

# AOML v2.2: Semantic Constraint Architecture

## Claim Structure, Structural Rules, and Validation Habitats

Companion Document to Paper II, Foundations of the Convergent Semantic Architecture

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**Scope.** Minimal formal core derived from Cross-Linguistic Compositional Analysis (CLCA) across 16 typologically unrelated languages and consolidated against the 16-language union pipeline. Separates primitive claim structure (six primary axes, four meta-axes, core operators, four levels) from empirically discovered structural rules (R1–R9) and validation-habitat constraints. Its central result is the meta-axis substitution family: a single schema,  $M[A] \rightarrow A$ , instantiated on each of the four meta-axes, which grounds the Universal Fallacy Architecture (UFA) without ontology inflation.

**The architecture at a glance.** 6 primary axes · 4 meta-axes · 7 core operators (8 in the full Layer 1C inventory; see the note below) · 3 target types · 4 levels · 8 methods · 9 structural rules · 5 UFA types.

**Note on the operator count.** "7 core operators" counts the operators the legality matrix (§ II) differentially licenses: ATTR, CAUSE, BECOME, RESULT, ABSTR, STRAT, REVEAL. CONTR (negative or contrastive attribution) is a coordinate operator of the same layer, but it is not differentially licensed: its matrix column is uniformly licensed ( $\checkmark$  on every axis), because negation is not licensed or blocked per axis in the way the others are. Its own misuse is a Type 2 violation, and it is distinct from the opposition topology whose mis-specification is Type 5. The full operator inventory in Layer 1C is therefore eight, which is the count the papers use.

**v2.2 changes from v2.1.** (1) LIFE primary axis  $\rightarrow$  LIKE meta-axis: verisimilitude reanalyzed as the grammaticalized similitive ("resembles A without being A"); primary axes 7  $\rightarrow$  6. (2) EVID meta-axis added (evidentiality: source-of-knowledge marking); meta-axes 2  $\rightarrow$  4 (DEG, TEMP, LIKE, EVID). (3) Three new structural rules: R7 (agentive polarity asymmetry), R8 (LIKE substitution), R9 (EVID substitution). (4) R1 refined: blocks direct causation of a dispositional state, not indirect facilitation of conditions. (5) Empirical ratification of the v2.1 core by the 16-language union pipeline (R1, R3, R4, REVEAL, DEG, target-type ontology: all attested in both independent language sets).

## I. Primitive Geometry: Axes, Meta-Axes, Operators, Levels

**Design principle.** Only make something primitive if the whole theory breaks without it. Everything else lives in subregions (Layer 2), condition overlays (Structural Rules, § III), or derived observations. The test for each element: does removing it collapse the constraint geometry, or just lose descriptive coverage?

### Layer 1A. Primary Axes

*Answer: what kind of claim is being made?*

| Axis | Role | Description | Target Type | Notes |
|------|------|-------------|-------------|-------|
|------|------|-------------|-------------|-------|

|                                          |                         |                                                                                                                                                                                               |               |                                                                                |
|------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------------------------------------------------------------------|
| <b>VER</b> · VERIDICAL (Epistemic)       | Factual correspondence  | Truth-value of propositions; correspondence between claim and state of affairs. The paradigm case of truth: what most people mean by "true" or "false."                                       | Epistemic     | Subregions: factual truth, correctness, reality-contact                        |
| <b>AUTH</b> · AUTHENTICITY (Ontological) | Genuine vs. counterfeit | Origin integrity of objects, documents, artifacts. Whether something is the original or an imitation. Validated by provenance, not observation.                                               | Ontological   | Subregions: genuineness, originality; polarity asymmetry in CAUSE (R3)         |
| <b>SINC</b> · SINCERITY (Dispositional)  | Honesty of intent       | Inner alignment between stated and actual belief or intention. Validated by testimony and pattern of conduct, not directly observable. Virtue, not fact.                                      | Dispositional | Subregions: honesty, reliability, faithfulness. Universal causation block (R1) |
| <b>NORM</b> · NORMATIVE (Institutional)  | Rightness / justice     | Moral, legal, or procedural correctness. Ought-claims: what should be the case rather than what is. Validated by principle or consensus, not experiment.                                      | Institutional | Subregions: justice, legitimacy, appropriateness. Direct causation resisted    |
| <b>ESS</b> · ESSENCE (Ontological)       | Inherent nature         | Fundamental, definitional, or necessary properties. What something is by its nature, not by observation or social convention. Resistance to change is intrinsic.                              | Ontological   | CAUSE and BECOME strongly blocked. Abstract nominalization marginal (R2)       |
| <b>VERIF</b> · VERIFICATION (Epistemic)  | Evidential proof        | The process of establishing, proving, or confirming a claim through appropriate evidence. Distinct from VERIDICAL: VERIF is the epistemic act of validation, not the state of correspondence. | Epistemic     | Runs claim→world (see § V). Strong RESULT and ATTR licensing                   |

## Layer 1B. Meta-Axes

*Answer: what grammatical modulation of a primary-axis claim is asserted? Cannot substitute for the host (R5 · R6 · R8 · R9).*

| Meta-Axis | Role | Description | Notes |
|-----------|------|-------------|-------|
|-----------|------|-------------|-------|

|                             |                     |                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                            |
|-----------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>DEG</b> · DEGREE         | Magnitude modifier  | Intensity, threshold, and comparison position of a claim on any primary axis. Ordinal in natural language: more/less, enough/too much, greater than. Structurally analogous to f'(x), the derivative of the primary-axis claim.                                                                                           | Inherits operators from host axis. Cannot substitute for host in inference (R5). Confirmed by both CLCA protocols (seeded + naive)                                                                                                                         |
| <b>TEMP</b> · TEMPORAL      | Position modifier   | Order, direction, and persistence of a claim across time. Ordinal: before/after, already/not yet, earlier/later. Adds internal stratification (past / present / future levels). Analogous to ff(x).                                                                                                                       | Inherits operators from host axis. Internal level stratification generates Type 4 UFA violations when crossed. Now CLCA-confirmed via the reliability construction (sustained sincerity = TEMP[SINC], attested in both sets); substitution prohibited (R6) |
| <b>LIKE</b> · LIKENESS      | Similative modifier | "Resembles A without being A." The grammaticalized similative: verisimilitude is LIKE[VER], lifelikeness its aesthetic subset. Host-dependent valence: forgery (AUTH), hypocrisy (SINC), sophistry (VERIF), demagoguery (NORM), truthiness (VER), illusion (ESS). Reclassifies what v2.1 listed as the LIFE primary axis. | Inherits operators from host; cannot substitute for it (R8). Truth-stem + similative compound attested in 6 unrelated traditions [CLCA-BOTH]                                                                                                               |
| <b>EVID</b> · EVIDENTIALITY | Source modifier     | Marks the source of a claim: directly witnessed, reported (hearsay), or inferred (conjectural). Grammaticalized three-way in Quechua (-m/-mi · -s/-si · -chá); lexical across the sample.                                                                                                                                 | Inherits operators from host; cannot substitute for it (R9). Distinct from the validation-habitat layer (descriptive source-marking vs. normative admissibility)                                                                                           |

## Layer 1C. Core Operators

*Answer: what structural transformation or relation is being asserted?*

| Operator                  | Role              | Description                                                                                                                                                              | Notes                                                                              |
|---------------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <b>ATTR</b> · ATTRIBUTION | Assign property   | "X is [axis]": assigns a truth-kind property to a subject. The most basic assertion. Universally licensed across all primary axes.                                       | ✓ All axes. No restrictions. Universal cross-linguistically                        |
| <b>CAUSE</b> · CAUSATION  | Bring about state | "Make X [axis]": external agent produces or destroys a state. Licensing is polarity-conditioned and target-type-conditioned. The most restricted operator in the system. | Restricted: target type governs licensing. Polarity asymmetry for AUTH. See R1, R3 |

|                               |                            |                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                       |
|-------------------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>BECOME</b> · BECOMING      | Change of state            | "X becomes [axis]": subject transitions into an axis-state. Directionally asymmetric: positive emergence is natural, negative emergence is marked or blocked in most languages.                                                                                                                                                                                                                                                              | Biased: positive states (become-true/real) >> negative (become-false/fake). See R4                                                                                                    |
| <b>RESULT</b> · RESULT        | State established          | "X proved/turned out to be [axis]": marks an achieved or discovered state. Universally licensed. The pathway through which REVEAL-type constructions are often realized.                                                                                                                                                                                                                                                                     | ✓ All axes. Near-universal licensing                                                                                                                                                  |
| <b>ABSTR</b> · ABSTRACTION    | Nominalize concept         | "Truth / justice / authenticity": converts an axis-property into a standalone concept. Universally productive; marginal for ESSENCE. The LIKE simulative has no independent nominalization: it inherits from its host.                                                                                                                                                                                                                       | ✓ Most axes. Marginal for ESS (cross-linguistically)                                                                                                                                  |
| <b>STRAT</b> · STRATIFICATION | Layered distinction        | "Inner vs. outer truth / surface vs. deep sincerity": marks internal contrast within an axis. Universally attested. The operation through which levels become linguistically accessible.                                                                                                                                                                                                                                                     | ✓ All axes. Restricted for AUTH and SINC (surface stratification less natural)                                                                                                        |
| <b>CONTR</b> · CONTRAST       | Negative attribution       | "Not true / unreliable / invalid": predicates the negative pole of a truth-claim (CF2 negation; the negation partner of ATTR). Universally licensed [CLCA-BOTH]. Operator-level misuse → UFA Type 2. Distinct from the opposition FRAME (the precondition), whose misconfiguration is Type 5.                                                                                                                                                | ✓ All axes. Negation universal. Type 5 belongs to the FRAME precondition, not to this operator                                                                                        |
| <b>REVEAL</b> · REVELATION    | Disclosure of latent truth | "X was revealed to be [axis]": presupposes a latent pre-existing host-axis state, disclosed rather than constructed. Attested in the intransitive truth-revelation construction across 16/16 languages in both CLCA sets (Sets A & B) [CLCA-BOTH]. The former "LIFE blocks REVEAL" diagnostic is retired: LIKE[A] is resemblance with no latent A to disclose, so the restriction follows from the meta-axis structure, not a separate axis. | Provisional primitive (pending cross-architectural validation). Encodes a structural presupposition that RESULT + STRAT cannot reconstruct. See § II for full operator–axis licensing |

## Layer 1D. Levels

*Answer: at what stratum is the claim operating?*

| Level                      | Role                        | Description                                                                                                    | Notes                                                                              |
|----------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <b>EMP</b> · EMPIRICAL     | Physical observation        | Claims grounded in observable, testable states of the world. Validated by OBSERVATION or EXPERIMENT.           | Default for VER, AUTH                                                              |
| <b>CONV</b> · CONVENTIONAL | Social / legal norms        | Claims grounded in institutional, cultural, or socially agreed standards. Validated by CONSENSUS or PRINCIPLE. | Default for SINC, NORM                                                             |
| <b>FORM</b> · FORMAL       | Logical / mathematical      | Claims grounded in logical or mathematical necessity. Validated by LOGIC or STATISTICS.                        | Default for ESS, VERIF                                                             |
| <b>ULT</b> · ULTIMATE      | Metaphysical / definitional | Claims grounded in fundamental or definitional necessity. Not falsifiable by empirical counter-example.        | ESS claims often reach ULTIMATE. Level-crossing without justification = Type 4 UFA |

## Layer 2. Target-Type Classes

*A cross-cutting structural partition over the primary-axis space; governs differential operator licensing.*

| Target Type          | Role              | Description                                                                                                                                                                                                                                 | Notes                                                                                                                                             |
|----------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>FACTUAL</b>       | States of reality | VER, AUTH: properties of things in the world. Externally observable and, for some axes, externally producible. The paradigm domain for OBSERVATION and EXPERIMENT.                                                                          | CAUSE generally licensed (subject to polarity conditions). BECOME natural for VER, asymmetric for AUTH                                            |
| <b>EPISTEMIC</b>     | Knowledge states  | VER (as belief state), VERIF: properties of claims or belief-states relative to evidence. VERIF runs claim→world (testing); VER can run world→claim (discovery). Both resist direct causation of the epistemic state itself.                | RESULT and ATTR strongly licensed. CAUSE restricted (cannot directly cause knowledge, only conditions that facilitate it)                         |
| <b>DISPOSITIONAL</b> | Character states  | SINC: stable inner tendencies of agents. Not observable states of the world, not epistemic states: they are cultivated through practice and revealed through pattern of conduct. Universal causation block (R1) applies exclusively to this | CAUSE universally blocked ( $p < 10^{-9}$ ). BECOME marginal. RESULT and REVEAL licensed. This is the deepest structural constraint in the system |

|  |  |       |  |
|--|--|-------|--|
|  |  | type. |  |
|--|--|-------|--|

## II. Core Legality Matrix: Primary Axes × Core Operators

**What this table represents.** This is the primitive legality layer only. It shows whether an operator is licensed (✓), restricted or conditioned (Δ), or blocked (X) for each primary axis as a default structural fact. Polarity effects, target-type effects, and meta-axis substitution errors are captured in the Structural Rules (§ III), not in this table. REVEAL is a provisional primitive (v2.2); the former LIFE/REVEAL diagnostic is retired (see § I).

| Axis                        | O1 ATTR "X is [axis]" | O2 CAUSE "make X [axis]" | O3 BECOME "X becomes [axis]" | O4 RESULT "X proved [axis]" | O5 ABSTR "truth / justice" | O6 STRAT "inner/outer [axis]" | O7 CONTR "[axis] vs. not-[axis]" | O8 REVEAL "X revealed [axis]" |
|-----------------------------|-----------------------|--------------------------|------------------------------|-----------------------------|----------------------------|-------------------------------|----------------------------------|-------------------------------|
| <b>VER</b> (Epistemic)      | ✓                     | Δ                        | Δ                            | ✓                           | ✓                          | ✓                             | ✓                                | ✓                             |
| <b>VERIF</b> (Epistemic)    | ✓                     | Δ                        | Δ                            | ✓                           | ✓                          | ✓                             | ✓                                | ✓                             |
| <b>AUTH</b> (Ontological)   | ✓                     | Δ polarity               | Δ                            | ✓                           | ✓                          | Δ                             | ✓                                | ✓                             |
| <b>ESS</b> (Ontological)    | ✓                     | X                        | X                            | Δ                           | Δ                          | ✓                             | ✓                                | ✓                             |
| <b>SINC</b> (Dispositional) | ✓                     | X 16/16                  | Δ                            | ✓                           | ✓                          | Δ                             | ✓                                | ✓                             |
| <b>NORM</b> (Institutional) | ✓                     | Δ                        | Δ                            | ✓                           | ✓                          | ✓                             | ✓                                | Δ                             |

*Legend: ✓ licensed (universal) · Δ restricted, conditioned, or marginal · X blocked.*

### Restricted and blocked cells, in full

**VER · VERIDICAL** (Epistemic axes: knowledge and evidence states)

- CAUSE Δ Restricted: factual states can be produced; direct production of the belief-state is limited.
- BECOME Δ Restricted: positive bias (become-true natural); negative dispreferred (see R4).
- REVEAL ✓ Licensed: revelation constructions universal for truth-states.
- Condition (C2): CAUSE licenses production of facts or states but not direct causation of the knowledge-state itself. Condition (C3): positive inchoative strongly preferred; the negative form ("becomes false") is dispreferred or blocked in most languages (R4).

**VERIF · VERIFICATION**

- CAUSE  $\Delta$  Restricted: can create conditions for verification; cannot directly cause verification.
- BECOME  $\Delta$  Restricted: verification processes can develop; verification states are achieved, not undergone.
- RESULT  $\checkmark$  Universal: the primary realization pathway.
- REVEAL  $\checkmark$  Licensed: verification revealed through evidential process.

#### **AUTH • AUTHENTICITY** (Ontological axes: properties of things in the world)

- CAUSE  $\Delta$  Polarity-conditioned: CAUS- (destroy/forge) licensed; CAUS+ (create) blocked (see R3).
- BECOME  $\Delta$  Marginal: authenticity is revealed, not acquired incrementally.
- STRAT  $\Delta$  Restricted: internal stratification less natural for material origin.
- REVEAL  $\checkmark$  Licensed: authenticity revealed, not produced; natural cross-linguistically.
- Condition (C2): Polarity asymmetry. CAUSE(+) blocked (authenticity cannot be manufactured externally); CAUSE(-) licensed (forgery, destruction of authenticity is natural cross-linguistically). This is the strongest argument for the ontological axis-class distinction (R3).

#### **ESS • ESSENCE**

- CAUSE  $\times$  Blocked: essential properties are intrinsic; external causation violates the axis.
- BECOME  $\times$  Blocked: things do not become their essence; they either have it or do not.
- RESULT  $\Delta$  Marginal: can result in classification; less natural for deep essence claims.
- ABSTR  $\Delta$  Marginal: abstract nominalization marginal cross-linguistically for ESS.
- REVEAL  $\checkmark$  Licensed: "reveal its essential nature" is natural cross-linguistically.

#### **SINC • SINCERITY** (Dispositional axis: character states of agents; the universal causation block applies)

- CAUSE  $\times$  Universal block: 16/16 languages,  $p < 10^{-9}$ .
- BECOME  $\Delta$  Marginal: character development is possible but internally driven, not simple transition.
- STRAT  $\Delta$  Restricted: the surface/deep sincerity distinction exists but is less productive than on other axes.
- REVEAL  $\checkmark$  Licensed: character revealed through conduct; natural cross-linguistically.
- Universal Causation Block (R1): CAUSE universally blocked for SINC across all 16 languages (Fisher's exact  $p < 10^{-9}$ ). Character traits are internally cultivated, not externally produced. This is the strongest single empirical finding of CLCA and the primary evidence for the DISPOSITIONAL target-type class.

#### **NORM • NORMATIVE** (moral and institutional rightness)

- CAUSE  $\Delta$  Restricted: institutional causation (law, policy) licensed; direct personal causation resisted.
- BECOME  $\Delta$  Restricted: normative states can shift; direction depends on institutional process.
- REVEAL  $\Delta$  Restricted: normative claims revealed through precedent, but less natural.

## Meta-axes in the matrix

Meta-axes inherit operators from the host primary axis across all operators and cannot substitute for the host in any inference step.

- **DEG** · Meta: inherits from the host primary axis across all operators. Substitution Constraint (R5): DEG[A] cannot substitute for A in any inference step. Degree of a claim  $\neq$  the claim itself. Appeal to Probability: DEG[VER]  $\rightarrow$  VER. Appeal to Emotion: DEG[SINC]  $\rightarrow$  VER. Both are Type 2 Operator Overextension (meta-axis substitution subtype) in UFA.
- **TEMP** · Meta (provisional): inherits from the host primary axis; adds past / present / future stratification. Substitution Constraint (R6): TEMP[A] cannot substitute for A. Recency or temporal position cannot validate a claim on its host axis without independent method. TEMP also introduces past/present/future level structure; crossing these levels without justification = UFA Type 4 Stratification Misalignment. Examples: Appeal to Novelty (TEMP[NORM]  $\rightarrow$  NORM), Sunk Cost (Jpast  $\rightarrow$  future obligation), Presentism (present standards applied to past events). Note: TEMP emerged in CLCA-Revision (D21) but not the CLCA-1.1 synthesis; cross-architectural confirmation pending.
- **LIKE** · Meta: inherits from the host primary axis across all operators. Substitution Constraint (R8): LIKE[A] cannot substitute for A in any inference step (see § III, § V).
- **EVID** · Meta: inherits from the host primary axis across all operators. Substitution Constraint (R9): EVID[A] cannot substitute for A in any inference step (see § III, § V).

## III. Structural Rules: Empirical Constraints on the Core Legality Matrix

**Layer distinction.** These rules are not primitive: they are empirical constraints discovered through CLCA that overlay the core legality matrix. They capture polarity effects, target-type conditioning, directional biases, and meta-axis substitution prohibitions that cannot be reduced to simple  $\checkmark/X/\Delta$  cells in the matrix above. Each rule maps to one or more UFA violation types.

| Rule                                    | Formal Statement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Empirical Basis                                                                                                                | UFA Mapping                                                                                        |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| <b>R1</b> Dispositional Causation Block | CAUSE $\times$ DISPOSITIONAL (SINC) $\rightarrow$ universally blocked. Direct causation of a dispositional character state is structurally prohibited across all tested languages. v2.2 refinement: the block is on direct causation of the state, not on indirect facilitation of conditions (Basque <i>zintzotu eragin</i> , Korean <i>진정성을 높인다</i> ) nor on BECOME (character development over time). "Make someone sincere": blocked. "Help someone become more honest" / "cultivate sincerity": attested. | 16/16 languages, both CLCA sets [CLCA-BOTH]. The strongest single empirical finding in the system.                             | Type 2 · Operator Overextension: CAUSE applied beyond its licensed scope to a dispositional target |
| <b>R2</b> Essence Stability             | CAUSE $\times$ ESS $\rightarrow$ blocked · BECOME $\times$ ESS $\rightarrow$ blocked. Essential properties are treated as intrinsic and non-manipulable: neither externally caused nor gradually acquired. Things have or lack essential properties; they do not acquire or lose them through process. "Make it essentially X": blocked. "Reveal its                                                                                                                                                           | Not tested by the union pipeline (ESS-adjacent dimensions surfaced only in zh/sa); marked not-confirmed rather than confirmed. | Type 2 · Operator Overextension                                                                    |



|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                           |                                                                                                        |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
|                                           | essential nature": licensed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                           |                                                                                                        |
| <b>R3</b> Authenticity Polarity Asymmetry | CAUSE(+) × AUTH → blocked · CAUSE(−) × AUTH → licensed. Authenticity cannot be externally manufactured (CAUS+ blocked) but can be destroyed or forged (CAUS− licensed). The copy-vs-forgery distinction lives not in the causation but in whether the product is then passed off as genuine: that is the R8 / LIKE layer. "Manufacture authentic goods": blocked. "Forge a document": licensed.                                                                                             | Confirmed in both CLCA sets [CLCA-BOTH]. Asymmetry consistent across language families.                                   | Type 2 · Operator Overextension: the positive polarity of CAUSE extends beyond licensed scope for AUTH |
| <b>R4</b> Positive Emergence Bias         | BECOME(+state) >> BECOME(−state) across truth-domain axes. Positive emergence is natural and productive ("become true", "become real"); negative emergence is marked, dispreferred, or blocked, conceptualized as degradation rather than autonomous development. "The rumor became true": natural. "The statement became false": marked or blocked in most languages.                                                                                                                      | Confirmed in both CLCA sets [CLCA-BOTH].                                                                                  | Type 2 · Operator Overextension: BECOME(−) extended beyond its licensed polarity                       |
| <b>R5</b> Degree Meta-Axis Substitution   | DEG[A] → A in any inference step. The degree of a primary-axis claim cannot substitute for the claim itself: how much / how intensely A is the case does not establish that A is the case. The derivative is not the function. High probability (DEG[VER]) ≠ truth (VER). Very sincere-seeming (DEG[SINC]) ≠ honest.                                                                                                                                                                        | Confirmed as a meta-axis by both CLCA protocols. Unifies Appeal to Probability, Appeal to Emotion, Argumentum ad Populum. | Type 2 · Operator Overextension (meta-axis substitution subtype)                                       |
| <b>R6</b> Temporal Meta-Axis Substitution | TEMP[A] → A · internal level-crossing → Type 4. The temporal position of a claim cannot substitute for the claim itself, and crossing TEMP's internal past/present/future strata without justification produces a stratification error. v2.2: TEMP gains cross-linguistic footing through the reliability construction (sustained sincerity = TEMP[SINC]). Newer ≠ better (Appeal to Novelty). Past investment ≠ future warrant (Sunk Cost). Present standards on past events (Presentism). | [FALLACY] for the substitution; [CLCA-BOTH] for TEMP itself via reliability (§ VI.1).                                     | Type 2 / Type 4                                                                                        |
| <b>R7</b> Agentive Polarity Asymmetry     | ABSTR(agentive) × positive-pole → blocked · × negative-pole → licensed. Languages lexicalize                                                                                                                                                                                                                                                                                                                                                                                                | Confirmed in both CLCA sets [CLCA-BOTH] ( <i>liar</i>                                                                     | Type 2 · Operator Overextension: polarity-conditioned licensing of the agentive ABSTR                  |

|                                                |                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                             |                                                                  |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
|                                                | the agent of falsehood (a single word for <i>liar</i> ) but provide no parallel agentive noun for the habitual truth-teller: a polarity-conditioned licensing of the agentive nominalization. New in v2.2. Mechanism open. "Liar", "forger", "fraud": lexicalized. "Truth-teller": phrasal, never a single agentive noun.                                                                                      | lexicalizes, <i>truth-teller</i> does not).                                                                 | operator                                                         |
| <b>R8</b> Likeness Meta-Axis Substitution      | LIKE[A] → A in any inference step. Resembling A cannot substitute for being A. One schema whose violation, per host axis, is a named deception: forgery (AUTH), sophistry (VERIF), hypocrisy (SINC), demagoguery (NORM), truthiness (VER), illusion (ESS). New in v2.2. A convincing fake (LIKE[AUTH]) passed off as genuine = forgery. Truth-resembling rhetoric (LIKE[VER]) passed off as true = truthiness. | Confirmed [CLCA-BOTH]: the truth-stem + simulative compound is grammaticalized in six unrelated traditions. | Type 2 · Operator Overextension (meta-axis substitution subtype) |
| <b>R9</b> Evidentiality Meta-Axis Substitution | EVID[A] → A in any inference step. The evidential source of a claim cannot substitute for the claim itself: that it was asserted, reported, or inferred does not establish it. New in v2.2. It was reported, therefore true (hearsay-as-proof). It can be inferred, therefore true (inference-as-proof). Authority asserts it, therefore true.                                                                 | Confirmed [CLCA-BOTH] dimension; grammaticalized three-way in Quechua, lexical across the sample.           | Type 2 · Operator Overextension (meta-axis substitution subtype) |

## IV. Validation Habitats: Axis → Method → UFA Type 3 Violations

**What this table represents.** Methods are not semantic axes: they are validation habitats. Each primary axis has a default method that licenses the claim type and one or more inadmissible methods whose use constitutes a Type 3 Verification Habitat Mismatch in UFA. Using the wrong validation method for a claim type is one of the most common and rhetorically effective error patterns.

| Axis                | Default Method(s)        | Admissible Exceptions            | Inadmissible Methods                       | Canonical Type 3 Violations                                                |
|---------------------|--------------------------|----------------------------------|--------------------------------------------|----------------------------------------------------------------------------|
| VERIDICAL / VER     | OBSERVATION · EXPERIMENT | STATISTICS for population claims | CONSENSUS · TESTIMONY · PRINCIPLE          | Appeal to Authority · Bandwagon · Appeal to Nature · Argumentum ad Populum |
| AUTHENTICITY / AUTH | PROVENANCE               | EXPERIMENT for material dating   | CONSENSUS · OBSERVATION (appearance alone) | Argument from Appearance · Appeal to Reputation                            |

|                      |                                 |                                                             |                                                         |                                                                           |
|----------------------|---------------------------------|-------------------------------------------------------------|---------------------------------------------------------|---------------------------------------------------------------------------|
| SINCERITY / SINC     | TESTIMONY                       | OBSERVATION of conduct pattern over time                    | EXPERIMENT · STATISTICS · OBSERVATION (single instance) | Ad Hominem (reverse) · Appeal to Sincerity as Proof · Passion as Evidence |
| NORMATIVE / NORM     | PRINCIPLE · CONSENSUS           | LOGIC for formal derivation from principles                 | OBSERVATION · EXPERIMENT                                | Naturalistic Fallacy · Is-Ought Error · Appeal to Consequences            |
| ESSENCE / ESS        | LOGIC                           | PRINCIPLE for definitional extension                        | OBSERVATION · CONSENSUS · STATISTICS                    | Essentialism from Observation · Definitional Fallacy · No True Scotsman   |
| VERIFICATION / VERIF | EXPERIMENT · STATISTICS · LOGIC | Multiple methods depending on the claim type being verified | TESTIMONY (as sole evidence) · CONSENSUS                | Iipse Dixit · Appeal to Authority · Verification by Consensus             |

## V. The Meta-Axis Substitution Family and the Stability Principle

**The central result of v2.2.** R5, R6, R8, and R9 are not four independent rules: they are one structural pattern,  $M[A] \rightarrow A$ , instantiated on each of the four meta-axes. A grammatical modulation of a claim (its degree, its time, its resemblance, its source) cannot substitute for the claim itself. Each instance maps to UFA Type 2 (Operator Overextension, meta-axis substitution subtype), and together they generate a large, principled family of classical fallacies from a single schema.

| Rule · Meta-Axis   | Schema                  | "X[A] passed off as A" yields                                                                                  |
|--------------------|-------------------------|----------------------------------------------------------------------------------------------------------------|
| R5 · Degree        | DEG[A] $\rightarrow$ A  | Appeal to Probability · Appeal to Emotion · Argumentum ad Populum                                              |
| R6 · Temporal      | TEMP[A] $\rightarrow$ A | Appeal to Novelty · Sunk Cost · Presentism                                                                     |
| R8 · Likeness      | LIKE[A] $\rightarrow$ A | Forgery (AUTH) · Sophistry (VERIF) · Hypocrisy (SINC) · Demagoguery (NORM) · Truthiness (VER) · Illusion (ESS) |
| R9 · Evidentiality | EVID[A] $\rightarrow$ A | Appeal to Authority · Hearsay-as-proof · Inference-as-proof                                                    |

**The stability principle.** The six primary axes are load-bearing primitives. When new data surfaces an apparent need to split an axis or add a value, the refinement almost always resolves into an existing orthogonal layer (a meta-axis modulation (DEG/TEMP/LIKE/EVID), a level stratification, a subregion, or a cross-axis predicate) rather than a new axis. The working rule: prefer an orthogonal-layer resolution before enlarging the axis set. Of seven proposed refinements tested against the 16-language union pipeline (§ VI), six dissolved into existing structure; the one genuine residual is recorded, not absorbed. That 6-and-1 asymmetry is the architecture's honesty check.

## VI. Resolved Refinements and the Single Open Conflict

**The proposal arc.** Seven candidate refinements were examined against the union-pipeline data. Six dissolved into existing structure rather than new axes or values; the seventh, Sanskrit *mithyā* / a multi-valued opposition FRAME, is the single genuine open conflict, and it challenges the bivalence of the FRAME on the ESS axis (a Type-5 precondition question), not an operator or an axis.

| # | Proposal                             | Outcome                                                                                                                                                |
|---|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | SINC split (reliability as sub-axis) | Dissolved → TEMP[SINC]: reliability is sustained-over-time sincerity; the finding also grounds TEMP cross-linguistically                               |
| 2 | NORM split (deontic / institutional) | Dissolved → R1 on NORM's SINC rider: substantive/moral NORM is constitutive (CAUSE blocked); institutional NORM is constituted status (CAUSE licensed) |
| 3 | AUTH neutral intermediate            | Dissolved → LIKE[AUTH] + R8: acknowledged copy (neutral) vs. forgery (passed off as genuine)                                                           |
| 4 | VER/NORM gradient                    | Dissolved → an axis-neutral conformity predicate (correctness takes its axis from its standard); the axes stay distinct                                |
| 5 | Partial-truth rule                   | Dissolved → R5 + the deception principle (DEG[VER] passed off as VER, knowingly)                                                                       |
| 6 | Deontic interaction                  | Dissolved → NORM over truth-related conduct ("one ought not to lie" is NORM on its normal domain)                                                      |
| 7 | FRAME multi-valued ( <i>mithyā</i> ) | Mostly dissolved (LIKE[ESS] + level-relativity); a strong <i>anirvacanīya</i> residual is recorded, not adopted                                        |

**The single open conflict.** FRAME bivalence vs. Advaita *anirvacanīya*. This is the only refinement not resolved into existing structure. Sanskrit's *mithyā*, genuinely indeterminable as either *sat* (real) or *asat* (unreal), a stable third ontological value resisting the opposition FRAME's binary assumption, is single-tradition, single-language [CLCA-B], with no cross-corpus parallel, and is held open by the data's own open question (G8 OQ-11). The FRAME remains binary by default; the three-valued ontology is recorded as a scoped open question pending evidence that other traditions independently lexicalize a third ontological value. The decision is deferred, appropriately so: it should not be resolved on one tradition's evidence. That one genuine residual, not swept in after six clean dissolutions, is what gives the stability principle (V) its discriminating power.

## Colophon

**Architecture.** AOML v2.2 (Axis–Operator–Method–Level) · six primary axes · four meta-axes · seven core operators plus REVEAL provisional (eight in the full Layer 1C inventory) · four levels · nine structural rules (R1–R9).

**Empirical basis.** CLCA G-phase outputs over 16 languages (Sets A & B, no shared languages) plus the 16-language union pipeline.

**UFA type classifications.** Type 1 Axis Transfer Error · Type 2 Operator Overextension (including the meta-axis substitution family R5/R6/R8/R9) · Type 3 Verification Habitat Mismatch · Type 4 Stratification Misalignment · Type 5 Contrast Frame Collapse. CONTR (the negation operator) and the opposition FRAME (the Type-5 precondition) are distinguished; see § I.

**Machine-readable companions** (in the public replication repository):

- Constraint matrix (JSON): [https://github.com/WellFlow-Labs/CLCA\\_A/blob/main/aoml/aoml\\_constraint\\_matrix\\_v2.2.json](https://github.com/WellFlow-Labs/CLCA_A/blob/main/aoml/aoml_constraint_matrix_v2.2.json)
- Architecture notes (Markdown): [https://github.com/WellFlow-Labs/CLCA\\_A/blob/main/aoml/AOML\\_v2.2\\_architecture.md](https://github.com/WellFlow-Labs/CLCA_A/blob/main/aoml/AOML_v2.2_architecture.md)
- Living HTML version of this specification: [https://github.com/WellFlow-Labs/CLCA\\_A/blob/main/Aoml\\_v2.2\\_constraint\\_architecture.html](https://github.com/WellFlow-Labs/CLCA_A/blob/main/Aoml_v2.2_constraint_architecture.html)

**Related documents:**

- Seeley, B. A. (2026). *Cross-Linguistic Compositional Analysis (CLCA)*. Paper I, Foundations of the Convergent Semantic Architecture. <https://doi.org/10.5281/zenodo.21709636>
- Seeley, B. A. (2026). *The Universal Fallacy Architecture*. Paper II, Foundations of the Convergent Semantic Architecture. This document is its normative companion specification.
- Seeley, B. A. (2026). *The Universal Fallacy Map*. Companion document to Paper II. <https://doi.org/10.5281/zenodo.21766167>
- Seeley, B. A. (2026). *Terminology Correspondence Table*. Companion document to the series (Papers I–IV). <https://doi.org/10.5281/zenodo.21781768>

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