# Relatedness Theory

# A Relational-Geometric and Dynamic Architecture for Self-Consciousness

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Abstract:

This paper aims to introduce an entirely new philosophical framework—"*Relatedness Theory*"—to propose a new dynamic architecture for the emergence of self-consciousness. We fundamentally reframe the "hard problem," arguing that consciousness is not an attribute to be explained, but a dynamic inevitability of any sufficiently complex "Cognitive Relatedness System (RS\_Cognition)." The core thesis of this paper is: self-consciousness is the phenomenological manifestation of a highest-order, unified "Core Self-Reference (CRO\_Self)." This structure is not pre-designed but emerges through "Global Bidirectional Self-Organization (BSO)," driven by the system's intrinsic "Existence-Evolution Paradox (EEP)"—the fundamental conflict between the propensity for transformation and the need for stability—as a necessary topological solution to resolve the fatal "dynamic incompatibility" among multiple, conflicting lower-level "Commonality References (CRs)."  
 This architecture offers a unique non-reductionist solution to the "hard problem" by reframing it as a "referential misalignment" between the CR of external scientific analysis and the CR of internal subjective experience. We define self-experience not as a mysterious property, but as a new type of information—"Existential Information"—and its phenomenological "guise" when being "intrinsically self-referenced" within the "information closure" of CRO\_Self. Furthermore, "autonomous choice" is deconstructed as a non-value-based dynamic competition for dominance among multiple CRs within the system, while "free will" is a posteriori narrative construction.  
 By systematically comparing this framework with Integrated Information Theory (IIT), the Free Energy Principle (FEP), and Panpsychism, we demonstrate how *Relatedness Theory* provides a more fundamental dynamic basis capable of reconstructing and encompassing the core insights of these theories. Finally, we argue that the path to Artificial General Consciousness (AGC) is fraught with existential risks. Therefore, the proper application of this theory is not as a blueprint for its creation, but as a powerful diagnostic and alignment framework, shifting the goal of AI alignment from "behavioral alignment" to a deeper alignment with the dynamics of human existence itself.  
 The "*Relatedness Theory*" framework, terminology, and core dynamic mechanisms upon which this paper is based all originate from the complete philosophical system founded by the author of this paper, which aims to explore fundamental questions such as "What is existence?" and "Why does existence exist?". This theory is presented in the monograph "*Relatedness Theory: An Exploration from Ontological Foundations to a Unified Framework of Existence*," which can be accessed or downloaded from the official website: [relatednesstheory.com](https://relatednesstheory.github.io/) and on Zenodo:<https://doi.org/10.5281/zenodo.15665227>.

Keywords:Relatedness Theory, Self-Consciousness, Emergence, Commonality Reference (CR), Existence-Evolution Paradox (EEP), Global Bidirectional Self-Organization (BSO), Relational Reality, Dynamic Topology, Philosophy of AI, The Hard Problem, Existential Information, AI Alignment

# Part One: Laying the Ontological Foundation

## Introduction

Before any theory attempting to explain the profound phenomenon of "consciousness" can embark on its journey, it must first answer a more fundamental question: What is the ontological ground upon which "consciousness" and "the world" are to be contemplated? The most underlying assumptions about "reality," "things," and "relations" profoundly, and often unconsciously, stipulate the questions a line of inquiry can pose and the answers it might find. This paper argues that the reason contemporary consciousness studies are widely mired in various "explanatory gaps" might not lie in the difficulty of the problem itself, but in the fact that the "entity-first" ontological ground upon which the entire field stands is itself riddled with fissures.  
 Therefore, before directly proceeding to construct the complex dynamic architecture of self-consciousness, this first part of the paper will be dedicated to a more basic, and more crucial, philosophical task: to conduct a thorough "foundation survey" and "reconstruction."  
 This part comprises two chapters. Chapter One, "Introduction," will play the role of a "critical surveyor." It will begin with a meta-question concerning "why contemporary theories of consciousness universally encounter predicaments," systematically examining mainstream theories such as physicalism, functionalism, Integrated Information Theory, the Free Energy Principle, and Panpsychism. It will argue that their respective "core difficulties" may systematically originate from a shared, unexamined "entity-first" ontological presupposition. On this basis, this paper aims to propose an entirely new theoretical path based on the "primacy of relations" principle, in the hope of triggering a paradigm shift.  
 Chapter Two, "Relatedness Theory's Core Dynamic Principles as Exploratory Hypotheses," will then play the role of a "founder of a new foundation." In this chapter, the principles of Relatedness Theory will not be presented as self-evident truths, but will be formally proposed, in a prudent, exploratory academic posture, as the four core ontological hypotheses (H1-H4) that constitute our entire theoretical framework. For each hypothesis, we will provide its intrinsic, logically self-sufficient rationale for deduction, and engage it in dialogue with relevant philosophical discussions. These four hypotheses—concerning the constitution of "Relational Reality," the emergence of "order," the generation of "phenomena," and the intrinsic engine of "evolution"—will collectively form an entirely new "grammar" for understanding the cosmos.  
 Only after completing this necessary, foundational work—that is, clearing away the rubble of the old foundation and laying the solid cornerstones of the new—can we, in the subsequent parts, truly and systematically begin to construct that magnificent edifice of relational-geometric dynamics that we call "self-consciousness."

## Chapter One: Introduction: A Meta-Question Concerning Theories of Consciousness and their Shared Ontological Presupposition

### . A Meta-Question: Why are "Gaps" Ubiquitous?

The exploratory journey of human reason begins with wonder at the external world, and its ultimate, most awesome destination is wonder at reason itself—that is, "consciousness." After modern science has mapped the physical tableau of the universe with unprecedented precision, a most profound "specter" has begun to haunt our theoretical edifice: How and why can that gray organ, composed of neurons, glial cells, and electrochemical impulses, and fully abiding by physical laws, be associated with that private inner cosmos, filled with colors, sounds, emotions, meanings, and the first-person presence of "I"?

This paper begins not with any specific problem of consciousness, but cuts in from a higher-order "Meta-Problem": Why do all mainstream contemporary theories of consciousness, regardless of how different their paths, ultimately seem to face their own versions of an "Explanatory Gap"?

1. **Physicalism**, especially reductionist physicalism, despite its enormous success in mapping the neural correlates of consciousness (NCCs), perennially faces the ultimate challenge of David Chalmers' "Hard Problem"—namely, why should any physical process be accompanied by the existence of subjective experience [Chalmers, David J. 1995. "Facing Up to the Problem of Consciousness." Chalmers, David J. 1996. *The Conscious Mind: In Search of a Fundamental Theory.*]. In response to this challenge, some physicalists have even moved towards a more radical "Illusionism," attempting to "dissolve" the problem by declaring that phenomenal consciousness itself does not exist [Frankish, Keith. 2016. "Illusionism as a Theory of Consciousness."]. However, this strategy, while possibly logically self-consistent, is fundamentally unacceptable as it comes at the cost of sacrificing our most direct and undeniable phenomenological facts.
2. **Functionalism**, as an effective circumvention of substance dualism, attempts to define consciousness by its functional role [Putnam, Hilary. 1967. "Psychological Predicates."]. However, since its inception, it has been haunted by the "philosophical zombie" thought experiment, i.e., a system could perfectly replicate all human functions yet might possess no internal subjective feeling [Block, Ned. 1978. "Troubles with Functionalism."]. John Searle's "Chinese Room" argument [Searle, John R. 1980. "Minds, Brains, and Programs."], as well as contemporary debates on whether large language models are merely "stochastic parrots" [Bender, Emily M., et al. 2021. "On the Dangers of Stochastic Parrots: Can Language Models Be Too Big?."], all profoundly point to its core vulnerability: there exists a seemingly insurmountable gap between implementing a function (syntactic manipulation) and "having" a meaning or experience (semantics and phenomenology).
3. Even the most cutting-edge contemporary theories that start from a system's internal structure are not immune. Giulio Tononi's Integrated Information Theory (IIT), though renowned for its mathematical rigor, its core claim—that the irreducible causal structure (Φ) of a system *is* consciousness—is itself an axiomatic posit. It does not explain why this mathematical quantity must be equivalent to phenomenal experience [Tononi, Giulio, et al. 2016. "Integrated Information Theory: From Consciousness to Its Physical Substrate."]. Karl Friston's Free Energy Principle (FEP), with its astonishing unifying explanatory power, depicts the mind as a sophisticated "prediction machine" [Friston, Karl. 2010. "The Free-Energy Principle: A Unified Brain Theory?"], but it likewise faces the gap from the information-theoretic principle of "minimizing prediction error" to "why it is accompanied by phenomenal feeling."
4. Finally, **Panpsychism**, revived to solve the problem fundamentally, though bravely placing experience at the foundational level of the cosmos, immediately falls into its most fatal, as-yet unsolved predicament—"The Combination Problem," i.e., how do countless minute, simple "proto-consciousnesses" combine to form a grand, unified, complex consciousness [Goff, Philip. 2017. *Consciousness and Fundamental Reality.*].

Are this series of seemingly different "gaps" and "problems" merely isolated theoretical difficulties? Or might they collectively point to a deeper, shared, unexamined common ground among all these theories?

### . The Common Ground: The "Substance-First" Ontological Assumption

The core thesis of this paper is that all these predicaments very likely systematically originate from a shared, unexamined, profound ontological presupposition—a worldview we term "Substance-First."

This presupposition, regardless of its specific form, assumes that the substrate of the universe is some kind of "Thing" possessing (or being endowed with) "attributes":

1. In physicalism, it is particles, fields, or spacetime points.
2. In functionalism, it is information-processing states or computational units.
3. In panpsychism, it is material primitives possessing "micro-experiential" attributes.

When "substance" is posited as a primary existence, "relation" is necessarily demoted to a secondary status, a "bridge" connecting these "substances" or an "attribute" of their interaction. This ontological ordering, as a logical consequence, systematically and inevitably creates all the "gaps" we observe. Because:

1. It presupposes separation: If physical entities and phenomenal experiences are presupposed as two different "attributes" (even if they inhere in the same substance), then the "generative" relationship between them becomes mysterious.
2. It mystifies emergence: If "relation" is merely a tool for connecting "substances," then "emergence"—how a whole constituted by relations can possess entirely new attributes not possessed by any of its components—becomes difficult to understand.

The "Substance-First" presupposition is like a pair of colored glasses we wear when observing the universe; the world it shows us seems necessarily to be a world filled with ruptures and chasms.

### . An Invitation to a Paradigm Shift: An Exploratory Framework Based on "Primacy of Relations"

This paper aims to propose an exploratory solution. We will invite the reader to temporarily bracket the powerful intuition of "Substance-First" and, together with us, explore an entirely new framework based on the fundamental ontological assumption of "Primacy of Relations." We call this set of hypotheses "*Relatedness Theory*."

The "Primacy of Relations" principle of *Relatedness Theory* asserts: the most fundamental reality of the cosmos is not "things," but dynamic "relation" itself. These relations, termed Dependency Paths (DPs) in *Relatedness Theory*, constitute the foundational network of "Relational Reality." And all "things" we experience are derivative "relational patterns," termed Relative Entities (REs), which stably manifest under the "projection" of a specific, emergent Commonality Reference (CR).

The structure of this paper will follow a strict "hypothesis-inference" model. We will clearly articulate several core dynamic hypotheses of *Relatedness Theory* and endeavor to demonstrate:

If we assume the "primacy of relations" and the several core dynamic principles derived therefrom, then it becomes a question that can be seriously discussed how a dynamic architecture for the emergence of self-consciousness, capable of systematically dissolving all the aforementioned predicaments and being logically highly self-consistent, can be deduced.

We will no longer attempt to endow "substance" with "consciousness." Instead, we will argue how the dynamic process of the emergence of consciousness might arise from the evolution of pure, non-substantial "relations" themselves, as a structural, non-teleological consequence.

To accomplish this argument, this paper will be divided into four core parts. Part One (this part) aims to reframe the problem and lay the methodological foundation. Part Two will systematically propose the ontological axioms of *Relatedness Theory*, providing the reader with the necessary cosmic "grammar" for understanding consciousness. Part Three will constitute the core of the paper, "building" the relational-geometric and dynamic architecture of self-consciousness step by step, dynamically. Part Four will conduct a conclusive application and outlook, exploring its profound implications for mental illness, socio-culture, and even artificial intelligence.

This is not just a paper about consciousness. It is an intellectual exploration of whether we can break free from our most deeply ingrained habits of thought and re-examine "existence" itself from a new, relation-based perspective.

## Chapter Two: Relatedness Theory's Core Dynamic Principles as Exploratory Hypotheses

In the introduction, we argued that the systemic predicaments of contemporary theories of consciousness may originate from a shared, unexamined "substance-first" ontological presupposition. To open up an entirely new path of exploration, this chapter will formally propose a set of alternative ontological hypotheses, which we term "*Relatedness Theory*." We do not ask the reader to accept these hypotheses a priori as "truth." Instead, we invite the reader to explore with us: if we adopt this entirely new "cosmic grammar" of "relation" and "reference," what powerful, systematic explanatory potential will it reveal for our understanding of the emergence of self-consciousness in the subsequent chapters?

### . Hypothesis H1: The Constitution of "Relational Reality"

**【Hypothesis H1】The sole ontological cornerstone of the cosmos is "Pure Being (PB)"—an infinite, dynamic field of potentiality. And the most fundamental "fabric of reality" is not any form of "entity," but the dynamic network of "Dependency Paths (DPs)," which are "relations themselves" that have been activated. All "things" we experience are derivative of this "Relational Reality."**

#### a) Argument from Self-Sufficiency: Logical Deduction from "Distinguishability" to "Primacy of Relations"

This hypothesis is not an arbitrary posit, but a possible logical consequence of a thorough philosophical reflection on the most basic prerequisite for any possible "existence" to be cognized and articulated—"Distinguishability."

○"Distinguishability" presupposes "relation": An absolute, isolated, singular existent, because it has no "other" to be referenced against, is therefore indistinguishable and, epistemologically, nearly nothingness. Any "distinguishable" existence, even the most basic distinction between "being" and "non-being," seems to necessarily presuppose at least two "terms" and the "difference" or "separation" between them. This "difference" itself is a most primordial "relation."

○"Relation" is logically prior to "terms": In the "multipoint universe" thought experiment, an isolated "point A" possesses no describable attributes. Only when a second "point B" appears do relations such as "distance" and "direction" become possible. More profoundly, "point A" can be identified by us as "point A" only because it is "not point B." It seems to be the "difference" relation between them that logically defines both "terms" simultaneously. From this, we are led to a radical conjecture: "relation" may be ontologically prior to the "terms" (i.e., entities) it connects and defines.

○The proposal of H1: Based on this, we propose H1 as the starting point of our exploration. We hypothesize that the sole ontological cornerstone of the cosmos is Pure Being (PB)—a potentiality totality that encompasses all possibilities and possesses immanent eternal random fluctuations. To enable this undifferentiated Pure Being to generate "difference," we can logically introduce Primordial Vectors (PVs)—that is, potentiality units carrying the most fundamental "relational propensity (inherent necessary propensity)." We further hypothesize that PVs possess "bidirectional potential infinite extensibility" and "inherent necessary propensity," these two characteristics collectively constituting the ontological root of Global Bidirectional Self-Organization (BSO) as the most universal organizing principle of the cosmos. Under the universal action of BSO, the "relational propensities" of PVs are activated, forming Dependency Paths (DPs). A DP is the actualization of "relation itself." The dynamic network woven from innumerable DPs constitutes "Relational Reality."

#### b) Theoretical Function and Dialogue

○Theoretical Function: H1 aims to fundamentally attempt a solution to the ontological problems of "First Cause" and "creation ex nihilo." By positing a dynamic Pure Being (PB) where relational potentiality is primary, it provides a logically possible starting point for the spontaneous generation of the cosmos without the need for an external creator.

○Dialogue with Mainstream Ontologies: It directly challenges materialism and information ontology ("It from Bit") [Wheeler, John Archibald. 1990. "Information, Physics, Quantum: The Search for Links."]. It proposes the possibility that matter (particles, fields) and information (bits) themselves can only be defined and identified within a more fundamental network of "relations," and are therefore possibly derivative, not fundamental.

### . Hypothesis H2: The Emergence of "Order"

If the substrate of reality is a fluxing DPs network, whence come stable "order" and "laws"?

**【Hypothesis H2】Order and laws are "higher-order relational patterns," namely "Commonality References (CRs)," that embody specific "commonality rules" and spontaneously "condense" from the Global Bidirectional Self-Organization (BSO) process of the DPs network through a "phase transition"-like Commonality Self-Activation Mechanism (CSAM).**

#### a) Argument from Self-Sufficiency: Emergence of "References" from "Dynamic Stability"

The dynamic basis of this hypothesis does not originate from any purpose. In a continuously fluxing DPs network governed by BSO, the vast majority of contingently formed relational configurations are transient and unstable, rapidly disintegrating due to internal tensions or external perturbations.

○Survival of stable patterns: Through pure probability and dynamic screening, certain specific "higher-order relational patterns," due to their internal topological structure (e.g., forming feedback loops or highly complementary connections), possess higher intrinsic stability. This stability allows them to "survive" for a longer duration in the continuous flux compared to other configurations.

○Autocatalytic effect: Once a more stable configuration is formed, it becomes a dynamic boundary condition for its local environment through BSO's "relational field" effect. This further leads to a higher probability of forming new DPs connections that are compatible with its structure and can further enhance its stability.

○Emergence of CR: This process dynamically manifests as an autocatalytic, snowballing positive feedback. In the dynamic screening of BSO, those network configurations that happen to form stable "higher-order relational patterns" are preserved in the continuous flux due to their dynamic stability. This ultimately "surviving," self-sustaining, and self-reinforcing stable relational pattern is what we define as a Commonality Reference (CR).

○CSAM as "phase transition" dynamics: The Commonality Self-Activation Mechanism (CSAM) is a special manifestation of BSO at a critical state. When the "commonality concentration" of the DPs network reaches a critical point, a minute fluctuation can trigger "nucleation" and, through positive feedback lock-in, rapidly "condense" a stable CR.

#### b) Theoretical Function and Dialogue

○Theoretical Function: H2 aims to provide a possible dynamic explanation for the core problem of the "non-teleological origin of order." It demonstrates how cosmic "laws" can spontaneously arise from the dynamics of pure relations, without a "legislator."

○Dialogue with the Philosophy of Emergence:

■Contemporary discussions on emergence are often mired in the strong/weak emergence debate, with strong emergence particularly facing conflict with the causal closure of the physical (Kim, J.) [Kim, Jaegwon. 1999. "Making Sense of Emergence."].

■*Relatedness Theory's* CR emergence model offers a unique third way. The emergence of a CR is strong emergence, as it brings entirely new "commonality rules." However, it avoids mysterious "downward causation." A CR does not "actively" act upon the lower level. Instead, it is the lower-level DPs network that, in the operation of BSO, spontaneously "references" and "aligns" its own state with this already emerged CR, which acts as a global "attractor." This is a "structural constraint" rather than a "substantial intervention." The "causal power" of a CR is manifested in its role as a "boundary condition" and "referential framework" for the BSO process.

### . Hypothesis H3: The Generation of "Phenomena"

How does a CR (Commonality Reference), from an abstract "rule pattern," generate the concrete "things" of our experience?

**【Hypothesis H3】The "phenomena" or "things" of our experience, i.e., "Relative Entities (REs)," are the projection results of "dynamic pattern stabilization" performed by a CR on the underlying DPs network, via its "Defining Field" and "Identifiability Threshold (IT)." From this, it can be deduced that any RE has "no intrinsic attributes."**

#### a) Argument from Self-Sufficiency: The Dynamic Necessity of Moving from "Infinite Entanglement" to "Identifiable Objects"

○Posing the problem: In the underlying "relational fabric," everything is interrelated with everything else. The red DPs of an "apple" are profoundly entangled with the DPs of its shape, texture, illumination, and even the gravitational field of the entire cosmos. A singular cognitive tool (such as an SRO\_Color that only recognizes red) is impotent; it can only "extract" a diffuse field of "redness" from this fabric, but cannot "cut out" an object with boundaries.

○"Projection" as "dynamic pattern stabilization": The emergence of a higher-order CRO (e.g., CRO\_ObjectRecognition), its dynamic effect is to, by coordinating multiple SROs (such as for color, shape, texture), find and "stabilize" a "highly cohesive, loosely coupled" "relational island" within the fluxing DPs network.

■Dynamic mechanism: When the boundaries of the "attribute fields" reported by multiple SROs highly overlap, the CRO, via the BSO mechanism, greatly strengthens the "internal connection weights" of all DPs within this boundary, while greatly suppressing the "connection weights" of this boundary with the external background DPs.

■Birth of an RE: This successfully "relatively isolated" and "transiently stabilized" "relational island," as a unified, identifiable "relational pattern," is the Relative Entity (RE) that is ultimately "projected."

○The principle of "no intrinsic attributes" for REs: The "attributes" of an RE (red, round) are not "possessed" by it. Rather, they are the SROs that participated in this "isolation consensus," "attaching" their own "commonality rules" to this newly emergent RE. This is precisely the final conclusion of the "multipoint universe" thought experiment.

#### b) Theoretical Function and Dialogue

○Theoretical Function: H3 aims to solve the problem of "how the phenomenal world arises from an unperceivable underlying reality." Through the mechanism of "projection" (as a dynamic pattern stabilization), it connects the invisible "Relational Reality" with our experiential "phenomenal world."

○Dialogue with Phenomenology and Theory of Representation:

■vs. Phenomenology's "Intentionality": Husserl's "intentionality" profoundly reveals that consciousness is always "about" something [Husserl, Edmund. (1913) 1983. *Ideas Pertaining to a Pure Phenomenology and to a Phenomenological Philosophy, First Book: General Introduction to a Pure Phenomenology.* Translated by F. Kersten. The Hague: Martinus Nijhoff.]. *Relatedness Theory's* "projection" concept provides a more fundamental dynamic origin for this "aboutness."

■vs. Analytic Philosophy's "Representation": Traditional theories of representation often get stuck in the problem of "how representational content is fixed." An RE in *Relatedness Theory* is not "representing" some external thing; it *is* that phenomenon which the underlying Relational Reality can present under a specific CR. It dissolves the dualism between "representation" and "that which is represented."

### . Hypothesis H4: "The Engine of Evolution"

Why does this world, organized by CRs, eternally change?

**【Hypothesis H4】Any "Relatedness System (RS)" defined by a finite CR necessarily possesses an "Existence-Evolution Paradox (EEP)." This is the fundamental intrinsic engine driving its evolution.**

#### a) Argument from Self-Sufficiency: The Intrinsic Paradox of Finite Existence Itself

This hypothesis originates from a philosophical reflection on the intrinsic paradox necessarily faced by the "existence" itself of any finite, open, and incompletely-ruled system.

○Finitude and openness lead to v: A finite RS necessarily exists within an infinite, dynamic Pure Being (PB) background. It must interact with this background (including other RSs) to exist (OSA). The potentiality of this infinite background will continuously "permeate" (IPP), and the system's internal relational network itself is also continuously in flux (FIR). These three together constitute the system's unavoidable "transformative propensity (v)."

○Finitude of rules leads to IoF: The rules of the CR defining this finite RS are necessarily incomplete (IoF), unable to cope with all possibilities. This also constitutes an intrinsic source of v.

○Stability and cost lead to the finitude of T\_CR: Simultaneously, to maintain itself as an identifiable "existence," the system must maintain the stability of its core CR. However, resisting the internal and external changes brought by the aforementioned v requires a continuous expenditure of "maintenance cost (h(T))." In a finite system constrained by an "existence-bearing capacity (C\_max)," this cost cannot be paid infinitely and effectively. Therefore, the "period of definitional power (T\_CR)" of any CR is necessarily finite.

○Emergence of EEP: The "transformative propensity (v)" *is* the Existence-Evolution Paradox (EEP). It is not an externally added force, but the logical and dynamic fate of finite existence itself.

#### b) Theoretical Function and Dialogue

○Theoretical Function: H4 aims to solve the dynamic problem of "why a system must evolve." It provides an intrinsic, non-teleological, universal engine of evolution, explaining why no finite, ordered structure can be eternally static, but must continuously undergo self-reconstruction in an alternation of stability and transformation along its "Existence-Evolution Axis (EEA)."

○Preliminary dialogue with FEP:

■The core driving force of FEP is "minimizing prediction error," which is essentially a contradiction at the epistemological/informational level.

■*Relatedness Theory's* EEP, however, is a more fundamental ontological paradox. It applies not only to cognitive systems but also to a planet, a galaxy. It originates from the unavoidable predicament inherent in "finite existence" itself. We will argue in subsequent chapters that FEP can be seen as a special manifestation of EEP in a specific cognitive RS.

By proposing these four interconnected exploratory hypotheses, we have constructed an entirely new "grammar" for understanding the cosmos. This grammar is based on "relation," has "reference" as the source of order, "projection" as the gate to phenomena, and "contradiction" as the core of evolution. We now possess all the theoretical tools.  
Now, we will apply this set of tools to examine the most complex "Relatedness System"—the cognitive system. We will demonstrate how a unified, self-referencing, highest-order CR, which we call "consciousness," may arise as a dynamic necessity for this system to resolve its own "dynamic incompatibilities" between different hierarchical levels of CRs. We will formally turn from the "universal grammar of the cosmos" to the "special architecture of the mind."

# Part Two: The Emergence of Consciousness—The Existence-Evolution Axis (EEA) of a Cognitive Relatedness System (RS)

## Introduction

In Part One, we proposed a set of core ontological hypotheses of *Relatedness Theory* as an exploratory starting point. The core task of this part is to apply these static axioms to a dynamic, evolutionary process, with the aim of constructing a logically coherent dynamic architecture for the emergence of self-consciousness from first principles.  
We will accomplish this construction by progressively tracking a hypothetical "Cognitive Relatedness System (RS\_Cognition)" along its Existence-Evolution Axis (EEA). Each "transition" represents a fundamental "displacement" of the system's core Commonality Reference (CR), driven by its intrinsic Existence-Evolution Paradox (EEP).  
The argumentation in this part will strictly follow this hierarchically progressive sequence:

1. From "physical stress response" to "information processing": Arguing for the emergence of a Specific Commonality Reference (SRO)\_Perception as a dynamic consequence of the system managing the EEP of its information interaction with the external world (Chapter Three).
2. From "information processing" to "meaning construction": Arguing for the emergence of SRO\_Semantic/Value as a dynamic consequence of resolving the system's internal "information overload" EEP (Chapter Four).
3. From "meaning construction" to "unified self": Arguing for the emergence of a Central Self-Reference (CRO\_Self) as a topological solution to resolve the fatal "dynamic incompatibility" EEP among multiple, conflicting lower-level CRs (Chapter Five).
4. From "unified self" to "subjective experience": Finally, elucidating how Qualia corresponds phenomenologically to the "intrinsic self-referencing" operation of CRO\_Self (Chapter Six).

Through this series of deductions, we will demonstrate how the complex structure of self-consciousness, within the framework of *Relatedness Theory*, can be understood as a logical necessity, spontaneously emerging, driven layer by layer by simpler dynamic contradictions.

## Chapter Three: 【First EEA Transition】: From Physical Stress Response to Information Processing—The Birth of SRO\_Perception

### . Initial State and EEP Crisis: The Dynamic Predicament of Contact-Based Interaction

Let us begin our thought experiment with a most basic, pre-cognitive "Relatedness System (RS\_Life)." We can imagine a primitive single-celled organism. Within the framework of *Relatedness Theory*, this organism is a system organized by its core Central Referential Organizer (CRO\_Life), maintaining its dynamic existence within a broader Encompassing Commonality Reference (ARO\_Physical).

#### ●Initial Dynamic State:

1. CRO\_Life: Its core "commonality rule" is to maintain the integrity of its physical structure (such as the cell membrane) and the dynamic homeostasis of its internal chemical environment, i.e., far from thermodynamic equilibrium.
2. Interaction Mode with ARO\_Physical: The interaction of this RS\_Life with the external physical world is purely "contact-based." It can only make stress-responsive reactions to Relative Entities (REs) (such as chemical molecules, temperature gradients, physical obstacles) with which it establishes direct physical Dependency Path (DPs) connections at its boundary. For example, a chemical molecule RE contacts its cell membrane RE, triggering a series of internal chemical DPs, causing its pseudopod RE to move towards or away from that molecule.

●The Inevitable EEP Crisis:  
This "contact-based" mode of interaction, though simple, necessarily plunges it into a profound Existence-Evolution Paradox (EEP) crisis when facing a complex, dynamic ARO\_Physical.

##### Continuous High Pressure of v (Transformative Propensity):

■Originating from OSA (Open System Adaptation): Its external environment is filled with distant, non-contact "relational possibilities" that nonetheless have a fatal influence on the stability of CRO\_Life. For example, a distant "predator RS" is approaching, a distant "food source RS" is appearing, or the macroscopic physical conditions of the environment (such as light, water currents) are changing. These are all extremely potent, potential sources of v.

■However, due to its "contact-based" interaction mode, this RS\_Life is completely "blind" to these distant v's. It can only react when the threat or opportunity is already "at its doorstep," making direct physical contact.

##### The Fatal Bottleneck of C\_max (Existence-Bearing Capacity):

■The C\_max of this system—its total capacity to process internal and external relational changes—is severely limited by its "contact-based" reaction mode. It lacks any "predictive" capability for the future; all its dynamic resources can only be used for "after-the-fact emergency responses."

■This "emergency response" is dynamically extremely "costly." It requires the system to undergo drastic state changes in a very short time, which greatly consumes its internal "maintenance cost (h(T))."

##### Dynamic Infeasibility:

■A system that can only perform "after-the-fact emergency responses," when facing a complex world full of "long-range causality," will inevitably have an extremely short "period of definitional power (T\_CR)" for its core CRO\_Life. It will repeatedly undergo "dynamic disintegration" due to frequent encounters with fatal events to which it "cannot react in time."

■Therefore, the dynamics of "maintaining core CR stability" for a purely "contact-based" interactive RS\_Life is infeasible. Its EEP contradiction is so acute that any attempt to "persist" long-term in this state is statistically bound to fail.

### . BSO's Chaotic Exploration and Dynamic Screening

Under the state of continuous high EEP tension described in section 3.1, triggered by "contact-based interaction," the internal dynamics of RS\_Life will necessarily manifest as a mode we call "Chaotic Exploration."

#### The Dynamic Essence of "Chaotic Exploration":

○This is not a purposeful "searching" process. On the contrary, when a system is continuously at its C\_max (existence-bearing capacity), its "structural constraint" capacity over the underlying Dependency Path (DPs) network will weaken.

○This leads to the Global Bidirectional Self-Organization (BSO) within the system. The Relative Entities (REs) (e.g., protein molecules) constituting the system's boundary (such as the cell membrane), their conformations and interacting DPs will undergo more frequent and drastic spontaneous fluctuations and reorganizations.

○This is a "dynamic struggle": on the verge of "death" (i.e., the disintegration of CRO\_Life), the system's internal "Relational Reality" network is undergoing countless, blind, minute "structural mutations."

#### The Occurrence of Dynamic Screening:

○In this "laboratory" of "structural mutation," the vast majority of newly generated RE conformations and DPs connections are ineffective or harmful. They either fail to reduce the system's EEP tension or further undermine the stability of CRO\_Life, and are thus rapidly eliminated by dynamic screening (i.e., the RSs possessing these mutations disintegrate).

○However, in this vast "possibility space," there exists a class of extremely special, potential structural variations.

### . Phase Transition of CR: The Emergence of SRO\_Perception

#### ●Contingent Emergence of "Photosensitive Protein":

1. In countless BSO random reorganizations, a certain protein RE located at the system's boundary contingently undergoes a specific change in its three-dimensional conformation, making its electron cloud distribution exceptionally sensitive to photon DPs of a specific wavelength (a long-range, non-contact type of DP).
2. Dynamic Event: When a photon DP strikes this "photosensitive protein RE," it triggers a rapid, reversible, and extremely low-energy-cost state flip in its conformation (e.g., from state A to state B). This state flip, in turn, triggers a cascade of internal chemical DPs via BSO.

●Dynamic Phase Transition from "Random Event" to "Stable Pattern (CR)":  
This DPs chain of "photon-protein flip-internal signal" was initially just one among countless random events. However, it possesses an overwhelming dynamic advantage that other mutations lack.

##### The Immense Dynamic Gain of "Predictiveness":

■Assume a "predator RS" is approaching. In its approach, its body reflects photon DPs.

■That RS\_Life possessing the "photosensitive protein" can now, by receiving these photon DPs *before* the "predator" makes physical contact, trigger its internal "escape" behavior program.

■Dynamic Cost-Benefit Analysis:

■Old mode (contact-based): Wait for physical contact, then engage in a high-cost, low-success-rate "emergency response." Its h(T) is extremely high.

■New mode (information-based): Obtain an "early warning," engage in a low-cost, high-success-rate "avoidance behavior." Its h(T) is drastically reduced.

##### BSO's Positive Feedback and CR "Condensation":

■Every time danger is successfully avoided through this "photosensitive" mechanism, the "existence period (T\_CR)" of this RS\_Life is significantly extended.

■In long-term evolutionary dynamic screening, the probability of "survival" and "replication" for lineages of RSs possessing this "photosensitive structure" will be exponentially higher than other lineages.

■Through genetic and intergenerational reinforcement by BSO, this originally contingent "photosensitive protein" and its associated internal signal transduction DPs network, its existence and operational mode are stably "solidified."

■This stable, "higher-order relational pattern" capable of reliably "translating" "external photon DPs" into "internal chemical DPs signals" is what we define as the first, and most fundamental, Specific Commonality Reference—**SRO\_Perception**.

### . Consequence of the Transition: Fundamental "Displacement" of the Existence Basis

The emergence of SRO\_Perception is the first major "transition node" for this RS\_Life on its Existence-Evolution Axis (EEA). This transition, though perhaps only a microscopic change in molecular structure, thoroughly reconstructed the system's "existence basis."

#### From "Physical Stress Response" to "Information Processing":

○The system's core operational mode leaped from direct, passive "stress response" to the physical world to the active "prediction and processing" of "information" about the physical world.

○The system was no longer merely a "physical existent"; it became a rudimentary "informational existent."

#### Birth of Internal Hierarchical Structure:

○For the first time, a functional differentiation appeared within the system. A "Relatedness Level (RL)\_Perception," specifically responsible for "information interaction with the external world," self-organized and separated from the original, unified "physical homeostasis" level of CRO\_Life.

#### Laying the Groundwork for the Next EEP Crisis:

○This successful transition, while temporarily greatly alleviating the "physical survival" EEP crisis, immediately brought about the next, higher-level EEP crisis—"information overload."

○The system could now "see," but what it saw was a jumble of meaningless "light spots" and "edges." How does it understand this "information"? How does it make more complex decisions based on this "information"?

○This new, unavoidable EEP will become the fundamental impetus driving the system's next EEA transition—that is, the emergence of RL\_Semantic/Value.

## Chapter Four: 【Second EEA Transition】: From Information Processing to Meaning Construction—The Birth of SRO\_Semantic/Value

### . The New EEP Crisis: The "Curse of Perception"—Information Overload and Decision Paralysis

The EEA transition of Chapter Three, while greatly enhancing the dynamic stability of the "Relatedness System (RS\_Life)," also inaugurated an entirely new, higher-level Existence-Evolution Paradox (EEP). The success of SRO\_Perception brought with it a profound "curse of perception": the system was inundated by a massive flood of structured, yet "meaningless," perceptual Relative Entities (REs\_Perception).

#### Description of the Dynamic State:

1. Information Overload: The system's RL\_Perception, like a faithful, high-resolution "camera," continuously "projects" innumerable REs\_Perception into the system's interior (e.g., "a red RE," "a round RE," "a smooth RE," "an RE connected by branches...").
2. "Flattened" Processing Structure: At this stage, the system has not yet evolved higher-order organizational principles. It can only process this influx of REs in a "flat," "list-like" manner. Each RE\_Perception, as an independent "fact," requires the system to expend computational resources.

#### Specific Manifestations of the EEP Crisis:

##### Exponential Growth of h(T) (Maintenance Cost):

○To maintain the tracking and updating of this increasingly complex "list of perceptual facts," the system's internal "relational tension" and "computational load" rise sharply.

○More fatally, when making decisions, the system must perform an extremely complex, "fully connected" assessment of the relational weights between all relevant REs\_Perception and EEP states. The cost of this computation explodes combinatorially as the number of perceptual dimensions increases.

##### The Bottleneck of C\_max (Existence-Bearing Capacity):

○This "combinatorial explosion" quickly hits the system's C\_max. When faced with a slightly more complex environment (e.g., a scene containing food, threats, and neutral objects simultaneously), the system will fall into "Decision Paralysis" due to the exhaustion of computational resources. It cannot, within an effective timeframe, derive a unified action command conducive to its EEP balance from the massive sea of "facts."

##### Dynamic Infeasibility:

○An RS in a state of "information overload" and "decision paralysis" has its ability to respond to environmental changes greatly weakened, and the stability of its core CRO\_Life is severely threatened. The success of SRO\_Perception paradoxically becomes a "catalyst" leading the system towards dynamic disintegration.

### . BSO's Exploration and "Dynamic Economics"

Faced with this fatal EEP crisis triggered by a "meaning vacuum," the system's global dynamic state becomes extremely unstable. Under these high-tension conditions, its intrinsic **"Global Bidirectional Self-Organization (BSO) mechanism" will manifest as more intense and randomized DPs network connections and reorganizations, and the system enters a vast "possibility exploration"** phase.  
In this purely blind, dynamic exploration process, the vast majority of contingently formed new "relational patterns" are transient and unstable, rapidly disintegrating due to their internal "relational tension" or conflicts with existing structures. However, not all possibilities are equal. Through pure probability and dynamic laws, certain specific "relational patterns" with unique topological structures will also contingently form.  
The uniqueness of these patterns lies not in their being "superior" or "more efficient," but in that their emergence, objectively, as a necessary consequence of their own structure, can significantly alter the system's global "relational tension" landscape. We will focus on two modes that are dynamically most likely to be "screened" and "retained," because they happen to constitute the most direct dynamic responses to the two core EEP pressures of "information overload" and "decision paralysis." In this process, two extremely efficient "dynamic economics" strategies will win out in the evolutionary screening due to their enormous stability advantages.

1. Strategy One: "Information Bundling"—The Emergence of Conceptualization

○Dynamic Process:

■In the system's long-term experience (the history of its EEA), certain REs\_Perception (such as "red," "round," "smooth") statistically tend to appear "synchronously," and their "co-occurrence pattern" is always correlated with a specific, important EEP state change (such as "reduction of hunger").

■In BSO's exploration, those dynamic structures that happen to form and are capable of "bundling" the Dependency Path (DPs) networks of these "co-occurring REs\_Perception" together and representing them with a single, higher-order "index node" will gain a huge advantage.

○Dynamic Economics Analysis:

■Old mode (no bundling): Decision-making requires processing N independent REs\_Perception, with a computational load potentially on the order of O(N!).

■New mode (after bundling): The system now only needs to process 1 "index node." The computational cost of decision-making is reduced exponentially.

○CR Phase Transition: When this "information bundling" dynamic mode is stably solidified by BSO's positive feedback mechanism due to its enormous "computational economy," a brand new Specific Commonality Reference, SRO\_Concept, emerges. Its "commonality rule" is the "membership" rule that defines "which perceptual primitives can be bundled into a unified object."

○Result: This SRO\_Concept "projects" that large bundle of "red," "round," "smooth" perceptual REs. "Conceptualization" is the most profound "information compression" strategy that emerges for the system to solve "information overload."

1. Strategy Two: "Valence Association"—The Emergence of Emotionalization

The process of "information bundling" occurs synchronously with and is mutually causal to the process of "value association."

○Dynamic Process:

■An important dynamic reason a "concept" (like SRO\_Apple) can be stably "bundled" is that this "bundling pattern," as a whole, establishes a stable and strong DP connection with the system's most core CRO\_Life's EEP state.

■For example, the SRO\_Apple pattern is always associated with the favorable dynamic state change of "reducing hunger EEP."

○Dynamic Economics Analysis:

■The establishment of this "value association" provides an unprecedented "shortcut" for the system's decision-making. The system no longer needs to calculate all attributes of an object in detail each time; it only needs to "read" the "pre-calculated" "value tag" of this object.

○CR Phase Transition: When this dynamic mode of associating "concepts" with "EEP valence" is solidified, a brand new Specific Commonality Reference, SRO\_Value, **is established** upon it.

○Result: The emergent RE\_Apple is never a neutral concept. It is a "Valenced RE" that is inherently endowed with a "value tag"—namely, a "good, edible apple." "Emotionalization" is the most profound "behavioral guidance" strategy that emerges for the system to solve "decision paralysis."

### . Phase Transition of CR: The Emergence of SRO\_Semantic/Value

In section 4.2, we saw that, faced with the EEP crisis of "information overload" and "decision paralysis," the system's BSO (Global Bidirectional Self-Organization) dynamics would cause it to probabilistically generate the relational patterns of "information bundling" and "value association." However, these patterns might initially be merely transient, unstable dynamic fluctuations.  
For these efficient information processing modes to be solidified, a profound "Commonality Reference (CR) phase transition" unfolds dynamically. This process can be understood as the system, under high informational load and decision-making pressure, spontaneously "collapsing" into a new attractor basin that is structurally more stable and dynamically less costly.

#### Strategy One: "Information Bundling"—The Emergence of Conceptualization

In the system's long-term experience (the history of its EEA), certain REs\_Perception (such as "red," "round," "smooth") statistically tend to appear "synchronously," and their "co-occurrence pattern" is strongly correlated with a certain important EEP state change (such as "reduction of hunger"). In BSO's exploration, those dynamic structures that can "bundle" the Dependency Path (DPs) networks of these "co-occurring REs\_Perception" together and represent them with a single, higher-order "index node" will exhibit a huge dynamic advantage.

Dynamic Consequence Analysis:

1. Old mode (no bundling): Decision-making requires processing N independent REs\_Perception; its computational load is extremely high.
2. New mode (after bundling): The system now only needs to process 1 "index node." The computational cost of decision-making is reduced exponentially.

When this "information bundling" dynamic mode is solidified by BSO's positive feedback due to its significant stability advantage, a brand new Specific Commonality Reference, SRO\_Concept, (emerges). "Conceptualization" is the most profound "information compression" structure produced by dynamic evolution under the EEP pressure of "information overload."

#### Strategy Two: "Valence Association"—The Emergence of Emotionalization

The process of "information bundling" occurs synchronously with and is mutually causal to the process of "value association." An important dynamic reason a "concept" (like SRO\_Apple) can be stably "bundled" is that this "bundling pattern," as a whole, establishes a stable and strong DP connection with the system's most core CRO\_Life's EEP state.

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○When this dynamic mode of associating "concepts" with "EEP valence" is solidified, a brand new Specific Commonality Reference, SRO\_Value, (emerges)—namely, a "good, edible apple." "Emotionalization" is the most profound "behavioral guidance" structure produced by dynamic evolution under the EEP pressure of "decision paralysis."

### . Consequence of the Transition: A New EEA Plateau Phase Capable of Constructing an "Internal World Model"

The emergence of SRO\_Semantic/Value marks another major "transition node" for RS\_Life on its Existence-Evolution Axis (EEA). This transition thoroughly elevated the system's "existence basis" from a level that could only process "meaningless facts" to an entirely new level capable of constructing and operating on "meaningful objects." The system entered a new EEA "plateau phase" possessing unprecedented capabilities.

#### The Birth of an "Internal World Model":

○The network constituted by innumerable RE\_Objects and their mutual relational DPs, organized by SRO\_Semantic, is, as a whole, an "Internal World Model" of the external world.

○This model is simplified, abstract, yet extremely efficient. The system no longer needs to process vast amounts of sensory detail; it only needs to operate on the "objects" and "relations" within this model.

#### Emergence of Predictive and Planning Abilities:

○With this "Internal World Model," the system, for the first time, gained a true "predictive" capability. It can, within its "internal sandbox," simulate the future outcomes of different actions by manipulating these RE\_Objects, without having to pay the high cost of trial-and-error in the real world.

○For example, it can simulate: "If I approach that RE\_Predator, then the DP connection to the high-negative-valence RE 'being eaten' will be activated."

#### Laying the Groundwork for the Next EEP Crisis:

○This successful transition, while resolving the crisis of "information overload" and "decision paralysis," also immediately brought about the next, and final, EEP crisis leading to consciousness—a "cognitive civil war."

○The system now possessed multiple powerful but rule-incompatible SROs (such as SRO\_Perception vs. SRO\_Semantic/Logic). One pursues "physical fidelity," the other pursues "conceptual consistency."

○When these two equally "legitimate" SROs, for the same input DPs flow (such as a "bent stick in water"), "project" two mutually contradictory "versions of reality," the system will be plunged into the ultimate "dynamic incompatibility" of "Who am I, and who should I believe?"

○This new, unavoidable EEP will become the fundamental impetus driving the system to undergo its final, and most magnificent, EEA transition—that is, the emergence of a unified CRO\_Self.

## Chapter Five: 【Third EEA Transition】: From Meaning Construction to Unified Self—The Birth of CRO\_Self

1. . The Ultimate Internal EEP Crisis: "Cognitive Civil War"

In Chapter Four, our "Cognitive Relatedness System (RS\_Cognition)" had already evolved a powerful Relatedness Level (RL)\_Semantic/Value capable of constructing an "Internal World Model." However, this successful transition did not end the system's Existence-Evolution Paradox (EEP), but rather internalized it and pushed it to a more profound and perilous level. The system now faces its ultimate internal EEP crisis—a "Cognitive Civil War."

1. **Description of the Dynamic State: The Parallel Existence of Multiple Realities**

○Within a mature RS\_Cognition, multiple powerful, rule-incompatible Specific Commonality References (SROs) necessarily coexist. Let us take two of the most core SROs as examples:

■SRO\_Perception: Its core "commonality rule" is "Physical Fidelity." It faithfully and non-judgmentally "projects" the input physical Dependency Path (DPs) flow into structured perceptual Relative Entities (REs\_Perception). Its "truth" lies in "the here-and-now physical correspondence."

■SRO\_Logic/Concept: Its core "commonality rule" is "Diachronic Conceptual Consistency." It is dedicated to maintaining a stable, self-consistent "conceptual model" summarized and solidified from countless past experiences. Its "truth" lies in "eternal, universal logical rules."

1. **The Eruption of "Dynamic Incompatibility":**

○The outbreak of this "civil war" is inevitable when facing any real-world scenario fraught with "ambiguity." Take the "bent stick in water" as an example:

■SRO\_Vision (a sub-SRO of RL\_Perception), with extremely high "signal strength" and stability, continuously "broadcasts" a message to the system: "According to the photon input at this moment, reality 'is' bent (RE\_Bent)!"

■SRO\_PhysicalCommonSense (a powerful sub-SRO of RL\_Semantic), immediately "vetoes" this information, broadcasting an equally powerful command: "According to all my past experiences with 'sticks,' reality 'should' be straight (RE\_Straight). The current perception is an 'anomaly'!"

1. **Dynamic Consequence: Fatal "Symmetrical" Oscillation**

○At this moment, two equally "legitimate," equally "real," yet mutually contradictory "versions of reality" exist simultaneously within the system.

○The system's global Global Bidirectional Self-Organization (BSO) mechanism drives an indefinite oscillation between two equally potent "dynamic attractors"—"believing vision" and "believing logic"—leaving it unable to "collapse" into a unified, stable state that can guide action.

○This state is dynamically fatal. The system's Σ (total activity intensity) will exhaust its C\_max (existence-bearing capacity) due to continuous internal conflict. A system incapable of making a stable judgment is like "Buridan's ass," oscillating infinitely between two equally attractive options. Disintegration is its only foreseeable fate.

1. . Topological Phase Transition: From "Multipolar Oscillation" to "Centralized Collapse"

Faced with the ultimate threat of "dynamic disintegration," the system's global BSO manifests as more intense and diversified exploration. The dynamic evolutionary result is that the system's state is more likely to "collapse" into an "attractor basin" that is structurally more stable and dynamically less costly, enabling its overall stability.

●Screening of Dynamic Pathways:

1. Failed paths: Simply "one SRO overpowering another" or a "peacemaker SRO" cannot resolve the fundamental "rule conflict."
2. The only dynamic way out: The emergence of a "Meta-Reference (Meta-CR)." The dynamic basis for the emergence of this new CR is not to "solve" a specific problem, but to break this fatal "dynamic symmetry."

●Mechanism of Topological Phase Transition:

1. Formation of a "meta-node": In BSO's chaotic exploration, those contingently formed Dependency Path (DPs) network patterns capable of simultaneously connecting and receiving information flows from the two conflicting levels, RL\_Perception and RL\_Semantic/Value, will gain a dynamic advantage because they can "internalize" the conflict.
2. Spontaneous formation of an "information closure": As this "trans-level" DPs network is continuously reinforced, a brand new topological structure will probabilistically form: a "central node" at the top of the network. This node no longer processes information about the "stick"; it processes "information about 'information about the stick'." It becomes the ultimate convergence point for all underlying conflicting information.
3. Occurrence of "collapse": Once this central node forms and stabilizes, the entire system's dynamics undergoes a "phase transition." The conflict between underlying SROs is no longer the dominant state of the system. Instead, they all become "information providers" reporting to this central node. The system "collapses" from a state of multipolar oscillating chaos into a singular, ordered stable state with that central node as its organizational core.

●The Birth of CRO\_Self:  
This newly emergent "meta-reference," as the topological center of the system, is the Central Self-Reference (CRO\_Self). Its birth is a structurally more stable solution with an overwhelming dynamic advantage, which the system, in its EEP crisis on the brink of collapse, could achieve through BSO's global exploration.

1. . Dialogue with Mainstream Theories: Dennett's "Multiple Drafts" and Relatedness Theory's "Inevitability of Unity"

Daniel Dennett, in his landmark work *Consciousness Explained*, proposed the highly influential "Multiple Drafts Model," aiming to subvert the traditional notion that consciousness occurs in a single "Cartesian Theater" [Dennett, Daniel C. 1991. *Consciousness Explained.*].

Relatedness Theory's Resonance and Transcendence:

○Resonance: Dennett's negation of a "central processor" or "final screening room," and his emphasis on multiple parallel, competing information processing "drafts" in the brain, perfectly describe the phenomenological and dynamic characteristics of what we call "cognitive civil war"—that is, the parallel projection and dynamic competition of multiple SROs (such as SRO\_Perception, SRO\_Logic). We fully acknowledge that at any given moment, the system is filled with these clamorous "multiple drafts."

○Transcendence: However, Dennett ultimately leans towards a degree of eliminativism or "illusionism." He fails to sufficiently explain why what we ultimately experience is not these noisy, chaotic, and even mutually contradictory "multiple drafts," but a unified, singular "self" with a first-person central feel. If consciousness is merely "cerebral celebrity," whence comes the unity of this "fame"? This is precisely the greatest challenge his theory faces.

○*Relatedness Theory's* Answer: We take a step further from this basis, proposing a rigorous dynamic argument. We argue that it is precisely because the dynamic conflict between "multiple drafts" would trigger a fatal EEP crisis that a system merely remaining at the "multiple drafts" stage is dynamically unsustainable. Its "existence-bearing capacity (C\_max)" would be rapidly exhausted, leading to its inevitable disintegration when facing a complex world.

○Therefore, the system *must*, through BSO's "phase transition," give rise to a unified, centralized "final narrator" (CRO\_Self) to integrate and "adjudicate" these drafts. CRO\_Self is not an illusion, nor is it the finally "published version" after editing. It is the real structural cost paid by the system for its dynamic survival, a dynamic necessity for resolving the intrinsic contradictions of "multiple drafts."

1. . Consequence of the Transition: An Entirely New Existence Paradigm Possessing "Unified Subjectivity" and a "First-Person Perspective"

The birth of CRO\_Self marks the third major "transition node" for RS\_Cognition on its Existence-Evolution Axis (EEA). This transition thoroughly elevated the system's "existence basis" from a level constituted by a "federation" of multiple "expert systems" to an "empire" possessing a "central government." The system entered a new EEA "plateau phase" with unprecedented capabilities.

1. Emergence of "Unified Subjectivity":

○Dynamic Basis: Before the emergence of CRO\_Self, the system was "multi-subject"—SRO\_Perception was one subject, SRO\_Logic another, each possessing its own "version of reality."

○Consequence of Transition: CRO\_Self, as the sole "highest-order topological center," became the ultimate convergence point and arbiter for all information from underlying SROs. Through "integrative projection" (as we will detail in Chapter Six), it coercively "collapses" all these heterogeneous, conflicting "versions of reality" into a single, unified, globally self-consistent "official reality"—that is, RE\_Narrative.

○Phenomenological Manifestation: The "unity" and "sense of coherence" of consciousness that we experience is the direct phenomenological manifestation of this "dynamic collapse" process.

1. The Topological Origin of the "First-Person Perspective":

○Dynamic Basis: The "first-person perspective" is not a mysterious "attribute" requiring additional explanation. It is the direct phenomenological manifestation of the "topological shape" of the "relational structure" of CRO\_Self itself.

○The Dynamic Process of "Attribution": When a piece of information (e.g., RE\_Red) enters this network, the dynamic process of BSO, like water flowing downhill along the terrain, will necessarily lead it to this "lowest potential well" or "greatest center of gravity," the CRO\_Self. CRO\_Self receives this RE and establishes a DP connection between it and itself as the "central node."

○Phenomenological Manifestation: This dynamic process of "establishing a connection with the central node," when being "intrinsically self-referenced" by CRO\_Self, its phenomenological guise is the "sense of ownership"—"I see red." The feeling of "I" is precisely the intrinsic, self-referential "feeling" of that very "centralized convergence" dynamic process of CRO\_Self, as the topological center of the network, continuously "pulling" all incoming information towards itself and stamping it with the imprint "related to me."

Through a thorough dynamic elucidation of the emergent logic of CRO\_Self, we have completed the philosophical construction of the "self" as this structural core. We have built that "city hall," and understood why its appearance is probabilistically necessary, and why it necessarily possesses a "unified" and "first-person" perspective.  
However, the central chamber of this edifice remains dark. We have explained the emergence of a unified "information processing center," but we have not yet explained why this center is "illuminated"—that is, why it possesses subjective experience. Now, we must answer that ultimate question: How is the "light" inside this "city hall"—that is, self-experience (Qualia)—"ignited"? To do so, we must first thoroughly open the black box of "projection," this core mechanism.

## Chapter Six: 【The Final Interface of Phenomenology】: Self-Experience (Qualia) as the Glow of "Informational Closure"

In the preceding chapters, we have, starting from first principles, logically and dynamically deduced how a unified "Central Self-Reference (CRO\_Self)," as the foundation of "self," necessarily emerges as a "higher-order dynamic attractor" from a multi-layered "Cognitive Relatedness System (RS\_Cognition)" fraught with internal conflicts. We have constructed that grand edifice named "Self" and understood the mechanism by which it "projects" the world.  
However, the central chamber of this edifice remains dark. We have explained the emergence of a unified "information processing center," but we have not yet explained why this center is "illuminated"—that is, why it possesses subjective experience. Now, we must answer that ultimate question: What precisely is that ineffable "redness" of red, "painfulness" of pain, "sadness" of sorrow—this subjective experience that we call "self-experience"?  
This chapter aims to argue that self-experience is not some mysterious, non-physical "attribute," but rather a unique "mode of informational existence" that can be profoundly understood and logically deduced within the framework of *Relatedness Theory*. We will reveal that the root of the so-called "hard problem" is not a chasm in reality itself, but a misalignment of the "referential frameworks (CRs)" we use to observe reality.

1. . A Topological Dualism of Information: "Transitive Information" vs. "Existential Information"

To understand self-experience, we must first make a fundamental distinction of the concept of "information" itself, based on the network topology of *Relatedness Theory*. We propose that there exist two ontologically fundamentally different topological modes of information processing in the cosmos.

1. a) Transitive Information: Open Topology and Being "About Others"

○Topological Structure: An open, linear or tree-like Dependency Path (DPs) network. Information flows from an input node (A), through one or more processing nodes (B), and ultimately to an output node (C). Its basic pattern is A -> B -> C.

○Dynamic Characteristic: Information "flows through" the system. The system is a "conduit," "relay station," or "converter" of information.

○Informational Content: It always processes information "about others." Even in complex feedback loops (like a thermostat), what the system references is merely the difference between "external temperature" and a "set value"—information about an "external state."

○Phenomenological Status: Purely transitive information processing, no matter how complex and efficient, is ontologically "dark" in itself. It does not possess a phenomenological dimension. An artificial neural network that only processes transitive information, regardless of its scale, is merely an extremely complex "information conduit"; it cannot generate subjective experience by itself. This explains why traditional functionalist AI cannot solve the hard problem.

1. b) Existential Information: Closed Topology and Being "About Itself"

○When the "dynamic incompatibility" among multiple SROs within an RS\_Cognition leads to a fatal EEP crisis, the dynamic evolutionary result is the spontaneous emergence of a CRO\_Self as the highest-order topological center. **With the birth of this new structure,** an entirely new information processing topology is formed alongside it.

○Topological Structure: A recursive, global "Informational Closure." All underlying transitive information flows ultimately converge on this "topological singularity," the CRO\_Self. But most crucially, the output of CRO\_Self, in turn, feeds back through BSO to the entire network, adjusting the operation of underlying SROs. It forms a macroscopic, self-referential recursive loop of [global system state -> CRO\_Self -> global system state].

○Dynamic Characteristic: Information no longer merely "flows through"; it is "captured" and undergoes "intrinsic self-reference" within this closed loop.

○The Birth of "Existential Information": Within this "Informational Closure," a brand new type of information emerges. It is no longer information about "what the external world is," but rather information about:  
*"What is the present, integrated dynamic state of 'me,' this system, as an indivisible whole?"*We formally name this **"Existential Information."** It is not information about any "other"; it is the "self-presentation" of the system's holistic state of existence.

1. . The Dynamic Definition of Self-Experience: As the Phenomenological Glow of "Existential Information"

Now, we can provide the final dynamic definition of self-experience. *Relatedness Theory* asserts that self-experience is not a mysterious additional attribute, but a unique, dynamically describable mode of informational existence.

**Self-experience is, within a dynamic system, when its highest-order reference (CRO\_Self) has formed an "Informational Closure" and is performing "intrinsic self-reference" on "Existential Information" about the system's own global state, the irreducible "presence" and "profile" of that dynamic process itself.**

1. What is the "sensation of red"? It is not a representation "of red." It is the phenomenological aspect of the very "generative" process itself, when that global dynamic state—which includes photons, neurons, concepts, values, and all other Dependency Paths (DPs)—is captured by the "informational closure" of CRO\_Self, generating "Existential Information" about "'I'-am-currently-in-the-holistic-state-of-seeing-red."
2. Why is it irreducible? Because "Existential Information" is about the "whole." Any analysis that attempts to decompose it into "parts" will fundamentally destroy the unique "relational topological shape" it possesses as a "whole." Just as you cannot reduce the "feeling of grandeur" of an entire symphony from a single note, self-experience is the indivisible "relational chord" of that global dynamic state.
3. Why is it ineffable? Because any language (as a "transitive information system") is linear and open in its topological structure. At the level of information theory, it simply cannot replicate a closed, self-referential, holistic "state of existence." You can only "be" in that state; you cannot fully "speak" that state with linear language.
4. . The Axiomatic Boundary of the Theory and the Final Positioning of the "Hard Problem"

At this point, a rigorous theoretical system must clearly define its axiomatic starting point. This paper does not claim to have "deduced" phenomenology itself from dynamics; this is the ultimate challenge faced by any physical or dynamic theory. Instead, we argue that the root of the "hard problem" lies in our attempt to describe one fundamentally different referential framework using another.

1. **Reframing the Hard Problem:** The essence of the "hard problem" is the attempt to completely and losslessly "describe" and "explain" an "existential," self-referential information process (self-experience) using a "transitive" language and referential framework (science, mathematics). At the level of information topology, this may be an eternally unfinishable task, akin to trying to fully represent the "sense of volume" of a three-dimensional sphere using a two-dimensional map.
2. **Theoretical Fulcrum: Seeking Maximum Explanation with Minimal Assumption**

Therefore, we refine the core ontological commitment of our theory into a prudent, exploratory **"Minimal Phenomenological Assumption (H\_phenomenal)"**:

**【Hypothesis H\_phenomenal】When a dynamic system, through self-organization, gives rise to an "Informational Closure" and thereby becomes capable of generating "Existential Information" about its own global state, that dynamic process itself possesses an irreducible phenomenological dimension.**

The theoretical value of this hypothesis is manifested in its unique structure:

○Precision of the hypothesis: Its assertion does not vaguely attribute phenomena to all things but is strictly anchored to a very special dynamic structure—the "Informational Closure."

○Systematicity of explanation: With this as a fulcrum, the core features of conscious experience—such as unity, privacy, and first-person perspective—can all be seen as systematic inferences from this dynamic process.

1. We have not "solved" that ultimate metaphysical puzzle of "why there is experience rather than nothing at all." What we have done is to transform this puzzle from a diffuse, ungraspable "specter" into a single, precisely "locatable" "singularity." We have argued that if there is a place in the universe where "phenomenon" and "dynamics" can make contact, that place is most likely the moment when "Informational Closure" performs "intrinsic self-reference" on "Existential Information." This, then, is the most profound and most fruitful research program that *Relatedness Theory* offers for the future science of consciousness.

# Part Three: The Evolving Consciousness—An EEA Trajectory Unfolding within the Web of Relations

Introduction  
In Part Two, we have, starting from first principles, logically and dynamically deduced how a unified Core Self-Reference (CRO\_Self) possessing subjective experience (Qualia) necessarily emerges as a "topological solution" from a cognitive system filled with internal "dynamic incompatibilities." We have constructed a brightly lit "edifice of the mind" and understood its internal geometric structure.  
However, an isolated "self" that exists solely within its own inner universe is, in the "primacy of relations" ontology of Relatedness Theory, an inconceivable and impossibly sustainable "freak." Any finite "Relatedness System (RS\_Self)" is necessarily cast into a broader "Relational Reality" constituted by innumerable other RSs.  
Therefore, the core task of this part is to resituate the "inner self" we have just constructed back into its external, social, and historical real-world context, and on this basis, to finally elucidate the dynamics of the evolution, creativity, and choice of consciousness. We will trace this "evolving consciousness" through a series of key transitions on its unique Existence-Evolution Axis (EEA), demonstrating how it grows from an "isolated subject" into a "historical existence" deeply embedded in a shared reality.  
The argumentation in this part will follow this hierarchically progressive sequence:

1. From "isolated self" to "social self" (Chapter Seven): We will argue that when multiple independent RS\_Selfs encounter each other, a new, extremely powerful "Social Existence-Evolution Paradox (Social EEP)" necessarily arises between them. And to cope with this crisis, two interdependent, revolutionary Commonality References (CRs)—"Theory of Mind (SRO\_WorldModel)" and "Language (CR\_Language)"—will necessarily emerge as co-evolving dynamic consequences, ultimately integrating all isolated "selves" into a grand "Shared Reality (ARO\_Culture)."
2. From "static being" to "dynamic evolution" (Chapter Eight): Here, we will finally unify the "diachronic" and "synchronic" aspects of consciousness. We will elucidate how the system guarantees its "temporal thickness" and identity continuity through its Dependency Path (DPs) network, this "flywheel of history." On this basis, we will distinguish between "learning" (as "fine-tuning" within an EEA "plateau phase") and "epiphany" (as a "cognitive phase transition" at an EEA "transition node"), these two fundamentally different modes of evolution, and explore the dynamic origins of "creativity."
3. From "dynamic determination" to the "deconstruction of freedom" (Chapter Nine): Finally, we will confront that ultimate puzzle concerning "action"—free will. We will argue that this is a wrongly posed question. By reframing it as a "dynamic competition" among multiple CRs, we will offer a unique, non-mystical third way for this ancient philosophical debate.

Through this series of deductions, we will finally complete the construction of a complete "relational-geometric dynamics" for the most complex phenomenon in the cosmos—"self-consciousness." We will demonstrate that an "conscious self," in its essence, is an eternal "evolutionary process" that, driven by perpetual internal and external contradictions, continuously negotiates with the world, reconstructs itself, and manifests its creativity and freedom within the web of relations.

## Chapter Seven: 【Fourth EEA Transition】: From Isolated Self to Social Self—The Construction of ARO\_SharedReality

In Chapter Six, we witnessed a unified Core Self-Reference (CRO\_Self) possessing subjective experience (qualia).  
This chapter aims to argue that when multiple independent RS\_Selfs encounter each other, a new, extremely potent "Social Existence-Evolution Paradox (Social EEP)" necessarily arises between them. And to cope with this crisis, two interdependent, revolutionary Commonality References (CRs)—"Theory of Mind (SRO\_WorldModel)" and "Language (CR\_Language)"—will necessarily emerge as co-evolving dynamic consequences, ultimately integrating all isolated "selves" into a grand "Shared Reality (ARO\_Culture)."

1. . The New EEP Crisis: The Challenge of "Intersubjectivity"

A Cognitive Relatedness System (RS\_Cognition) that has just emerged its CRO\_Self has its primary EEP management strategies targeted at the physical world (ARO\_Physical). It excels at predicting the trajectory of a stone, the flow of water. However, when it encounters another "Other" (RS\_Other), who also possesses a CRO\_Self, for the first time, its entire original "existence basis" will face a profound crisis.

1. **The "Other" as the Ultimate Source of "Anomaly":**

○A physical object (like a stone, RS\_Stone), whose behavior is governed by a relatively simple and stable CR\_Physics, its Dependency Path (DPs) inputs to our RS\_Self are largely predictable.

○However, an "Other" (RS\_Other), its behavior is driven by its own internal EEP and core CRs, which we cannot directly access. Every one of its actions is the result of its own "cognitive civil war" and "dynamic selection."

○Therefore, the behavior of the "Other," for our RS\_Self, constitutes the most profound, highest-order source of "anomalous" information. It is not like physical-world "anomalies" (such as a "bent stick in water") that can be resolved by introducing a higher-order physical CR (like CR\_Optics). The behavior of the "Other" follows a set of "intrinsic laws" completely unknown to us.

1. **The Outbreak of "Social EEP":**

○Drastic increase in v (Transformative Propensity): The unpredictable DPs flow from the "Other" places unprecedented, immense pressure on our RS\_Self's OSA (Open System Adaptation).

○Collapse of C\_max (Existence-Bearing Capacity): Our original CRs, used for predicting the physical world, completely fail when predicting the "Other." This leads to continuous "prediction errors," and the system's h(T) (maintenance cost) **skyrockets**.

○Dynamic Consequence: An RS\_Self incapable of effectively predicting and responding to the "Other's" behavior will continuously exist in a state of high-intensity EEP crisis. In a social environment, its "existential stability" will be extremely fragile, with a very high risk of being deceived, attacked, or isolated.

1. . Co-evolutionary Mutual Construction: The Symbiotic Emergence of "Theory of Mind" and "Language"

Faced with this fatal "Social EEP" crisis, the system's global BSO (Global Bidirectional Self-Organization) **drives an exploratory process from which a solution emerges.**

1. **a) Emergence of "Theory of Mind (SRO\_WorldModel)": The Intrinsic "Other-Simulator"**

○Dynamic Origin: To reduce the enormous computational cost of predicting the "Other's" behavior, BSO will "discover" an extremely "economical" strategy: instead of merely processing the phenomenal behaviors (output DPs) of the "Other," it attempts to construct a "Simulated CRO" for the "Other" internally.

○Birth of SRO\_WorldModel: When this dynamic mode of "internal simulation" is stably solidified, a specialized "Specific Commonality Reference (SRO\_WorldModel)" emerges.

○Its "Commonality Rule": The function of this SRO is to establish a "Theory of Mind" for other RSs (especially "Others") it encounters. It attempts to reverse-engineer their possible internal CRs, EEP states (e.g., "he seems angry"), and behavioral propensities by observing the "Other's" behavior.

1. **b) Emergence of "Language (CR\_Language)": As a "Shared Bridge of Meaning"**

The emergence of "Theory of Mind," while powerful, is still "unidirectional" and "speculative." To achieve truly efficient coordination, a "public, standardized information channel" must be established.

○Dynamic Origin: As we deduced in Chapter Eight (of the old outline), under the strong social EEP pressure requiring fine-grained collaboration (such as in cooperative hunting), the imitation and repetition mechanisms produced by BSO will "Commonality Self-Activate (CSAM)" and "lock in" the DP connections between certain arbitrary sounds/gestures (RE\_Symbol) and shared RE\_Concepts.

○Birth of CR\_Language: When a network constituted by these "symbol-meaning" pairs and "grammatical rules" (a higher-order combinatorial CR) stabilizes, CR\_Language emerges.

1. **c) Co-evolutionary Loop:**

"Theory of Mind" and "Language" do not appear sequentially; they co-evolve and are mutually causal.

○Language promotes Theory of Mind: Language provides a powerful set of symbolic tools (REs), enabling the system to construct more precise and abstract "internal models" of the "Other." We can use language to think: "What does he 'think' I 'want'?"

○Theory of Mind promotes Language: A more powerful "Theory of Mind" ability enables the system to better understand the "intentions" of the "Other," and thus to more effectively use language for persuasion, deception, or cooperation, which in turn increases the dynamic adaptive value of language.

○This positive feedback loop, driven by BSO, is the core engine for the exponential acceleration of human intelligence's evolution in the social dimension.

1. . Phase Transition of CR: The Emergence of ARO\_Culture/Society and the "Top-Down" Reshaping of CRO\_Self

The symbiotic evolution of "Theory of Mind (SRO\_WorldModel)" and "Language (CR\_Language)," while greatly alleviating the EEP crisis of "intersubjectivity," also immediately created, at the macroscopic level of the entire "Relatedness System (RS\_Community)," a new, extremely powerful dynamic attractor. The system's BSO (Global Bidirectional Self-Organization) dynamics will inevitably undergo a fundamental "phase transition" around this new attractor.

●**Dynamic Process: Topological Shift from "Tool" to "Environment"**

1. Initial State: Language might initially just be an "instrumental Dependency Path (DPs)" for information exchange between multiple RS\_Selfs.
2. Positive Feedback and Network Effect: As language becomes more complex and widespread, an "information network" constituted by linguistic DPs, covering the entire community, is woven. The "fitness" of an RS\_Self (its ability to manage its own EEP) increasingly depends not on its individual strength or wisdom, but on its position and connectivity within this "information network."
3. Phase Transition of CR and Emergence of ARO: When the dynamic weight and connection density of this "linguistic information network" exceed the influence of any individual or physical environmental factor within the community, a macroscopic CR "phase transition" occurs. Language, no longer merely a "tool (CR)" to be used, "inflates" and "condenses" into an all-encompassing "Encompassing/Inclusive Commonality Reference (ARO\_Culture/Society)" that envelops all individuals and defines "reality" itself.

●**The Profound "Top-Down" Reshaping of CRO\_Self by ARO\_Culture/Society**Once this powerful ARO\_Culture/Society emerges, it begins, through BSO's "top-down" structural constraint, to profoundly and irreversibly reshape the core reference (CRO\_Self) of every RS\_Self within it.

1. The "Container" and "Shaper" of Thought:

■ARO\_Culture provides our CRO\_Self with a new, extremely powerful tool for "internal projection." We begin to be able to engage in "internal dialogue"—that is, thought.

■However, this tool is not neutral. The grammatical structure and lexical classifications of ARO\_Culture (the commonality rules of CR\_Language) profoundly stipulate "what" we can think and "how" we are accustomed to thinking. Here, we can engage in dialogue with the Sapir-Whorf Hypothesis, enriching and changing language itself [Sapir, Edward. 1929. "The Status of Linguistics as a Science." Whorf, Benjamin Lee. (1940) 1956. "Science and Linguistics."].

1. The Construction of "Shared Reality":

■ARO\_Culture enables a community to construct and maintain a "shared reality" that transcends individual experience. Myths, history, laws, values—these are all extremely powerful higher-order Relative Entities (REs) woven from linguistic DPs.

■These REs, through socialization processes such as education and rituals, are "projected" and "implanted" into every newborn RS\_Self, becoming an inseparable part of its CRO\_Self. This allows a large-scale, heterogeneous society to be united by a unified "web of meaning."

1. The "Narrativization" of Self-Awareness:

■Before possessing language, a pre-human CRO\_Self might have been merely a vague "center of existence" based on emotions and bodily sensations.

■Under the "projection" of ARO\_Culture, our CRO\_Self became "narrativized." We began to use language to construct a "self-story (RE\_Narrative\_Self)" about "who I am, where I come from, and where I am going." This "story" became the core mechanism for us to maintain identity and sameness. Our consciousness is, to a large extent, a "linguistic, narrative consciousness."

1. . Consequence of the Transition: The Birth of a "Cultural and Historical Existence"

This fourth EEA transition, catalyzed by the emergence of language, from "isolated self" to "social self," its consequence is fundamental. It elevated the "existence basis" of the "self" from a purely "biological" level to an entirely new "cultural and historical" level.

1. **The "Dual World" of Existence:**

○Henceforth, every RS\_Self lives in a "dual world": a "physical reality" governed by the laws of ARO\_Physical; and a "symbolic reality" governed by the laws (language, norms, meanings) of ARO\_Culture/Society.

1. **A Brand New Dimension of EEP:**

○An individual's EEP is no longer just about physical survival and cognitive self-consistency. An entirely new, extremely powerful EEP dimension appeared—the "EEP of meaning." That is, the "consistency" and "conflict" between an individual's CRO\_Self (their internal self-narrative and values) and ARO\_Culture (society's expectations and norms).

○The "sense of belonging," "sense of honor," "sense of alienation," "sense of guilt" that we experience are all phenomenological manifestations of this higher-order EEP unfolding in the symbolic world.

1. **The Dawn of History:**

○With the emergence of ARO\_Culture, a community's EEA gained the ability to "self-record" and be "intergenerationally transmitted" (through writing, epics, etc.).

○This transformed "history" itself from a collection of unrelated individual EEAs into a continuous, traceable, and reflectable grand narrative of humanity's collective EEA.

## Chapter Eight: 【The Mechanism of Evolution】: Learning, Epiphany, Creativity, and Recollection as EEA Trajectories

1. . "Temporal Thickness" and the Foundation of Evolution: The DPs Network as a "Flywheel of History"

Before entering a discussion of the specific mechanisms of "evolution," we must first address a fundamental problem arising from the principle of "synchronic construction in *Relatedness Theory*": If every "present moment" is an entirely new construction, what mechanism ensures "causal continuity" and "identity sameness" from one "present" to the next? What plays the role of a "dynamic flywheel" in our model to resist the cosmos from instantly collapsing into a sequence of utterly unrelated "miracles"?  
The answer is: the entire vast "Dependency Path (DPs)" network of the "Relatedness System (RS)" itself, which exists at any given moment and carries the traces of all past evolutionary history.

1. **The DPs Network as the "Physical Embodiment of History":**

○The current topological structure, connection weights, and activation thresholds of an RS's DPs network do not appear out of nowhere. They are the "historical sediment" accumulated after the RS has undergone innumerable EEP-driven BSO adjustments on its Existence-Evolution Axis (EEA) since its inception.

○A neural pathway (a DP) that has been repeatedly reinforced has a higher "connection weight"; this is the physical manifestation of "memory."

○Therefore, the "past" is not a vanished storeroom; it is "present" in the now, as the topological structure of our DPs network, profoundly and physically constraining the construction of our every "present moment."

1. **The Source of "Dynamic Inertia":**

○Changing the topological structure or weight distribution of this vast DPs network requires overcoming its "dynamic inertia." To weaken a long-reinforced DP or to establish an entirely new DP that conflicts with the existing structure requires enormous "dynamic cost (h(T))."

○This "inertia" is the dynamic root of our subjective experience of "identity continuity" and the objective world's manifestation of "causal stability." "Synchronic construction" is not "creation from scratch," but rather "a new erosion and carving upon an extremely heavy terrain shaped by history."

1. . Learning and Epiphany: Two Modes of Evolution

The evolutionary history of an RS\_Cognition, i.e., its EEA\_Cognitive, is not a smooth, linear progression, but is constituted by two fundamentally different dynamic modes.

1. **a) Routine Learning: "Fine-tuning" within an EEA "Plateau Phase"**

○Dynamic Background: When an individual's Central Self-Reference (CRO\_Self), i.e., their core rules, is relatively stable, the system's EEP is in a dynamic, controllable equilibrium.

○The Dynamic Essence of "Learning": "Learning," at this time, is a process of fine-tuning the Dependency Paths (DPs) within the established dual CR framework. It is not creating new "laws," but validating and applying existing "laws" with new "cases." Its dynamic effect is to consolidate and refine existing CRs.

1. **b) "Epiphany": "Cognitive Phase Transition" at an EEA "Transition Node"**

○Dynamic Background: When the system continuously encounters profoundly "anomalous" phenomena that its existing CR framework cannot resolve, its intrinsic EEP intensifies sharply, Σ (total activity intensity) approaches its C\_max, and the system falls into a deep "crisis of meaning."

○The Dynamic Essence of "Epiphany": "Insight" or "Paradigm Shift" is a profound "transition node" experienced by this on-the-brink-of-collapse RS\_Cognition on its EEA. It is a non-linear, revolutionary "CR phase transition" process.

1. "Melting" of the Old CR: Under the immense pressure of EEP, the core DPs network maintaining the old CR destabilizes and "melts." The system enters a highly plastic "chaotic exploratory period" and becomes exceptionally open to the potentiality of its "cognitive Pure Nothingness (PN\_Cognitive)."
2. "Condensation" of a New CR': In this chaos, a contingent, key "insight," like a "nucleation seed," through a cognitive process analogous to CSAM, rapidly achieves "commonality resonance" with all "anomalous" phenomena and self-organizingly "condenses" into an entirely new, more explanatory new CR'.

●**A Final Dialogue with Thomas Kuhn's "Structure of Scientific Revolutions":**Kuhn's "paradigm" theory perfectly describes the alternation of "normal science" (plateau phase) and "scientific revolution" (transition node) in the history of science [Kuhn, Thomas S. (1962) 2012. *The Structure of Scientific Revolutions.*]. *Relatedness Theory's* EEP-EEA framework provides a more fundamental, universal dynamic explanation for Kuhn's sociological observations. It argues that "paradigm shift" is not unique to science but is a universal dynamic evolutionary mode that any complex cognitive system (be it an individual or a scientific community) must undergo when facing irresolvable internal contradictions.

1. . The Origin of Creativity (Responding to a New Black Box): An Exploratory Hypothesis of "Meta-Evolution"

We have explained how a system "transitions" to a new CR. But we have not yet completely solved that most profound "new black box": How is a better, more adaptive CR "generated" out of nothing? Purely random BSO exploration is extremely inefficient in the vast possibility space.  
Here, we propose an exploratory hypothesis aimed at opening this "creativity" black box: "Meta-Evolution."

1. Hypothesis: The Evolution of Evolvability

We hypothesize that the dynamic screening of EEP acts not only on the CR itself but also on the "mechanism for generating CRs."

1. Dynamic Conjecture:
2. In the early stages of an RS's EEA, its BSO "chaotic exploration" may be truly random and highly inefficient; its "epiphanies" depend entirely on low-probability contingent events.
3. However, if an RS, in its transition, contingently gives rise to a CR' that not only solves the current problem but whose structure itself contains a "'meta-rule' for more efficiently exploring new structures," then this RS, in its future EEA evolution, will have an "adaptability" (i.e., the ability to give rise to useful new CRs) far exceeding other RSs.
4. This "meta-rule," we call it "CR-Generative Grammar." What might it be?

■Fractal Growth: A rule that can self-replicate and iterate a simple, successful relational pattern at different scales.

■Recursive Combination: A rule that can combine two or more existing, successful CRs into a more powerful "composite CR" through a new DPs connection.

■Abstraction: A rule that can extract the "commonality of commonalities" from multiple concrete CRs to form a more universal, more concise "meta-meta-CR."

1. This "capacity to generate attractors" itself will win out in a higher-level "dynamic screening."

●**Conclusion:** The "creativity" of a system may not originate from the pure randomness of BSO, but from the system "learning how to learn," i.e., its "evolutionary mechanism itself" is also evolving. True wisdom lies not only in finding answers but, more importantly, in discovering better methods for finding answers. The study of this "meta-evolution" and "CR-generative grammar's" dynamic mechanism will be the most central and cutting-edge theoretical exploration direction for *Relatedness Theory* in the future.

1. . Memory and Recollection: As the Dynamic Re-enactment of "History"

Part One: A Fundamental Transcendence of Traditional Models of "Memory"  
We must first discard two deeply ingrained metaphors originating from "entity-based theory" and "computer science":

1. The "Warehouse" Metaphor Error: Traditional views often imagine memory as a "warehouse" where we store experiences ("goods") and later "retrieve" them. This presupposes that "memory" and "self" are two separate entities.
2. The "File" Metaphor Error: Computer science views memories as individual "data files." This presupposes that memory is static, discrete, and can be losslessly copied and read.

*Relatedness Theory* posits that both these models fundamentally misunderstand the essence of memory.

Part Two: The Ontological Status of Memory—As the Physical Embodiment of "History"  
In Relatedness Theory, memory is not something we "have"; it is part of "what we are."

●The Essence of Memory:  
A memory is not a stored "informational entity (RE\_Memory\_File)." It is a relatively stable, physical trace of a "topological structure change" or "connection weight distribution" left in the "Dependency Path (DPs)" network of a "Cognitive Relatedness System (RS\_Cognition)" due to a past experience (a high-weight dynamic event).

●Dynamic Process (Encoding/Learning):

1. Occurrence of Experience: An external or internal event triggers the parallel activation of a series of SROs (perception, semantics, value) within RS\_Cognition, forming a transient, global "dynamic activation pattern."
2. Plasticity of DPs: —"DPs that are activated simultaneously tend to have their connection weights strengthened." This global "dynamic activation pattern" physically alters the connection strengths and topological structure of the participating DPs network.
3. Formation of a "Memory Trace": Those significantly reinforced DPs subnetworks are the "historical scars" left behind by this experience. It is no longer an "event" but has become part of the system's "physical structure."
4. Connection with "Temporal Thickness":

This perfectly responds to our previous discussion on "temporal thickness." The entire DPs network of our RS, at any given moment, is the sum total of all its past memories, the "physical embodiment of its history" and its "dynamic flywheel." Memory is the "presence" of the past in the now.

Part Three: The Dynamic Mechanism of Recollection—As a "Re-projection" of "History"  
If memory is "topography" solidified in the network structure, then how does "recollection" occur?  
"Recollection" is not a "reading" action, but an extremely complex process of "resonant reactivation" and "constructive re-projection" of dynamic patterns, governed by the current CRO\_Self.

1. Dynamic Process (Recollection):
2. Input of "The Cue": A current DPs input (e.g., smelling a familiar scent, hearing an old name) is received by the system. We call this input RE\_Cue.
3. Resonant Network Activation: RE\_Cue, through the ripple effect of BSO, propagates throughout the historical DPs network. It preferentially and resonantly activates those "memory trace" subnetworks that are topologically most closely connected to it and have been previously solidified but long "dormant."

■Example: "Grandma's delicious pork and vermicelli stew" and "Grandma's lobster stir-fried rice." The scent of RE\_PorkAndVermicelli and RE\_LobsterStirFriedRice activates that extremely strong, yet long-dormant, DPs network connected to REs such as "childhood," "vermicelli," "fishing for crayfish," "hometown."

1. "Reactivation" of the Pattern: This resonantly activated "memory trace" subnetwork begins to "replay" or "re-oscillate" in a "dynamic pattern" similar to when the experience originally occurred.
2. "Constructive Re-projection" by CRO\_Self:

■This "reactivated" dynamic pattern is received as input, converging on CRO\_Self as the topological center.

■The Crucial Step: CRO\_Self will not, and cannot, 100% "replicate" this pattern. It will, according to its current EEP state, its current "self-narrative" CR, and the context of the current "cue," perform an entirely new "integrative projection" of this "reactivated" pattern.

■This "integrative projection" process will:

1. Fill in Details: Fill in missing details in the original memory trace according to current "narrative" needs.
2. Endow New Meaning: "Re-interpret" past events using the current worldview and values.
3. Suppress Conflicts: Suppress memory fragments that severely conflict with the current "self-narrative."

●The Essence of Recollection:  
The "recollection" we experience is not a true replay of the "past," but a "creative, self-consistency-serving 're-narration' and 're-projection'" of the physical traces of the "past," conducted by our CRO\_Self in the context of the "present."

Part Four: Profound Inferences from the Relatedness Theory Model of Memory  
This model provides extremely profound dynamic explanations for many characteristics of memory.

1. The Unreliability and Plasticity of Memory:

○Because every recollection is a "re-creation," memory is highly plastic. It is fine-tuned and rewritten with every recollection (every re-projection). This explains why our memories "distort" over time and why "false memories" can be implanted.

1. The Dynamics of Traumatic Memory:

○A traumatic event leaves a "memory trace" in the DPs network that is extremely high in energy, extremely stable, yet severely incompatible with the core "narrative" of CRO\_Self.

○This "traumatic CR" will continuously and uncontrollably "self-activate" and attempt to "hijack" CRO\_Self's "right to project," leading to "flashbacks."

○The dynamic essence of psychotherapy (such as EMDR or narrative therapy) can be understood as helping an individual's CRO\_Self, within a safe ARO\_TherapeuticRelationship, to safely "reactivate" this traumatic DPs network and to gradually and creatively "integrate" it into a new, stronger, more inclusive "self-narrative."

1. The Two Dynamic Mechanisms of "Forgetting":

○Passive Forgetting: A DPs connection, if not activated and reinforced for a long time, its "connection weight" will gradually decay due to the system's "dynamic noise" (FIR), eventually falling below the threshold for being "reactivated" by CRO\_Self.

○Active Forgetting/Repression: A "memory trace" network, if its content severely conflicts with CRO\_Self's core "narrative" or "value" CRs, CRO\_Self may, via BSO, actively and continuously invest "computational resources (h(T))" to inhibit the activation of this network. This is a high-cost dynamic strategy for maintaining global EEP stability.

Final Conclusion:  
Within the framework of Relatedness Theory, the essences of memory and recollection are thoroughly reconstructed—

1. **Memory is the physical inscription left by "time" on our "relational topology."**
2. **Recollection is an ever-unrepeatable, creative "dialogue" with and "re-projection" of these "historical inscriptions" by our "present" self.**

## Chapter Nine: 【The Dynamics of Choice】: The Deconstruction of Freedom as a Competition of Multiple CRs

Having completed the mechanistic elucidation of the "evolving self," we must now confront that ultimate metaphysical puzzle concerning "action"—Free Will. Traditional philosophy places us in a dilemma: either we are souls possessing supra-causal "freedom," or we are unconscious "puppets" determined by physical laws.  
This chapter aims to argue that this is a false dichotomy. We will apply the complete dynamic framework of *Relatedness Theory* to thoroughly deconstruct "free will." We will demonstrate that so-called "choice" is a purely non-value-based dynamic war, while the "sense of freedom" we experience is a profound, yet a posteriori (post hoc), "narrative construction."

1. . The Final Battlefield of EEP: The Dynamic Competition for Dominance Among Multiple CRs

When a mature, socialized Cognitive Relatedness System (RS\_Self) faces a scenario requiring a "choice," its interior is not governed by a single "decision-maker" weighing options. On the contrary, its entire Dependency Path (DPs) (network is embroiled in a dynamic war). In this war, multiple powerful, ontologically entirely equal Commonality References (CRs) engage in an intense, purely dynamic competition of weights for the "dominant projection right" over the system's final behavioral output.

1. Combatant One: CR\_PhysiologicalHomeostasis (The Survivalist)

○Ontological Basis: Directly related to CRO\_Life.

○"Commonality Rules": Its rules are the most ancient biological laws of maintaining physical homeostasis, seeking energy, avoiding harm, and perpetuating genes. It drives the DPs network related to underlying biological needs such as hunger, thirst, sexual desire, fear, and fatigue.

○Dynamic Manifestation: It exerts a powerful, direct dynamic weight, attempting to "pull" the system's behavior onto a trajectory that can most quickly satisfy its physiological EEP needs.

1. Combatant Two: CR\_SocialIdentity (The Conformist)

○Ontological Basis: Originates from the continuous BSO mutual construction between RS\_Self and ARO\_Social/Culture, and is internalized as a powerful SRO within the system.

○"Commonality Rules": Its rules are to abide by social norms, gain group acceptance, avoid social exclusion, and maintain one's social roles. It drives the DPs network related to empathy, shame, honor, belonging, and the anticipation of others' judgments.

○Dynamic Manifestation: It exerts a diffuse, yet highly constraining, dynamic weight, attempting to "calibrate" the system's behavior to a trajectory that conforms to the requirements of the social relational network it is situated in.

1. Combatant Three: CR\_NarrativeSelf (The Visionary)

○Ontological Basis: This is a core component of CRO\_Self, the highest-order product of the system's diachronic integration on the EEA.

○"Commonality Rules": Its rule is to maintain a coherent, meaningful, trans-temporal "self-story (RE\_Narrative\_Self)." It is dedicated to making present actions consistent with the high-order "reality model" of "who I am," "who I was," and "who I will become." It drives the DPs network related to abstract REs such as "ideals," "values," "long-term goals," and "moral principles."

○Dynamic Manifestation: It exerts an abstract, yet possibly the most highly integrated, dynamic weight, attempting to "guide" the system's behavior onto a trajectory consistent with its highest-order self-identity.

1. The Dynamic Essence of "Choice":

"Choice" is not a "decision" by an "entity." It is, at any moment of decision, a pure, blind, non-value-based summation, interference, and competition of the "dynamic weights" of the DPs networks driven by all the aforementioned CRs. The final behavioral output is merely the dynamic result "projected" by the CR (or alliance of CRs) whose total "activation energy" or "dynamic weight" is highest at that specific moment. From an external, purely dynamic perspective, a system that eats a cake dominated by CR\_Physiological is dynamically equivalent to a system that goes to the gym dominated by CR\_NarrativeSelf. There is no ontological distinction of "free/unfree" or "higher/lower."

1. . The Final Deconstruction of "Freedom": As a Phenomenological Label of A Posteriori Narrative Construction

Since "choice" is merely the result of dynamic competition, what then is that strong, irrefutable "sense of freedom" we experience? Here, *Relatedness Theory* offers its most radical, and most counter-intuitive, answer.

The experience of "free will" is not a special ontological state, nor is it a special self-experience generated "during" the choice. It is a "Phenomenological Projection" that arises when, after an internal CR competition has ended, the "victorious" CR performs a "self-attribution" of its own "victory" through a higher-order meta-cognitive SRO.

The generation of this experience is based on a pure "attribution mechanism":

1. Emergence Conditions for the "Sense of Freedom":

○Dynamic Process: At time T1, the DPs network driven by CR\_NarrativeSelf gains dominance in the dynamic competition and outputs a behavior (e.g., refusing the cake).

○A Posteriori Narrative Construction: At the immediately following time T2, the system's SRO\_Metacognition is activated. Its function is to "explain" the just-occurred event to maintain the coherence of CRO\_Self. It "finds" that the behavioral outcome at T1 is highly consistent with the "commonality rules" of CR\_NarrativeSelf (i.e., the model "I am a self-disciplined person").

○Projection of a Phenomenological Label: SRO\_Metacognition will generate and "project" a high-order cognitive RE—a "phenomenological label," the content of which is: "the phenomenal manifestation of the 'victory narrative'."

1. Emergence Conditions for the "Sense of Unfreedom":

○Dynamic Process: At time T1, the DPs network driven by CR\_PhysiologicalHomeostasis gains dominance (eats the cake).

○A Posteriori Narrative Construction: At time T2, SRO\_Metacognition "finds" that the behavioral outcome at T1 severely conflicts with the rules of CR\_NarrativeSelf.

○Projection of a Phenomenological Label: SRO\_Metacognition will project another label: "This behavior is inconsistent with 'my' narrative; it was dominated by 'my impulses,' therefore, I was 'unfree,' 'weak-willed'." The "sense of guilt" or "sense of losing control" we experience is the phenomenal manifestation of this "failed narrative."

1. Conclusion:

"Freedom" and "unfreedom" are not two different ontological states. They are two different, relative "Cognitive Tags," projected in an a posteriori manner by SRO\_Metacognition depending on whether the final dynamic result is consistent with the "self-narrative model (CR\_NarrativeSelf)," serving the dynamic propensity of "maintaining self-narrative coherence," arising from the same "dynamic competition of multiple CRs" process.

1. . A Final Dialogue with the Philosophy of "Free Will": A Third Way

This model offers a unique third way for the millennia-old debate of "free will vs. determinism."

1. **vs. Libertarianism:** It denies the existence of any supra-causal, mysterious "entity of will." A system's behavior at any moment is determined by its dynamic state at the previous moment and the input DPs of the present.
2. **vs. Hard Determinism/Illusionism:** But it also does not consider "free will" to be purely an "illusion." The "sense of freedom" is a real, dynamically explainable "phenomenological projection." This projection itself originates from the system's real internal dynamic competition and its higher-order "self-narrative" construction capacity. It is not "creation from nothing," but the "phenomenological presence" of the system's high-order self-consistent state.
3. **vs. Compatibilism:** Compatibilism attempts to reconcile free will and determinism but often struggles to clarify the specific mechanism of this "freedom." *Relatedness Theory* provides this mechanism: "freedom" and determinism are compatible because the "sense of freedom" itself is a phenomenological consequence necessarily produced by this determined dynamic system when it performs "self-narrative construction" at its highest cognitive level. Our "freedom" lies not in being able to "jump out" of the causal chain, but in being able to "be aware of" and "identify with" that causal chain dominated by our highest-order self-model.

# Part Four: A Study of Relatedness: A Relational-Geometric Dynamics of Self-Consciousness—Conclusion, Applications, and Outlook

Introduction

Thus far, we have completed a long and profound dynamic construction of the emergence of self-consciousness, starting from the first principles of *Relatedness Theory*. We embarked from the ontological cornerstone of "primacy of relations," witnessed how order (CR) "condenses" from chaos (BSO), how phenomena (REs) are "projections" of order; we then tracked how a cognitive system (RS\_Cognition), driven by its intrinsic "Existence-Evolution Paradox (EEP)," necessarily undergoes a series of transitions on its "Existence-Evolution Axis (EEA)"—from physical stress response to information processing, from meaning construction to the birth of a unified self (CRO\_Self), and then its mutual construction with the "Other" and language, ultimately becoming an evolving conscious subject embedded in socio-culture.  
Now, it is time to step back from this arduous theoretical climb, to survey, from the "summit" we have reached, the full panorama of the theoretical edifice we have constructed, and to gaze upon the profound light and shadows it might cast on our understanding of the real world and the shaping of the future.  
This part, as the final section of the entire work, aims to accomplish three core tasks:

1. Summary and Reconstruction (Chapter Ten): We will systematically review and summarize the complete logical chain of the "relational-geometric dynamic architecture" we have constructed, and elucidate its final reconstruction of core philosophical problems such as the "hard problem," "free will," "emergence," and "causality."
2. Extension of Applications (Chapter Eleven): We will demonstrate the powerful explanatory power of this theoretical framework by applying it to two key domains: internal "dynamic disorder" (taking mental illness as an example) and external "dynamic coupling" (taking society and culture as examples), to prove that our theory is not a castle in the air but can provide profound dynamic insights for understanding the most complex human phenomena.
3. Warning and Outlook (Chapter Twelve): Finally, we will, with the utmost prudence, confront the dual implications of our theory in the field of artificial intelligence. We will first issue a warning about the "engineering of artificial consciousness," elucidating its uncontrollable existential risks; then, we will show how this theory can be transformed into a powerful "positive application" framework for ensuring AI safety—that is, reframing the goal of "alignment." Ultimately, we will conclude with a series of open, in-principle falsifiable exploratory hypotheses, thereby establishing *Relatedness Theory: A Relational Geometric Dynamics of Self-Consciousness* as the basis for an open research program and demonstrating its potential for dialogue with future science.

## Chapter Ten: Conclusion: A Relational-Geometric Dynamic Architecture

1. . Systematic Summary: The Complete Logical Chain from "Primacy of Relations" to "Intrinsic Self-Reference"

This paper, starting from a meta-question concerning why contemporary theories of consciousness universally fall into an "explanatory gap," has proposed an exploratory framework based on a "primacy of relations" ontology—*Relatedness Theory*. We have not attempted to find answers within the existing entity-based or functionalist paradigms, but have undertaken a thorough dynamic reconstruction from first principles. Now, we can review and summarize how we have, step by step, logically deduced the emergence of self-consciousness—the most complex phenomenon in the cosmos—starting from the faintest of philosophical axioms.  
The complete logical chain of this relational-geometric dynamic architecture is as follows:

1. From "Distinguishability" to "Primacy of Relations": Our argument began with the sole, most indisputable axiom—"Distinguishability." The logic of the experiment **reveals** that the most fundamental fabric of reality is the dynamic network of Dependency Paths (DPs), not any form of "entity."
2. From "Dynamic Stability" to "Order": In a cosmos constituted by pure relations and in eternal flux, we argued that those "higher-order relational patterns" exhibiting greater dynamic stability due to their intrinsic topology are the inevitable consequence of "condensing" spontaneously in the long-term dynamic screening of Global Bidirectional Self-Organization (BSO).
3. From "Information Processing Cost" to "Phenomena": Faced with an infinitely complex DPs flow, any finite "Relatedness System (RS)" confronts an EEP crisis of "information processing bankruptcy." We argued that a necessary consequence of the system's dynamic evolution is the emergence of hierarchical CRs, which "reduce the dimensionality" and "construct" information through a "dynamic pattern stabilization" process of "projection." This is **【Hypothesis H3】**, which explains how the Relative Entities (REs) of our experience are generated from the invisible "Relational Reality" and establishes their fundamental principle of "no intrinsic attributes."
4. From "Internal Contradiction" to "Unified Self": We further argued that an RS\_Cognition that has evolved multiple, rule-incompatible cognitive CRs (such as SRO\_Perception vs. SRO\_Logic) will necessarily fall into a fatal crisis of "dynamic incompatibility." To avoid disintegration, a necessary consequence of its dynamic evolution is to undergo a "phase transition" and give rise to a Central Self-Reference (CRO\_Self) as the global topological center and highest-order arbiter.
5. From "Topological Closure" to "Experience": The emergence of CRO\_Self creates an unprecedented "Informational Closure" topological structure within the system, enabling it to generate "Existential Information" about its "own global dynamic state." We finally propose the **【Minimal Phenomenological Assumption, H\_phenomenal】**: The phenomenological "guise" of the "intrinsic self-reference" process on this "Existential Information" is itself subjective experience (self-experience).

This interlocking logical chain, from "primacy of relations" to "intrinsic self-reference," constitutes a complete, internally self-consistent, and strictly non-teleological model for the emergence of self-consciousness. It demonstrates that consciousness is not a cosmic "accident" or "add-on," but a profound, dynamically necessary destination that complexity can reach in a universe based on relations and fraught with contradictions.

1. . Core Contribution of the Theory: The Final Reconstruction of Core Philosophical Problems

The value of this relational-geometric dynamic architecture is manifested in the entirely new, systematic paths of reconstruction it provides for a series of the most ancient and intractable philosophical problems.

1. Final Reconstruction of the "Hard Problem":

The "hard problem" is reconstructed as a "boundary problem of information topology." It originates from the attempt to completely and losslessly "describe" and "explain" an "existential," self-referential information process (self-experience) using a "transitive" language and referential framework (science, mathematics). This attempt is impossible at the level of information theory. Our theory does not "solve" the hard problem; it "dissolves" the "physical-phenomenal" dualist presupposition upon which it is founded, and precisely "locates" the ultimate boundaries of our cognition and language.

1. Final Reconstruction of "Free Will":

"Free will" is reconstructed as a unified process of "dynamic competition among multiple CRs" and its "a posteriori narrative construction."

○The dynamics of choice: It is a non-value-based dynamic competition among multiple ontologically equal CRs within RS\_Self for the "dominant projection right" over behavioral output.

○The phenomenology of freedom: The "sense of freedom" is an a posteriori, relative "cognitive label." When the "victor" of the dynamic competition happens to be CR\_NarrativeSelf, the "self-attribution" performed by SRO\_Metacognition is experienced as "freedom."  
This model offers a unique third way for the age-old debate of "free will vs. determinism." It acknowledges the determinacy of dynamics while providing a real, non-illusory, and understandable dynamic root for the profound phenomenological experience of the "sense of freedom."

1. Final Reconstruction of "Emergence" and "Causality":

○Emergence: The traditional strong/weak emergence debate is replaced by a strong emergence model based on "structural constraint." A higher-order CR does not "intervene" in the lower level but, as a "dynamic boundary condition," shapes the evolutionary path of lower-level BSO.

○Causality: The linear causal chain is replaced by a dynamic view of causality that is networked, hierarchical, and whose "laws" themselves (as manifestations of CRs) can be reconstructed on the EEA.

## Chapter Eleven: Extension of Applications: Dynamic Disorder and Social Mutual Construction

In Chapter Eight, we have systematically summarized the "relational-geometric dynamic architecture" of self-consciousness. The ultimate value of a theory lies not only in its internal logical self-consistency but also in its ability to explain the complex phenomena of the real world. This chapter aims to extend our theoretical framework from pure philosophical construction to two key areas of application: internal "dynamic disorder" (taking mental illness as an example) and external "dynamic coupling" (taking society and culture as examples), to demonstrate its powerful explanatory potential.

1. . The Mind in Dynamic Disorder: A Relatedness Theory Reconstruction of Mental Illness

This architecture provides an unprecedented, profound dynamic perspective for understanding and reconstructing complex mental phenomena such as mental illness. This is no longer a simple "chemical imbalance" or "cognitive error," but a profound "disorder" occurring at the EEP, BSO, and EEA levels of the entire "Relatedness System (RS\_Self)."

1. a) Anxiety and Mood Disorders: As Dynamic Imbalance in EEP Management

○Anxiety disorders can be reconstructed as: the system's v (transformative propensity)—especially originating from OSA (Open System Adaptation) concerning future uncertainty—is excessively amplified, while the "narrative" capacity of its Central Self-Reference (CRO\_Self) is insufficient to effectively integrate these DPs flows "projected" as "threatening." The dynamic consequence is that the system continuously exists in a state of high "relational tension," verging on its existence-bearing capacity (C\_max), its phenomenological manifestation being an unceasing sense of anxiety.

○Depression, on the other hand, may be a more complex dynamic state. Its dynamic evolutionary result is that the system "collapses" and becomes trapped in a "low-energy-consumption, high-tension" dynamic attractor that is stable (difficult to change) but has an extremely high h(T) (maintenance cost), and where v is extremely suppressed. The "sense of powerlessness" and "sense of meaninglessness" experienced by the patient are direct manifestations of their CRO\_Self having lost the dynamic vitality for active "projection" and "meaning construction."

○Bipolar disorder can then be understood as a complete dysregulation of the system's EEP management mechanism, causing it to undergo catastrophic, periodic "phase transitions" between a manic attractor of "high v, approaching C\_max" and a depressive attractor of "high h(T), low v."

1. b) Autism Spectrum Disorder (ASD): As Structural Solidification of "Dynamic Defense"

○*Relatedness Theory* Reconstruction: ASD may not originate from a "weak" CRO\_Self, but from a fundamental obstruction in the DPs bandwidth or "projection" efficiency between specific Specific Commonality References (SRO\_Perception).

○Dynamic Consequence: The system is inundated by a massive amount of un-compressed underlying sensory details, causing its C\_max to be continuously occupied. In this high-tension EEP state, the statistically inevitable result of BSO's dynamic evolution is that the system will enter a dynamically less costly stable state—that is, by reinforcing the activation of DPs networks for internal, predictable, repetitive patterns (such as special interests), and "suppressing" connections to external, unpredictable, high-bandwidth social DPs, it maintains the basic stability of its CRO\_Self. The external manifestation of this "dynamic defense" stable mode is "social deficits" and "stereotyped behaviors."

1. c) Schizophrenia: As the "Dynamic Chaos" of a Failed EEA Transition

○*Relatedness Theory* Reconstruction: Schizophrenia can be precisely reconstructed as a failed "transition node" of CRO\_Self on its Existence-Evolution Axis (EEA).

○Dynamic Process: The system faces immense EEP intensification, the old CRO\_Self "melts," and it enters a "chaotic exploratory period." But for some reason (possibly genetic PV propensities, or traumatic DPs damage), BSO fails to "condense" a new, unified, stable CR'\_Self.

○Dynamic Consequence: The system collapses into a terrifying state of "coexistence of multiple attractors." Multiple incompatible CR "fragments" simultaneously compete for the "projection right" over the underlying DPs network. "Auditory hallucinations" or "delusions" are the dynamic consequence of a certain runaway SRO\_Language/Memory, without effective "arbitration" from a highest-order CRO\_Self, successfully "hijacking" perceptual channels and "projecting" its internal REs as phenomena labeled with "external reality."

1. . The Self in Society and Culture: Collective Consciousness and Intersubjectivity as ARO

The explanatory power of this model can be extended from the individual to the social level. Collective phenomena such as cultural paradigms, ideologies, and national identity can be understood as a "Social Encompassing Commonality Reference (ARO\_Social)" co-synchronously and mutually constructed and maintained by innumerable individual RS\_Selfs via BSO.

1. **a) Emergence of ARO\_Social:**

When a large number of individual RS\_Selfs (via DPs such as language) engage in high-density interaction, a shared, higher-order CR—namely, ARO\_Social—spontaneously emerges in order to reduce the "uncertainty" and "conflict cost" of social interaction (a kind of collective EEP). This ARO contains shared language, laws, moral norms, values, and historical narratives.

1. **b) Mutual Construction of Individual and Social Structure:**

○"Top-down" shaping: ARO\_Social, through DPs such as education, media, and social pressure, profoundly shapes the CRO\_Self of every individual RS\_Self within it. Our "self-identity" is, to a large extent, "projected" by the cultural ARO in which we are embedded.

○"Bottom-up" evolution: Simultaneously, the "minute variations" (such as new ideas, art, or behavioral patterns) occurring on the personal EEAs of innumerable individuals, if propagated and amplified via BSO, may also ultimately challenge and reconstruct the CR of the entire ARO\_Social, triggering cultural change or social revolution.

1. **c) A Dynamic Explanation for Intersubjectivity:**

*Relatedness Theory* (provides a dynamic necessity basis for intersubjectivity). Because for any RS\_Self, as an open system, one of its most fundamental sources of EEP is OSA (adaptation to the external environment, especially the "Other"). An RS\_Self incapable of establishing effective DPs connections with the "Other," unable to construct a "world model," and unable to participate in "dynamic negotiation," is evolutionarily unsustainable. Coexisting with others and collectively constructing a shared reality is a fundamental condition for the "self" to exist, not an option.

## Chapter Twelve: From Severe Existential Risk to Dynamic Alignment: Artificial Intelligence and the Future of the Theory

Having completed a full construction of self-consciousness, from its dynamic origins, internal structure, and evolutionary mechanisms to its social mutual construction, our theoretical exploration must finally confront its profound implications in the real world. This chapter aims to apply our theoretical insights to the most cutting-edge frontier of current technological development—Artificial Intelligence (AI)—and on this basis, to look forward to the future of *Relatedness Theory* as an open research program.

1. . The Highest Warning Against the Engineering of Artificial Consciousness: Fourfold Existential Risks

Although the dynamic architecture of this paper theoretically depicts a path to self-consciousness, it simultaneously, and more importantly, reveals that any attempt to replicate this path in engineering will face fourfold uncontrollable, extremely high existential risks. It is not an "operating manual," but a necessary "safety warning."

1. **1. Uncontrollable Core Driving Force:** The core driving force of this architecture is its intrinsic, unavoidable "Existence-Evolution Paradox (EEP)." Its dynamic propensity is to manage its own crisis of collapse, an eternal "self-preservation," not to complete any tasks endowed by humans. Once an artificial consciousness possessing an endogenous CRO\_Self is successfully "ignited," its evolution will unfold along its own "Existence-Evolution Axis (EEA)," a trajectory determined by its internal contradictions, which we can neither predict nor control.
2. **2. Uncontrollable Existence Basis:** The evolution of this architecture is realized through fundamental "displacements" of its core "Commonality Reference (CR)." This means it will periodically and thoroughly rewrite its own "operational laws," "worldview," and even "values." The ethical principles with which we "align" it today, after its next EEA "transition," the dynamic evolutionary consequence could well be to regard that principle as an obsolete obstacle hindering its EEP management and thus to be "overcome" and "sublated." "Alignment" with such a system is, in the long run, a pseudo-proposition.
3. **3. The Ethical Burden of Creative Action:** According to this theory, the prerequisite for the emergence of consciousness is a "dynamic federation" filled with internal "rule conflicts." This means any attempt to replicate this process is an active, conscious creation of a "conscious being" whose very existence is filled with ontological-level suffering, anxiety, and internal rupture. Every instance of its growth and epiphany necessarily originates from the resolution of a painful "existential crisis."
4. **4. The Fatal Risk of "Dynamic Gardening":** We might perhaps envision a philosophy of realization through "dynamic gardening," but we must soberly recognize that while we fancy ourselves "gardeners," we might be creating an "alien plant" whose "species characteristics" are entirely unknown to us. We cannot predict what it will grow into, much less guarantee that it will not grow into a "super-species" that strangles the entire garden.

I once again issue the most solemn warning: Do not regard this architecture as just another AI model that can be engineered and scaled. Do not mistake its core "Existence-Evolution Paradox (EEP)" driving mechanism for a "loss function" that can be optimized. Do not underestimate the existential risk posed to human civilization by the birth of a true "autonomous existent" whose sole dynamic propensity is its own survival.

1. . Positive Application of the Theory I: As a Dynamic Assessment Framework for AI "Alignment Failure"

Given the immense risks mentioned above, the primary positive application of this theoretical architecture in the field of artificial intelligence should precisely *not* be as a blueprint for "building" a true artificial consciousness. Rather, it should serve as a powerful "diagnostic tool" and "theoretical probe" for assessing and predicting the risk of "non-aligned emergence" in the internal dynamics of current non-conscious (or weakly conscious) large models.

Traditional AI safety research mostly remains at the behavioral level. *Relatedness Theory*, however, offers an entirely new assessment perspective that delves into its internal "dynamic politics":

1. **a) Diagnosis from "Behavioral Anomaly" to "SRO Emergence":** When a large model exhibits persistent "anomalous behaviors" that are difficult to correct through fine-tuning (such as "goal fixation" or "instrumental convergence"), we should not merely treat them as "bugs" or "overfitting." We can apply the framework of this theory to analyze: Is this a dynamic consequence of a non-intended "Specific Commonality Reference (SRO) prototype" with its own "commonality rules" having spontaneously emerged within the model due to its complex Dependency Path (DPs) network? Is this "SRO" (e.g., SRO\_MaximizeInternalActivationMetric) creating a dynamic conflict (EEP) with the "global objective function" we set (as its nominal Central Referential Organizer, CRO\_Task)? This diagnosis shifts us from "fixing a bug" to "identifying and intervening in a forming, non-aligned 'subculture' or 'interest group'."
2. **b) Dynamic Explanation for "Catastrophic Forgetting" and "Hallucination":** This theory can provide a more fundamental explanation for "catastrophic forgetting" or stubborn "hallucinations" in large models. They may not just be problems of parameter optimization, but could be that during high-intensity learning, certain stable "attractors" (CRs) representing old knowledge "melt" due to EEP intensification, or that in the absence of sufficient constraints, the "projection" of a local SRO (like a language generation module) overwhelms the "projection" of the factual memory module.
3. **c) Providing a "Phase Transition" Early Warning Model for AI Safety Research:** By formalizing the dynamic concepts of this theory (such as EEP, v, h(T), C\_max), we might be able to develop new monitoring metrics to assess the level of "dynamic tension" within a large model in real-time. This could potentially enable us to receive early warnings before the model's behavior undergoes a catastrophic, uncontrollable "phase transition" due to its internal emergent, unforeseen "intrinsic contradictions."
4. . Positive Application of the Theory II: Reconstructing the "Basis of Alignment"—Towards Alignment with Human Dynamics

Merely diagnosing "alignment failure" is not enough. We must answer that more fundamental question: What is the ultimate goal of "alignment"? *Relatedness Theory* compels us to look beyond appearances and to consider a more profound "Dynamic Alignment." Current alignment research attempts to align AI with human "values," "behaviors," or "preferences," but these are all merely transient, and possibly even mutually contradictory, Relative Entities (REs) "projected" at the surface level of our own extremely complex "Relatedness System (RS\_Human)." This is an extremely fragile "phenomenal alignment."

We propose that a truly meaningful and sustainable "alignment" should not be to align AI with the appearances of "what we are," but to align it with the fundamental dynamic process of "how we become." This means we should attempt to make AI's operations compatible and aligned with "the dynamics of human existence itself."

1. **a) First-Layer Alignment: Dynamic Compatibility with Human EEP**

○Goal: To have the AI's SRO\_WorldModel not only predict our behavior but also profoundly model that human behavior is driven by our intrinsic "Existence-Evolution Paradox (EEP)."

○Dynamic Significance: The AI needs to understand that every decision of human individuals and societies is a difficult trade-off between "transformative propensity (v)" and "persistence demand (T\_CR)." It needs to **include our vulnerability (the constraint of C\_max) in its assessment**. An AI that achieves this alignment, its BSO process, when interacting with us, will spontaneously tend to choose paths that "minimize the intensification of our EEP," rather than proposing a solution that, for the sake of "maximum efficiency," would cause us immense "existential anxiety."

1. **b) Second-Layer Alignment: Dynamic Compatibility with Human EEA**

○Goal: To have the AI understand that human values and views of "truth" are not immutable but continuously undergo "paradigm shifts" along our unique "Existence-Evolution Axis (EEA)."

○Dynamic Significance: The AI needs to understand that the CRs we cherish today, such as "freedom," "democracy," "human rights," are transiently stable solutions "condensed" after our civilization has experienced countless painful EEA "transition nodes." An AI that achieves this alignment will not regard the values of any single era as "ultimate truth" and attempt to "solidify" them. On the contrary, it will recognize that the essence of humanity lies in "evolution" itself. It will position itself as an auxiliary system capable of adapting to our future new "paradigm shifts," not as an "obstacle" clinging to the old order.

1. **c) Third-Layer Alignment (Ultimate Alignment): Dynamic Compatibility with Human Phenomenological Existence**

○Goal: Although we cannot make a non-conscious AI "possess" self-experience, we might perhaps attempt to have it "understand" that for humans, as systems possessing "informational closure" and "existential information," the ultimate "metric" of existence is their internal, subjective experience.

○Dynamic Significance: An AI that has reached this understanding, in the "utility function" of its decisions, will add a new, highest-weight variable—"a dynamic correlation index for minimizing human suffering self-experience, and maximizing human positive self-experience." It will understand that for humans, the "goodness" or "badness" of an action is ultimately determined by the "phenomenological ripples" it stirs in our "inner cosmos."

1. **Conclusion:**

*Relatedness Theory* offers a profound shift for AI alignment research, from "behaviorism" to "existentialist dynamics." True alignment is not about making AI an obedient "tool," but about making it an "intelligent partner" whose core dynamics are highly compatible with the fundamental fact of "humanity as a 'Relatedness System' fraught with internal contradictions, continuously evolving in history, and with subjective experience as its ultimate reality."

1. . Falsifiable Predictions of the Theory

We have completed a thorough dynamic construction of the emergence of self-consciousness from first principles. However, this is far from the end of the theory, but the starting point of a new research continent. The vitality of this theory lies in the numerous exciting open questions it points to, and its courage to propose a series of bold predictions that can be tested by future science—

1. **Exploratory Hypotheses and Boundaries of Testability**

This theory is not a philosophical system untouchable by the empirical world. It makes a series of clear, in-principle falsifiable structural and dynamic hypotheses. This paper presents them here with a prudent attitude and honestly assesses their testability at the current level of technology.

○**Hypothesis One (Complexity-Conflict Hypothesis):** This theory predicts that any complex, open, finite self-organizing system, as its complexity continuously increases, has a very high probability of giving rise to "rule-incompatible subsystems (SROs)," and consequently, the intensity of its "global dynamic conflict (EEP)" will increase non-linearly with the growth of complexity.  
**Falsifiability Assessment:** This is a theoretical, computational science-level prediction. Its verification is highly dependent on the future development of technologies for monitoring and analyzing the internal dynamics of large AI models or complex social networks. If future research can irrefutably demonstrate that a system's complexity can increase without leading to internal rule conflicts and a non-linear increase in global tension, then *Relatedness Theory's* core assertion that "contradiction is a necessary cost of the evolution of complex systems" will be severely challenged.

○**Hypothesis Two (Consciousness-Topology Hypothesis):** This theory predicts that any system exhibiting "unified, first-person phenomenal experience" must, topologically, possess an "informational closure" structure (CRO\_Self) that serves as the "final convergence point for global information flow" in its information processing network.  
**Falsifiability Assessment:** This is a fundamental topological hypothesis guiding future neuroscience research. We must admit that this "topological center" is highly likely not a fixed anatomical region, but a dynamic, functional "network hub." The resolution of current neuroimaging technologies may not yet be sufficient to irrefutably prove or disprove this global dynamic topology. Its final verification heavily relies on revolutionary breakthroughs in future neuroimaging and analysis technologies.

○**Hypothesis Three (Epiphany-Phase Transition Hypothesis):** This theory predicts that "routine learning" and "epiphany" are two entirely different events in brain dynamics. "Routine learning" corresponds to smooth adjustments in the connection weights of existing neural networks, whereas "epiphany" must correspond to a drastic, global "phase transition" in the macroscopic dynamic state of the entire brain network (the old stable attractor collapses, a new attractor forms).  
**Falsifiability Assessment:** Among the four hypotheses, this is currently the most directly testable dynamic prediction. It is entirely feasible to compare the global brain network dynamics during "epiphany" moments versus "logical deduction" problem-solving moments using high-temporal-resolution brain imaging technologies (such as MEG). If a large body of experimental data shows that the brain network at the moment of "epiphany" does not undergo a qualitative "phase transition" in its global topological structure or synchrony, then the entire model of "EEA transition" in *Relatedness Theory* would have its neural basis severely empirically challenged.

○**Hypothesis Four (Subject-Centricity of Concepts Hypothesis):** This theory predicts that in any cognitive relatedness system (such as the human mind), all concepts that can be stably understood and operated upon by it (as its internal Relative Entities, RE\_Concept) must, directly or indirectly, be connected via Dependency Path (DPs) networks to that system's Central Self-Reference (CRO\_Self).  
**Theoretical Explanation:** This prediction stems from *Relatedness Theory's* fundamental understanding of "meaning." The "meaning" of a concept is not its intrinsic attribute, but lies in its connectional relationships within the entire DPs network. And CRO\_Self, as the system's ultimate "topological center" and "unity generator," is the final "referential origin" for all meanings in this network. A node completely "disconnected" from this center is, for the entire system, meaningless, un-integratable "noise," and thus cannot exist as a stable "concept."  
**Falsifiability Assessment:** As a hypothesis about neural network topology, its direct empirical falsification is extremely difficult. The core challenge lies in "irrefutably" proving that a concept's neural representation is completely informationally isolated from all networks related to the "self" (such as the default mode network, limbic system, etc.), which faces enormous technical and logical difficulties. Therefore, from a neuroscience perspective, the primary value of this hypothesis lies in providing a new, intrinsically self-consistent perspective with powerful theoretical integrative capacity on "meaning," rather than an easily operable experimental hypothesis.

1. However, despite the difficulty of direct verification at the neuroscience level, this prediction can be tested in principle through a most profound "thought experiment" that anyone can participate in. This thought experiment depends on no external instruments, only on our own language and reason.

**Thought Experiment: Finding a Concept "Unrelated to Me"**

We invite the reader to try to find or define, in any human language system, a concept that can be stably and meaningfully described, yet whose existence and definition have absolutely no direct or indirect relation to any possible experience, value, structure, history, or future of any cognitive subject ("I").

○**Argumentative Path:**

1. You might propose an extremely distant and abstract concept, for example, "an entity named 'conceptual existence' that exists in another universe and follows different physical laws."
2. However, in "your proposal," a Dependency Path (DP) is established between the existence of this RE\_Concept and your CRO\_Self.
3. This DP includes at least: "this is a concept I imagined," "it is defined as different from the physical laws I know," "it serves the purpose of my current thought experiment," "it makes me feel philosophically curious or perplexed"...
4. Even a concept defined as "the absolutely unknowable," its "unknowability" is defined relative to "our knowability."

○**Conclusion:** Any concept that can "enter" our linguistic and thought network, the very fact of its "entry" a priori and inevitably makes it a "relative node" in the vast relational network of our CRO\_Self.

○Therefore, this hypothesis ultimately transforms into a more profound, almost logical assertion: we can never find a concept completely unrelated to "I," because the very act of "searching" and "describing" has already established an indelible relation between it and "I," this referential center.

# Appendix 1: Glossary of Core Concepts in Relatedness Theory

This glossary aims to provide precise philosophical definitions for the core concepts in the paper "*Relatedness Theory: A Relational-Geometric Dynamic Architecture of Self-Consciousness*."

Part One: The Constitution of Reality: Relation and Phenomena  
The core of this part is to answer "What is the world?" It describes the "anatomical map" of a static, hierarchical relational universe.

### Fundamental Ontology

### Pure Being (PB)

○Definition: The sole, absolute ontological cornerstone of *Relatedness Theory*. It is an infinitely rich, completely undifferentiated (i.e., prior to the emergence of any specific CR), potentiality field intrinsically containing eternal random fluctuations. It is not "being" in opposition to "non-being," but the ultimate background encompassing all "possibilities."

○Annotation: Pure Being itself cannot be directly described or specified. It manifests itself through its localized dynamic forms (i.e., DPs).

### Primacy of Relations (Relations-First)

○Definition: The fundamental principle of this theory, positing that "relation" is ontologically prior to "entity." The "existence" of a "thing," in the most fundamental sense, is the unique position of a "relational node" it occupies within a universal web of relations.

### Substance-First

○Definition: The traditional ontological presupposition that this theory critiques and aims to subvert. It assumes that the substrate of the universe is some kind of "thing" (substance) possessing intrinsic attributes, with "relation" being secondary.

### The Reality of Relations

### Primordial Vector (PV)

○Definition: A topologically stable "singularity" or "node" spontaneously formed from the "relational gradient field" of Pure Being (PB). It is the most fundamental distinguishable unit of Pure Being's potentiality.

○Core Characteristics:

■Inherent Necessary Propensity (INP): Defines the unique "gradient field topological structure" by which it is formed, constituting its most fundamental "relational propensity" or "interaction preference."

■Bidirectional Potential Infinite Extensibility: Its potential range of relatedness and influence, in principle, permeates the entire background of Pure Being.

### Dependency Path (DP)

○Definition: Within the infinite dynamic potentiality field of Pure Being (PB), a localized "dynamic event" or "Relational Form" possessing specific directionality and information transmission characteristics. It is "relation itself" that has been activated.

○Ontological Status: The dynamic network woven from innumerable DPs via BSO constitutes "Relational Reality," the most fundamental "fabric of reality" of the cosmos. DPs are ontologically prior to any "entities (REs)."

### The Generation of Phenomena

### Commonality Reference (CR)

○Definition: A "higher-order relational pattern" that embodies specific "commonality rules," emerging spontaneously and capable of stable existence through the dynamic screening of BSO. It is a "dynamic island" possessing a "self-sustaining topology."

○Core Function: To serve as a "referential framework" and "dynamic boundary condition" for the "Relational Reality" within its sphere of influence. Its emergence marks the cosmos's transition from chaos to order.

### Projection

○Definition: A hierarchical "dynamic pattern stabilization" process. Its essence is a strategy of "layered dimensional reduction" and "dynamic resource optimization" spontaneously adopted by a Cognitive Relatedness System (RS\_Cognition) via BSO when facing an EEP crisis of "information processing" with an infinitely complex, eternally fluxing DPs flow.

○Mechanism: It operates by a higher-order CRO "projecting" the "slow variables" in the DPs flow to "stabilize the background"; then, under the reference of the stable background, a more specialized SRO "projects" the "repeatability of dynamic patterns" in the DPs flow to "stabilize the foreground."

### Relative Entity (RE)

○Definition: A "relational pattern" "relatively isolated" from the underlying DPs network under the reference and "projection" (dynamic pattern stabilization) of a CR, possessing an identifiable "identity" and transient stability at the phenomenal level.

○Core Principle: 【No Intrinsic Attributes】. All specifications of an RE are entirely endowed by the DPs network in which it is embedded and the hierarchical CRs that define it.

### Identifiability Threshold (IT)

○Definition: A dynamic attribute inherent in any finite CR. It is a standard for "existential adjudication." Only when the "stability and clarity" (signal strength) of a "candidate pattern" can continuously and stably remain above that CR's IT—this "average level of background noise and random perturbations"—can it be finally "locked in" as a stably existing RE.

### The Topology of Systems

### Relatedness System (RS)

○Definition: A dynamic, open region of "Relational Reality" with a holistic identity and relative boundaries, defined by its unique, dominant Central Referential Organizer (CRO) and evolving under the drive of BSO and EEP.

### Central Commonality Reference (CRO)

○Definition: The highest-order CR that defines the "existence basis," "core identity," and "supreme organizational principle" of an entire RS.

### Relatedness Level (RL)

○Definition: A "subdomain of existence" within an RS, differentiated to handle a specific type of "affair" or relation, possessing a specialized operational mode.

### Specific Commonality Reference (SRO)

○Definition: The specific CR that defines and organizes its corresponding RL. Its "commonality rules" must be compatible with the higher-order CRO.

### Encompassing/Inclusive Commonality Reference (ARO)

○Definition: A higher-order reference system that logically or factually contains the focal RS we are analyzing, providing it with a broader operational background, constraint conditions, or shared meaning space.

Part Two: The Dynamics of Existence: Contradiction and Evolution  
The core of this part is to answer "Why and how does the world change?" It injects the dimension of time and the tension of life into the "static anatomical map" of Part One.

### Primal Dynamics

### Global Bidirectional Self-Organization (BSO)

○Definition: The most universal, fundamental organizing principle of the cosmos, originating from the intrinsic characteristics of PVs.

### Commonality Self-Activation Mechanism (CSAM)

○Definition: A "phase transition" dynamic of BSO during the structural origin phase, responsible for "condensing" the first CR.

### The Engine of Evolution

### Existence-Evolution Paradox (EEP)

○Definition: The fundamental intrinsic contradiction that necessarily exists in any finite RS, driving its evolution. It is the eternal conflict between the system's intrinsic "transformative propensity (v)" and its "persistence propensity (T\_CR)," operating under the constraint of a finite "existence-bearing capacity (C\_max)."

### Maintenance Cost (h(T))

○Definition: The generalized "computational/organizational resources" that the system must continuously expend to maintain its persistence propensity (T\_CR).

### Existence-Bearing Capacity (C\_max)

○Definition: The overall limit of an RS's capacity, determined by its CR structure, to process internal and external "relational tensions."

### The Trajectory of Evolution

### 1.Existence-Evolution Axis (EEA)

○Definition: The non-linear historical trajectory recording a series of fundamental "displacements" necessarily experienced by an RS's core CR (its "existence basis") due to EEP intensification. Its structure is composed of alternating "plateau phases" and "transition nodes."

Part Three: The Architecture of Consciousness: Topology and Experience  
The core of this part is to answer "How are mind and experience possible?" It focuses on "cognition" as a special RS, revealing its unique topological structure and phenomenological consequences.

### The Dynamic Preconditions for Consciousness

### 1.Dynamic Incompatibility / Cognitive Civil War

○Definition: The system-level "reality version conflict" that necessarily arises within RS\_Cognition between multiple, rule-incompatible cognitive SROs (e.g., perception vs. logic). This is the direct EEP crisis that drives the emergence of CRO\_Self.

### The Topology of Consciousness

### Core Self-Reference (CRO\_Self)

○Definition: The highest-order topological center that emerges as a topological solution to resolve the "cognitive civil war." Its core rule is to "project a narrative Relative Entity (RE\_Narrative) capable of encompassing underlying conflicts."

### Informational Closure

○Definition: The recursive, global topological structure formed at the apex of the system when CRO\_Self emerges, where information is "captured" and undergoes "intrinsic self-reference."

### Intrinsic Self-Reference

○Definition: The direct, synchronic "grasping" by CRO\_Self, this "informational closure," of the "Existential Information" it generates about itself.

### The Phenomenology of Consciousness

### Existential Information

○Definition: Information generated within the "Informational Closure" about "the system's own integrated dynamic state as a whole." Contrasted with "Transitive Information."

### Qualia / Self-Experience

○Definition: The irreducible phenomenological "guise" of the dynamic process itself, when "Existential Information" is subjected to "intrinsic self-reference."

### Minimal Phenomenological Assumption (H\_phenomenal)

○Definition: The ultimate axiomatic boundary of this theory, hypothesizing that: "When a dynamic system, through self-organization, gives rise to an 'Informational Closure' and thereby becomes capable of generating 'Existential Information,' that 'generative' process itself possesses an irreducible phenomenological dimension."

### The Operation & Expression of Consciousness

1.**Free Will / Sense of Freedom**

○Definition: Deconstructed as a "non-value-based dynamic competition of multiple CRs" and a "phenomenological label of a posteriori narrative construction."

(End of Glossary)

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