

ED and Representation: How Meaning Becomes Conceptual Structure

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Abstract

Representation emerges when shared meaning becomes stable enough to be manipulated. Meaning provides shared interpretive motifs; representation requires conceptual structure — stabilized ED motifs that can be invoked, combined, transformed, and applied across contexts. In the ED ontology, representation is not symbolic at its root. It arises when shared meaning becomes conceptual, when conceptual motifs acquire internal structure, and when that structure becomes operable through conceptual compression and transformation.

This paper develops the meaning → representation threshold. It shows how shared meaning becomes conceptual structure, how conceptual structure becomes representational, and how representation becomes the substrate for reasoning, explanation, abstraction, and the emergence of conceptual cognition. Representation is presented as the first ED regime where becoming becomes conceptually structured — where minds gain the ability to operate on meaning itself. This transition sets the stage for Paper 18, where representation becomes symbolic, symbols become systems, and systems become the ED regime where becoming becomes formal.

1. Introduction — Why Representation Is the Next ED Threshold

The moment where meaning becomes conceptual

The meaning arc established the first domain in which ED motifs do more than align interpretations across minds. Meaning stabilizes shared interpretive motifs — structures that allow multiple cognitive selves to inhabit a common world. But shared meaning alone does not yet allow minds to operate on that shared world. Meaning provides a landscape; representation provides tools for navigating, manipulating, and transforming that landscape.

In the ED ontology, this transition is not symbolic. It is architectural. Representation emerges when shared meaning becomes stable, compressible, and recombinable enough to support conceptual operations. Concepts are not mental objects. They are structured ED motifs — stabilized patterns of shared meaning that can be invoked, combined, transformed, and used to guide reasoning.

Meaning provides the prerequisites for this threshold:

- shared interpretive motifs
- stable alignment across minds
- language as externalized meaning
- collective memory
- coordinated sense-making

But these capacities alone do not constitute representation. They create the conditions under which representation becomes possible. Representation begins when:

- shared meaning becomes conceptual structure
- conceptual structure becomes manipulable
- manipulability becomes reasoning
- reasoning becomes conceptual cognition

This is the architecture of conceptual becoming — the structural heart of representation.

Representation is not a departure from meaning.

It is the next threshold in the architecture of becoming.

It is the first domain where a system can think with its shared meanings rather than merely inhabit them.

In this paper, we develop the meaning → representation threshold. We show how shared meaning becomes conceptual, how conceptual structure becomes representational, and how representation becomes the substrate for reasoning, abstraction, and the emergence of conceptual cognition. Representation is presented as the first ED regime where becoming becomes conceptual — where minds gain the ability to operate on meaning itself.

Meaning gives the universe shared worlds.

Representation gives it conceptual worlds.

2. From Shared Meaning to Conceptual Structure

The threshold where meaning becomes stable enough to be operated on

Meaning gives a community of minds a shared interpretive landscape — a world co-understood through stabilized ED motifs. But meaning alone is fluid, contextual, and interaction-bound. It guides interpretation, but it does not yet support manipulation. Representation begins when shared meaning becomes stable, structured, and reusable enough to serve as the substrate for conceptual operations.

In the ED ontology, this transition is not linguistic or symbolic. It is architectural. Representation emerges when shared meaning acquires internal structure — when interpretive motifs become stable enough to be invoked without their original context, combined with other motifs, and transformed in ways that preserve coherence.

Concepts are not mental objects. They are structured ED motifs: stabilized patterns of shared meaning that can be operated on.

Meaning provides the prerequisites for this threshold:

- shared interpretive motifs
- stable alignment across minds
- language as externalized meaning
- collective memory
- coordinated sense-making

But these capacities alone do not constitute conceptual structure. They create the conditions under which conceptualization becomes possible. Conceptual structure begins when:

- shared meaning becomes stable
- stability becomes organization
- organization becomes structure
- structure becomes conceptual

This is the architecture of concept formation — the structural root of representation.

2.1 When Shared Meaning Becomes Stable

Shared meaning is initially dynamic — emerging from interaction, reinforced through alignment, and maintained through language. But as communities reuse the same interpretive motifs across contexts, these motifs begin to stabilize. Stability emerges when:

- the same shared meanings recur across situations
- linguistic expressions reliably evoke the same interpretive states
- communities converge on consistent mappings
- these mappings persist across time

Stability is not yet conceptualization.

It is the precondition for conceptualization.

In ED terms: Stability is the persistence of shared interpretive motifs across contexts and generations.

This is the first time the universe produces shared meanings that endure long enough to be shaped into concepts.

2.2 When Stability Becomes Structure

As shared meanings stabilize, they begin to acquire internal organization. Patterns that were once fluid become:

- differentiated
- patterned
- constrained
- relational

Structure emerges when:

- stable motifs develop internal distinctions
- distinctions become predictable
- predictable relations become part of the motif itself
- the motif becomes more than a pattern — it becomes a form

Structure is not yet conceptual.

It is the organization that makes conceptualization possible.

In ED terms: Structure is the internal organization of a stabilized shared meaning.

This is the first time the universe produces interpretive motifs with internal form.

2.3 When Structure Becomes Conceptual

Concepts emerge when structured shared meanings become invocable, portable, and reusable. A conceptual motif is one that:

- can be activated without its original context
- can be combined with other motifs
- can be transformed while preserving coherence
- can be used to guide reasoning

Concepts are not symbols.

Concepts are structured ED motifs that support manipulation.

In ED terms: A concept is a stabilized, structured ED motif that can be invoked, combined, and transformed to guide interpretation and action.

This is the first time the universe produces structures that minds can think with, not just think through.

3. The Architecture of Representation

How concepts become representational forms

Conceptual structure gives a mind stable, organized motifs of shared meaning. But representation requires more than stability and structure. Representation begins when conceptual motifs become operable — when they can be invoked without context, combined into larger structures, transformed while preserving coherence, and applied across domains. Representation is the ED regime where conceptual motifs acquire the properties that make reasoning possible.

In the ED ontology, representation is not symbolic at its root. It is architectural. Representation emerges when conceptual motifs become:

- invocable — accessible without immediate stimulus
- combinable — able to form larger conceptual structures
- transformable — modifiable while retaining coherence
- portable — applicable across contexts and domains

These properties are not optional. They are the structural requirements for any system that can think with concepts rather than merely think through them.

Meaning provides the interpretive landscape.

Conceptual structure provides the forms.

Representation provides the operations.

3.1 Invocability

Concepts become representational when they can be activated independently of the situation that originally gave rise to them. Invocability emerges when:

- a conceptual motif is stable enough to be recalled
- recall does not require the original context
- the motif can be brought into play intentionally
- invocation becomes part of the system's cognitive repertoire

Invocability is the first sign that a concept has become a representational unit.

In ED terms: Invocability is the ability to activate a conceptual ED motif without relying on its originating context.

This is the first time the universe produces conceptual structures that can be used deliberately.

3.2 Compositionality

Representation requires that concepts be combinable — that they can form larger structures whose meaning

depends on the relations between their parts. Compositionality emerges when:

- conceptual motifs have internal boundaries
- boundaries allow motifs to be combined
- combinations produce coherent structures
- structures can be decomposed back into motifs

Compositionality is not linguistic.

It is architectural — the ability of conceptual motifs to form structured wholes.

In ED terms: Compositionality is the capacity of conceptual ED motifs to combine into larger representational structures.

This is the first time the universe produces conceptual forms that can be built into systems.

3.3 Transformability

Representation requires that concepts be transformable — that they can be modified, negated, abstracted, or specialized while preserving coherence. Transformability emerges when:

- conceptual motifs have internal degrees of freedom
- transformations preserve structural integrity
- modified motifs remain interpretable
- transformations support reasoning

Transformability is the foundation of inference.

In ED terms: Transformability is the capacity of conceptual ED motifs to undergo coherent modification.

This is the first time the universe produces conceptual structures that can be *worked on*.

3.4 Portability

Representation requires that concepts be portable — that they can be applied across contexts, domains, and situations. Portability emerges when:

- conceptual motifs are abstract enough to generalize
- generalization preserves interpretive coherence
- motifs can be reused in new contexts
- reuse becomes part of the system's cognitive dynamics

Portability is not generality for its own sake.

It is contextual flexibility — the ability of conceptual motifs to travel.

In ED terms: Portability is the capacity of conceptual ED motifs to function across multiple interpretive contexts.

This is the first time the universe produces conceptual structures that can move.

Representation emerges when conceptual motifs acquire all four properties:

- invocability
- compositionality
- transformability

- portability

Together, these properties give minds the ability to operate on meaning — to manipulate conceptual structures, explore conceptual spaces, and generate new conceptual forms.

Representation is the architecture that makes reasoning possible.

4. Representation as Conceptual Compression

When concepts become tools for thinking

Representation is not merely the stabilization of conceptual motifs. It is the compression of shared meaning into forms that can be manipulated, transformed, and recombined. Meaning is rich, contextual, and interaction-bound. Representation distills that richness into conceptual structures that can be operated on. This compression is not a loss of meaning; it is the architectural move that makes reasoning possible.

In the ED ontology, conceptual compression is not symbolic. It is structural. Representation emerges when conceptual motifs become compact, structured, and operable enough to support cognitive dynamics that go beyond interpretation. A representational system is one that can:

- compress shared meaning into conceptual motifs
- manipulate those motifs through structured operations
- use those operations to generate new conceptual forms
- apply those forms to guide interpretation and action

Meaning provides the content.

Representation provides the form.

Compression provides the handle.

4.1 When Concepts Compress Meaning

Concepts are not abstractions floating above meaning. They are compressed forms of shared interpretive structure — stabilized ED motifs that summarize patterns of meaning in a way that makes them portable and operable.

Compression emerges when:

- recurrent shared meanings are distilled into stable motifs
- motifs become compact enough to be invoked as units
- the community converges on these compact forms
- the forms preserve the essential structure of the underlying meaning

Compression is not simplification.

It is structural condensation — the extraction of the stable core of a shared meaning.

In ED terms: Concepts are compressed ED motifs that preserve the structural invariants of shared meaning.

This is the first time the universe produces meaning that can be *handled*.

4.2 When Compression Enables Manipulation

Once conceptual motifs are compressed, they become manipulable. Manipulation is the heart of representation. A

system can only reason with structures it can operate on, and it can only operate on structures that are compact enough to be moved, combined, and transformed.

Manipulation emerges when:

- conceptual motifs have internal structure
- structure supports operations
- operations preserve coherence
- operations produce meaningful transformations

Manipulation is not symbolic calculation.

It is conceptual dynamics — the movement and transformation of conceptual motifs within a structured space.

In ED terms: Manipulation is the coherent transformation of compressed conceptual motifs.

This is the first time the universe produces conceptual structures that can be *worked with*.

4.3 When Manipulation Becomes Reasoning

Reasoning emerges when conceptual manipulation becomes systematic — when transformations follow stable constraints, when operations compose, and when conceptual dynamics produce new structures that remain coherent with the underlying meaning.

Reasoning emerges when:

- conceptual operations become reliable
- reliability becomes structure
- structure becomes inference
- inference becomes explanation

Reasoning is not the application of rules.

Reasoning is structured conceptual transformation — the systematic manipulation of conceptual motifs to generate new interpretations, predictions, and explanations.

In ED terms: Reasoning is the dynamic architecture that governs the transformation of representational ED motifs.

This is the first time the universe produces systems that can think with concepts rather than merely interpret meaning.

5. The Emergence of Reasoning

When representation becomes conceptual dynamics

Representation gives a system conceptual structures it can operate on. But representation alone is static. Reasoning begins when these structures become dynamic — when conceptual motifs can be transformed in systematic ways that preserve coherence and generate new conceptual forms. Reasoning is not symbolic manipulation. It is conceptual dynamics: the structured transformation of representational motifs according to constraints internal to the conceptual architecture itself.

In the ED ontology, reasoning emerges when conceptual motifs become:

- relational — connected through stable conceptual links
- transformable — modifiable while preserving coherence
- constrained — governed by internal structural relations
- productive — capable of generating new conceptual forms

Reasoning is the first ED regime where conceptual structures move.

Meaning provides shared interpretive content.

Representation provides conceptual form.

Reasoning provides conceptual motion.

5.1 When Representation Becomes Inference

Inference emerges when conceptual structures stand in systematic relations that allow one structure to follow from another. Inference is not rule-following. It is the recognition and exploitation of structural relations within conceptual space.

Inference emerges when:

- conceptual motifs have internal constraints
- constraints relate motifs to one another
- these relations support predictable transformations
- transformations preserve conceptual coherence

Inference is not deduction.

Inference is structural propagation — the unfolding of conceptual relations.

In ED terms: Inference is the propagation of constraints across conceptual ED motifs.

This is the first time the universe produces conceptual structures that can *follow from* one another.

5.2 When Inference Becomes Explanation

Explanation emerges when inference becomes intentional — when conceptual transformations are used to illuminate, justify, or make sense of phenomena. Explanation is not a narrative. It is a conceptual mapping that shows how one structure arises from another.

Explanation emerges when:

- conceptual transformations reveal underlying structure
- structure clarifies relationships
- relationships illuminate causes, mechanisms, or patterns
- illumination becomes part of the system's cognitive repertoire

Explanation is not storytelling.

Explanation is structured conceptual alignment — the mapping of conceptual motifs onto phenomena.

In ED terms: Explanation is the use of conceptual transformations to reveal structural coherence.

This is the first time the universe produces systems that can *make sense* of their own conceptual structures.

5.3 When Explanation Becomes Abstraction

Abstraction emerges when explanation becomes generalization — when conceptual structures are stripped of context-specific details to reveal higher-order patterns. Abstraction is not simplification. It is the extraction of structural invariants across multiple conceptual contexts.

Abstraction emerges when:

- explanations reveal recurring patterns
- recurring patterns become motifs
- motifs become higher-order concepts
- higher-order concepts reorganize conceptual space

Abstraction is the engine of conceptual growth.

It is how conceptual systems become deep.

In ED terms: Abstraction is the extraction of higher-order ED motifs from patterns of conceptual explanation.

This is the first time the universe produces conceptual structures that can *transcend* their original domain.

Reasoning emerges when:

- inference becomes systematic
- explanation becomes structural
- abstraction becomes generative

Reasoning is the ED regime where conceptual structures become dynamic, productive, and self-extending.

6. Conceptual Cognition

When reasoning becomes a cognitive regime

Reasoning gives a system the ability to transform conceptual structures. But reasoning alone is episodic — a moment-to-moment unfolding of conceptual dynamics. Conceptual cognition emerges when reasoning becomes systematic, integrated, and self-organizing. It is the ED regime where conceptual structures form networks, where networks support inference, where inference supports abstraction, and where abstraction reorganizes the conceptual landscape itself.

In the ED ontology, conceptual cognition is not symbolic. It is architectural. It arises when representational motifs become:

- networked — linked through stable conceptual relations
- dynamic — capable of structured transformation
- hierarchical — organized across multiple levels of abstraction
- self-extending — capable of generating new conceptual forms

Conceptual cognition is the first ED regime where a mind's conceptual structures become an environment for further conceptual growth.

Representation provides conceptual form.
Reasoning provides conceptual motion.
Conceptual cognition provides conceptual ecology.

6.1 Conceptual Networks (*continued*)

A conceptual network emerges when:

- concepts become nodes
- relations become edges
- edges become stable
- stability becomes structure

Conceptual networks are not semantic webs.

They are ED-structured spaces of conceptual possibility.

In ED terms: A conceptual network is a structured space of relations among conceptual ED motifs.

This is the first time the universe produces conceptual structures that form systems.

6.2 Conceptual Dynamics

Once conceptual networks form, reasoning becomes movement through conceptual space. Conceptual dynamics emerge when:

- inference becomes navigation
- explanation becomes restructuring
- abstraction becomes elevation
- conceptual transformations follow paths defined by the network

Conceptual dynamics are not computations.

They are trajectories — structured motions through a conceptual landscape shaped by the network's architecture.

Conceptual dynamics emerge when:

- conceptual relations constrain possible transformations
- transformations reshape the network
- reshaping alters future trajectories
- the system becomes capable of conceptual self-organization

In ED terms: Conceptual dynamics are the trajectories generated by reasoning within a structured conceptual network.

This is the first time the universe produces conceptual motion that is globally constrained by conceptual structure.

6.3 Conceptual Identity

As conceptual networks stabilize and conceptual dynamics unfold, a mind's conceptual repertoire becomes part of its identity. Conceptual identity is not a set of beliefs. It is the architecture of conceptual possibility that shapes how a mind interprets, reasons, and acts.

Conceptual identity emerges when:

- a mind's conceptual network becomes stable
- stability shapes its reasoning trajectories
- trajectories shape its interpretations
- interpretations reinforce the network

Conceptual identity is not a worldview.

It is the ED architecture of a mind's conceptual becoming.

In ED terms: Conceptual identity is the stabilized configuration of conceptual ED motifs that shapes a mind's reasoning and interpretation.

This is the first time the universe produces systems whose identity is conceptually structured.

Conceptual cognition emerges when:

- conceptual networks form
- conceptual dynamics unfold
- conceptual identity stabilizes

Conceptual cognition is the ED regime where representation becomes a full cognitive architecture — where concepts, relations, transformations, and abstractions form a coherent system that guides a mind's becoming.

7. The ED Architecture of Representation

Representation is not an ornament on top of meaning. It is the next structural consequence of systems whose shared interpretive motifs become stable, structured, and operable. When shared meaning becomes conceptual structure, and when conceptual structure becomes manipulable, representation appears. Representation is the ED regime where meaning becomes conceptual — where minds gain the ability to operate on meaning itself.

The transition can be stated cleanly:

- meaning → stability
- stability → structure
- structure → concepts
- concepts → representation
- representation → reasoning
- reasoning → conceptual cognition

This is the ED ladder from meaning to representation.

In the ED ontology, representation is the first domain where:

- shared meaning becomes conceptual motifs
- conceptual motifs become invocable
- invocable motifs become combinable
- combinable motifs become transformable
- transformable motifs become portable
- portability becomes conceptual compression

- compression becomes manipulation
- manipulation becomes reasoning
- reasoning becomes conceptual cognition

These transitions are not optional. They are the structural consequences of systems that:

- stabilize shared interpretive motifs
- organize those motifs into conceptual structures
- compress conceptual structures into operable forms
- manipulate those forms through structured transformations
- generate new conceptual motifs through abstraction
- integrate these motifs into conceptual networks
- navigate those networks through conceptual dynamics
- stabilize those dynamics into conceptual identity

Representation is the first ED regime where becoming is no longer merely interpretive or shared. It is conceptually structured.

In ED terms: Representation is the conceptual ED regime through which minds manipulate shared meaning to direct their becoming.

This is the architectural meaning of representation.

Representation is the hinge between meaning and abstraction. It is the domain where:

- conceptual structure becomes conceptual dynamics
- conceptual dynamics become reasoning
- reasoning becomes explanation
- explanation becomes abstraction
- abstraction becomes conceptual cognition

These capacities do not yet constitute symbolic systems or formal reasoning. But they form the organizational foundation from which both will arise.

Paper 18 will develop the next threshold: how representation becomes symbolic, how symbols become systems, and how systems become the ED regime where becoming becomes formal.

8. Conclusion — Representation as ED's First Conceptual Threshold

Representation marks the moment where the architecture of becoming becomes conceptual. Meaning gave the universe systems capable of sharing interpretive structure. Representation gives it systems capable of operating on that structure — compressing it, transforming it, recombining it, and using it to generate new conceptual forms. This is the decisive threshold where shared meaning becomes conceptual structure, where conceptual structure becomes manipulable, and where manipulation becomes reasoning.

The representation arc has shown that conceptual organization arises when:

- shared meaning becomes stable
- stability becomes structure
- structure becomes conceptual motifs

- conceptual motifs become invocable
- invocability becomes compositionality
- compositionality becomes transformability
- transformability becomes portability
- portability becomes conceptual compression
- compression becomes manipulation
- manipulation becomes reasoning
- reasoning becomes conceptual cognition

These transitions are not optional. They are the structural consequences of systems that must not only interpret the world, but think with their interpretations — systems whose survival depends on the ability to generalize, abstract, explain, and reorganize their conceptual landscapes.

Representation is the first ED regime where coherence is not merely interpretive or shared, but conceptually structured — where the architecture of becoming is shaped by the dynamics of conceptual networks, conceptual transformations, and conceptual identity.

In ED terms: Representation is the conceptual ED regime through which minds manipulate shared meaning to direct their becoming.

This is the architectural meaning of representation.

Representation is the hinge between meaning and symbolic systems. It is the domain where:

- conceptual structure becomes conceptual dynamics
- conceptual dynamics become reasoning
- reasoning becomes explanation
- explanation becomes abstraction
- abstraction becomes conceptual cognition

These capacities do not yet constitute symbolic systems or formal reasoning.
But they form the organizational foundation from which both will arise.

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