Death: a poem by Emily Dickinson in Tova Neve's translation," page also containing a second Hebrew translation by Yoav Itamar, published 1 August 2022, accessed 28 July 2026, https://www.yekum.org/2022/08/%D7%98%D7%95%D7%91%D7%94-%D7%A0%D7%95%D7%95%D7%94-%D7%A2%D7%9C-%D7%90%D7%9E%D7%99%D7%9C%D7%99-%D7%93%D7%99%D7%A7%D7%A0%D7%A1%D7%95%D7%9F-%D7%95%D7%A9%D7%99%D7%A8-%D7%A9%D7%9C-%D7%93%D7%99%D7%A7%D7%A0/.

[26] Hebcal, "Hebrew Date Converter: 28 July 2026 / 14 Av 5786," accessed 28 July 2026, https://www.hebcal.com/converter?g2h=1&gd=28&gm=7&gy=2026.

[27] Dickinson Electronic Archives, "about 25 July 1854 (Letter 166)," Dickinson/Abiah Root correspondence, accessed 26 July 2026, https://archive.emilydickinson.org/correspondence/aroot/l166.html.

[28] Dickinson Electronic Archives, editorial note for Letter 166, accessed 26 July 2026, https://archive.emilydickinson.org/correspondence/aroot/jnl166.html.

[29] Dickinson Electronic Archives, "autumn 1881 (Letter 728)," Dickinson/Higginson correspondence, accessed 26 July 2026, https://archive.emilydickinson.org/correspondence/higginson/l728.html.

[30] Dickinson Electronic Archives, Thomas H. Johnson's editorial note for Letter 728, identifying Margaret Waldo Higginson and her birth date, accessed 26 July 2026, https://archive.emilydickinson.org/correspondence/higginson/jnl728.html.

[31] Dickinson Electronic Archives, Letter 167, headed "Tuesday night", Austin correspondence; the body uses "Sue", accessed 26 July 2026, https://archive.emilydickinson.org/correspondence/austin/l167.html.

[32] Dickinson Electronic Archives, editorial dating note for Letter 167; the note identifies 25 July or 1 August 1854 as the possible date, accessed 26 July 2026, https://archive.emilydickinson.org/correspondence/austin/jnl167.html.

[33] E. Harpaz, *The Observer Matrix: A Forensic Framework for Identity-Locked Arithmetic Convergence in Independent Records*, independently published (2026). Paperback ISBN-13 979-8186474654; print ASIN B0H6TRWFVX; Kindle ASIN B0H6TZZBPL.

[34] E. Harpaz, *The 9/11 Identity Matrix: Forensic Pattern Convergence Across Time, Data, and Observer Identity*, current 100-Evidence-Unit digital edition, ASIN B0GHBN85GF (2026).

[35] E. Harpaz, *The Titanic Identity Matrix: A Forensic Analysis of the Titanic Wreck Coordinates and Recursive Time Structure*, current 190-chain/85-unit digital edition, ASIN B0GWW6QQW2 (2026).

[36] E. Harpaz, *The Ford Capri Identity Matrix: One Car. One Photograph. Complete Identity Resolution*, current 20-finding/123-equation digital edition, ASIN B0GX5FYJDN (2026).

[37] E. Harpaz, *The Living Subscriber: Retrocausality of Identity in a Card from 2000*, current research edition with two-state addendum and statistical appendix, ASIN B0GY6CLYL5 (2026).

[38] E. Harpaz, *The Result Was Already Encoded: A Live-Time RTM Case File*, current locked-ledger digital edition, ASIN B0H6LSRBLF (2026).

[39] RTM111ER, "RTM public code organization," GitHub (2026), `https://github.com/RTM111ER`.

[40] RTM111ER, "RTM Simulation Suite: statistical validation code for The 9/11 Identity Matrix," GitHub repository (2026), `https://github.com/RTM111ER/-RTM-Simulation-Suite`.

[41] RTM111ER, "Titanic statistical validation," GitHub repository (2026), `https://github.com/RTM111ER/rtm-titanic-statistical-validation`.

[42] RTM111ER, "Ford Capri Identity Matrix reproducibility code," GitHub repository (2026), `https://github.com/RTM111ER/ford-capri-rtm`.

[43] RTM111ER, "The Living Subscriber statistical appendix," GitHub repository (2026), `https://github.com/RTM111ER/the-living-subscriber-statistical-appendix`.

[44] RTM111ER, "Strict arithmetic and null-world simulation audit for live-time Findings 1 and 2," GitHub repository (2026), `https://github.com/RTM111ER/rtm-strict-simulation-audit`.

[45] RTM111ER, "RTM 14–15 July 2026 reproducibility package," GitHub repository (2026), `https://github.com/RTM111ER/RTM-14-15-July-2026-Validation`.

[46] E. Harpaz, "Observer-linked arithmetic convergence in a same-day Hebrew date query: An RTM case report from 14 July 2026" (2026). doi:10.5281/zenodo.21363194.

[47] E. Harpaz, "Same-day observer-linked convergence and cross-day numerical carryover on 15 July 2026" (2026). doi:10.5281/zenodo.21384203.

[48] E. Harpaz, "The Reflective Time Model: Convergence of empirical data on biographical anchors across four independent domains" (2026). doi:10.5281/zenodo.20425701.