

Rethinking Relation in a Generative Relational Framework

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Abstract

This paper refines the concept of relation within a Generative Relational framework. It develops three coupled registers of reality—ontological, relational, and manifestational—and assigns each a distinct analytical role. Objects are identified through criterion-indexed distinguishability, while relations are specified through couplings that render states, trajectories, or generative conditions dynamically non-independent. Relational reality is characterized by emergence, sufficient persistence, and causal efficacy at a selected scale. Manifestation concerns indexed availability to experiential, epistemic, observational, or symbolic systems, while symbolic structures may mediate relational reality prior to subject-relative manifestation. The framework thereby supports a relational account of contingency that can precede aesthetic recognition and separates distinguishability from comparability and metric commensurability. Interaction is treated as localized dynamic participation capable of revising persistent couplings, and register-relative equivalence allows manifestational similarity to coexist with relational or ontological difference. A comparison with Lacanian registers clarifies transversal mediation across distinct register architectures. The resulting account provides a foundation for analyses of trust, institutions, power, artificial intelligence, political interaction, and aesthetic judgment.

Keywords: relation; relational reality; coupling; manifestation; Generative Relational framework

Discussion Paper Note

This paper is a foundational and exploratory inquiry into the meaning of *relation* within a Generative Relational framework. It develops a more precise vocabulary for several concepts that have previously been used across the broader research programme, including object, distinguishability, relational reality, manifestation, interaction, coupling, contingency, and commensurability. The paper is therefore primarily clarificatory and constructive. It does not seek to reduce heterogeneous philosophical, mathematical, physical, social, or political uses of relation to a single substantive model.

A central motivation is the observation that the ordinary language of relation can conceal several different structures. A relation may refer to an observed interaction, a persistent institutional position, a historical dependence, a causal constraint, a symbolic classification, an affective orientation, a physical coupling, or a more abstract condition of dynamic non-independence. The present inquiry asks which minimal commitments are required if these cases are to be discussed within one framework without assuming that they share a single metric, ontology, or empirical realization.

The paper provisionally treats distinguishability as a minimal condition for objects of relational analysis. Distinguishability is indexed to a relevant register, criterion, or structure. Objects may therefore be distinguishable in one register and equivalent in another. This formulation is intended to avoid premature commitment to a thick ontology of independently constituted entities. The objects entering a relation may themselves be emergent, historically formed, or relationally individuated.

Three mutually coupled registers organize the inquiry: ontological reality, relational reality, and manifestational reality. These registers are neither a hierarchy nor a temporal sequence. Ontological reality is relative to the ontology provisionally adopted for a given inquiry. Relational reality concerns objects that emerge within generative relational systems, exhibit sufficient persistence over a relevant spatiotemporal scale, and exercise continuing causal efficacy within those systems. Manifestational reality concerns the ways in which objects, differences, structures, or effects become present to an epistemic, experiential, or interpretive system.

A major claim explored in the paper is that relational reality need not depend upon prior manifestation. A relation can already organize possible trajectories, constraints, expectations, or causal pathways before a particular subject perceives, recognizes, or symbolically articulates it. This point is especially important for the treatment of contingency. A contingent structure can belong to relational reality through its historical and generative organization even when its contingency has not yet become salient to a subject. Perception and aesthetic judgment may subsequently disclose such contingency without creating it in the first instance.

The distinction between manifestation and symbolic mediation requires special care. A relational reality may be generated or stabilized through symbolic structures while remaining unmanifested to a particular subject. Conversely, manifestation may occur affectively, perceptually, or practically before a clear symbolic articulation is available. The paper therefore avoids treating “pre-manifestational” as equivalent to “pre-symbolic.” This distinction also motivates a comparison with Lacanian registers. The comparison is intended to clarify differences in principles of partition rather than to assert a direct correspondence among ontological reality and the Real, relational reality and the Imaginary, or manifestational reality and the Symbolic.

Relation is further examined through the abstract language of coupling. The term *field* is used cautiously and does not imply that social or symbolic relations are reducible to physical fields. Rather, the framework allows a field to denote a structured domain in which states, dispositions, constraints, or potentials vary and through which differentiated objects may affect one another’s possible trajectories. A relation can then be understood as a coupling through which otherwise distinguishable objects or fields become dynamically non-independent. Such coupling may constrain, enable, amplify, suppress, stabilize, destabilize, or redirect possible evolution without uniquely determining an outcome.

Interaction occupies a more specific position. It is treated as a localized dynamical event or process within an already relational domain, while also remaining capable of modifying the relations that condition it. This permits a recursive structure in which relations shape interactions and interactions update relations. The distinction is especially relevant for later political and institutional analysis, where role relations, trust,

accountability, power, and symbolic classifications can persist beyond any single observable interaction.

The paper also separates distinguishability from comparability and metric commensurability. Two relationally real objects may be distinguishable while lacking a justified common order or metric. Comparisons become legitimate only when an additional comparison structure, mapping, or projection can be specified and defended. This restriction is intended to preserve heterogeneity among relational domains and to prevent formal convenience from being mistaken for substantive equivalence.

Formal expressions in the paper are schematic unless explicitly stated otherwise. They provide compact representations of conceptual relations rather than a completed mathematical theory. Terms such as coupling, field, dynamics, state, trajectory, and causal efficacy are used to sharpen theoretical questions while leaving open the mathematical structures appropriate to particular empirical domains. Stronger formalization, empirical operationalization, and domain-specific validation remain later research tasks.

The paper's broader purpose is to establish a foundation for subsequent work. Trust, institutions, political relations, power, artificial intelligence, aesthetic judgment, historical contingency, and social classification all raise questions whose treatment depends upon a sufficiently clear account of relation itself. The present paper therefore narrows its task deliberately: it asks what kinds of distinctions and dynamics a Generative Relational framework must recognize before those substantive inquiries can be developed with adequate conceptual resolution.

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Notices

Status. This working draft develops a foundational account of relation within an ongoing Generative Relational research programme. The terminology, formal notation, scope conditions, and relations to adjacent philosophical traditions remain open to revision. The paper does not present a complete ontology, a finished social theory, or a universal mathematical formalization of relation.

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Statement on the use of language models. The exploratory discussions and preparation of this paper involved OpenAI's ChatGPT. ChatGPT supported exploratory dialogue, conceptual reconstruction, argumentative criticism, organization, and drafting in L^AT_EX. The author selected the research questions, developed and approved the theoretical commitments, and bears sole responsibility for the manuscript, including its definitions, distinctions, examples, formal constructions, arguments, conclusions, and errors. Authorship credit remains with the human author.

1 Introduction

Relation is frequently invoked before it is defined. Social actors stand in relations of trust, authority, dependence, obligation, exchange, recognition, and conflict. Institutions relate offices, rules, practices, resources, and participants. Physical and computational models describe couplings among states, variables, fields, and agents. Philosophical accounts of relationality question whether apparently independent objects can be treated as primary or whether their identities, capacities, and meanings depend partly upon wider structures. Across these uses, however, the word *relation* can designate substantially different things. It may refer to an observed interaction, a causal dependence, a structural position, a historical connection, a symbolic classification, a similarity relation, or a condition under which the possible trajectory of one object is altered by another. Process-oriented and relational traditions have developed related challenges to substance-centered explanation across philosophy and sociology, although they differ substantially in ontology, method, and scope [37, 16, 4].

A Generative Relational framework places particular pressure on this ambiguity. The framework begins from the possibility that entities, meanings, values, roles, and other relatively stable objects can emerge through historically extended relational processes. This emphasis on temporality and individuation intersects with processual approaches that treat entities and boundaries as historically constituted analytical achievements [1, 35]. Such a commitment cannot leave relation as an undefined primitive without creating a circular difficulty. If entities can be generated relationally, relation cannot simply be defined as an interaction between already completed entities. Yet if relation is expanded so broadly that any conceivable association counts, the concept loses analytical force. The problem is therefore to identify a sufficiently minimal account of relation that permits emergent objects while retaining distinctions among relation, interaction, manifestation, comparison, and causal contribution.

This paper develops that account through four connected moves. First, it treats *distinguishability* as a minimal condition for objects of relational analysis. An object need not be an ontologically fundamental substance. It need only be differentiable, under a specified register or criterion, from another object or from a relevant background. Second, it distinguishes three mutually coupled registers of reality: ontological, relational, and manifestational. These registers are neither stages nor levels of decreasing reality. They mark different questions concerning what an inquiry takes to exist, what emerges and persists with causal efficacy within a relational system, and what becomes present to an epistemic or experiential system.

Third, the paper characterizes relation through *coupling*. The proposal is abstract. A coupling exists when distinguishable objects or fields become dynamically non-independent such that the state, trajectory, or generative conditions of one participate in shaping the possible evolution of another. This participation need not uniquely determine an outcome. It can instead constrain, enable, amplify, suppress, stabilize, destabilize, or redirect a space of possible trajectories. The vocabulary of coupling is therefore used as a general dynamical language rather than as a claim that heterogeneous social, symbolic, biological, and physical relations share one mathematical form.

Fourth, the paper separates relation from its possible manifestations. A relationally real structure can emerge, persist, and exercise causal efficacy without already having been perceived by a particular subject. The distinction is especially consequential for contingency. A contingent configuration can already belong to the relational organization of a history before a subject recognizes the event as contingent, experiences its salience, or judges it beautiful, meaningful, or worthy of inquiry. Manifestation may disclose a relational difference without constituting that difference in the first instance. At the same time, manifestation can feed back into relational reality and alter subsequent dynamics. The resulting architecture is therefore recursive rather than sequential.

The same consideration complicates any simple separation between relational reality and symbolic structure. A relation can be mediated, constituted, or stabilized through names, categories, rules, legal statuses, narratives, and other symbolic forms before the relevant structure becomes manifest to a given subject. Pre-manifestational relational reality is consequently not equivalent to pre-symbolic reality. This point matters both for social theory and for the comparison with Lacanian registers developed later in the paper. The ontological, relational, and manifestational registers proposed here should not be mapped

directly onto the Real, Imaginary, and Symbolic. The two frameworks partition their objects according to different theoretical problems, and symbolic mediation can traverse more than one Generative Relational register.

A further consequence concerns comparison. Distinguishability is weaker than comparability, and comparability is weaker than metric commensurability. Two objects can be distinguishable as relational realities even when no justified common metric places them within a single distance space. Comparison therefore requires an additional structure: a mapping, ordering, projection, invariant, or other defensible basis on which the selected aspects of heterogeneous objects can be related. This restriction becomes important when a framework ranges across perceptual, institutional, symbolic, technological, and physical domains. A shared abstract vocabulary of relation should not silently erase the heterogeneity of the objects to which it is applied. Philosophical work on incomparability and world-version plurality likewise shows why a common vocabulary does not automatically supply a common ordering or metric [13, 21].

These distinctions also reposition *interaction*. Interaction is not required as the primitive condition of relation. A legal status, institutional role, historical dependence, trust relation, or shared structural constraint may continue to organize possible action when no discrete interaction is currently occurring. Interaction can instead be treated as a temporally situated realization of relational coupling that may also transform the relations conditioning it. Schematically, a relational structure at time t can condition a set of interactions, while those interactions contribute to the relational structure available at a later time. This recursive relation creates a bridge between highly abstract relational analysis and the more local analysis of practices, institutional roles, accountability, and political conduct.

The paper remains foundational in scope. It does not offer a complete ontology, a universal metric of relation, or a finished formal dynamics. Its claims are more limited. A Generative Relational framework benefits from distinguishing objects by register-relative criteria, treating relation through dynamic coupling rather than observed interaction alone, specifying relational reality through emergence, sufficient persistence, and causal efficacy, and preserving the conceptual independence of relational reality from prior manifestation. The framework also benefits from explicit limits on comparison across heterogeneous relational domains.

The structure of the argument follows these tasks. Section 2 introduces object distinguishability. Section 3 defines the three coupled registers. Sections 4 and 5 develop relational coupling and its causal content. Section 6 specifies the conditions of relational reality. Sections 7 and 8 separate relational reality from prior manifestation while retaining symbolic mediation. Section 9 locates interaction within the wider relational architecture. The subsequent sections examine incommensurability, contingency, aesthetic manifestation, register-relative equivalence, the comparison with Lacanian registers, and the implications for political relations. The final sections state theoretical limits and consolidate the framework's principal distinctions.

2 Object Distinguishability

This section establishes the minimal account of an object required for the subsequent analysis of relation. Its role is conceptual and preparatory. The section specifies how an inquiry can distinguish objects while leaving the framework open among competing accounts of self-contained substance, introduces criterion-indexed identity and difference, and clarifies how several distinction criteria can apply to the same candidate object. The discussion proceeds from an analytical notion of object to indexed distinguishability, equivalence structure, distinction profiles, and relational eligibility. This order keeps the object concept sufficiently weak for later use across ontological, relational, and manifestational registers while preserving enough structure for a precise account of coupling.

2.1 Analytical Objects

Generative Relational analysis requires terms that can enter descriptions of coupling, persistence, transformation, and causal contribution. The term *object* serves this analytical function. Its use leaves commitments to substance ontology, atomism, and a fixed inventory of entities open for domain-specific argument. An

object may be material, institutional, symbolic, computational, affective, historical, or emergent, provided that an inquiry can identify a defensible basis on which the object is distinguished from relevant alternatives. This deliberately weak object concept is compatible with accounts that emphasize individuation, multi-level organization, and scale-sensitive decomposition [35, 38].

Definition 2.1 (Analytical object). An *analytical object* is a candidate unit of inquiry for which at least one specified criterion supports a stable distinction from relevant alternatives over the scope of the analysis.

The definition assigns objecthood relative to an inquiry and its stated criteria. Stability in this context concerns the reliability of the distinction within the analytical scope. The requirement applies at the selected scale, context, and historical interval of the analysis. A political office can remain distinguishable during an institutional analysis while its legal powers evolve. A software agent can remain distinguishable during an interaction while its internal state changes. A social category can remain distinguishable within a historical archive while its meaning and boundaries undergo substantial transformation.

This analytical use of *object* also permits objects to be internally structured. A state, institution, person, market, model, or religious figure may contain heterogeneous components and relations while remaining identifiable for a given inquiry. Objecthood therefore marks a level of analytical resolution while remaining compatible with substantial internal complexity.

Remark 2.2 (Resolution dependence). Object boundaries depend partly on the resolution and purpose of an inquiry. A unit treated as one object at one scale may be decomposed into several objects at another scale, while several local objects may be treated as one organized object at a broader scale. The relevant distinction criterion should therefore be stated at the scale at which subsequent relational claims are made.

2.2 Indexed Distinguishability

The phrase *distinguishable up to something* identifies the central form of object distinction used in this paper. The phrase indicates that sameness and difference are indexed to a criterion, structure, register, transformation, or observational resolution. Let Λ denote such an index. The notation $x \sim_{\Lambda} y$ states that x and y are equivalent under Λ , while $x \not\sim_{\Lambda} y$ states that the same pair is distinguishable under that index. The notation records the basis of distinction directly and keeps identity claims tied to their analytical conditions.

Definition 2.3 (Indexed distinguishability). Two candidate objects are *distinguishable under Λ* when the criterion indexed by Λ assigns them different analytical identities within the relevant scope. They are *equivalent under Λ* when the criterion assigns them the same analytical identity within that scope.

Indexed distinguishability permits several legitimate descriptions of the same pair of candidates. Two objects can share a classification under one criterion and differ under another. A pair of institutional roles can be equivalent under a salary classification and distinct under authority. Two computational agents can be equivalent under a selected behavioral test and distinct under training history, ownership, architecture, or resource dependence. Each statement gains its meaning from the index that organizes the comparison.

The indexing requirement also constrains claims of identity. A statement such as “these objects are the same” remains incomplete until the relevant basis of sameness is recoverable from the surrounding analysis. Generative Relational analysis therefore treats identity as structured by explicit conditions of resolution and comparison. This discipline becomes especially important when one inquiry moves among physical, institutional, symbolic, experiential, and historical descriptions.

2.3 Equivalence Structure

Some distinction criteria support an equivalence relation over a domain of candidates. In such cases, $\sim_{\Lambda}$ can organize candidates into classes whose members are treated as equivalent for a specified analytical purpose. The resulting class functions as an object type at that resolution. A change of criterion may alter the partition and thereby alter which candidates are treated as one analytical kind. Related debates in

structural realism illustrate how identity and objecthood can depend on the structural relations selected as theoretically significant [27].

Definition 2.4 (Criterion-relative identity). *Criterion-relative identity* is the identity assigned to candidates by a specified equivalence structure $\sim_\Lambda$ over the domain relevant to an inquiry.

Criterion-relative identity provides a formal interpretation of the expression “up to Λ .” In geometry, algebra, computation, law, and social classification, an analytical object is often identified through invariance under a selected transformation or rule. The present framework adopts this structural idea at a general level while leaving the substantive content of Λ to domain-specific inquiry.

The equivalence structure also separates object identification from exhaustive description. Identifying an object under Λ requires only the features relevant to that criterion. Features outside the criterion can continue to vary and can become relevant under another index. This permits analytical precision while keeping features outside the selected criterion available for later description.

Remark 2.5 (Partial criteria). Several useful criteria provide only partial classifications, graded similarities, or context-sensitive distinctions. The notation $\sim_\Lambda$ is most appropriate when an equivalence structure is available. Broader forms of distinguishability can be represented through a criterion-specific comparison rule while preserving the same indexing principle. Later sections therefore rely on indexed distinction more generally than on a universal equivalence relation.

2.4 Distinction Profiles

Complex objects frequently participate in several distinction structures at once. A single scalar measure would collapse these structures prematurely. A *distinction profile* records the set of criteria under which a candidate pair is equivalent, distinguishable, or unresolved. The profile preserves heterogeneity among criteria and prepares the later analysis of the three reality registers.

Definition 2.6 (Distinction profile). A *distinction profile* for a candidate pair records the outcomes of the specified distinction criteria relevant to an inquiry. The profile may contain categorical, structural, ordered, graded, or unresolved components according to the forms of comparison justified in each domain.

A distinction profile is therefore a structured record whose function differs from a distance measure. Several criteria may lack a shared metric or even a shared ordering. The profile can still identify where difference occurs and where the available inquiry leaves identity unresolved. This separation between distinction and measurement will be developed in Section 10.

The same structure also prepares register-relative analysis. An object pair may later prove equivalent within one reality register and distinguishable within another. The distinction profile can preserve both statements while allowing each register to retain its own criterion of distinction. Section 3 introduces the ontological, relational, and manifestational registers that make this possibility explicit.

2.5 Relational Eligibility

The object concept developed above supplies the entry condition for relational analysis. Relational claims require candidate terms whose distinction is specified at the scale and under the criteria relevant to the claim. The terms can be emergent, historically formed, internally complex, or dependent on other relations. Their eligibility rests on analytical distinguishability. Questions of metaphysical independence belong to the ontological account adopted for the relevant inquiry.

Proposition 2.7 (Relational eligibility). *A candidate object is eligible to enter a Generative Relational analysis when its distinction can be specified under at least one criterion relevant to the relation under study and maintained with sufficient stability for the scope of that analysis.*

The proposition gives distinguishability a minimal role. It supplies identifiable terms for relational analysis while leaving the character of the connecting relation open. Coupling and causal dependence constitute additional structures, developed in Sections 4 and 5.

Relational eligibility also allows the objects entering a relation to change through the relation itself. Once a coupling alters capacities, boundaries, roles, or trajectories, the distinction criteria may require revision. Object identification and relational dynamics can therefore co-evolve across an extended analysis. The initial distinction provides analytical traction, while later distinctions can register transformations generated within the system.

Remark 2.8 (Analytical revision). A change in distinction criteria can represent a substantive theoretical revision in the framework. Generative processes may create new boundaries, dissolve previous classifications, or make previously marginal differences causally significant. A relational analysis should preserve the history of such revisions when they contribute to the explanation of system evolution.

Object distinguishability therefore establishes a minimal vocabulary for the remainder of the paper. Analytical objects are identified under explicit criteria, identity remains indexed to the relevant structure, and multiple criteria can coexist within a distinction profile. These commitments provide sufficiently stable terms for relational analysis while retaining openness to emergence, historical revision, and cross-scale re-description. The next section specifies the three coupled reality registers within which these forms of distinction acquire different theoretical roles.

3 Reality Registers

This section establishes the register architecture used throughout the paper. Its role is to separate three analytically distinct qualifications of reality while preserving their mutual dependence within generative relational systems. The section introduces the general meaning of a reality register, specifies the ontological, relational, and manifestational registers, and then develops their cross-register coupling and register-specific analytical discipline. The discussion proceeds at the level of conceptual architecture. Later sections develop the dynamics of relational emergence, manifestation independence, symbolic mediation, interaction, and register-relative equivalence in greater detail.

3.1 Register Architecture

The register architecture provides a common coordinate system for claims about existence, relational efficacy, and appearance. Its objective is to distinguish several meanings of reality that frequently become compressed into a single vocabulary. The method is criterion-sensitive: each register specifies a different basis on which an object, difference, or structure can qualify as real for the purposes of analysis.

Definition 3.1 (Reality register). A *reality register* is an analytical domain that specifies a criterion or family of criteria under which objects, differences, and structures can be identified, distinguished, and described as real within an inquiry.

The Generative Relational framework uses three coupled registers: *ontological reality*, *relational reality*, and *manifestational reality*. The term *register* emphasizes concurrent modes of qualification. Each register can describe aspects of the same object, and each can participate in the generation or transformation of structures identified in the others. Figure 1 provides a preliminary schematic of this architecture. Temporal precedence, explanatory priority, and causal direction are therefore established at the level of particular cases.

The architecture extends the indexed distinguishability developed in Section 2. A candidate pair may be indistinguishable under one register-specific criterion and distinguishable under another. Register membership also carries a stronger analytical function than classification alone. Each register indicates which kinds of persistence, causal contribution, or manifestation are relevant to the corresponding claim of reality.

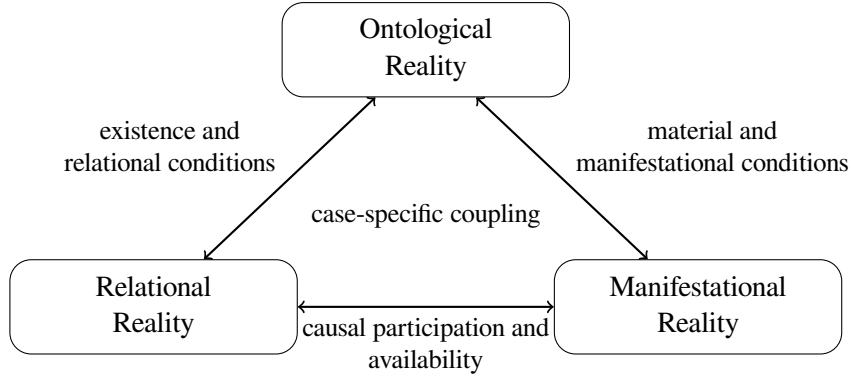


Figure 1: Preliminary diagram of the three coupled reality registers. The bidirectional arrows indicate that coupling can proceed in several directions across particular processes. The diagram therefore summarizes a coupled architecture rather than a fixed hierarchy or temporal sequence.

Remark 3.2 (Register plurality). A single object may receive valid descriptions in all three registers. The resulting descriptions can differ in resolution, temporal scale, causal role, and evidential basis. Register plurality therefore preserves heterogeneous accounts within one analytical framework while requiring each account to state its own criterion of qualification.

3.2 Ontological Reality

This subsection specifies the register in which an inquiry states its working commitments concerning existence. Its objective is to make ontological claims explicit while preserving the framework’s compatibility with several possible ontological positions. The discussion treats ontology as a declared analytical commitment whose content depends on the domain and purpose of inquiry.

Definition 3.3 (Ontological reality). *Ontological reality* concerns what an adopted ontology treats as existing and the structures through which that ontology individuates states, events, processes, objects, or other basic units.

Ontological distinguishability is therefore ontology-relative. A physicalist analysis may distinguish candidates through spacetime position, field configuration, material composition, or dynamical state. A process-oriented analysis may privilege events, transformations, or temporally extended processes. Other ontological commitments can supply different individuation conditions. The register architecture permits these alternatives to be stated explicitly before their consequences are carried into relational analysis. Process philosophy and structural realism provide two influential examples of ontological programmes in which relations, processes, or structures receive a central theoretical role [37, 27].

This treatment assigns ontological reality a precise structural role. It provides one basis on which candidate objects and differences can be specified, while the Generative Relational framework remains open to revision of the underlying ontology. Ontological claims can consequently be strengthened, weakened, or reformulated without requiring the entire relational framework to adopt a single permanent inventory of fundamental entities.

Remark 3.4 (Ontological commitment). Ontological commitment enters the framework through an inquiry’s declared account of existence and individuation. Claims made in the ontological register therefore inherit the scope, assumptions, and limits of that account. This explicit indexing becomes important when the same phenomenon is later examined through relational persistence or manifestational appearance.

3.3 Relational Reality

This subsection specifies the register that carries the central theoretical commitment of the paper. Its role is to identify emergent objects whose reality is grounded in their organization within a generative

relational system. The objective is to state the qualifying criteria at an architectural level while reserving their dynamical development for Section 6.

Definition 3.5 (Relational reality). A *relational reality* is an object that emerges within a generative relational system, persists with sufficient stability over a relevant region or interval of spacetime, and exerts causal efficacy upon that system during the scope of analysis.

The definition gives relational reality three linked qualifications: emergence, sufficient persistence, and causal efficacy. Emergence concerns the formation of an object through relational organization. Persistence concerns the maintenance of enough continuity for the object to participate in further system evolution. Causal efficacy concerns the object's contribution to the states, trajectories, constraints, affordances, or transformations of the system in which it participates.

Relational reality is therefore scale-sensitive and system-relative. A trust relation can be stable over a sequence of interactions while remaining mutable across a longer history. An institutional office can organize expectations, permissions, and actions across many persons even as officeholders change. A currency, deity, social category, or experienced continuity of self can acquire persistent causal roles through different generative mechanisms. Their common qualification lies in the combination of relational emergence, sufficient persistence, and causal efficacy within the relevant system. Social ontology and critical-realist work provide established precedents for treating institutions, classifications, and organized social structures as causally consequential while preserving distinctions among their modes of existence [34, 22, 15].

The register also accommodates symbolic participation in relational formation. Legal classifications, names, narratives, accounting conventions, and other symbolic structures can contribute to the generation or stabilization of a relational reality. Their participation concerns mediation within the relational system. Section 8 develops this point and its relation to manifestation.

Remark 3.6 (System dependence). The status of a relational reality is assessed within a specified generative relational system and at a specified analytical scale. A structure can possess strong causal efficacy within one relational domain and weak relevance within another. The system boundary and scale therefore form part of the conditions under which relational reality is evaluated.

3.4 Manifestational Reality

This subsection specifies the register of appearance, availability, and recognition. Its role is to distinguish the reality of an object's manifestation from the ontological and relational conditions that may participate in producing it. The objective is to provide a broad account of manifestation that can include perceptual, affective, observational, conceptual, and symbolic forms while preserving their internal differences.

Definition 3.7 (Manifestational reality). *Manifestational reality* concerns the form in which an object, difference, event, or structure becomes present or available within an experiential, observational, interpretive, or symbolic system.

Manifestation can occur at several levels of articulation. A difference may appear through affective salience before receiving a stable concept. A pattern may become observationally available before an explanatory theory is formed. A social distinction may become conceptually recognized and later receive a legal or institutional name. These forms belong to the manifestational register because the relevant structure has entered a domain in which it can guide experience, recognition, interpretation, or communication. Work on symbolic and constructed social worlds similarly emphasizes that modes of description, recognition, and institutional representation can organize experience while remaining analytically distinguishable from the entities and relations they mediate [8, 21].

Manifestational reality therefore includes more than explicit symbolic articulation. Perception, felt difference, attention, recognition, conceptual classification, and symbolization can represent distinct manifestational modes. Their differentiation becomes important when a relational reality already participates in system dynamics while its explicit recognition remains partial or delayed. Section 7 develops that temporal and epistemic separation.

A perceptual episode provides a useful illustration. A flower seen during illness can possess a fully determinate manifestational reality for the experiencing subject: it can occupy attention, organize perception, and guide response. An ordinary physically instantiated flower may produce a similar manifestational form through a different ontological and relational history. The register architecture permits these cases to be described at the level of manifestation while leaving their ontological and relational profiles open for separate analysis. Section 10 returns to this example when discussing comparison across heterogeneous relational realities.

3.5 Register Coupling

This subsection establishes the connective structure of the three-register architecture. Its role is to specify how ontological, relational, and manifestational realities can participate in one another's generation and transformation. The discussion uses causal and generative dependence as the primary method, with temporal order determined by the process under study.

Definition 3.8 (Register coupling). *Register coupling* is a causally or generatively significant dependence through which structures qualified in one reality register contribute to the formation, persistence, transformation, or manifestation of structures qualified in another register.

Ontological conditions can shape the space of relational possibilities. Material location, bodily capacities, technological infrastructure, and physical constraints can affect which relations can form and how long they can persist. Relational organization can in turn condition manifestation by directing attention, establishing categories, structuring expectations, and distributing access to objects or information. Manifestations can reshape relational reality through interpretation, communication, institutionalization, coordinated action, and revised classification.

Coupling can also connect manifestation with ontological transformation. A symbolically articulated engineering design can coordinate actions that alter a material environment. A perceived environmental condition can initiate collective interventions that modify physical arrangements. Such processes show why register coupling carries causal content beyond a descriptive mapping among three vocabularies.

The architecture therefore treats the three registers as a coupled system whose local directionality varies across processes. A historical analysis may trace a relational structure that precedes its recognition by a particular subject. A technological analysis may trace manifestational representations that guide material intervention. A political analysis may follow repeated feedback among institutional relations, public classifications, and embodied action. The register framework supplies a stable vocabulary for these heterogeneous causal orders.

Proposition 3.9 (Coupled register principle). *Claims concerning ontological, relational, and manifestational reality should be evaluated under their register-specific criteria and connected through explicitly stated coupling mechanisms when one register is used to explain change in another.*

The proposition places a methodological constraint on cross-register argument. A manifestational difference can motivate investigation of a relational or ontological difference, while the stronger cross-register claim requires an account of the coupling that connects the relevant structures. The same discipline applies when relational persistence is used to explain recurrent forms of manifestation or when ontological conditions are used to explain relational constraints.

3.6 Register Profiles

This subsection integrates the three-register architecture with the distinction profiles introduced in Section 2. Its role is to provide a compact method for tracking how one candidate object, or one pair of candidate objects, is qualified across the three registers. The objective is to preserve register-specific differences while preparing later analyses of cross-register equivalence and incommensurability.

Definition 3.10 (Register profile). *A register profile* records the ontological, relational, and manifestational qualifications relevant to an object or candidate pair under the criteria adopted for an inquiry.

A register profile can record several kinds of relation among the three descriptions. Two candidates may share a manifestational classification while having distinct relational histories and causal embeddings. Two relational objects may occupy similar institutional roles while differing in their ontological implementation. A single relational reality may support several manifestational forms across communities, historical periods, or observational systems.

These possibilities give equivalence a register-relative meaning. Equivalence under one register leaves the status under the other registers open for separate determination. Section 13 develops this principle in detail, including cases in which behavioral or manifestational similarity coexists with relational difference.

Register profiles also preserve unresolved status. An inquiry may establish a manifestational distinction while lacking sufficient evidence for an ontological judgment. Another inquiry may identify a stable relational object while its internal ontological realization remains contested. Recording that asymmetry supports theoretical precision and avoids premature collapse among registers.

3.7 Register-Specific Analysis

This subsection consolidates the methodological consequences of the register architecture. Its role is to specify the analytical discipline required when reality claims move among ontological, relational, and manifestational domains. The discussion organizes this discipline around explicit qualification, coupling analysis, and historical revision.

First, a claim of reality should identify the register under which its criterion is being applied. Statements concerning physical existence, relational causal efficacy, and experienced appearance answer different analytical questions even when they concern the same candidate object. Register specification makes those questions recoverable from the argument.

Second, cross-register explanation should identify the coupling mechanism that connects the relevant structures. Symbolic classification can stabilize a relational object; relational organization can shape recurrent perception; an embodied intervention can alter material conditions. Each explanation gains clarity when the coupling is treated as part of the account rather than as an implicit transition between vocabularies.

Third, register descriptions should remain historically revisable. Generative processes can alter object boundaries, causal roles, symbolic classifications, and modes of manifestation. A register profile at one historical moment can therefore differ substantially from a later profile while preserving a traceable history of transformation.

The three-register architecture provides the conceptual environment in which the paper's account of relation can now be developed. Ontological reality specifies working commitments concerning existence, relational reality identifies emergent and causally efficacious organization, and manifestational reality specifies forms of experiential, observational, interpretive, and symbolic availability. Their mutual coupling permits causal influence and feedback across registers while preserving register-specific criteria. Section 4 uses this architecture to define relation more precisely through coupling among distinguishable objects or fields.

4 Relational Coupling

This section supplies the paper's operative account of relation. Its structural role is to connect the minimal object concept developed in Section 2 and the three-register architecture developed in Section 3 with the causal analysis of Section 5. The section defines relation through coupling among distinguishable analytical objects or fields, specifies the domain in which a coupling is evaluated, distinguishes several directional and higher-order configurations, and identifies the spatial, temporal, and organizational scales that delimit a relational claim. The discussion uses a domain-general dynamical vocabulary. This vocabulary provides analytical structure while leaving the mathematical form of particular physical, social, institutional, symbolic, or technological relations open to domain-specific work.

4.1 Coupling Domain

This subsection establishes the domain within which a relational claim acquires meaning. Its role is to connect criterion-indexed distinguishability with a specified arena of possible dependence. The discussion identifies the participants, variables, background conditions, and resolution required for a coupling to be analytically stated.

A relational claim always presupposes a domain in which its candidate objects can affect the space of admissible states or trajectories. The domain can be physical, biological, institutional, economic, symbolic, technological, or a combination of several such structures. It can also contain fields whose variation is distributed across space, time, population, or organizational position. The term *field* is used here in this broad analytical sense: a structured domain in which states, dispositions, constraints, potentials, or other relevant quantities vary. Particular applications may adopt the more specific meaning of field supplied by their own disciplinary theories. Systems, cybernetic, and relational approaches provide precedents for analyzing domains through patterned dependence, feedback, and mutual conditioning while assigning different formal meanings to those terms [6, 28, 4].

Definition 4.1 (Coupling domain). A *coupling domain* is the specified analytical domain within which two or more distinguishable objects, fields, or configurations can contribute to one another's admissible states, trajectories, or generative conditions under a chosen resolution and time scale.

The coupling domain carries information that an abstract statement such as “*A* is related to *B*” leaves unspecified. It indicates which features of *A* and *B* are analytically active, which background structures are held stable for the inquiry, and which temporal and spatial interval gives the relation its support. A legal relation between two officeholders, for example, can be evaluated through role assignments, jurisdiction, authority, and institutional procedures. A material coupling between two physical systems can be evaluated through variables selected by the corresponding physical theory. The same pair of analytical objects can therefore participate in several relations under different coupling domains.

A coupling domain also preserves the resolution dependence developed in Section 2. An object distinguished at one resolution can become part of a larger aggregate at another. Conversely, an aggregate can be decomposed into components whose internal couplings become relevant to a finer-grained inquiry. Relational specification therefore begins with an explicit statement of analytical resolution before claims concerning strength, direction, persistence, or causal efficacy are introduced.

Remark 4.2 (Domain plurality). One pair of analytical objects can participate in several coupling domains at the same historical moment. A person and an institution can be coupled through legal status, economic dependence, symbolic classification, information flow, and material access. These couplings can overlap while retaining distinct variables, time scales, and mechanisms.

4.2 Dynamic Dependence

This subsection provides the minimal dynamical content of relation. Its role is to distinguish a generative-relational coupling from a purely descriptive association. The objective is to identify the dependence through which one object or field enters the state space, trajectory space, or generative conditions of another while reserving the detailed forms of causal influence for Section 5.

Definition 4.3 (Relational coupling). A *relational coupling* is a structured dynamic dependence among distinguishable analytical objects or fields through which the admissible states, trajectories, or generative conditions of one or more participants vary with the state or configuration of other participants within a specified coupling domain.

This definition places relation at the level of dynamical dependence. The relevant dependence can concern a current state, a transition probability, a constraint on accessible states, a disposition, a threshold, a rule of updating, or the generative conditions under which later objects and relations can emerge. The definition therefore accommodates deterministic and probabilistic systems, continuous and discrete dynamics, as well as historical systems whose transition structure changes through time.

The term *structured* carries an important analytical role. A coupling is specified through a pattern that can be identified across a relevant interval or class of cases. Momentary co-occurrence can provide evidence for further investigation, while a relational claim requires an account of the dependence through which one configuration enters the possible evolution of another. The appropriate account can take the form of a physical mechanism, an institutional rule, an informational channel, a historical dependence, a symbolic classification, or another domain-specific process.

Dynamic dependence also extends beyond immediate state change. A relation can modify the space of possible trajectories while the currently observed state remains unchanged. An institutional permission can enlarge an actor's feasible action set before the permission is exercised. A prohibition can narrow that set throughout a period of compliance. A trust relation can alter the range of information an actor is prepared to disclose before any disclosure event takes place. These cases place relational coupling in the organization of possibility as well as in realized transitions. Structuration theory likewise emphasizes recursively organized relations between practices and structures, although the present coupling concept is intended to remain more domain-general [18].

Proposition 4.4 (Dynamic dependence principle). *A relational claim within the Generative Relational framework requires a specified dependence through which the configuration of a participant, field, or higher-order structure contributes to the admissible evolution of another participant or of the coupled system.*

The proposition supplies a minimal discipline for relational explanation. Observed similarity, temporal proximity, or shared classification can motivate a relational hypothesis. The stronger claim of coupling is supported by an account of how the relevant configurations enter the transition structure or generative conditions of the system under study.

4.3 Coupling Directionality

This subsection specifies the directional structure of relational coupling. Its role is to separate relation from an assumption of reciprocal influence and to prepare the causal distinctions developed in Section 5. The discussion distinguishes directed, reciprocal, and mediated configurations while retaining a common coupling vocabulary.

A coupling can be directed. In such a case, the state or configuration of A contributes to the admissible evolution of B under the selected domain and resolution. The corresponding analytical notation can record this direction as $C_{A \rightarrow B}$. Directionality concerns the dependence under analysis and therefore varies with the selected variables and time scale. A legal rule can shape an actor's available actions, while the actor's conduct may influence the later interpretation or revision of that rule through a separate coupling.

Reciprocal coupling combines directional dependencies within a shared process. The pair $C_{A \rightarrow B}$ and $C_{B \rightarrow A}$ can differ in strength, latency, mechanism, and persistence. Reciprocity therefore describes a configuration of directional couplings whose influences can differ in strength, latency, mechanism, and persistence. This distinction is particularly important in relations structured by authority, dependency, expertise, ownership, or asymmetric access to resources.

Mediated coupling introduces an intermediate object, field, or institutional structure. The influence of A on B can proceed through a mediator M , with M transforming the channel through which the dependence is realized. A classification system, technological platform, market, legal institution, or shared symbolic order can occupy this mediating position. The mediator can carry its own dynamics and can therefore reshape the coupling during the period under study.

Directionality can also be distributed across a relational configuration. Several objects can jointly condition the trajectory of one object, and one object can simultaneously participate in several outgoing couplings. A relational system therefore admits directed structures considerably richer than a single bilateral link. Section 9 later examines how localized interactions occur within such pre-existing and evolving configurations.

Remark 4.5 (Asymmetric structure). Asymmetry is a structural property of many couplings. Its analytical relevance lies in the distribution of influence, constraint, dependence, and access across participants. Nor-

mative evaluation of such asymmetry requires additional criteria supplied by the relevant political, ethical, or institutional theory.

4.4 Coupling Order

This subsection extends the account beyond dyadic relation. Its role is to represent relational structures whose generative content depends on several participants or fields together. The objective is to preserve higher-order organization that would be lost if every relation were decomposed into a set of independent pairwise links.

Dyadic coupling is analytically useful when the dependence between two participants carries the relevant explanatory structure. Many systems, however, contain configurations in which a third object or a wider field changes what a pairwise relation can mean or do. A contractual relation between two parties can depend on a legal institution that defines enforceability. A political interaction between two officeholders can depend on a constitutional structure that assigns their roles. A market exchange can depend on monetary, legal, and infrastructural arrangements that jointly sustain the transaction.

Definition 4.6 (Coupling order). *Coupling order* specifies the number and organization of analytically indispensable participants or fields whose joint configuration contributes to the dependence under study.

Higher-order coupling can therefore be represented by a dependence involving a configuration such as $C(A, B, M)$ when the joint organization of A , B , and M carries explanatory content beyond separate pairwise descriptions. The notation is schematic, leaving the mathematical formalism to domain-specific analysis. Hypergraphs, multilayer networks, field models, stochastic processes, dynamical systems, category-theoretic constructions, or qualitative historical analysis may each provide suitable representations in different applications.

The higher-order perspective is especially important for the Generative Relational framework because objects and relations can co-emerge within a shared generative domain. The institutional identities of two actors, for example, can depend on a wider organizational structure that also determines the range of interactions available to them. Treating the wider structure as an analytically active participant preserves the generative conditions through which the dyadic relation acquires its specific form.

Higher-order coupling also permits a relation to involve heterogeneous participants. A human actor, an algorithmic system, a legal category, and a material infrastructure can participate in one coupled process while occupying different reality-register profiles. Their participation depends on the specified coupling domain and generative role, while comparison among their internal structures remains a separate analytical task developed in Section 10.

4.5 Coupling Scale

This subsection identifies the scales that delimit a relational claim. Its role is to connect coupling with the spatial, temporal, organizational, and historical resolutions under which dynamic dependence is observed. The discussion prepares later analysis of persistence and relational emergence by showing how one coupling can change character across scales.

Relational coupling always has a scale of support. Spatial support can range from local bodily contact to distributed infrastructures and planetary systems. Temporal support can range from rapid interaction to institutional arrangements that persist across generations. Organizational support can range from interpersonal relations to nested institutions, markets, states, and transnational systems. Historical support can include inherited classifications, path-dependent rules, accumulated trust, and other structures whose present causal relevance depends on earlier trajectories.

Scale changes the analytical object. A sequence of localized interactions can appear as a stable relational pattern at a longer temporal resolution. A broad institutional relation can decompose into heterogeneous local practices at a finer organizational resolution. A coupling that appears weak in one interval can accumulate through repeated exposure and become decisive over a longer horizon. Relational analysis

therefore records the scale under which the coupling is identified and treats changes of scale as transformations of the analytical description.

The relation between scale and persistence becomes especially important for relational reality. Section 6 develops the conditions under which an organization of couplings acquires sufficient stability and causal efficacy to qualify as a relationally real object. The present section supplies the prior requirement: persistence is evaluated relative to a stated temporal and organizational scale.

Remark 4.7 (Scale dependence). The same generative process can support several relational descriptions across scales. These descriptions can be jointly informative when their coupling mechanisms and aggregation rules are stated explicitly.

4.6 Relational Specification

This subsection consolidates the analytical requirements introduced throughout the section. Its role is methodological: it provides a compact specification for stating a relation in a form that can later support causal analysis, emergence analysis, and empirical or interpretive investigation. The specification is organized around participants, domain, dependence, directionality, order, and scale.

A relational specification first identifies the distinguishable analytical objects or fields that participate in the inquiry. It then states the coupling domain and the variables, dispositions, constraints, or generative conditions through which dynamic dependence is expressed. Directionality records the orientation of dependence; coupling order records the higher-order structures required for the account; scale records the spatial, temporal, organizational, and historical support of the relation. Register profiles can be added when the analysis depends on distinctions among ontological, relational, and manifestational qualifications.

Definition 4.8 (Relational specification). A *relational specification* is an explicit account of the participants, coupling domain, dynamic dependence, directionality, coupling order, and scale that jointly identify the relation under investigation.

This specification supports comparison among theories and cases because it makes the object of relational analysis recoverable from the argument. Two accounts can use the same term—for example, trust, dependence, power, or institutional relation—while referring to different coupling domains, participants, or scales. Relational specification reveals those differences before stronger claims concerning persistence, causal efficacy, normative status, or equivalence are evaluated.

The specification also preserves the openness of the Generative Relational framework to multiple formal and qualitative methods. A dynamical model can represent coupling through transition functions or changing parameters. A historical study can reconstruct coupling through sequences of institutional change and inherited constraints. An interpretive analysis can examine symbolic or conceptual mediation when those structures contribute to the generative conditions of action. Each method can satisfy the relational specification by making its domain, participants, and dependence explicit.

Relational coupling therefore provides the paper's basic account of relation: distinguishable objects or fields participate in a structured dynamic dependence within a specified domain and scale. Directionality, mediation, higher-order organization, and scale refine the form of that dependence. This definition supplies the conceptual basis for Section 5, which examines the causal content through which couplings constrain, enable, amplify, stabilize, destabilize, and otherwise transform possible trajectories.

5 Causal Dynamics

This section specifies the causal content carried by relational coupling. Its structural role is to develop the dynamic implications of the coupling concept introduced in Section 4 and to prepare the criteria for relational emergence developed in Section 6. The section identifies several forms through which a coupling contributes to system evolution: partial determination, constraint, enablement, amplification, attenuation, stabilization, destabilization, and path transformation. The discussion proceeds through a trajectory-centered

method. Each causal form is characterized by the change it produces in admissible states, transition structures, or generative conditions across a specified coupling domain and scale.

5.1 Causal Contribution

This subsection establishes the minimal causal content of relational coupling. Its role is to specify the sense in which one coupled configuration enters the evolution of another configuration or of the coupled system. The objective is to formulate a domain-general criterion that remains compatible with deterministic, probabilistic, historical, institutional, and symbolic forms of dynamics.

A relational coupling acquires causal significance when variation in a coupled configuration contributes to variation in admissible states, transition structures, or generative conditions under the domain and scale specified for the inquiry. The relevant contribution can operate through direct state change, through modification of transition probabilities, through alteration of a constraint set, through changes in thresholds or sensitivities, or through the formation of conditions under which later relations become possible. Causal analysis therefore concerns the organization of evolution as well as realized movement between observed states.

Definition 5.1 (Causal contribution). *A causal contribution is a coupling-mediated contribution through which the configuration of an analytical object, field, or higher-order relational structure changes the admissible evolution of another participant or of the coupled system within a specified domain, scale, and interval.*

The definition treats causal contribution as scale-indexed and domain-indexed. A coupling can carry substantial causal significance at one organizational level and limited significance at another. A contractual classification can strongly shape an individual's institutional options while producing little observable change in the short-term physical state of the individual. A weak local interaction can accumulate through repetition and become causally important at a longer temporal scale. The identification of causal contribution therefore requires the same analytical discipline applied to coupling in Section 4: domain, resolution, interval, and active variables are stated before strength or consequence is assessed. Interventionist and emergentist accounts of causation provide distinct reference points for relating causal claims to contrasts, organization, and level-sensitive mechanisms [39, 15]. Multi-level philosophy of science further cautions that decomposition and causal attribution can change with the organization and resolution selected for inquiry [38].

Causal contribution also provides the link between relational structure and relational reality. A coupling that repeatedly contributes to system evolution can participate in a persistent organization whose effects extend beyond a single interaction. Section 6 develops the conditions under which such an organization qualifies as a relationally real object.

Proposition 5.2 (Causal relevance). *A coupling is causally relevant to a selected trajectory when variation in the coupled configuration changes the trajectory's admissible development under the specified analytical domain and scale.*

This proposition supplies a practical criterion for analysis. The relevant change can concern realized transitions, the range of accessible states, the relative accessibility of several paths, the persistence of an existing state, or the generative conditions of later structures. The criterion therefore supports causal reasoning across heterogeneous domains while allowing each domain to provide its own evidential and methodological standards.

5.2 Partial Determination

This subsection clarifies the degree of determination carried by a relation. Its role is to separate causal contribution from a requirement of exhaustive control over system evolution. The objective is to preserve a strong account of causal efficacy while accommodating open, stochastic, multi-causal, and historically evolving systems.

Most relational systems contain several simultaneously active couplings. Material conditions, institutional rules, symbolic classifications, learned dispositions, historical inheritances, and current interactions can jointly shape an evolving trajectory. A single relation can therefore contribute only part of the effective dynamics. The contribution can be decisive in one region of state space, secondary in another, and latent until a threshold is crossed.

Definition 5.3 (Partial determination). *Partial determination* is the contribution of a coupling to the structure of possible evolution while additional relations, background conditions, and contingent events retain causal relevance to the resulting trajectory.

Partial determination is especially important for generative analysis because the future configuration of a system can contain objects and couplings that are absent from the current analytical description. A present relation can alter the conditions under which these later structures emerge while leaving their specific realization open to further historical development. Causal efficacy therefore includes contributions to possibility formation as well as contributions to already specified transitions.

The distinction also supports multi-scale analysis. A policy rule can strongly determine a formal eligibility condition while leaving individual behavior highly variable. A trust relation can strongly shape expectations while leaving specific decisions responsive to context. A technological standard can channel future design choices while permitting several compatible implementations. In each case, causal analysis records the structured contribution of the relation at the scale where that contribution becomes analytically visible.

Remark 5.4 (Causal plurality). Several couplings can contribute to the same transition while operating through different mechanisms and time scales. Their causal roles can be complementary, competitive, conditional, or sequential. Relational analysis therefore treats causal organization as potentially plural and historically variable.

5.3 Trajectory Constraints

This subsection examines constraint as one major form of causal contribution. Its structural role is to show how relational coupling can shape evolution by organizing the accessible region of a system's state or trajectory space. The discussion focuses on permissions, prohibitions, thresholds, dependencies, and structural conditions that regulate possible movement.

A constraint modifies the set of states or transitions available to a coupled participant. Physical boundaries, legal rules, resource dependencies, organizational hierarchies, technical protocols, and established conventions can all carry this function under appropriate domains of analysis. The causal effect can remain present during intervals in which the constrained transition is never attempted. Its efficacy lies in the structure of accessible possibility.

Definition 5.5 (Relational constraint). A *relational constraint* is a coupling-mediated condition that narrows, orders, thresholds, or otherwise structures the admissible trajectories of a participant or coupled system.

Constraint can operate through several modes. A hard boundary excludes a class of transitions under the selected model. A soft constraint changes relative costs or probabilities. A threshold allows a transition after specified conditions accumulate. A dependency links one participant's feasible actions to resources, permissions, information, or responses controlled elsewhere in the relational system. These modes can coexist within the same relational configuration.

Constraint also carries a temporal dimension. Past relations can remain active through inherited institutions, durable infrastructures, accumulated debt, classification systems, and learned expectations. The current trajectory can therefore remain conditioned by couplings whose formative interactions occurred at an earlier historical moment. This persistence becomes central to the analysis of relational emergence in Section 6.

Remark 5.6 (Latent constraint). A constraint can remain causally active during periods of behavioral compliance. The absence of an attempted transition provides limited information about the presence or strength of the relation that structures the available trajectory space.

5.4 Enabling Dynamics

This subsection develops enablement as a complementary form of causal contribution. Its role is to identify relations that enlarge or reorganize the space of attainable trajectories. The objective is to give generative possibility a causal status comparable to restriction, persistence, and direct state change.

A coupling can make new actions, interpretations, exchanges, or institutional positions available. Access to a resource network can enable projects beyond an isolated participant's available capacity. Legal recognition can activate a set of institutional capacities. Shared language can enable coordination across participants. Trust can expand the range of information exchanged and the set of cooperative strategies considered viable. These cases illustrate causal contribution through enlarged or reorganized possibility.

Definition 5.7 (Relational enablement). *Relational enablement* is a coupling-mediated change that expands, activates, or reorganizes the set of admissible trajectories or generative conditions available to a participant or coupled system.

Enablement is central to a generative relational framework because relational value can arise through newly created possibility spaces. The causal effect of a relation can therefore precede the realization of any particular enabled trajectory. A research affiliation can create access to conversations, archives, collaborators, or conceptual resources whose eventual consequences remain open. An institutional reform can establish capacities that later actors activate under conditions unforeseen at the time of reform. Generative causal analysis records these changes in possibility structure as part of the causal content of the relation.

Enablement can also modify the capacity to form further relations. A platform, institution, or shared practice can bring previously disconnected participants into a coupling domain. The resulting relations can generate additional objects, meanings, roles, or constraints. Causal dynamics therefore include second-order effects in which a current coupling changes the system's capacity for subsequent coupling.

Proposition 5.8 (Generative enablement). *A relation has generative causal significance when its operation changes the system's capacity to form later states, objects, interactions, or couplings within the selected analytical horizon.*

5.5 Amplification Dynamics

This subsection analyzes changes in the magnitude and propagation of causal influence. Its structural role is to explain how relational configurations can amplify or attenuate disturbances across repeated interactions, networked couplings, institutional procedures, or feedback processes. The discussion focuses on evolving sensitivity across a specified relational configuration.

Amplification occurs when a coupling increases the downstream effect of a variation relative to the effect supported by the surrounding configuration at an earlier stage or under a relevant comparison condition. Attenuation reduces that downstream effect. Both processes can arise through repeated reinforcement, resource concentration, interpretive alignment, filtering, buffering, redundancy, or distributed response.

Definition 5.9 (Relational amplification). *Relational amplification* is a coupling-mediated increase in the effect of a variation on subsequent states, trajectories, or generative conditions across a specified relational configuration.

Definition 5.10 (Relational attenuation). *Relational attenuation* is a coupling-mediated decrease in the effect of a variation on subsequent states, trajectories, or generative conditions across a specified relational configuration.

Trust and distrust provide intuitive illustrations. A trusted source can receive greater interpretive weight, increasing the effect of its statements on later expectations and actions. Repeated suspicion can similarly increase sensitivity to ambiguous cues and propagate defensive responses. Institutional review, redundancy, or procedural delay can attenuate the effect of a local disturbance before it reaches the wider system. These examples concern causal organization and can later support normative analysis while remaining analytically distinct from normative evaluation itself.

Amplification and attenuation are scale-sensitive. A process that attenuates short-term volatility can amplify long-term dependency. A local buffer can protect one component while transferring pressure elsewhere. The analysis of causal dynamics therefore tracks the location, horizon, and target of the measured effect before characterizing a coupling as amplifying or attenuating.

5.6 Stability Dynamics

This subsection examines the contribution of coupling to persistence and transition. Its role is to prepare the concept of sufficient persistence used in Section 6. The objective is to distinguish causal processes that stabilize a relational configuration from those that increase its susceptibility to reorganization.

A stabilizing coupling contributes to the persistence or recurrent recovery of a configuration across relevant disturbances. Such stabilization can arise through negative feedback, mutual adjustment, institutional enforcement, resource replenishment, repeated expectation, or other domain-specific mechanisms. A destabilizing coupling increases sensitivity to perturbation, weakens recovery, expands competing trajectories, or contributes to transition into another configuration.

Definition 5.11 (Relational stabilization). *Relational stabilization* is a coupling-mediated contribution that increases the persistence, recurrence, or recovery of a relational configuration over a specified interval and scale.

Definition 5.12 (Relational destabilization). *Relational destabilization* is a coupling-mediated contribution that increases the susceptibility of a relational configuration to reorganization, transition, or loss of persistence over a specified interval and scale.

Stability in this framework is scale-relative and history-sensitive. A market, institution, trust relation, identity category, or symbolic convention can remain stable across many local interactions while its underlying couplings gradually change. Conversely, recurrent local disruption can coexist with a persistent higher-order organization. Relational analysis therefore records the object whose stability is being assessed, the interval over which recurrence is observed, and the disturbances relevant to that assessment.

The stability vocabulary also clarifies why persistence contributes to relational reality. Persistent causal organization can acquire effects that are irreducible to a single local interaction at the analytical scale of interest. Section 6 develops this transition from causal coupling to an emergent relational object.

5.7 Path Transformation

This subsection integrates the preceding causal forms through the concept of path transformation. Its structural role is to characterize relational causation as change in the organization of future trajectories across time. The objective is to connect local causal contributions with the historical and generative orientation of the broader framework.

A coupling can transform a path by changing which states remain reachable, which transitions become easier or harder, which disturbances receive amplification, which configurations gain stability, and which later relations can form. The resulting trajectory can therefore depend on the sequence through which couplings emerge, persist, and change. Historical order acquires causal relevance because earlier relations alter the conditions under which later relations operate.

Definition 5.13 (Path transformation). *Path transformation* is a coupling-mediated reorganization of the system's future trajectory structure through accumulated changes in constraint, enablement, sensitivity, stability, or generative capacity.

Path transformation provides a common language for heterogeneous causal mechanisms while preserving their domain-specific content. A physical coupling can alter a material trajectory, an institutional relation can alter a set of available actions, a symbolic classification can alter interpretation and access, and a historical trust relation can alter expectations across later interactions. Their mechanisms differ, yet each case can be examined through the contribution of coupling to the organization of possible evolution.

This trajectory-centered account also prepares the paper's later treatment of interaction. Section 9 will examine localized events through which existing couplings are enacted and transformed. The present section establishes the broader causal background: interaction occurs within a trajectory space already structured by relations, and its consequences can subsequently reorganize that space.

Proposition 5.14 (Trajectory organization). *The causal content of a relational configuration can be analyzed through its contribution to the organization of admissible trajectories across a specified domain, scale, and historical interval.*

The proposition summarizes the section's analytical method. Causal dynamics in GR concern the ways couplings participate in the evolution of possibility, transition, persistence, sensitivity, and generative capacity. This account provides the causal foundation for the next question addressed in Section 6: the conditions under which an organized pattern of such couplings acquires sufficient persistence and causal efficacy to count as relationally real.

6 Relational Emergence

This section establishes the conditions under which an organized pattern of relational coupling can be treated as a relationally real object. Its structural role is to connect the causal account developed in Section 5 with the distinction between relational and manifestational reality developed later in Section 7. The section specifies emergence, organizational coherence, scale-relative persistence, causal efficacy, individuation, and historical stabilization, and then integrates these elements into a relational-reality criterion. The discussion uses a process-oriented method: a candidate relational object is examined through the organization that supports it, the interval over which that organization remains identifiable, and the causal contribution it makes to subsequent relational dynamics.

6.1 Emergence Conditions

This subsection establishes the transition from distributed coupling to an emergent analytical object. Its role is to identify the additional structure required when a configuration of relations acquires an identifiable pattern that can itself participate in further analysis. The discussion begins with coupling configurations and then specifies the conditions under which a higher-order organization can be distinguished from the local processes that support it.

Relational coupling supplies dynamic dependence among distinguishable objects or fields. A coupled configuration can also develop an organization whose properties become identifiable at a broader analytical scale. Repeated expectations can form a trust relation, recurring institutional practices can form a role structure, and distributed exchanges can support a monetary or market relation. In each case, the relevant object is constituted through relations while also becoming available as an object of subsequent relational analysis. Simondon provides a particularly relevant philosophical precedent for treating individuals as outcomes of ongoing processes of individuation [35].

Definition 6.1 (Relational emergence). *Relational emergence* is the formation of an identifiable organization through interacting or jointly evolving couplings, where the resulting organization acquires properties, persistence, or causal capacities that are analytically attributable to the organized configuration at the selected scale.

The definition gives emergence a scale-relative meaning. The analytical object can depend continuously on lower-level processes while retaining a coherent higher-level description. A trust relation can

depend on memory, expectation, communication, institutional context, and repeated conduct while still functioning as a distinguishable relational object in later interactions. Similarly, an institutional role can depend on rules, documents, practices, and recognition while entering later causal explanations as a structured position within an organization. Contemporary discussions of emergence likewise distinguish several forms of higher-level organization and causal contribution [7, 15, 38].

Emergence therefore concerns a change in analytical organization. The relevant question is whether a distributed coupling configuration supports a pattern that can be identified, tracked, and causally assessed over the scale selected for inquiry. This formulation preserves the domain-specific mechanisms of the underlying system while allowing relational analysis to examine structures whose effects become visible at broader scales.

Remark 6.2 (Scale-relative emergence). An emergent relational object is indexed to an analytical scale, resolution, and historical interval. A pattern that functions as a coherent object at one scale can be decomposed into several interacting processes at a finer scale and can participate as one component of a broader configuration at a coarser scale.

6.2 Organizational Coherence

This subsection specifies the internal organization required for an emergent relational object to remain identifiable across local variation. Its structural role is to distinguish a relational organization from a transient collection of couplings. The discussion examines recurrence, mutual support, role structure, and coordinated variation as possible sources of coherence.

Organizational coherence concerns the pattern through which multiple couplings jointly sustain an identifiable configuration. Coherence can arise through feedback, repeated coordination, institutional rules, shared classifications, material dependencies, symbolic practices, or combinations of these mechanisms. The relevant organization can tolerate local change while preserving a recognizable pattern at the selected scale.

Definition 6.3 (Relational organization). A *relational organization* is a structured configuration of couplings whose coordinated operation supports an identifiable pattern across a specified domain, resolution, and historical interval.

The definition allows several forms of internal organization. Some relational objects exhibit relatively stable roles among participants. Others exhibit recurrent distributions, shared expectations, networked dependencies, or persistent patterns of access and constraint. The organization can therefore be topological, institutional, symbolic, material, informational, affective, or multi-domain. Its analytical identity depends on the structure relevant to the inquiry.

Coherence also supports recursive relational analysis. Once a configuration is identified as a relational organization, the organization can enter additional couplings. A trust relation can shape later disclosure, an institutional classification can shape access to resources, and a market convention can shape subsequent exchange. The emergent organization thereby becomes a participant in the generative conditions of later relations.

Proposition 6.4 (Recursive participation). *An emergent relational organization can enter later coupling domains as an analytical object when its organized configuration contributes to the states, trajectories, or generative conditions of other participants at the selected scale.*

Recursive participation gives relational emergence a generative consequence. Relations can generate objects that subsequently modify the relational system through which they arose. This recursive capacity links relational emergence to the broader Generative Relational commitment that entities, meanings, values, roles, and other relatively stable structures can arise through relational processes and later contribute to further relational evolution.

6.3 Persistence Scale

This subsection develops persistence as a temporal condition of relational reality. Its structural role is to specify the duration and recurrence required for an emergent organization to remain analytically identifiable across local change. The discussion treats persistence as scale-relative and connects it to the stability dynamics developed in Section 5.6.

Persistence refers to continued identifiability across a relevant interval. A relational object can undergo internal change while retaining the organization that supports its analytical identity. Trust can strengthen or weaken, institutional authority can be transferred among officeholders, and a symbolic classification can change in application while preserving a recognizable relational structure across the period under study.

Definition 6.5 (Sufficient persistence). *Sufficient persistence* is the continued identifiability or recurrent reconstitution of an emergent relational organization across the temporal and organizational scale required by the analytical task.

The term *sufficient* makes persistence relative to the explanatory purpose. A short-lived configuration can be sufficiently persistent for the analysis of a rapid interaction, while a theory of institutional order can require persistence across years or generations. The relevant threshold is therefore supplied by the temporal scale of the phenomenon and the causal claims attached to the relational object.

Persistence can take several forms. Continuous persistence maintains an organization through ongoing coupling. Recurrent persistence restores a recognizable configuration after local interruption. Inherited persistence carries an organization through material infrastructures, legal rules, archives, practices, expectations, or other historical supports. These forms can combine within the same relational object.

Remark 6.6 (Persistence profile). The persistence of a relational object can be represented through several features, including duration, recurrence, recovery after disturbance, transfer across participants, and continuity of causal role. Domain-specific analysis can select the features appropriate to the object under study.

Scale-relative persistence also prevents permanence from becoming a condition of reality. Relational objects can emerge, transform, and dissolve. Their reality concerns the interval in which the organization remains sufficiently stable to support identifiable causal participation. Historical change is therefore compatible with relational objecthood and can become part of the object's own developmental account.

6.4 Causal Efficacy

This subsection specifies the causal condition of relational reality. Its structural role is to connect emergent organization and persistence with the trajectory-centered account of causation developed in Section 5. The objective is to determine whether the candidate relational object contributes to subsequent states, possibilities, constraints, sensitivities, or generative conditions at the scale where the object is identified.

An emergent configuration becomes causally efficacious when its organized presence changes the trajectory structure of the relational system. The contribution can operate through constraint, enablement, amplification, attenuation, stabilization, destabilization, or path transformation. The causal role can also concern the formation of later relations and objects. A relational object therefore acquires causal significance through the organized effects that accompany its continued participation in the system.

Definition 6.7 (Relational causal efficacy). *Relational causal efficacy* is the capacity of an emergent relational organization to contribute, at a specified scale and historical interval, to the states, admissible trajectories, or generative conditions of the relational system in which it participates.

Causal efficacy is evaluated at the same analytical scale at which the relational object is individuated. A higher-order organization can have a causal role through the coordination it provides across lower-level processes. For example, institutional authority can organize permissions and obligations across many local interactions, while a trust relation can organize expectations and disclosure across repeated encounters. The

analysis tracks the contribution of the organized pattern while remaining compatible with detailed accounts of its underlying mechanisms.

The criterion also supports counterfactual and comparative inquiry where such methods are appropriate to the domain. Researchers can examine how trajectory structure changes across variation in the strength, presence, configuration, or historical support of the candidate relational object. The specific method of causal assessment remains domain-sensitive and can include mechanistic, historical, statistical, experimental, interpretive, or formal approaches.

Proposition 6.8 (Emergent causal participation). *A relational organization supports a higher-order causal description when its identified configuration contributes to subsequent relational dynamics in a way that remains stable enough for the selected analytical scale and purpose.*

This proposition connects causal efficacy with persistence. A momentary pattern can influence a local event, while a relationally real object requires an organization whose causal participation remains identifiable across the relevant interval. Persistence and efficacy therefore operate together in the assessment of relational reality.

6.5 Relational Individuation

This subsection develops the individuation of emergent relational objects. Its structural role is to specify how an organization receives analytical boundaries, identity conditions, and continuity criteria within a broader field of couplings. The discussion treats individuation as register-relative and scale-relative, consistent with the account of distinguishability developed in Section 2.

Relational individuation begins when an organized configuration can be reliably distinguished from alternative configurations under a specified set of criteria. The relevant boundaries can be material, institutional, functional, historical, symbolic, topological, or mixed. Their selection depends on the object and the explanatory task. A relational object's identity therefore arises through a structured profile of distinctions and continuities, with intrinsic self-containment left outside the minimal individuation criteria.

Definition 6.9 (Relational individuation). *Relational individuation* is the specification of an emergent relational organization as a distinguishable analytical object through criteria of boundary, continuity, and causal participation appropriate to a selected register, scale, and historical interval.

Individuation can remain porous. Institutions overlap, identities participate in several social fields, trust relations extend through intermediaries, and symbolic structures travel across communities. Porosity can therefore form part of the object's relational profile. The analytical task is to identify the boundaries that matter for the causal and historical question under study.

The concept also supports nested relational objects. A person can participate in a household, the household in a legal and economic structure, and that structure in broader institutional and political configurations. Each level can support distinguishable relational objects under its own scale and criteria. Nested individuation allows analysis to move across levels while preserving the specific causal and historical organization of each object.

Remark 6.10 (Boundary plurality). A relational object can carry several valid boundaries across different analytical tasks. Legal, economic, affective, technological, and symbolic boundaries can select overlapping configurations while supporting distinct questions about the same historical system.

6.6 Historical Stabilization

This subsection situates relational emergence within historical development. Its structural role is to explain how repeated coupling, inherited structures, and accumulated path transformations support the persistence and causal capacity of relational objects. The discussion emphasizes historical support as part of the object's generative conditions.

Relational organizations develop through histories of coupling. Repeated interactions can reinforce expectations, rules can sediment into institutional practice, classifications can become embedded in documents and infrastructures, and resource distributions can stabilize patterns of dependence. These processes accumulate support for an emergent object and can alter the costs, probabilities, meanings, or possibilities associated with later trajectories.

Historical stabilization also permits the supporting mechanisms of a relational object to change across time. A convention can begin through local coordination and later gain legal support. An institutional role can shift from personal authority to codified procedure. A social category can move across informal practice, administrative classification, and technological encoding. The relational object's continuity can therefore coexist with transformation in the mechanisms that sustain it.

Definition 6.11 (Historical stabilization). *Historical stabilization* is the accumulation and reorganization of relational supports through which an emergent organization preserves or reconstitutes sufficient persistence and causal efficacy across a specified historical interval.

Historical stabilization gives relational reality a developmental character. The present structure of a relational object can carry traces of prior couplings and can inherit asymmetries, capacities, constraints, and symbolic forms generated earlier in its history. Later analysis can therefore examine both the current causal organization and the historical processes through which that organization became durable.

Remark 6.12 (Historical plurality). Several histories can contribute to the same relational object. Material, institutional, symbolic, technological, ecological, and interpersonal histories can converge within one configuration while retaining distinct mechanisms and time scales.

6.7 Relational Reality Criterion

This subsection integrates the preceding concepts into the paper's working criterion for relational reality. Its structural role is to provide a compact analytical test that can guide later discussions of manifestation, symbolic mediation, interaction, incommensurability, and contingency. The criterion is presented as a scale-sensitive research device whose application requires domain-specific evidence.

Definition 6.13 (Relational reality). A *relationally real object* is an emergent and individuated relational organization that exhibits sufficient persistence across a specified domain and historical interval and that exercises causal efficacy within the relational system in which it participates.

This definition combines four analytical tasks. Emergence identifies the organized configuration produced through coupling. Individuation specifies the object under a selected register and scale. Sufficient persistence establishes continuity or recurrent reconstitution across the interval relevant to the inquiry. Causal efficacy establishes the object's contribution to subsequent states, trajectories, or generative conditions.

The criterion also preserves the recursive character of GR. A relationally real object can become a participant in later couplings, can contribute to the formation of further relational objects, and can itself transform through those relations. Relational reality therefore concerns organized causal participation within an evolving system whose emergent structures remain historically open to transformation.

Proposition 6.14 (Relational reality criterion). *A candidate relational object warrants treatment as relationally real when its emergent organization can be individuated at the selected scale, remains sufficiently persistent across the relevant historical interval, and contributes causally to subsequent relational dynamics or generative conditions.*

The criterion establishes the ontological and dynamical work assigned to the relational register in this paper. The next section examines a separate issue: the relation between relational reality and manifestation to an epistemic or experiential system. That distinction permits the analysis of relational objects whose emergence, persistence, and causal efficacy precede their later perception, recognition, or articulation.

7 Manifestation Independence

This section establishes the independence of relational reality from prior manifestation to a particular experiential, observational, interpretive, or symbolic system. Its structural role is to separate the criterion of relational reality developed in Section 6 from the conditions through which a relational object becomes available to an epistemic system. The section specifies constitutive separation, manifestation indexing, access modes, recognition structure, temporal lag, and the resulting independence criterion. The discussion proceeds by comparing the conditions used to qualify a relationally real object with the conditions used to qualify an episode or mode of manifestation, while preserving the mutual coupling among the three reality registers established in Section 3.

7.1 Constitutive Separation

This subsection establishes the conceptual separation between relational qualification and manifestational availability. Its role is to identify the criteria governing each assessment and to prevent epistemic access from becoming part of the constitutive threshold for relational reality. The discussion compares the relational-reality criterion with the manifestation criterion introduced in Section 3.4.

A relationally real object qualifies through emergent organization, sufficient persistence, individuation, and causal efficacy within a specified generative relational system. Manifestation concerns the availability of an object, difference, event, or structure within an experiential, observational, interpretive, or symbolic system. These criteria answer distinct analytical questions. Relational qualification concerns the object's organized causal participation in a system. Manifestational qualification concerns the form and conditions under which that object or its effects become available to an epistemic system. The separation between structures that exist and act independently of a particular observation and the epistemic conditions through which they become known has an important precedent in critical realism [9].

Definition 7.1 (Constitutive separation). *Constitutive separation* is the analytical distinction between the conditions that qualify an object as relationally real and the conditions that qualify that object, its difference, or its effects as manifest within an epistemic or experiential system.

Constitutive separation permits a relational object to satisfy the criterion in Section 6.7 while remaining unavailable to a selected subject or observational system. A classification can already shape access to resources before the classified person encounters the category. A trust relation can organize disclosure and interpretation before participants form an explicit concept of the relation. A historically stabilized convention can guide conduct through inherited practices while its organizing structure remains only partially articulated.

The distinction also supports later feedback from manifestation into relational organization. Once a relational object becomes perceptible, conceptually recognized, or symbolically articulated, that manifestation can alter conduct, coordination, classification, and institutional response. Manifestational availability therefore acquires causal significance through register coupling while retaining a distinct qualification criterion.

Proposition 7.2 (Relational qualification). *The relational status of a candidate object is determined by its emergent organization, sufficient persistence, individuation, and causal efficacy within the selected generative relational system; manifestation to a specified subject or epistemic system is assessed under a separate register-specific criterion.*

7.2 Manifestation Indexing

This subsection specifies the indexing required for claims about manifestation. Its structural role is to identify the subject, system, time, and mode relative to which manifestational availability is assessed. The objective is to replace an undifferentiated language of appearance with a criterion-sensitive account that can represent partial, local, delayed, and heterogeneous access.

Manifestation is indexed to an epistemic or experiential system. The relevant system can be a human subject, a collective interpretive practice, an institutional procedure, an observational instrument, or another organized system capable of registering differences under the criteria selected for the inquiry. The same relational object can therefore possess distinct manifestational profiles across subjects, institutions, technologies, and historical periods.

Temporal indexing is equally important. A relational object can become available to one system at one time and to another system at a later time. A bureaucratic classification may be visible to an administrative database while remaining outside the awareness of the person affected by it. An institutional pattern may be familiar to participants through practice before researchers develop a concept that makes the pattern analytically explicit. Manifestation claims therefore require a specified locus and interval of availability.

Mode indexing identifies the form through which availability occurs. Perceptual salience, affective orientation, behavioral sensitivity, observational detection, conceptual recognition, and symbolic articulation can each make a structure available in different ways. Their evidential standards and causal consequences can differ substantially even when they concern the same relational object.

Definition 7.3 (Manifestation index). A *manifestation index* specifies the epistemic or experiential system, historical interval, and mode of availability under which a claim of manifestation is evaluated.

Manifestation indexing makes the independence thesis precise. A claim concerning a relational object's manifestational availability always requires an index: manifestation to whom or to which system, during which interval, and through which mode. The relational object's causal participation can continue across these varying manifestational conditions.

7.3 Access Modes

This subsection differentiates the principal forms through which a relational object or its effects can become available. Its structural role is to clarify the internal heterogeneity of the manifestational register and to support later analysis of symbolic mediation in Section 8. The discussion treats access modes as partially overlapping forms whose order and combination depend on the generative process under study.

Perceptual access concerns sensory or quasi-sensory availability. Affective access concerns salience, attraction, aversion, unease, familiarity, or other orientations through which a difference acquires practical significance. Behavioral access concerns systematic responsiveness to a structure through conduct, even when explicit conceptual recognition remains limited. Observational access concerns registration through instruments, records, indicators, or organized procedures. Conceptual access concerns the formation of distinctions capable of supporting explicit interpretation. Symbolic access concerns articulation through names, signs, categories, narratives, rules, or other symbolic forms.

These modes can coexist and can emerge in several sequences. A person can respond behaviorally to an institutional relation before developing an explicit concept of it. A community can carry a symbolic distinction through inherited practice while individual participants possess different levels of conceptual or affective access. An instrument can register a pattern before a community of inquiry agrees on its interpretation. Manifestation therefore has a structured plurality that resists reduction to conscious perception alone.

Remark 7.4 (Access plurality). A relational object can acquire several simultaneous manifestation modes across several epistemic systems. The resulting manifestational profile can change through learning, institutionalization, technological mediation, collective interpretation, and historical transformation.

The plurality of access modes also clarifies the role of symbolization. Symbolic articulation represents one powerful mode of manifestation and can reshape the relational system through classification, communication, memory, and coordination. Section 8 examines the additional case in which symbolic structures participate in the generation or stabilization of relational reality before a selected subject acquires explicit manifestational access to that reality.

7.4 Recognition Structure

This subsection locates recognition within the broader architecture of manifestation. Its structural role is to distinguish the availability of a relational structure from the stronger capacity to identify, classify, or interpret that structure under a relatively stable concept. The objective is to preserve intermediate cases in which causal sensitivity or felt difference is present while explicit recognition remains developing.

Recognition organizes manifestational content through distinctions that can be identified again across separate episodes. A person may experience recurring unease in a particular institutional setting and later recognize a persistent power relation. A researcher may observe repeated covariation and later identify a stable relational mechanism. A community may inherit differentiated practices and later articulate the distinctions that organize them. In each case, recognition adds a recurrent interpretive structure to prior or concurrent manifestational access.

Definition 7.5 (Relational recognition). *Relational recognition* is the manifestational organization through which an epistemic system identifies a relational object, pattern, or difference with sufficient continuity to support reidentification, interpretation, or communication across episodes.

Recognition can therefore intensify the causal consequences of manifestation. Once a relation becomes recognizable, participants can name it, contest it, coordinate around it, redesign practices, or construct institutions that alter its future trajectory. Recognition can also stabilize an existing relation by standardizing expectations and classifications. These consequences illustrate the recursive coupling between manifestational and relational reality.

Recognition remains indexed to a system and historical interval. Several subjects can recognize different aspects of the same relational object, and collective recognition can develop through distributed contributions across several perspectives. The framework therefore treats recognition as an organized manifestational achievement whose scope and resolution require explicit specification.

7.5 Temporal Lag

This subsection develops the temporal relation between relational emergence and manifestational access. Its structural role is to explain how a relational object can participate causally in a system during an interval that precedes its later recognition by a selected epistemic system. The discussion uses historical sequencing while preserving the broader principle that register coupling can proceed in several directions.

Historical stabilization can generate a temporal lag between causal operation and explicit recognition. Institutional classifications can structure rights, access, and expectations before affected participants learn the relevant categories. Social conventions can guide conduct before their organizing rules become objects of reflection. Patterns of trust or distrust can shape interpretation before participants explicitly identify the relation that organizes those responses.

Temporal lag concerns a local sequence within a specific process. It therefore carries a narrower meaning than the architecture of the three reality registers. Ontological, relational, and manifestational reality remain mutually coupled, while a particular relational object can display relational emergence at one time and manifestational availability to a particular system at another. The sequence belongs to the history of that object-system relation.

Definition 7.6 (Manifestational lag). *Manifestational lag* is the historical interval during which a relationally real object already exercises relevant causal efficacy while the selected mode of manifestational access arises later for a specified epistemic or experiential system.

Manifestational lag provides an important basis for later analysis of contingency. A historically generated structure of alternatives, dependencies, and path formation can already organize an event's relational contingency before a subject experiences that contingency as salient or aesthetically significant. Sections 11 and 12 develop that case in detail.

7.6 Independence Criterion

This subsection integrates constitutive separation, manifestation indexing, access plurality, recognition, and temporal lag into a compact criterion. Its structural role is to state the paper's working principle of manifestation independence and to prepare the analysis of symbolic mediation in the next section. The criterion is formulated as a relation between two independently assessed register-specific qualifications.

Definition 7.7 (Manifestation independence). *Manifestation independence* is the principle that a candidate object's qualification as relationally real depends on its relational emergence, individuation, sufficient persistence, and causal efficacy within the selected generative relational system, while its manifestational status depends on its availability to a specified epistemic or experiential system under a specified mode and historical interval.

The definition permits a relational object to be causally operative while its manifestational status varies across observers, institutions, technologies, and times. It also permits later manifestation to transform the relational object through attention, interpretation, communication, classification, and action. Independence therefore concerns the criteria of qualification, while coupling concerns the causal relations that connect the registers during concrete processes.

Proposition 7.8 (Manifestation-independence principle). *Evidence for relational emergence, sufficient persistence, individuation, and causal efficacy can establish relational reality independently of evidence for perception, recognition, or symbolic articulation by a selected subject. Claims about manifestation require their own indexed evidence concerning availability within the relevant epistemic or experiential system.*

The principle provides the conceptual basis for distinguishing relational reality from perceived reality and from explicitly symbolized reality. It also creates space for relational structures whose generation already involves symbolic institutions, inherited categories, or signifying practices while a particular subject remains only partially aware of the resulting organization. Section 8 develops this distinction by examining the causal role of symbolic structures within relational generation and stabilization.

8 Symbolic Mediation

This section specifies the role of symbolic organization within the three-register architecture developed in Sections 3 and 7. Its structural role is to distinguish symbolic manifestation from symbolic mediation and to explain how symbols, categories, rules, narratives, classifications, and other organized sign structures can participate in the generation and persistence of relational reality. The section develops symbolic qualification, mediation architecture, constitutive functions, stabilization functions, transmission functions, subject-relative access, recursive mediation, and an analytical criterion for symbolic mediation. The discussion proceeds through functional distinctions: each subsection identifies a different contribution that symbolic organization can make to relational dynamics while preserving the register-specific qualification criteria established earlier in the paper.

8.1 Symbolic Qualification

This subsection establishes the analytical status of symbolic organization in the present framework. Its role is to separate the question of whether a form is symbolically articulated from the question of how that form participates in relational dynamics. The objective is to provide a criterion that can be used throughout the section while preserving the possibility that a symbolic object participates in several reality registers.

A symbolic form is an organized difference whose use depends on a system of signification, classification, convention, rule, or encoded distinction. Names, legal categories, institutional offices, numerical classifications, ritual marks, accounting entries, written rules, and machine-readable codes can all serve as symbolic forms under appropriate system-relative criteria. Their material realizations can vary while the symbolically organized distinction retains practical continuity across different tokens, media, or occasions.

Definition 8.1 (Symbolic form). A *symbolic form* is a reproducible organized distinction whose operative identity depends on a signifying, classificatory, conventional, rule-governed, or encoded structure within a specified system.

Symbolic qualification is therefore system-relative. The same physical mark can function as a symbol within one organized practice and as an uninterpreted mark within another. Symbolic identity can also persist across several material realizations when a community, institution, technical system, or other organized process treats those realizations as instances of the same encoded distinction.

The three reality registers provide separate descriptions of such cases. A symbolic form can possess an ontological realization, acquire relational reality through sufficiently persistent causal participation, and become manifest to one or more epistemic systems. These descriptions can coexist because symbolic qualification specifies a mode of organization, while the three registers specify distinct modes of reality and availability.

Remark 8.2 (Register plurality). A symbolic form can participate simultaneously in ontological, relational, and manifestational descriptions. Its analytical role in a particular argument depends on the register-specific question under examination.

8.2 Mediation Architecture

This subsection defines symbolic mediation and locates it within the broader concept of relational coupling. Its structural role is to connect symbolic organization with the causal dynamics developed in Sections 4 and 5. The discussion identifies mediation through the changes that symbolically organized distinctions make to available states, trajectories, interpretations, permissions, expectations, and coordination patterns.

Symbolic mediation occurs when a symbolic form contributes to the coupling among distinguishable objects, fields, or organized domains. A legal category can alter the actions available to an institution and a person. A monetary denomination can coordinate exchange across participants who encounter different physical tokens. An institutional title can organize authority, responsibility, and expectations across interactions. A classification stored in an administrative system can shape later decisions through procedures that reuse the encoded distinction.

Definition 8.3 (Symbolic mediation). *Symbolic mediation* is the participation of symbolically organized distinctions in the generation, constraint, enablement, stabilization, transmission, or transformation of relational couplings and their associated trajectories.

This definition places symbolic mediation within relational dynamics. The symbolic form contributes through the operations, expectations, permissions, interpretations, or transitions that depend on it. Its causal contribution can be direct, distributed across institutional procedures, or delayed through records and inherited practices. The relevant unit of analysis is therefore the mediated coupling, with the isolated sign token treated as one component of the mediating organization.

Symbolic manifestation and symbolic mediation answer different analytical questions. Symbolic manifestation concerns the availability of an articulated form to an epistemic or experiential system. Symbolic mediation concerns the causal participation of symbolically organized distinctions in a relational system. A form can manifest to one system and mediate consequences for another, which makes subject and system indexing essential.

Proposition 8.4 (Mediation distinction). *Symbolic manifestation and symbolic mediation are separately assessable. The first concerns indexed availability of symbolic form, while the second concerns its contribution to relational organization and dynamics.*

8.3 Constitutive Functions

This subsection examines cases in which symbolic organization participates in the formation of the relational object itself. Its structural role is to show that symbolic mediation can contribute at the level of

relational emergence, with effects extending beyond the later representation of an already stabilized object. The discussion focuses on classifications, roles, rules, and encoded identities whose use organizes the relations through which the object acquires persistence and causal efficacy.

Some relational realities depend partly on symbolically organized distinctions for their individuation and operation. Institutional offices are constituted through titles, rules, competencies, procedures, and recognized role boundaries. Monetary objects depend on denominations, accounting conventions, contractual categories, and institutional rules that organize exchange and obligation. Legal statuses depend on classifications whose encoded distinctions shape permissions, duties, and institutional responses. In such cases, symbolic organization participates in the relational architecture that sustains the object across time.

Constitutive symbolic mediation can operate through several linked mechanisms. A symbolic distinction can identify a role, connect that role to a rule, coordinate expectations across participants, preserve the distinction across records, and activate institutional procedures when specified conditions are met. The resulting relational object can persist through changing personnel, physical tokens, and local interactions because the symbolic organization helps reproduce the coupling pattern at a broader scale.

Definition 8.5 (Constitutive symbolic mediation). *Constitutive symbolic mediation* is symbolic participation in the formation or individuation of a relational object whose persistence and causal organization depend materially on symbolically structured distinctions.

Constitutive mediation can remain distributed across several systems. One participant may know a title, another may operate a database category, another may follow a procedural rule, and an affected person may encounter only the resulting constraint or opportunity. The relational object's constitution can therefore depend on symbolic organization even when explicit recognition is uneven across participants.

8.4 Stabilization Functions

This subsection specifies the contribution of symbolic mediation to relational persistence. Its structural role is to connect symbolic organization with the persistence and historical stabilization criteria developed in Section 6. The objective is to identify mechanisms through which symbolic forms help preserve relational organization across changes in participants, material realizations, and local contexts.

Symbolic structures can stabilize relational reality by preserving distinctions across time. Names support recurrent identification. Records preserve previous classifications and decisions. Rules coordinate conduct across separate occasions. Narratives transmit interpretive orientations. Formal categories allow institutions to reproduce similar responses across changing personnel. Encoded standards support compatibility across different technical systems. These mechanisms extend relational continuity beyond immediate memory and co-presence.

Stabilization also depends on repetition and uptake. A symbolic distinction acquires stronger relational efficacy when multiple procedures, expectations, records, and actions repeatedly depend on it. Repeated use can connect local instances into a durable pattern whose persistence exceeds the duration of any single interaction. The symbolic structure thereby participates in historical stabilization through distributed reproduction.

Remark 8.6 (Symbolic persistence). Symbolic continuity can support relational persistence across substantial changes in material token, participant identity, and local setting when the relevant distinction continues to organize coordinated responses.

Symbolic stabilization can also preserve older relational structures through later periods. An inherited classification can continue to guide decisions long after the circumstances of its creation have changed. A historical narrative can preserve an expectation structure across generations. A procedural code can carry earlier institutional distinctions into new technological systems. These cases illustrate how symbolic mediation can contribute to path dependence and historical continuity within a generative relational system.

8.5 Transmission Functions

This subsection examines the movement of relational organization across persons, institutions, media, and historical periods. Its structural role is to explain how symbolic mediation expands the spatial and temporal reach of coupling. The discussion treats transmission as the reproduction of operative distinctions through communication, records, procedures, education, technical encoding, and other organized carriers.

Relational structures often exceed the spatial range of direct interaction. Symbolic forms can transmit role expectations, obligations, classifications, permissions, prohibitions, and interpretive schemes across participants who never meet. A written rule can coordinate geographically separated offices. A record can connect a past decision to a later procedure. A classification code can link data collection, administrative review, and resource allocation across several institutions. A shared name can coordinate reference across communities that encounter different manifestations of the same relational object.

Transmission can also extend across time. Symbolic records preserve selected distinctions for later uptake, while education and ritual reproduce interpretive structures through successive participants. Technical systems can automate the reuse of classifications and thresholds. These processes permit a relational object to participate in future couplings through historically transmitted symbolic organization.

Definition 8.7 (Symbolic transmission). *Symbolic transmission* is the reproduction of an operative symbolic distinction across changes in participant, location, medium, or historical interval such that the distinction continues to contribute to relational organization.

Transmission changes the scale of relation. A distinction that begins in a local practice can become embedded in documents, standards, institutions, and technical systems, thereby acquiring wider causal reach. The resulting expansion can also transform the distinction itself because each new medium and context introduces additional relations, interpretations, and constraints.

8.6 Subject-Relative Access

This subsection clarifies the relation between symbolic mediation and manifestation to particular subjects or systems. Its structural role is to resolve the apparent tension between symbolically mediated relational reality and manifestation independence. The discussion uses the manifestation indexing framework from Section 7.2 to distinguish the location of symbolic articulation from the location of relational consequence.

A symbolically mediated relation can be fully operative for an affected subject before that subject possesses perceptual, conceptual, or symbolic access to the relevant structure. An administrative category can be encoded in an institutional database and shape eligibility before the classified person knows the category. A contractual distinction can guide institutional action before a party encounters the relevant clause. A ritual differentiation can organize collective practice while individual participants possess uneven capacities to articulate the distinction conceptually.

These cases contain manifestation at some locus because the symbolic form is encoded, interpreted, or operationalized within an organized system. The key independence claim is indexed to the subject or system whose access is under analysis. Symbolic mediation can therefore precede manifestation to the affected subject while the same symbolic structure is already manifest within an institution, record system, technical process, or another participant's interpretive practice.

Proposition 8.8 (Indexed symbolic mediation). *A relational reality can be symbolically mediated before it becomes manifest to a specified subject when the operative symbolic distinctions are already encoded, reproduced, or acted upon within other components of the relational system.*

This proposition gives a precise formulation of the distinction developed in Section 7. Manifestation independence concerns qualification relative to a selected epistemic system, while symbolic mediation can be distributed across a broader relational field. The two claims are therefore compatible within a coupled-register architecture. Accounts of social construction, institutional facts, symbolic power, and self-reproducing social communication provide several different theoretical routes for understanding such mediation [8, 34, 10, 28].

8.7 Recursive Mediation

This subsection develops the feedback structure produced when symbolic manifestation alters the relational object that later manifestations concern. Its structural role is to connect symbolic mediation with the recursive dynamics of the Generative Relational framework. The objective is to show how symbols can both preserve existing relational organization and participate in the creation of revised relations, roles, expectations, and causal pathways.

Symbolic articulation can reorganize a relational field by making distinctions portable, repeatable, contestable, and institutionally actionable. Naming a previously diffuse pattern can coordinate attention. Formalizing a role can change expectations and accountability. Creating a category can alter data collection, eligibility rules, and future classification. Publicly articulating a trust relation can influence later disclosure and interpretation. These processes produce feedback from manifestation into relational organization.

The revised relational structure can subsequently alter the conditions of later manifestation. A newly institutionalized category can become more salient, produce new records, and generate new experiences. A recognized distinction can attract further symbolic elaboration. A formal rule can create cases that require additional interpretation. Symbolic mediation therefore participates in recursive register coupling across successive historical intervals.

Definition 8.9 (Recursive symbolic mediation). *Recursive symbolic mediation* is the feedback process through which symbolic articulation modifies relational organization and the modified relational organization subsequently reshapes the production, distribution, or interpretation of symbolic forms.

Recursive mediation gives symbolic structures a generative role. Their efficacy arises through repeated participation in relational dynamics, and their own forms can change through the histories they help produce. This reciprocal structure preserves the general commitment of the framework to co-evolving objects, relations, and manifestations.

8.8 Mediation Criterion

This subsection consolidates the section into an operational analytical criterion. Its structural role is to provide a compact procedure for identifying symbolic mediation while preserving the distinction among symbolic form, relational reality, and manifestation. The criterion proceeds through four questions concerning symbolic organization, relational participation, manifestational indexing, and recursive effects.

First, the analysis identifies the operative symbolic distinction and the system within which its identity is reproduced. Second, it specifies the relational couplings whose states, possibilities, or trajectories depend on that symbolic organization. Third, it indexes the subjects, institutions, technical systems, or other epistemic loci to which the symbolic form and its relational effects are manifest. Fourth, it examines whether subsequent articulation, classification, interpretation, or reuse modifies the relational organization that supported the earlier symbolic process.

Definition 8.10 (Symbolic-mediation criterion). A symbolic form qualifies as a mediator within a selected generative relational system when its organized distinction contributes causally to the formation, constraint, enablement, stabilization, transmission, or transformation of one or more relational couplings under the selected scale and historical interval. Its manifestational profile is evaluated separately through indexed modes of availability.

The criterion secures the principal result of this section. Symbolic structure can participate deeply in relational reality while manifestation remains uneven across subjects and systems. The next section develops interaction as a more localized dynamical process within this broader architecture of coupling, causal contribution, relational emergence, manifestation, and symbolic mediation.

9 Interaction Dynamics

This section locates interaction within the broader account of relation developed in Sections 4–8. Its structural role is to connect persistent relational coupling with bounded events and processes in which coupled objects, fields, or organized domains make causally relevant contributions to ongoing dynamics. The section has four objectives: to specify the analytical unit of an interaction, to characterize participant configuration and relational context, to describe interaction as a site of dynamical participation, and to explain how interactions can revise the couplings that condition later events. The discussion proceeds through a process-oriented method. Each subsection isolates one component of interaction while preserving the distinction among relational structure, local dynamical realization, and subsequent relational revision.

9.1 Interaction Episodes

This subsection establishes the basic analytical unit of interaction. Its role is to distinguish a temporally and operationally bounded episode from the wider relational organization in which that episode occurs. The objective is to make interaction identifiable at a useful scale while preserving continuity with the persistent couplings developed earlier in the paper.

A relation can persist across intervals between salient local events identified by the analyst. Institutional authority, contractual obligation, trust, technical dependency, ecological exposure, and symbolic classification can continue to organize trajectories across such intervals. Interaction concerns a more localized process: coupled participants contribute to changes in states, available transitions, expectations, dispositions, records, or shared conditions during an analytically specified episode.

Definition 9.1 (Interaction episode). An *interaction episode* is a bounded process in which distinguishable participants situated within a relational domain make causally relevant contributions to changes in one another, in their shared conditions, or in the couplings that organize subsequent trajectories.

The boundary of an episode is scale-relative. A spoken exchange can constitute one episode at a conversational scale, while a negotiation extending across several meetings can constitute one episode at an institutional scale. A software-mediated transaction can unfold across milliseconds within a technical system and across days within an administrative process. Analytical usefulness therefore depends on selecting a temporal and organizational resolution that preserves the relevant causal sequence.

Episode boundaries also support comparison across repeated events. Several interactions can share a relational context while varying in participants, content, timing, intensity, or consequence. This makes interaction analysis compatible with the broader GR emphasis on historically evolving coupling structures. Interaction-order and structuration traditions similarly treat situated encounters as analytically specific events embedded in wider social organization [19, 18].

Remark 9.2 (Scale-relative episodes). Interaction episodes are individuated relative to the temporal and organizational scale of inquiry. A process can be treated as one interaction at one scale and as a sequence of interactions at a finer scale.

9.2 Participant Configuration

This subsection specifies the entities that can participate in interaction. Its structural role is to extend interaction beyond a dyadic model and to preserve the broad object concept introduced in Section 2. The objective is to characterize interaction across heterogeneous participants without assuming a common metric, common ontology, or symmetric mode of agency.

Participants can include persons, collectives, institutions, technical systems, artifacts, symbolic organizations, ecological processes, and other objects that satisfy the relevant distinguishability criteria. Interaction can therefore be dyadic, polyadic, distributed, or field-mediated. A person and an institution can interact through an application procedure; a human and an AI system can interact through generated

responses and subsequent revisions; several offices can interact through a coordinated administrative process; an organism can interact with an ecological field through reciprocal changes in behavior and local conditions.

Participant heterogeneity is compatible with the incommensurability developed later in Section 10. Interaction requires causally relevant coupling across the selected episode and can proceed across heterogeneous metrics, ontologies, and modes of agency. Different participants can contribute through different variables, mechanisms, and register profiles while remaining dynamically connected through a shared process.

Interaction can also display strong directional asymmetry. An institutional classification may alter a person's available actions while the person's immediate contribution to the classification system remains comparatively small. A technical system can shape a user's options while receiving only a limited input signal in return. Such cases remain interactions because the relevant process contains causally linked contributions within a common relational domain.

Definition 9.3 (Participant configuration). *A participant configuration is the set of distinguishable objects, fields, or organized domains whose causally relevant contributions define the selected interaction episode, together with the directionality and mediation through which those contributions are connected.*

9.3 Relational Context

This subsection specifies the wider coupling structure that conditions an interaction episode. Its structural role is to preserve the distinction between interaction and relation while explaining their dependence. The objective is to show how persistent relational organization shapes the possibilities, interpretations, asymmetries, and consequences of a local event.

Every interaction occurs within a relational context that supplies a structured space of possibilities. Existing roles can allocate authority and obligation. Trust can change the range of disclosures that participants consider viable. Legal classifications can alter available procedures. Technical standards can shape interoperable actions. Historical memory can affect the interpretation of ambiguous conduct. Symbolic mediation can coordinate expectations across participants who possess different levels of manifestational access.

The relational context therefore contributes to the conditions under which an interaction acquires its meaning and causal profile. Identical observable movements can participate in different interactions when role structures, historical relations, or symbolic classifications differ. A signature can confirm consent, acknowledge receipt, authorize payment, or satisfy a ritual requirement depending on the coupling structure within which the act is embedded.

The contextual contribution is dynamic. Relational structures can alter the sensitivity of participants to specific signals, the costs of available actions, the credibility of commitments, and the expected consequences of response. Interaction analysis therefore benefits from specifying the active couplings that condition the episode alongside the event-level sequence itself.

Proposition 9.4 (Contextual conditioning). *The causal and interpretive profile of an interaction episode depends partly on the relational couplings active during that episode. Changes in those couplings can alter the consequences of locally similar acts.*

9.4 Dynamic Participation

This subsection characterizes the causal contribution made during interaction. Its structural role is to connect event-level analysis with the causal dynamics specified in Section 5. The objective is to describe interaction through changes in trajectories, possibilities, sensitivities, and shared conditions while preserving partial determination and heterogeneous forms of causation.

Dynamic participation occurs when a participant's state, action, signal, absence, record, classification, or other system-relevant contribution changes the evolution available to another participant or to a shared

relational domain. The contribution can constrain an option, enable a transition, amplify a response, suppress a pathway, stabilize an expectation, destabilize an existing pattern, or redirect later development. These forms correspond to the causal vocabulary developed in Section 5.

An interaction can contain several causal layers. A spoken statement can alter an interlocutor's immediate interpretation, create a persistent record, modify an institutional expectation, and influence later third-party decisions. A technical response can alter a user's next action while also updating a system state that shapes later outputs. Interaction dynamics therefore extend beyond immediate behavioral reaction when the episode changes the relational conditions governing later trajectories.

Manifestational access can vary across participants during the same episode. One participant may explicitly recognize the relevant relation, another may respond affectively or behaviorally, and an institutional or technical process may register only a coded state transition. Interaction remains analyzable through the causally linked contributions that occur across these heterogeneous access modes.

Remark 9.5 (Heterogeneous participation). Interaction can combine intentional action, habitual response, automated processing, institutional procedure, symbolic mediation, and environmental feedback within one causally connected episode. Their contributions should be specified according to the mechanisms relevant to the selected scale.

9.5 Coupling Revision

This subsection develops the recursive effect of interaction on relational structure. Its structural role is to explain how a local episode can modify the couplings that shaped its own occurrence. The objective is to connect event-level participation with the historical evolution of relational reality.

An interaction can leave the surrounding coupling structure effectively stable, or it can modify its strength, directionality, scope, symbolic organization, participant expectations, or persistence conditions. A fulfilled commitment can strengthen trust. A violation can alter future interpretation and risk sensitivity. An administrative decision can create a record that changes later classification. A successful coordination episode can stabilize a procedure that becomes easier to reproduce. Repeated conflict can establish expectations that redirect subsequent behavior before any new episode begins.

The recursive structure can be represented by distinguishing the relational organization active at time t , the interaction episode occurring over a selected interval, and the relational organization observed after that interval. The later organization can preserve, weaken, strengthen, redirect, or reconfigure earlier couplings. This process supplies one mechanism through which historically repeated interactions contribute to relational emergence and stabilization.

Definition 9.6 (Coupling revision). *Coupling revision* is the interaction-generated modification of the strength, directionality, scope, mediation, persistence, or participant configuration of a relational coupling.

Coupling revision can also occur through third-party effects. An interaction between two participants can alter institutional rules, public expectations, records, or shared environments that subsequently affect additional participants. The resulting relational transformation can therefore exceed the original episode's immediate participant set.

9.6 Interaction Sequences

This subsection examines repeated and connected interactions. Its structural role is to bridge isolated episodes with historically persistent relational patterns. The objective is to identify how recurrence, memory, expectation, and path dependence can transform event sequences into durable relational organization.

Repeated interactions can accumulate through material traces, records, learned expectations, affective dispositions, institutional routines, and symbolic classifications. Each episode begins within a relational context partly shaped by earlier episodes and can contribute to the context inherited by later ones. Sequence analysis therefore treats interaction history as an evolving condition of future interaction. Formal

and behavioral studies of repeated cooperation show how interaction sequences can stabilize expectations, reciprocity, reputation, and trust [3, 32].

Repetition alone provides limited evidence of relational stabilization. The relevant question concerns whether recurrent episodes produce a sufficiently coherent organization that persists and exercises causal efficacy at the scale of inquiry. When this occurs, the interaction sequence can contribute to the relational emergence described in Section 6. Trust, distrust, authority, convention, and institutional routine can all acquire such persistence through historically repeated interaction under appropriate conditions.

Sequences can also display nonlinear effects. A small episode can have limited consequences early in a process and substantial consequences after expectations, records, or vulnerabilities have accumulated. Conversely, repeated corrective interactions can weaken a previously stabilized pattern. The significance of an episode therefore depends partly on its position within the historical sequence and the current sensitivity of the relational system.

Proposition 9.7 (Sequential accumulation). *Interaction sequences can generate relational structures whose persistence and causal efficacy exceed those of any individual episode when the effects of successive episodes accumulate through memory, expectation, material trace, symbolic organization, or other stabilizing mechanisms.*

9.7 Interaction Criterion

This subsection integrates episode boundaries, participant configuration, relational context, dynamic participation, coupling revision, and sequential accumulation into a compact analytical criterion. Its structural role is to complete the paper's distinction between relation and interaction and to prepare the later analysis of relational incommensurability, contingency, and political relations. The criterion identifies the minimum structure required for an event or process to qualify as an interaction within GR.

Definition 9.8 (Interaction criterion). An event or process qualifies as an *interaction* within the Generative Relational framework when: (i) distinguishable participants can be specified at the selected scale; (ii) those participants are situated within at least one relational coupling relevant to the episode; (iii) their states, actions, signals, records, classifications, or other contributions participate causally in changes affecting another participant or a shared relational domain; and (iv) the episode possesses a sufficiently identifiable boundary for its causal and relational consequences to be analyzed.

This criterion places interaction inside a wider relational architecture. Relations can persist across several episodes, while interactions provide local sites at which relational couplings are enacted, tested, reproduced, revised, or extended. The distinction supports movement between structural and practical analysis: persistent coupling explains the conditions of an episode, and the episode supplies one mechanism through which those conditions evolve.

The resulting architecture gives interaction a specific role within GR. Object distinguishability supplies participants, relational coupling supplies dynamic non-independence, causal dynamics supplies mechanisms of contribution, relational emergence supplies criteria for persistent organization, manifestation analysis supplies differentiated modes of access, and symbolic mediation supplies organized sign structures that can condition interaction. Interaction dynamics then identifies the bounded processes through which these components meet in historically situated events and contribute to subsequent relational development.

10 Relational Incommensurability

This section establishes the comparison architecture required for heterogeneous relational realities. Its structural role is to separate three analytical operations that can otherwise be conflated: distinguishing objects, comparing objects under a specified structure, and measuring differences within a common metric organization. The section has four objectives: to define the additional structure required for comparison,

to characterize partial comparison across heterogeneous relational domains, to specify the stronger requirements of metric commensurability, and to formulate a scale- and purpose-sensitive criterion of relational incommensurability. The discussion proceeds by adding comparison structure progressively. Distinguishability supplies the starting contrast; comparison introduces a common criterion or mapping; metric commensurability introduces still stronger structural commitments.

10.1 Comparison Structures

This subsection defines the minimal structure required for comparison. Its role is to extend the object distinguishability developed in Section 2 while preserving the distinction between identity conditions and comparative judgments. The objective is to show that a pair of distinguishable objects becomes comparable only relative to an explicitly specified comparative structure.

Distinguishability identifies a contrast between objects under a selected criterion. Comparison asks a further question about how the objects can be placed within a shared analytical organization. The shared organization can be ordinal, categorical, topological, probabilistic, functional, causal, historical, or metric. Each form supports a different family of comparative claims. Two institutions can be compared by formal authority, two interaction sequences by duration, two trust relations by persistence, and two symbolic systems by patterns of differentiation. The validity of each comparison rests on the structure that makes the relevant dimension common across the objects. Philosophical work on incomparability and incommensurability develops a related distinction between plurality and the stronger availability of a common ordering [13].

Definition 10.1 (Comparison structure). A *comparison structure* is a justified analytical organization that places two or more distinguishable objects within a common domain of comparison for a specified purpose and scale.

The comparison structure can be native to the objects or constructed by the analyst. A shared physical unit supplies a comparatively direct structure for length or duration. A comparative institutional index requires a constructed mapping from heterogeneous institutional features into a common analytical space. A historical comparison may use a set of relational features whose meaning has been stabilized sufficiently for the selected inquiry. The degree of construction therefore varies, while the requirement of explicit justification remains constant.

Comparison also inherits register dependence. Objects may be comparable under one register while their organization under another register remains outside the selected comparison. Two human-AI interactions can be compared by observed response time within a manifestational description, while their broader relational histories involve heterogeneous dependency, institutional, and production structures. A valid comparison should therefore identify the register, scale, variable family, and purpose that support the common structure.

Remark 10.2 (Comparison indexing). A comparative claim should be indexed to the register, scale, criterion, and purpose that define its comparison structure. This indexing prevents local comparability from being generalized into an unrestricted claim about the objects as wholes.

10.2 Domain Heterogeneity

This subsection characterizes the heterogeneity of relational domains. Its structural role is to explain why membership in relational reality supplies insufficient structure for unrestricted comparison. The objective is to identify the different organizations through which relationally real objects can emerge, persist, and exercise causal efficacy.

Relational realities can be generated through markedly different coupling architectures. A monetary object can depend on legal designation, accounting infrastructure, institutional enforcement, exchange practice, and collective expectation. A trust relation can depend on repeated interaction, memory, vulnerability, interpretation, and anticipated response. An ecological niche can depend on material flows,

organism-environment coupling, spatial constraints, and long-duration feedback. A technical classification can depend on data structures, model outputs, administrative rules, and downstream procedures. Each object can satisfy the relational-reality criterion while occupying a distinct relational domain.

Domain heterogeneity concerns more than variation in observed attributes. The objects can differ in their constituent couplings, temporal scales, causal mechanisms, modes of stabilization, individuation conditions, and register profiles. These differences affect which transformations preserve meaning and which comparative operations remain informative. A numerical distance that is well defined inside one domain can have limited or indeterminate interpretation when transferred to another.

Co-membership in the relational register therefore indicates a shared mode of qualification: emergence, sufficient persistence, and causal efficacy within a generative relational system. That shared qualification leaves the internal geometry of the relevant domains open. One relational reality may admit a natural metric, another an ordinal structure, another a network topology, and another only a family of locally meaningful qualitative distinctions.

Proposition 10.3 (Domain plurality). *Relational realities can satisfy a common qualification criterion while retaining heterogeneous internal structures, causal organizations, and comparison possibilities.*

This plurality is especially important for interdisciplinary analysis. The common vocabulary of relation can connect social, technical, ecological, phenomenological, and institutional objects at an abstract level, while the comparison structures appropriate to those objects remain domain-sensitive. The resulting framework supports conceptual unification at the level of relation and methodological plurality at the level of measurement.

10.3 Partial Comparability

This subsection develops comparison across selected dimensions of heterogeneous relational realities. Its structural role is to introduce a middle position between mere distinguishability and global commensurability. The objective is to show how local or purpose-specific comparisons can remain rigorous even when the broader relational organizations of the objects differ substantially.

Two objects can share a limited comparative projection. A physically instantiated flower and a perceptually generated flower can be compared by reported color, apparent location, experienced duration, attentional capture, or immediate behavioral response. Those comparisons use manifestational, temporal, or behavioral dimensions that can be specified across both cases. Their broader relational organizations remain heterogeneous: the physically instantiated flower participates in biological, ecological, material, and perceptual couplings, while the perceptually generated flower can arise through neural, experiential, affective, historical, and interpretive couplings.

A classical illustration in the *Perfect Enlightenment Sutra* describes a diseased eye seeing flowers in empty space.¹ The example serves here as a comparative construction; the sutra's broader metaphysical interpretation remains outside the present argument. Within GR, a perceptually generated flower can qualify as relationally real when the experience develops sufficient persistence and causal efficacy at the relevant scale. A physically instantiated flower can also qualify as relationally real through a different organization of couplings. Their common qualification supports a shared relational category, while each proposed comparison still requires its own comparative structure.

Example 10.4 (Flower comparison). Consider a perceptually generated flower that repeatedly redirects attention, induces reaching or avoidance, enters communication, and persists long enough to influence subsequent behavior. Consider also a physically instantiated flower participating in biological growth, ecological exchange, material interaction, and human perception. Both can qualify as relationally real under the criteria developed in Section 6. Their color appearance or behavioral effects can support local comparison. Their complete relational organizations require additional mappings before a broader comparison becomes meaningful.

¹The verified source text states, “譬彼病目，見空中華及第二月” in the *Dafangguang Yuanjue Xiuduoluo Liaoyi Jing*; see Chinese Text Project, <https://ctext.org/wiki.pl?chapter=579285>. Accessed 20 September 2026.

Partial comparability can also occur across social and technical systems. A human decision process and an automated classifier can be compared by error rate under a defined task, while their responsibility structures remain heterogeneous. Two forms of authority can be compared by scope of permitted action, while their histories of legitimation differ. Two currencies can be compared by exchange value at a given time, while the institutional networks that sustain them differ. Each comparison is valid within the projection that supplies common structure.

Definition 10.5 (Partial comparability). Two relational objects are *partially comparable* when a justified common structure supports comparison over a specified subset of their relevant properties, relations, trajectories, or effects.

Partial comparability therefore preserves analytical precision while avoiding a requirement that heterogeneous objects share a complete representational space. It also makes comparative scope explicit. The resulting claim concerns the selected projection and remains open to revision when the analytical purpose or scale changes.

10.4 Metric Commensurability

This subsection specifies the stronger conditions associated with metric comparison. Its structural role is to distinguish meaningful comparison from measurement by a common distance function or quantitative scale. The objective is to identify the additional assumptions introduced when heterogeneous relational realities are represented within a shared metric space.

Metric commensurability requires more than a common label or category. It requires a shared space in which distances, magnitudes, or ratios possess a stable interpretation for the objects under comparison. If objects originate in different relational domains, such a metric usually depends on mappings that select and transform features from each domain. A common comparison space C , together with mappings $\phi_X : X \rightarrow C$ and $\phi_Y : Y \rightarrow C$, can support a metric comparison when the mappings preserve the properties relevant to the stated purpose.

The existence of a numerical representation alone supplies limited evidence of commensurability. Numerical coding can always impose values on categories, yet the resulting distances acquire analytical meaning only when the mapping and metric preserve a justified relational structure. Assigning numbers to forms of trust, authority, aesthetic salience, or institutional vulnerability therefore requires an account of what the intervals or distances represent.

Metric construction can still be valuable. Quantitative measures can reveal patterns, support prediction, enable comparison across cases, and expose changes over time. GR places the main burden on structural interpretation: the metric should identify which relational features are preserved, which are compressed, and which remain outside the representation. This requirement is especially important when the objects possess heterogeneous causal mechanisms or different temporal scales.

Proposition 10.6 (Metric requirement). *Metric comparison across relational domains requires a justified common representation whose distances or magnitudes preserve the relational features relevant to the selected analytical purpose.*

Metric commensurability is therefore one possible comparative achievement among several. Ordinal ranking, categorical correspondence, topological similarity, functional analogy, causal comparison, and historical correspondence can each support rigorous analysis under different conditions. The choice of structure should follow the research objective and the organization of the relational objects under study.

10.5 Cross-Domain Mappings

This subsection examines the mappings that make comparison possible across heterogeneous relational domains. Its structural role is to locate translation, projection, and abstraction inside the comparative process. The objective is to clarify how cross-domain comparison can create analytical value while also transforming the objects represented.

A cross-domain mapping selects features from distinct relational organizations and places them in a shared representational domain. The mapping can preserve causal roles, temporal patterns, network positions, functional capacities, manifestational characteristics, or other structures. Each choice creates a particular comparative object. Comparing two institutions by decision latency, for example, produces a different common object from comparing them by accountability structure or distributional effect.

Mappings also introduce information loss. Compression is frequently useful and sometimes essential, yet the omitted structure can matter for later inference. A behavioral equivalence mapping between a human and an AI system can preserve observable response patterns while compressing differences in embodiment, training history, ownership, vulnerability, and institutional embedding. A price index can preserve selected exchange relations while compressing the social and ecological organization of production. The analytical status of the mapping therefore depends on the inferential work assigned to it.

Cross-domain mappings can be revised through empirical discovery or theoretical change. New causal evidence can reveal a previously compressed feature as relevant. A different ethical or political question can require a new projection. Historical change can also alter the meaning of a shared variable. Comparison therefore remains embedded in the generative history of inquiry. Goodman provides a complementary precedent for treating comparison and rendering as dependent on representational schemes and criteria of rightness [21]. and remains revisable across cases and historical conditions. Goodman provides a complementary precedent for treating comparison and rendering as dependent on representational schemes and criteria of rightness [21].

Definition 10.7 (Domain mapping). A *cross-domain mapping* is a justified transformation that projects selected structures from heterogeneous relational domains into a common comparative representation.

The mapping itself can become part of relational reality when institutions, markets, scientific communities, or technical systems begin acting through it. Rankings, classifications, credit scores, risk categories, and benchmark metrics can move from analytical representations into causally efficacious structures. This possibility links comparison back to the coupled-register architecture developed in Section 3: a manifestational or symbolic comparison can participate in later relational organization.

10.6 Incommensurability Criterion

This subsection integrates the preceding distinctions into a criterion of relational incommensurability. Its structural role is to establish the boundary conditions of comparison within GR. The objective is to characterize cases in which a proposed comparison lacks a sufficiently justified common structure at the selected scale and for the selected purpose.

Relational incommensurability is indexed to a specified purpose, scale, and comparative operation. Two objects can be incommensurable under one proposed metric and partially comparable under another structure. The physically instantiated flower and the perceptually generated flower can support comparison of reported appearance while their complete relational organizations lack a privileged global distance. Human and AI systems can support task-specific behavioral comparison while broader relational profiles require additional mappings. Political institutions can be ranked under a selected indicator while remaining structurally heterogeneous in historical formation, legal authority, and public meaning.

Definition 10.8 (Relational incommensurability). Two relational objects are *relationally incommensurable* for a specified purpose and scale when the available analytical structures lack a sufficiently justified common representation for the proposed comparative operation.

This definition treats incommensurability as an epistemic and structural status of a proposed comparison. The degree of relational reality remains a separate analytical question. Two incommensurable objects can each possess robust relational reality, and their causal interaction can remain substantial. Incommensurability therefore concerns comparison structure independently of the intensity of existence or efficacy.

The criterion also imposes analytical discipline on broad relational theories. A framework capable of describing money, trust, institutions, AI systems, ecological processes, aesthetic salience, and religious

objects under a common relational vocabulary can still preserve the distinct structures through which those objects become comparable. Abstract unity at the level of relation should therefore be accompanied by explicit justification at every comparative level.

Remark 10.9 (Comparative discipline). Claims of similarity, difference, ranking, distance, or equivalence among relational realities should identify the comparison structure that supports the claim. Relational incommensurability marks cases in which the proposed structure remains insufficient for the intended inference.

The resulting architecture separates three analytical achievements. Distinguishability establishes that objects can be individuated under a selected criterion. Comparability establishes a justified common structure for a specified inquiry. Metric commensurability establishes a still stronger common representation supporting meaningful measurement. This separation prepares the next section's treatment of contingency, where historical and generative structures can be relationally real even when their comparison across possible histories remains limited or structurally underdetermined.

11 Relational Contingency

This section develops contingency as a relational property of historically situated generative systems. Its structural role is to connect the account of relational emergence in Section 6 with the later analysis of aesthetic manifestation in Section 12. The section has five objectives: to specify the historical configuration relative to which contingency is assessed, to define generative possibility as a structured plurality of admissible continuations, to characterize the actualization of one continuation within that plurality, to explain how contingent actualizations can modify later relational conditions, and to establish the conditions under which contingency itself qualifies as relationally real. The discussion proceeds through a scale-sensitive reconstruction of historical configuration, possibility structure, actualization, path dependence, causal retention, manifestational timing, and the resulting contingency criterion.

11.1 Historical Configuration

This subsection establishes the historical reference structure required for claims of contingency. Its role is to specify the relational configuration relative to which an event, transition, or trajectory can be described as contingent. The objective is to replace an undifferentiated appeal to chance with an indexed account of historically situated generative conditions. The discussion treats history as an organized field of inherited couplings, constraints, capacities, material traces, symbolic mediations, and prior actualizations.

A generative relational system at a selected time can be represented analytically through a historical configuration, denoted here by $\mathcal{H}_t$. The symbol abbreviates the organized conditions relevant to the inquiry: current states, inherited relational structures, available resources, institutional arrangements, material environments, symbolic classifications, memories, expectations, and other historically carried features. The content of $\mathcal{H}_t$ depends on the system, scale, and explanatory purpose selected by the analysis.

Definition 11.1 (Historical configuration). A *historical configuration* is the scale-indexed organization of inherited and current conditions that structures the generative possibilities available to a relational system during a specified interval.

Historical configuration gives contingency a relational reference point. A transition acquires meaning through its position within an organized field of prior conditions and available continuations. The same observable event can therefore carry different contingency profiles under different histories. A meeting produced by a routine institutional schedule differs relationally from a meeting produced by intersecting travel delays, independent decisions, and a temporary spatial convergence, even when the manifest encounter appears similar. Processual sociology and historical institutionalism develop closely related arguments concerning temporal sequence, path dependence, and the causal importance of earlier contingent events [1, 2, 33, 30].

The historical configuration also preserves causal inheritance. Earlier actualizations leave material traces, institutional rules, learned dispositions, records, expectations, infrastructures, and altered distributions of possibility. These inherited structures contribute to later dynamics and make contingency historically situated. The relevant past therefore enters present possibility through organized relational effects carried across historical time.

Remark 11.2 (Historical indexing). Claims of relational contingency should specify the historical interval and relational scale under which the relevant generative conditions are reconstructed. A change in historical resolution can change the set of conditions treated as inherited, active, or available.

11.2 Possibility Structure

This subsection defines the structured plurality required for relational contingency. Its role is to identify the family of continuations supported by a historical configuration at a selected analytical resolution. The objective is to describe generative openness in a form compatible with deterministic, stochastic, institutional, interpretive, and mixed-domain systems. The discussion uses admissibility as the central concept and leaves domain-specific methods of possibility estimation to the relevant empirical or formal inquiry.

A historical configuration can support several continuations that remain compatible with the system's current constraints and capacities. These continuations can differ in state, sequence, interaction pattern, institutional response, interpretive development, or later relational organization. Their plurality forms a possibility structure. The structure can be sharply delimited in a formal model, reconstructed historically from available pathways, estimated probabilistically, or represented qualitatively through a bounded family of feasible developments.

Definition 11.3 (Generative possibility structure). A *generative possibility structure* is the scale- and model-indexed family of continuations that remain admissible under a specified historical configuration and its active relational constraints.

Admissibility is stronger than imaginative conceivability. A proposed continuation belongs to the possibility structure when the selected account of the system supplies a justified pathway through which the continuation could arise. In a physical model, admissibility can follow from dynamical constraints. In institutional analysis, admissibility can follow from rules, resources, authority, and strategic capacities. In historical analysis, admissibility can be reconstructed through documented alternatives, unrealized proposals, competing practices, or branching sequences supported by the available conditions.

Possibility structures can vary in breadth and organization. Some systems permit a narrow band of continuations around a stable trajectory. Others contain several distinct pathways, threshold-sensitive branches, or weakly constrained regions. The geometry of possibility can therefore carry substantive information about contingency. A system with several accessible basins, institutional options, or interpretive developments presents a different generative structure from a system whose admissible continuations remain tightly concentrated.

Proposition 11.4 (Structured openness). *Relational contingency increases in analytical significance when a historical configuration sustains multiple admissible continuations whose later realization depends materially on the configuration of couplings, sensitivities, and local events within the selected scale.*

Probability can represent one aspect of a possibility structure when a justified probability model is available. Relational contingency has a broader scope because admissibility, sensitivity, and path formation can also be analyzed through qualitative, historical, institutional, topological, or dynamical structures. Probability therefore functions as one possible representation within a wider generative account.

11.3 Actualization Dynamics

This subsection specifies the transition from generative possibility to realized history. Its structural role is to locate contingent events inside the evolving coupling system developed in Sections 4 and 9. The

objective is to characterize actualization as a relationally conditioned transition whose occurrence depends on the historical configuration, local dynamics, and the sensitivities of the system. The discussion focuses on trajectory formation and leaves the metaphysical status of unrealized possibilities open.

An actualization is the continuation that enters the realized history of the system during the interval under study. Its occurrence can depend on several forms of relational contribution: material constraint, institutional permission, strategic response, symbolic mediation, environmental perturbation, accumulated expectation, local interaction, and sensitivity to initial or intermediate conditions. The realized continuation therefore inherits structure from both the prior historical configuration and the specific couplings active during the transition.

Definition 11.5 (Contingent actualization). A *contingent actualization* is a realized continuation within a generative possibility structure whose occurrence depends materially on historically situated relational conditions while alternative continuations remain admissible at the selected scale and resolution.

The definition treats contingency as indexed to an analytical reconstruction. A finer resolution can reveal local conditions that make a transition highly constrained, while a broader resolution can preserve several admissible pathways. Conversely, a coarse description can conceal branching structures that become visible under a more detailed historical or dynamical account. Claims of contingency therefore gain precision through explicit scale, resolution, and model commitments.

Actualization also provides a bridge between relation and event. Persistent couplings structure the field of admissible development, while localized interactions, perturbations, and threshold crossings can redirect the realized trajectory. Section 9 described interaction episodes as temporally bounded realizations of relational coupling. Contingent actualization extends that account by locating such episodes within a wider plurality of generatively supported continuations.

Remark 11.6 (Epistemic uncertainty). Epistemic uncertainty concerns limits in observation, knowledge, inference, or prediction. Relational contingency concerns the generative structure attributed to the system under the selected analysis. The two can overlap in practice and should be assessed through separate evidential questions.

11.4 Path Dependence

This subsection develops the historical consequences of contingent actualization. Its role is to explain how a realized continuation changes the conditions governing later possibilities. The objective is to connect contingency with the recursive structure of generative relational systems, where actualized events can modify couplings, stabilize new objects, reshape symbolic mediation, and alter subsequent possibility structures. The discussion follows the historical sequence of relational updating.

A contingent actualization contributes to later history by changing the configuration from which subsequent developments emerge. An encounter can initiate a durable collaboration. A policy decision can establish a new administrative category. A technical standard can reorganize later compatibility. A public interpretation can alter the salience and legitimacy of future actions. Each case converts an event within one possibility structure into part of the historical configuration of the next interval.

This recursive transition gives contingency cumulative significance. The realized path can strengthen some couplings, weaken others, create new participants, alter access to resources, and reconfigure the conditions under which later interactions occur. Earlier contingency can thereby become embedded in later regularity. A path that began through a sensitive or locally contingent transition can acquire persistence through institutionalization, learning, material investment, symbolic codification, or repeated interaction.

Proposition 11.7 (Historical embedding). A *contingent actualization* can become part of a later historical configuration when its effects persist through relational couplings that modify subsequent possibilities, constraints, or generative conditions.

Path dependence within GR therefore concerns more than sequence dependence. The relevant issue is the relational retention of earlier actualizations. Historical order matters because prior events can reorganize the coupling architecture through which later events become possible. A path acquires generative significance when the system carries forward these relational effects.

11.5 Causal Retention

This subsection specifies the persistence condition through which contingency can become relationally real. Its structural role is to connect contingent actualization with the relational-reality criterion established in Section 6. The objective is to identify the circumstances under which a contingency structure continues to influence later states and trajectories beyond the local event that revealed or instantiated it. The discussion evaluates persistence and causal efficacy at the scale selected for the inquiry.

A singular contingent event can have transient effects, durable effects, or minimal later consequence. Relational reality concerns the stronger case in which the contingency structure, or the organization generated through its actualization, remains identifiable and causally efficacious across a relevant interval. Such retention can occur through memory, records, infrastructures, altered expectations, institutional commitments, ecological change, learned behavior, symbolic classification, or modified network structure.

Definition 11.8 (Causal retention). *Causal retention* is the persistence of relational effects through which a contingent configuration or actualization continues to shape later states, trajectories, or generative conditions at a specified scale.

Causal retention distinguishes a momentary irregularity from a historically productive contingency. A brief perturbation that leaves the later coupling structure effectively unchanged can remain important for local explanation. A perturbation that creates a new dependency, stabilizes a classification, redirects a research programme, or changes the distribution of future opportunities acquires a broader generative role. The difference concerns the persistence and organization of causal consequences.

Relational contingency can therefore qualify as relationally real when the openness, sensitivity, or path-forming organization itself possesses sufficient persistence and causal efficacy. The object of analysis can be a recurrent contingency structure, a historically stabilized vulnerability to branching, or a path-dependent organization generated through prior contingent actualizations. This formulation allows contingency to participate in relational reality while preserving the scale-sensitive criteria developed earlier in the paper.

Claim 11.9 (Relational reality of contingency). A contingency structure qualifies as relationally real when it emerges within a generative relational system, remains sufficiently identifiable across the selected interval, and contributes causally to the system's later possibility structure or realized trajectories.

11.6 Manifestational Timing

This subsection locates contingency relative to the manifestational register. Its structural role is to apply the manifestation-independence principle from Section 7 to historical-generative contingency. The objective is to show how a contingency structure can already participate in relational reality before a subject, community, institution, or observational system recognizes it as contingent. The discussion separates relational qualification, manifestational access, and later aesthetic evaluation.

A branching structure can shape trajectories before participants recognize the available alternatives. A historically inherited vulnerability can organize outcomes before a community possesses a concept for that vulnerability. A chance encounter can emerge from converging relational histories before either participant understands the convergence as significant. In each case, the generative conditions and causal organization precede the later episode of recognition at the selected subject-relative manifestation index.

The manifestation of contingency can occur through several access modes. A subject can experience surprise, salience, fragility, improbability, openness, or retrospective significance. An institution can register contingency through records, indicators, scenario analysis, or procedural review. A research community

can reconstruct contingency through historical comparison or formal modelling. These manifestations provide access to a contingency structure whose relational status depends on the generative and causal criteria developed in this section.

Proposition 11.10 (Manifestational timing). *A relational contingency can satisfy the criteria of historical configuration, generative possibility, and causal efficacy before it becomes manifest as contingency to a specified subject or epistemic system.*

Manifestation can subsequently feed back into the relational system. Recognition of a contingent pathway can change attention, preserve records, motivate intervention, alter expectations, or transform future choice structures. Aesthetic judgment can add another layer of selective salience and value. Section 12 develops that later stage while treating the underlying contingency structure as analytically prior only in the local process being examined, consistent with the coupled-register architecture of Section 3.

11.7 Scale Sensitivity

This subsection specifies the scale dependence of relational contingency. Its structural role is to prevent a contingency claim at one temporal, spatial, organizational, or descriptive scale from being generalized across the entire system. The objective is to provide a disciplined method for comparing contingency profiles across levels of analysis. The discussion indexes each claim to a selected historical interval, relational domain, resolution, and family of admissible continuations.

Contingency can vary across scales because the relevant conditions and admissible continuations change with the analytical frame. A local interaction can be highly contingent within a short interval while forming part of a stable institutional pattern across a decade. A long-term political transformation can appear strongly path-dependent at the institutional scale while containing many locally contingent interactions. A technical system can exhibit stable aggregate performance while individual trajectories remain sensitive to local perturbations.

Scale sensitivity also affects the evidential basis for alternative continuations. Historical evidence may support several institutional pathways within a particular period, while a finer-grained reconstruction narrows some branches through newly identified constraints. A formal model can reveal sensitivity near a transition region, while an empirical analysis can identify stabilizing mechanisms that reduce the range of realized outcomes. Relational contingency therefore benefits from explicit statements of scale and resolution.

Remark 11.11 (Contingency profile). *A contingency profile records the degree and form of generative openness attributed to a system across selected temporal, spatial, organizational, and descriptive scales. The profile can include branching structure, sensitivity, path dependence, persistence, and causal retention according to the requirements of the inquiry.*

The profile concept also supports comparison across heterogeneous domains while respecting Section 10. Two systems can be compared through a shared feature such as branching sensitivity or persistence of path effects when a justified comparison structure exists. Their wider contingency organizations can remain only partially comparable.

11.8 Relational Contingency Criterion

This subsection integrates the preceding analysis into a working criterion for relational contingency. Its structural role is to consolidate historical configuration, generative possibility, actualization, path dependence, causal retention, manifestational timing, and scale sensitivity into a single analytical protocol. The objective is to provide a criterion that can support later applications while preserving the open metaphysical commitments of the broader GR framework. The discussion proceeds by specifying the minimum information required for a defensible contingency claim.

Definition 11.12 (Relational contingency). *Relational contingency* is a scale-indexed generative condition in which a historical configuration supports a justified plurality of admissible continuations, the realized continuation depends materially on historically situated couplings and local dynamics, and the resulting path can contribute causally to the subsequent organization of the relational system.

A relational-contingency analysis should therefore identify the historical configuration, specify the relevant possibility structure, justify the admissibility of alternative continuations, reconstruct the relational conditions contributing to actualization, and evaluate the persistence of resulting causal effects. Claims concerning perception, surprise, recognition, or symbolic articulation require an additional manifestation index. Claims concerning aesthetic significance require the further evaluative architecture developed in Section 12.

The criterion preserves a distinction among three analytically separable issues. Generative openness concerns the plurality and organization of admissible continuations. Historical actualization concerns the relationally conditioned path that entered realized history. Manifestational access concerns the later availability of that contingency to an epistemic or experiential system. Their coupling can be studied empirically and conceptually while each retains its own qualification conditions.

Remark 11.13 (Contingency and GR). Relational contingency extends the general GR commitment to historically evolving couplings. A system's future possibilities depend on inherited relations, current interactions, emergent objects, and prior actualizations. Contingency therefore belongs to the architecture of generative history whenever relational organization leaves several developments admissible and subsequent dynamics actualize one path with causally retained consequences.

The resulting account prepares the transition to aesthetic manifestation. A contingent structure can already be relationally real, historically situated, and causally efficacious before it acquires salience for a subject. The next section examines the additional conditions through which such a structure becomes aesthetically significant within manifestational reality.

12 Aesthetic Manifestation

This section develops aesthetic manifestation as a mode through which relationally real structures acquire salience within an experiential or epistemic system. Its structural role is to connect the account of relational contingency in Section 11 with the later analysis of register-relative equivalence in Section 13. The section has five objectives: to specify aesthetic salience within the manifestational register, to distinguish aesthetic orientation from conceptual recognition and normative evaluation, to explain how contingency can become manifest as historically structured significance, to characterize the contribution of prior experience and relational history to aesthetic judgment, and to identify the generative consequences through which aesthetic manifestation can redirect attention, inquiry, and action. The discussion proceeds through manifestational salience, aesthetic orientation, contingency recognition, preconceptual differentiation, historical sensibility, generative feedback, and a concluding criterion for aesthetic manifestation.

12.1 Manifestational Salience

This subsection specifies the transition from manifestational availability to salience. Its role is to identify the additional organization through which an available difference becomes prominent enough to orient attention, interpretation, or practical engagement. The objective is to clarify why manifestation can remain weak, routine, or backgrounded in some cases while becoming experientially significant in others. The discussion treats salience as a relationally generated feature of manifestation whose intensity depends on both the manifested structure and the configuration of the receiving system.

Manifestation, as developed in Section 7, concerns indexed availability to an experiential, observational, interpretive, or symbolic system. Availability alone permits several degrees of practical consequence. A structure can be registered with minimal attention, carried through habit, or detected by an instrument

without becoming prominent within the system's ongoing organization. Saliency arises when the manifested difference acquires sufficient prominence to reorganize attention, expectation, interpretation, memory, or subsequent inquiry.

Definition 12.1 (Manifestational saliency). *Manifestational saliency* is the degree to which an available difference, object, event, or relational structure acquires prominence within an experiential or epistemic system and thereby contributes to the organization of attention, interpretation, memory, or action.

Saliency is indexed in the same manner as manifestation. A feature can be highly salient to one subject, weakly salient to another, and practically invisible to a third. The same subject can also display different saliency profiles across historical periods because accumulated experience, conceptual resources, affective orientation, and current concerns alter the receptive configuration through which manifestations are encountered. A mathematical pattern that once appeared ordinary can later acquire unusual elegance after the subject develops a richer comparative repertoire. A social interaction that once appeared routine can later disclose a persistent power structure after repeated encounters reorganize the subject's attention.

Saliency therefore belongs to the coupling between manifested structure and receiving system. The relevant structure contributes form, contrast, rhythm, irregularity, symmetry, tension, rarity, historical placement, or another differentiating feature. The receiving system contributes prior experience, expectations, sensitivity, memory, conceptual repertoire, affective disposition, and current orientation. Their coupling produces a manifestational event whose significance can exceed the informational content of the isolated stimulus.

Remark 12.2 (Saliency and availability). Manifestational availability supplies the condition under which a structure can enter an epistemic or experiential system. Saliency specifies the relative prominence acquired by that structure once available. The distinction preserves cases in which a relational reality is already manifest while remaining peripheral to attention.

12.2 Aesthetic Orientation

This subsection defines the aesthetic mode relevant to the paper. Its structural role is to identify a form of orientation through which saliency is organized around perceived form, tension, resonance, elegance, strangeness, generativity, or another quality that calls for sustained attention. The objective is to provide a working conception of aesthetic judgment that can operate across scientific, social, political, and ordinary experience while remaining analytically distinct from moral evaluation, truth assessment, and instrumental utility. The discussion uses aesthetic orientation as a broad category of significance-sensitive manifestation.

Aesthetic manifestation concerns more than sensory pleasantness. A structure can become aesthetically salient through beauty, discordance, compression, asymmetry, unresolved tension, unexpected coherence, or a sense that a configuration contains further generative potential. Such manifestations often precede a fully articulated account of their significance. A researcher can experience a conjecture as elegant before possessing a proof of its importance. A social observer can experience an institutional arrangement as deeply discordant before formulating a normative theory capable of specifying the wrong. A chance encounter can acquire unusual significance before the subject can explain which historical relations made the encounter possible. The history of aesthetics contains sharply different accounts of judgment, experience, and symbolic form; Kant, Dewey, and Goodman provide three influential reference points [25, 14, 20].

Definition 12.3 (Aesthetic orientation). An *aesthetic orientation* is a manifestational organization in which a perceived or registered configuration acquires significance through qualities of form, contrast, tension, resonance, coherence, discordance, or generative promise and thereby attracts, redirects, or sustains attention.

The definition gives aesthetic judgment a specific role in the Generative Relational framework. Aesthetic orientation selects and intensifies certain manifestations within a larger field of available differences. The resulting judgment can be preliminary, revisable, and only partially conceptualized. Its epistemic

importance lies in the allocation of attention toward structures whose significance may become clearer through later inquiry.

Aesthetic orientation also remains distinct from a claim that the manifested object is true, morally desirable, or practically useful. These evaluations can later couple with aesthetic judgment. Their criteria remain separately assessable. A formally elegant explanation can prove empirically inadequate. A politically troubling arrangement can display striking structural coherence. A question can appear intellectually beautiful while carrying limited immediate utility. The separation permits aesthetic judgment to guide attention while leaving later epistemic, normative, and practical evaluation open.

Proposition 12.4 (Aesthetic selectivity). *Aesthetic manifestation can function as a selective orientation within a field of manifest possibilities by increasing the salience of configurations that exhibit form, tension, resonance, or perceived generative significance relative to the subject's current relational and historical configuration.*

12.3 Contingency Recognition

This subsection applies aesthetic orientation to relational contingency. Its structural role is to explain how a historically generated contingent structure can become manifest as significant without making aesthetic judgment constitutive of the contingency itself. The objective is to preserve the distinction developed in Section 11 between relational contingency and its later availability to a subject. The discussion focuses on the manifestational recognition of alternative possibility, historical convergence, and realized path specificity.

A relationally contingent event can already be embedded in a historical configuration that sustains several admissible continuations. The realized event enters history through one actualized continuation and can alter later possibilities through causal retention. These conditions can hold before any subject experiences the event as contingent. Aesthetic manifestation begins when some aspect of this relational structure becomes salient to an experiential or epistemic system.

The manifested significance of contingency often concerns the relation between actuality and unrealized possibility. An encounter can appear remarkable because several independent trajectories converged within a narrow interval. A scientific observation can appear striking because a small deviation opens a new explanatory path. A question can acquire unusual beauty because it links domains whose connection had remained latent within the subject's prior knowledge. In each case, the aesthetic event concerns the experienced structure of possibility, convergence, or generative opening.

Definition 12.5 (Contingency recognition). *Contingency recognition* is the manifestational organization through which a subject or epistemic system becomes sensitive to the historically situated plurality, convergence, or path specificity associated with a relationally contingent event or structure.

Recognition can vary in conceptual precision. A subject can experience an event as surprising, uncanny, fortunate, elegant, or deeply meaningful while possessing only a partial reconstruction of the historical configuration that produced it. Later inquiry can expand the relational account by identifying previously unseen couplings, alternative pathways, and causal retention. Aesthetic recognition can therefore precede analytical reconstruction while remaining open to revision by it.

This structure clarifies the relation between contingency and existential significance. An event can become existentially salient when the subject experiences the realized path as one among several historically possible developments and recognizes that the present configuration could have unfolded differently. The experienced specificity of actuality can thereby acquire weight through its relation to unrealized possibilities. GR treats this significance as a manifestational achievement grounded in relational history rather than as a property supplied solely by isolated subjective preference.

12.4 Preconceptual Differentiation

This subsection examines aesthetic manifestation before stable conceptual articulation. Its structural role is to preserve intermediate forms of access between relational reality and explicit symbolic judgment. The

objective is to explain how felt difference, attraction, disturbance, familiarity, or resonance can already organize attention while the relevant object remains only partially conceptualized. The discussion builds on the access plurality developed in Section 7.3.

Aesthetic salience can emerge through affective, perceptual, or behavioral sensitivity before the subject can state a stable proposition about what has been encountered. A person can sense a difference between two ritual configurations before identifying the symbolic distinctions that organize them. A researcher can repeatedly return to an anomaly before formulating the concept that makes its significance explicit. A reader can experience a passage as structurally powerful before identifying the formal relation responsible for the response.

Definition 12.6 (Preconceptual differentiation). *Preconceptual differentiation* is a manifestational condition in which a subject or epistemic system responds differentially to a configuration before that difference has acquired a stable conceptual or propositional articulation.

Preconceptual differentiation already belongs to manifestation because a difference has become available within the receiving system and has altered its organization. Symbolic mediation can participate in the underlying relational structure even when the selected subject lacks symbolic access to that structure, as established in Section 8. Aesthetic manifestation therefore admits cases in which historically and symbolically mediated relations become affectively or perceptually salient before explicit recognition of their symbolic architecture.

This distinction is especially important for highly abstract relational realities. Their causal organization can shape conduct, expectation, and affect across long intervals before participants acquire a concept capable of naming the pattern. Aesthetic sensitivity can supply an early mode of access by preserving attention to a recurring difference whose theoretical interpretation remains developing. The later formation of concepts can then reorganize the original experience and produce new manifestational profiles.

Remark 12.7 (Conceptual development). Aesthetic manifestation can support conceptual development by stabilizing attention around a recurring difference. Conceptual articulation subsequently changes the conditions of future manifestation by adding names, categories, comparisons, and inferential connections to the receiving system.

12.5 Historical Sensibility

This subsection specifies the historical formation of aesthetic judgment. Its structural role is to connect manifestational salience with the accumulated relational history of the subject or epistemic system. The objective is to explain why similar configurations can generate different aesthetic responses across persons, communities, disciplines, and historical periods. The discussion treats aesthetic sensibility as a historically developed capacity for differential salience.

Aesthetic judgment depends partly on the receptive history through which a subject acquires patterns of expectation, comparison, memory, skill, symbolic repertoire, and affective orientation. Training in mathematics can alter sensitivity to compression, symmetry, and proof structure. Experience with political institutions can alter sensitivity to subtle forms of exclusion or accountability. Repeated exposure to artistic traditions can alter the forms of variation and novelty that become salient. These histories contribute to what the receiving system is able to notice and sustain as significant.

Definition 12.8 (Historical sensibility). *Historical sensibility* is the accumulated relational organization through which prior experience, learning, memory, practice, and symbolic mediation shape the configurations that can acquire aesthetic salience for a subject or epistemic system.

Historical sensibility gives aesthetic judgment a generative history. A judgment emerges through the coupling between current manifestation and an already structured receptive field. The field itself remains open to transformation through new encounters. Aesthetic experience can therefore revise the sensibility through which later experiences are judged, producing a recursive relation between attention and history.

The same structure also explains why aesthetic disagreement can persist among competent observers. Distinct histories can generate different repertoires of comparison, different sensitivities, and different expectations concerning form and significance. Such disagreement can motivate further inquiry into the relational conditions of judgment. The GR account therefore directs attention toward the histories that make particular forms of salience possible within particular communities.

12.6 Generative Feedback

This subsection develops the causal consequences of aesthetic manifestation. Its structural role is to connect aesthetic judgment with the recursive dynamics of relational systems. The objective is to show how salience can redirect attention, inquiry, communication, resource allocation, and interaction in ways that modify the relational field from which later manifestations emerge. The discussion focuses on feedback rather than on a universal developmental sequence.

Aesthetic manifestation can alter which objects receive sustained attention. Sustained attention can motivate observation, reading, experimentation, dialogue, preservation, or institutional support. These activities generate new interactions and can reveal previously hidden relational structures. Once articulated, the resulting concepts and symbols can circulate through communities, alter classifications, and stabilize new research or cultural practices. Aesthetic judgment thereby becomes one possible entry point into a recursive generative cycle.

The same mechanism can operate in question formation. A field can contain many technically admissible questions, while only some acquire enough aesthetic salience to attract sustained inquiry. Their perceived elegance, depth, tension, anomaly, or generative promise can redirect scarce attention toward particular problems. Later epistemic evaluation can confirm, revise, or dissolve the initial orientation. The original aesthetic selection nevertheless contributes causally to which possibilities receive further development.

Proposition 12.9 (Aesthetic feedback). *When aesthetic manifestation reorganizes attention or action, the resulting changes in inquiry, interaction, symbolic articulation, or resource allocation can modify the relational conditions that shape later manifestations and judgments.*

Aesthetic feedback also links individual experience with collective dynamics. A salient observation can be communicated, named, reproduced, institutionalized, or taught. Collective uptake can transform an initially local judgment into a wider relational reality with its own persistence and causal efficacy. Scientific problems, artistic forms, public symbols, and institutional concerns can all acquire expanded reach through such processes. Their later stability depends on the broader coupling system rather than on the initiating judgment alone.

This recursive structure gives aesthetic judgment a limited but consequential place within GR. Aesthetic manifestation can reveal, select, or intensify aspects of relational reality; subsequent practices can then transform the relations that support future manifestations. The framework thereby connects aesthetic experience with historical generativity while preserving separate criteria for relational reality, manifestation, epistemic validity, and normativity.

12.7 Aesthetic Manifestation Criterion

This subsection consolidates the preceding analysis into a working criterion. Its structural role is to specify the conditions under which a manifestation qualifies as aesthetically significant within the present framework. The objective is to provide a criterion broad enough for scientific, political, social, and ordinary cases while preserving the conceptual distinctions required by later sections. The discussion synthesizes salience, orientation, historical sensibility, and generative consequence.

Definition 12.10 (Aesthetic manifestation). *An aesthetic manifestation occurs when an available configuration acquires historically situated salience through perceived form, contrast, tension, resonance, coherence, discordance, contingency, or generative promise and thereby reorients attention, interpretation, memory, or possible action within an experiential or epistemic system.*

The criterion has four components. First, a configuration must already possess manifestational availability relative to the selected system. Second, the configuration acquires differential salience within that system. Third, the salience is organized through an aesthetic orientation shaped by the system's historical sensibility. Fourth, the resulting orientation has sufficient organizational consequence to redirect attention, interpretation, memory, inquiry, or possible action. These components can occur at different strengths and can be revised through later conceptual, epistemic, or normative evaluation.

The criterion also clarifies the relation between aesthetic manifestation and relational contingency. Contingency can qualify as relationally real through historical configuration, structured possibility, actualization, causal retention, and scale-sensitive persistence. Aesthetic manifestation concerns a later or concurrent mode of access in which some aspect of that structure becomes salient. The judgment can deepen through reconstruction of the relevant history, while the relational status of the contingency remains governed by the criterion developed in Section 11.

Remark 12.11 (Aesthetic scope). The present criterion treats aesthetic manifestation as a significance-sensitive mode of access rather than a general theory of aesthetics. Questions concerning artistic value, taste, aesthetic normativity, and the institutional history of art require additional distinctions and remain beyond the present section's foundational role.

Aesthetic manifestation completes the paper's account of how relationally real structures can become selectively significant within experience while preserving the independence of their prior relational status. The next section develops register-relative equivalence and examines how sameness or difference within one reality register can coexist with a different profile in another.

13 Register Equivalence

This section develops equivalence as a register-indexed relation among objects whose distinguishability has already been established. Its structural role is to connect the three-register architecture in Section 3 with the comparison problems developed in Section 10 and with the Lacanian comparison developed in Section 14. The section has five objectives: to define equivalence relative to a selected register and criterion, to distinguish local equivalence from cross-register identity, to characterize mixed equivalence profiles, to examine manifestational equivalence alongside relational and ontological difference, and to provide a working criterion for disciplined equivalence claims. The discussion proceeds through equivalence domains, register indexing, equivalence profiles, manifestational equivalence, relational difference, ontological difference, partial equivalence, and a concluding equivalence criterion.

13.1 Equivalence Domains

This subsection establishes the domain conditions required for an equivalence claim. Its role is to identify the analytical structure within which two objects can be treated as equivalent for a specified purpose. The objective is to specify equivalence through a declared domain, criterion, and resolution so that each claim carries an explicit basis of sameness. The discussion builds on the criterion-indexed account of object distinguishability developed in Section 2.

An equivalence claim compares selected features of distinguishable objects under a specified analytical rule. The relevant rule can concern physical state, relational position, causal role, manifest appearance, symbolic classification, functional response, or another explicitly defined property. The claim therefore requires a domain that contains the relevant objects and a criterion that specifies which differences remain analytically active.

Definition 13.1 (Equivalence domain). An *equivalence domain* is a specified set of objects together with a criterion and resolution under which selected differences are treated as analytically inactive for the purpose of a given comparison.

The resolution component is important because equivalence can change when the analytical grain changes. Two institutional roles can be equivalent for payroll classification while remaining different in authority, accountability, and historical position. Two signals can be equivalent for a detector operating at one resolution while remaining distinguishable at a finer resolution. Equivalence therefore belongs to an analytical configuration with explicitly stated conditions of application. Goodman’s pluralist treatment of description and worldmaking offers a useful parallel for understanding how sameness depends on the system of rendering under which objects are compared [21].

Remark 13.2 (Analytical resolution). The resolution of an equivalence domain determines which differences remain active in the comparison. A change in resolution can preserve, refine, or dissolve an earlier equivalence relation.

Equivalence domains also carry scope conditions. A criterion justified for one task can have limited relevance for another task. Functional equivalence in a narrow interface test, for example, can support claims about that interface while leaving institutional history, material constitution, vulnerability, or legal status for separate analysis. Explicit scope protects equivalence claims from acquiring broader force than their criterion supports.

13.2 Register Indexing

This subsection locates equivalence within the three reality registers. Its structural role is to specify how ontological, relational, and manifestational criteria generate distinct equivalence relations. The objective is to prevent a criterion operating in one register from silently governing another register. The discussion treats each equivalence relation as indexed to a selected register and to an additional criterion internal to that register.

The three registers distinguish different analytical questions. Ontological reality concerns the ontology under which objects and states are individuated. Relational reality concerns emergent, persistent, and causally efficacious organization within generative-relational systems. Manifestational reality concerns indexed availability within experiential, observational, interpretive, or symbolic systems. Each register therefore supports its own equivalence conditions.

For objects x and y , the notation $x \sim_{O,\alpha} y$, $x \sim_{R,\beta} y$, and $x \sim_{M,\gamma} y$ can be used inline to denote equivalence under ontological criterion α , relational criterion β , and manifestational criterion γ , respectively. The additional criterion index carries the comparison rule within the selected register. Register indexing thereby prevents the symbol $\sim$ from implying a universal equivalence relation.

Definition 13.3 (Register-indexed equivalence). *Register-indexed equivalence* holds when two distinguishable objects satisfy a declared equivalence criterion within a selected reality register and at a specified analytical resolution.

A register-indexed claim remains local to its declared conditions. Manifestational equivalence can concern appearance, response, symbolic designation, or another mode of availability. Relational equivalence can concern causal role, coupling pattern, persistence profile, or another relational organization. Ontological equivalence can concern the categories and structures supplied by the adopted ontology. Cross-register claims therefore require additional argument because each register evaluates a different aspect of the objects under study.

Proposition 13.4 (Register locality). *Equivalence established in one reality register supplies a local equivalence relation for that register and criterion. Equivalence in another register requires its own criterion and supporting analysis.*

Register locality also preserves the coupled architecture developed in Section 3. Coupling among registers can produce correlations among their equivalence structures. Strong correlation can make cross-register similarity empirically common in some domains. The analytical distinction remains useful because coupling permits divergence as well as alignment.

13.3 Equivalence Profiles

This subsection develops a compact representation for mixed equivalence across the three registers. Its structural role is to replace global sameness claims with a profile that records where equivalence holds, where difference remains, and where comparison remains underdetermined. The objective is to support heterogeneous cases involving partial correspondence among ontological, relational, and manifestational structures. The discussion uses equivalence profiles as a descriptive device that preserves the distinct comparison structures of the three registers.

A pair of objects can receive separate equivalence assessments in the three registers. The resulting pattern can be represented by a profile such as $E(x, y) = (e_O, e_R, e_M)$, where each component records the status of the selected register under its declared criterion. The component can indicate equivalence, difference, partial correspondence, or unresolved comparison. The profile therefore preserves register heterogeneity while making cross-register structure visible.

Definition 13.5 (Equivalence profile). An *equivalence profile* is an ordered record of register-specific equivalence assessments for a selected pair of objects under declared criteria and resolutions.

Equivalence profiles support several analytically important configurations. Two objects can share a manifestational profile while occupying different relational positions. Two objects can perform similar relational functions while appearing differently to observers. Two objects can share an ontological classification while acquiring divergent relational histories and manifestational meanings. A profile makes these combinations explicit and keeps each claim attached to the criterion that generated it.

The profile also accommodates unresolved or incommensurable components. Section 10 established that distinguishability and membership in a common register provide limited grounds for comparison. An equivalence profile can therefore include an open component when a justified common comparison structure is currently unavailable. This feature prevents analytical convenience from forcing heterogeneous objects into an artificial common scale.

Remark 13.6 (Profile openness). An equivalence profile can contain unresolved components. The profile records the current state of justified comparison and can be revised when new criteria, mappings, or empirical information become available.

13.4 Manifestational Equivalence

This subsection examines equivalence within the manifestational register. Its structural role is to show how strong similarity in appearance, response, or symbolic presentation can coexist with a different profile in the relational and ontological registers. The objective is to clarify the analytical reach of manifestational tests and classifications. The discussion uses an idealized human–AI case as a compact illustration of register locality.

Manifestational equivalence is always indexed to a receiving system and a mode of access. Two objects can produce equivalent responses for a selected observer, interface, classification system, or experimental protocol. Their equivalence concerns the dimensions that the receiving system can register under the chosen conditions. A broader receiving system, a longer observation interval, or a different mode of access can generate a different result.

Consider an idealized case in which a human participant and an artificial agent produce equivalent outputs across a specified interaction protocol. The protocol can justify a claim of manifestational equivalence relative to its tested dimensions. The two participants can nevertheless occupy different relational structures concerning production history, institutional status, ownership, dependency, vulnerability, maintenance, social expectation, and causal embedding. An adopted ontology can also differentiate their material or organizational constitution. The manifestational result therefore contributes one component to an equivalence profile while the other components remain independently assessable. Turing’s imitation-game formulation provides a historically important example of an explicitly behavioral criterion whose success conditions leave questions about internal organization and wider relational embedding open [36].

Example 13.7 (Interface equivalence). Suppose a human participant and an artificial agent generate equivalent responses under a fixed textual interface and a declared evaluation criterion. The result supports manifestational equivalence for that interface and criterion. Relational and ontological equivalence remain separate questions requiring their own domains of comparison.

This structure applies beyond human–AI comparison. Legal categories, institutional forms, market instruments, ritual objects, and scientific representations can become manifestationally equivalent under a selected classification while retaining different histories and causal organizations. The register framework therefore treats appearance and classification as important modes of reality while preserving the additional structures that participate in relational persistence and ontological individuation.

13.5 Relational Difference

This subsection specifies relational difference within an equivalence profile. Its structural role is to identify the kinds of divergence that can remain active even when manifestational similarity is high. The objective is to connect register equivalence with the earlier accounts of coupling, causal dynamics, and relational emergence. The discussion focuses on differences in coupling organization, causal position, persistence, history, and generative capacity.

Relational equivalence concerns the organization through which objects participate in a generative-relational system. Two objects can occupy different relational positions even when selected manifestations coincide. Relevant differences can include coupling directionality, dependency structure, authority, exposure to sanctions, access to resources, historical stabilization, interaction pathways, and capacity to alter later trajectories. These features determine how an object participates in the relational system and how the system responds to its presence.

A relational difference therefore has causal significance when it changes the space of possible evolution under the selected scale and criterion. The same outward response can arise through different dependency structures, and the later behavior of those structures can diverge when conditions change. Relational analysis accordingly examines the organization that sustains the manifestation in addition to the manifestation itself.

Definition 13.8 (Relational equivalence). Two objects exhibit *relational equivalence* under a selected criterion when their coupling organization, causal participation, persistence profile, or another declared relational feature is equivalent at the chosen scale and resolution.

Relational equivalence can be narrow or broad. A narrow criterion can compare a specific causal role, such as the capacity to authorize a transaction. A broader criterion can compare the architecture of dependencies, feedback, and historical stabilization supporting that role. Explicit criterion design therefore determines the scope of the equivalence claim and the kinds of difference that remain analytically active.

13.6 Ontological Difference

This subsection specifies ontological difference within the same framework. Its structural role is to preserve the dependence of ontological equivalence on the ontology adopted for analysis. The objective is to keep ontological claims distinct from relational and manifestational assessment while allowing their couplings to be studied. The discussion emphasizes ontology-relative individuation and the possibility of multiple ontological descriptions.

Ontological equivalence depends on the categories, identity conditions, and structures supplied by an adopted ontology. A physicalist ontology can distinguish objects through material constitution, spatiotemporal location, field state, or another physically specified property. A process ontology can privilege patterns of process continuity. A structural ontology can privilege relations among positions within a structure. GR therefore leaves the ontological register open to explicit theoretical commitment while requiring each equivalence claim to state the commitment that supports it.

Two objects can share a relational role under one criterion while receiving different ontological classifications. Conversely, objects placed in the same ontological category can develop different relational realities through divergent histories, couplings, and institutional positions. Ontological classification therefore contributes a distinct component to the equivalence profile.

Remark 13.9 (Ontological plurality). Register analysis can be conducted under more than one explicitly stated ontology. Divergent ontological classifications can then be compared at the meta-theoretical level while relational and manifestational analyses retain their own criteria.

This openness also prevents the relational register from functioning as a substitute ontology. Relational reality concerns the emergence, persistence, and causal efficacy of objects within generative-relational systems. Ontological reality concerns the ontology under which existence and individuation are specified. Their coupling can be strong, while their analytical tasks remain distinct.

13.7 Partial Equivalence

This subsection develops equivalence under heterogeneous and incomplete correspondence. Its structural role is to connect register equivalence with the partial comparability developed in Section 10. The objective is to provide a disciplined vocabulary for cases in which objects correspond along selected dimensions while retaining differences elsewhere. The discussion treats partial equivalence as a structured relation tied to declared projections or comparison maps.

Many practical equivalence claims operate through selected projections. Two institutional arrangements can be equivalent in voting rule while differing in enforcement. Two currencies can be equivalent for settlement of a specified debt while differing in jurisdictional backing and circulation. Two scientific models can be equivalent with respect to a selected prediction while differing in ontology or explanatory structure. Partial equivalence captures this bounded correspondence.

Definition 13.10 (Partial equivalence). *Partial equivalence* holds when two objects satisfy an equivalence criterion over a declared subset of features, projections, scales, or contexts while other components of their equivalence profile remain different, unresolved, or outside the comparison domain.

Partial equivalence is especially useful for cross-register analysis because it avoids pressure toward global identity. A manifestational criterion can support equivalence in one component, a relational criterion can support correspondence in another, and ontological comparison can remain open. The resulting profile records a layered similarity structure whose components can be revised independently.

The same approach supports empirical research. Investigators can operationalize a narrow equivalence relation, state its domain, test its stability across contexts, and then examine whether relational or ontological differences explain later divergence. Register equivalence thereby provides a framework for disciplined comparison across heterogeneous objects while preserving the distinctions established by the three-register architecture.

13.8 Equivalence Criterion

This subsection consolidates the preceding analysis into a working criterion for equivalence claims. Its structural role is to specify the minimum information required for a claim of sameness or correspondence within GR. The objective is to make equivalence claims transparent, revisable, and compatible with register heterogeneity. The discussion synthesizes domain specification, register indexing, analytical resolution, and profile construction.

Definition 13.11 (Equivalence criterion). An *equivalence claim* within GR is well specified when it identifies the objects under comparison, the selected reality register, the comparison criterion, the analytical resolution, the relevant scale or context, and the scope over which the resulting correspondence is intended to hold.

The criterion has six components. First, the objects must be distinguishable under a declared basis. Second, the equivalence domain must specify which features enter the comparison. Third, the relevant reality register must be identified. Fourth, the criterion and resolution must define the tolerated differences. Fifth, the scale and context must delimit the conditions of application. Sixth, the resulting claim must state its intended scope so that additional register components remain available for independent analysis.

Proposition 13.12 (Profile discipline). *A global claim of sameness acquires analytical support only through the set of register-specific criteria that justify its components. Register equivalence therefore favors explicit equivalence profiles over unrestricted identity claims in heterogeneous domains.*

The criterion clarifies the relation between equivalence and the broader GR framework. Distinguishability supplies the basis for identifying objects. Coupling and causal dynamics specify relational participation. Relational emergence identifies structures that qualify as relationally real. Manifestation identifies indexed modes of availability. Equivalence analysis then asks which selected features can be treated as corresponding within one or more of these domains. The resulting profile preserves both similarity and difference within a common analytical architecture.

Register equivalence completes the paper's formal distinction between sameness within a selected mode of reality and broader claims about object identity. The next section uses this distinction to compare the GR reality registers with the Lacanian Real, Imaginary, and Symbolic while preserving the different principles by which the two frameworks partition their analytical domains.

14 Lacanian Registers

This section situates the three reality registers developed in this paper in relation to Jacques Lacan's Real, Imaginary, and Symbolic. Its structural role is comparative: the preceding sections have already defined ontological, relational, and manifestational reality on their own terms, and the present section identifies points of proximity, divergence, and transversal mediation between the two register architectures. The section has four objectives: to distinguish the principles by which each framework partitions its analytical domain, to clarify the respective scope of the three apparent pairings, to specify the special role of symbolic mediation in relational reality, and to establish a disciplined basis for future dialogue with Lacanian theory. The discussion proceeds through comparison scope, partition principles, the three apparent pairings, symbolic transversality, coupled-register structure, and a concluding comparison criterion. Lacan's register theory changed across several phases of his work, so the comparison uses stable structural features while preserving historical variation within the Lacanian corpus [26, 24, 17].

14.1 Comparison Scope

This subsection defines the scope of the comparison. Its role is to prevent visual similarity among two triadic frameworks from carrying more theoretical weight than the concepts themselves support. The objective is to compare the organizing questions, domains of application, and modes of coupling that structure the two accounts. The discussion therefore treats apparent correspondence as a hypothesis requiring local justification.

The formal resemblance is immediate. GR distinguishes ontological, relational, and manifestational reality, while Lacanian theory distinguishes the Real, Imaginary, and Symbolic. Both architectures also permit mutual dependence among their registers. Lacan's later use of Borromean topology gave increasing emphasis to the interdependence of the Real, Imaginary, and Symbolic, while the present GR framework treats its three reality registers as mutually coupled analytical domains [24]. The shared triadic form supplies a legitimate reason for comparison.

The comparison acquires greater precision when the organizing problems are separated. GR uses its registers to analyze modes of reality, persistence, causal efficacy, and manifestation across heterogeneous systems. Its intended domain includes human subjects while also extending to institutions, artificial systems,

economic objects, ecological structures, symbolic formations, and other relationally generated objects. Lacanian register theory developed within psychoanalysis and centers the constitution of subjectivity, identification, signification, desire, and the limits encountered by symbolic-imaginary organization [24, 17]. The two frameworks can therefore intersect across many objects while preserving different theoretical centers of gravity.

Remark 14.1 (Comparison discipline). A structural resemblance between register architectures supports comparison after the partition principles and scope conditions of each register have been stated. Local correspondence gains force through an explicit criterion of comparison.

This discipline also protects the internal development of GR. Sections 3–13 established the GR registers through distinguishability, coupling, emergence, causal efficacy, manifestation, and equivalence. The Lacanian comparison therefore enters after those commitments have been defined, allowing the comparison to clarify conceptual boundaries while preserving the independent derivation of the GR architecture.

14.2 Partition Principles

This subsection identifies the principles that divide each framework into registers. Its structural role is to supply the main explanatory basis for the differences developed in the following subsections. The objective is to show that similar triadic form can coexist with distinct rules of partition. The discussion compares the primary analytical questions assigned to each framework.

GR partitions reality according to three different modes of qualification. The ontological register asks how objects, states, processes, or fields are individuated under an adopted ontology. The relational register asks when an organization generated within a system attains sufficient persistence and causal efficacy to qualify as relationally real. The manifestational register asks how an object or structure becomes available to an indexed experiential, observational, interpretive, or symbolic system. These registers concern different dimensions of the same object and can remain mutually coupled throughout its history.

Lacan's registers divide psychoanalytic structure according to a different conceptual lineage. The Imaginary is closely associated with image, identification, ego formation, specular relations, and forms of experienced coherence. The Symbolic concerns signifying structures, language, law, institutions, norms, and the trans-subjective order into which subjects are inserted. The Real acquires several formulations across Lacan's career, including material exteriority in earlier formulations and, increasingly, dimensions of impossibility, resistance, and unsymbolizability that disturb the organization of familiar symbolic-imaginary reality [24]. Lacan's 1953 presentation of the triad already treated the three terms as distinct dimensions of psychoanalytic experience, while later work repeatedly revised their relative emphasis and modes of knotting [26].

The resulting distinction concerns the basis of classification. GR classifies according to ontological qualification, relational organization, and manifestational availability. Lacanian RSI classifies dimensions of psychical, identificatory, signifying, and limiting structure. Overlap can emerge because symbolic orders, images, identifications, and limits all participate in relational systems and manifestations. The overlap therefore has the character of cross-framework mediation and local correspondence.

Proposition 14.2 (Partition locality). *Correspondence between a GR register and a Lacanian register is analytically local to the property under comparison. Broader identity between the registers requires additional argument concerning their domains, qualification criteria, and coupling structure.*

Partition locality provides the governing rule for the three pairings that commonly arise from the surface geometry of the two triads.

14.3 Ontological Reality and the Real

This subsection examines the apparent correspondence between ontological reality and the Lacanian Real. Its structural role is to separate ontology-relative individuation from the psychoanalytic problem of limits,

resistance, and impossibility. The objective is to identify the restricted domains in which the two concepts can touch while preserving their distinct analytical functions. The discussion follows the historical variability of the Real and the explicit ontology-relativity of GR.

Ontological reality in GR is indexed to an adopted ontology. A physicalist analysis can individuate objects through spacetime location, field configuration, material state, or another physically specified structure. A process ontology, structural ontology, or another metaphysical commitment can supply a different basis of individuation. The register itself therefore provides a place for ontological commitments while leaving their substantive content open to argument. Section 3 developed this flexibility as a condition for applying GR across heterogeneous domains.

The Lacanian Real has a different theoretical history. Early formulations sometimes approach material being beyond phenomenal appearance, which can create a partial resemblance to an ontological substrate. Later Lacanian formulations increasingly associate the Real with what resists integration into symbolic-imaginary reality, with impossibility, traumatic interruption, material meaninglessness, and points where representation reaches a structural limit [24]. The Real thereby concerns the limits and disturbances of signifying and imagistic organization as much as any claim about what ultimately exists.

The distinction becomes visible through the question each concept answers. Ontological reality asks which distinctions and entities are licensed by an adopted ontology. The Real asks how psychoanalytic structure encounters what escapes, exceeds, or disrupts symbolic-imaginary organization. A physical configuration can belong to GR's ontological register because a physical ontology individuates it, while its relation to the Lacanian Real depends on a further psychoanalytic analysis of representation, subjectivity, or impossibility. Likewise, a Lacanian encounter with the Real can concern a breakdown or limit of symbolization whose significance exceeds the task of ontological classification.

Remark 14.3 (Ontological overlap). Some early and material formulations of the Lacanian Real can overlap with questions placed in GR's ontological register. The overlap remains criterion-specific because GR treats ontology as an explicit analytical commitment, while Lacanian discussions of the Real also concern resistance, impossibility, and the limits of symbolization.

This restricted overlap prepares the more difficult comparison involving relational reality and the Imaginary.

14.4 Relational Reality and the Imaginary

This subsection examines the apparent correspondence between relational reality and the Lacanian Imaginary. Its structural role is to clarify the conceptual location of a GR category whose objects can be pre-manifestational, symbolically mediated, and causally efficacious across human and non-human systems. The objective is to distinguish relational emergence from image-based or identificatory organization while retaining the ways in which Imaginary structures can participate in relational reality. The discussion uses the relational reality criterion established in Section 6.

Relational reality in GR qualifies an emergent organization through sufficient persistence and causal efficacy within a generative-relational system. The category therefore includes structures whose reality depends on patterned coupling across time. Trust, money, institutional authority, social classification, collective expectation, and other objects can become relationally real when they stabilize sufficiently to alter subsequent trajectories. Section 7 further established that such qualification can precede manifestation to a particular subject.

The Lacanian Imaginary concerns a more specific organization of subjectivity. It is associated with images, ego formation, identification, rivalry, fantasy, coherence, and the ways subjects experience themselves and others through imagistic and identificatory structures [24, 17]. These structures can have powerful causal effects and can become durable components of social and institutional organization. Their causal and social importance therefore gives the Imaginary substantial relevance to GR analysis.

The relation between the concepts is best represented through mechanism inclusion together with register separation. Imaginary identifications can contribute to the generation and stabilization of relational

realities. A collective identity, for example, can acquire persistence through repeated images, narratives, embodied rituals, and mutual expectations. Once stabilized, the resulting relational reality can influence subjects who have limited or delayed awareness of the history that produced it. Imaginary processes then function as one family of generative mechanisms within a wider relational domain.

GR also extends relational reality beyond imagistic and identificatory organization. A legal classification can structure opportunities before a subject recognizes the classification. An automated scoring system can alter access to resources through institutional and technical couplings. An ecological relation can shape trajectories outside an egoic or specular structure. These cases preserve the generality of relational reality while leaving open the possibility that Imaginary mechanisms become decisive in specifically psychical or social domains.

Proposition 14.4 (Relational extension). *Imaginary structures can participate in the production, stabilization, and transformation of relational realities. Relational reality has a wider domain because its qualification depends on emergent persistence and causal efficacy across generative-relational systems.*

This extension clarifies why pre-manifestational relational reality remains compatible with symbolic or Imaginary mediation. The qualification of the relational object and the subject's access to that object answer different analytical questions.

14.5 Manifestational Reality and the Symbolic

This subsection examines the apparent correspondence between manifestational reality and the Lacanian Symbolic. Its structural role is to separate manifestation from symbolization while preserving the central role of signifying structures in shaping both manifestation and relational organization. The objective is to show how linguistic, legal, institutional, and classificatory structures can mediate reality across more than one GR register. The discussion draws on the manifestation indexing of Section 7 and the symbolic mediation analysis of Section 8.

Manifestational reality in GR concerns indexed availability. A structure can become manifest through perception, affective salience, behavioral sensitivity, observation, conceptual recognition, or symbolic articulation. The manifestational register therefore covers a wider set of access modes than linguistic or signifying articulation alone. A felt difference can be manifest before it receives a stable name. An instrument can register a pattern before an investigator integrates it into a conceptual vocabulary. A subject can respond behaviorally to a structure whose institutional classification remains obscure.

The Lacanian Symbolic describes a trans-subjective order of signifiers, language, law, institutions, norms, customs, rules, and related socio-linguistic structures [24]. Subjects enter an already organized Symbolic order that shapes positions, possibilities, and interpretations. This feature creates a particularly important intersection with GR because symbolic organization can exert causal effects before a given subject becomes explicitly aware of the relevant structure.

A legal status illustrates the point. The status can be constituted through statutes, records, institutional categories, and administrative procedures. Those symbolic structures can modify mobility, eligibility, access, and obligation while the affected person has incomplete knowledge of the operative classification. The relational reality of the status can therefore be symbolically mediated while remaining outside that person's manifestational access for some interval. Later recognition can make the same structure manifest and can introduce additional feedback into the relation.

Pre-manifestational status therefore remains compatible with prior symbolic mediation. This compatibility is central to GR because manifestation independence concerns the relation between a relational object and an indexed receiving system. The concept leaves the chronology of symbolic participation open across the history of a relational structure. Symbolic mediation can enter early, late, or repeatedly within the history of a relational reality.

Remark 14.5 (Symbolic scope). Within GR, symbolic structures can operate as constitutive, stabilizing, transmissive, and manifestational mechanisms. Their analytical role therefore crosses the relational and manifestational registers and can also alter ontological configurations through materially effective practices.

The breadth of symbolic mediation supports a transversal GR–Lacan comparison across register boundaries.

14.6 Symbolic Transversality

This subsection develops the transversal interpretation of the comparison. Its structural role is to replace a one-to-one register mapping with a framework for tracing how Lacanian processes can participate across several GR registers. The objective is to preserve insights from Lacanian theory while maintaining the distinct partition principles established earlier in this section. The discussion focuses on the Symbolic because its cross-register reach is especially clear.

The Symbolic can participate in relational constitution. Money, legal status, office, kinship categories, institutional authority, and many other social objects depend heavily on signifying and normative structures. Once organized and stabilized, these objects can acquire relational reality through persistent causal efficacy. The same Symbolic can also participate in manifestation by supplying names, categories, narratives, and interpretive schemas through which relational objects become available to subjects.

The Imaginary likewise has transversal reach. Images and identifications can shape manifestational salience while also stabilizing relational structures through repeated recognition, affective investment, and social expectation. The Real can enter GR analysis through several possible interfaces, including ontological disturbance, manifestational breakdown, or relational reorganization produced by events that exceed established symbolic-imaginary coordination. Each interface requires its own criterion because the Lacanian category is defined through its place in RSI, while GR uses its own qualification rules.

This cross-cutting structure can be summarized through a methodological principle: a Lacanian register can function as a mechanism, constraint, or mode of organization within more than one GR register. Conversely, a GR register can contain processes that Lacanian analysis would distribute across several RSI dimensions. The comparison therefore becomes a mapping among functions and mechanisms while preserving the three categories of each framework.

Definition 14.6 (Transversal correspondence). A *transversal correspondence* is a criterion-specific relation in which a process, mechanism, or structure identified within one register architecture contributes to phenomena distributed across several registers of another architecture.

Transversal correspondence gives the comparison a productive role. It allows GR to draw on Lacanian accounts of signification, identification, subject formation, and symbolic limits while preserving its own criteria for relational reality and manifestation. It also enables Lacanian analysis to enter later GR applications while preserving the independent architecture of each framework.

14.7 Coupled Registers

This subsection compares the coupled character of the two triadic architectures. Its structural role is to identify a genuine structural affinity while clarifying the different theoretical work performed by coupling in each framework. The objective is to connect Lacan’s later emphasis on mutual dependence among RSI with the coupled-register architecture developed in Section 3. The discussion treats coupling as a shared formal intuition whose substantive interpretation remains framework-specific.

Lacan’s later topology increasingly emphasized the mutual dependence of the Real, Imaginary, and Symbolic. The Borromean knot became a prominent device for expressing a form of interdependence in which the organization of the three registers must be considered together [24]. The development also reflected Lacan’s continuing revisions of the relative priority and articulation of the registers across his career.

GR likewise treats ontological, relational, and manifestational reality as mutually coupled. Ontological conditions can constrain relational organization. Relational realities can shape what becomes salient or intelligible within manifestation. Manifestations can redirect action and thereby transform relational structures. Symbolic or technical practices can also produce material interventions that alter ontological

configurations. Section 3 therefore presented the three registers as a coupled architecture whose dominant pathways can vary across systems, scales, and historical periods.

The affinity lies in the rejection of a simple layered sequence. The frameworks differ in the content assigned to each register and in the questions their couplings address. Lacanian coupling concerns the psychoanalytic organization of RSI and the constitution of subjectivity, desire, signification, and their limits. GR coupling concerns interactions among ontological qualification, relational emergence, and manifestational availability across a broader class of systems. The shared formal intuition of interdependence therefore supports dialogue while preserving distinct explanatory projects.

Remark 14.7 (Coupling analogy). Mutual register dependence provides a meaningful structural analogy between GR and Lacanian theory. The analogy concerns architecture and interdependence; the content of each node and the interpretation of each coupling remain framework-specific.

14.8 Comparison Criterion

This subsection consolidates the comparative argument into a working criterion. Its structural role is to provide a reusable method for later references to Lacanian theory in GR research. The objective is to distinguish productive conceptual borrowing from global register substitution. The discussion synthesizes partition locality, transversal correspondence, and coupled-register analysis.

A disciplined comparison begins by specifying the object under study, the GR register involved, the Lacanian concept being introduced, and the property that motivates the correspondence. The comparison then identifies whether the Lacanian concept functions as a constitutive mechanism, stabilizing condition, mode of manifestation, source of differentiation, or limit on representation. This procedure preserves the local explanatory value of the comparison and keeps the two architectures conceptually legible.

The resulting position can be stated compactly. GR's ontological reality and the Lacanian Real can intersect around selected questions of materiality and limits while retaining different organizing criteria. GR's relational reality can be shaped by Imaginary processes while extending across relational organizations whose persistence and causal efficacy arise independently of imagistic identification. GR's manifestational reality can be symbolically articulated while also including perceptual, affective, behavioral, and observational modes of access. Lacanian Symbolic structures can additionally constitute and stabilize relational realities prior to manifestation to a particular subject.

Proposition 14.8 (Comparison criterion). *A GR–Lacan correspondence is theoretically informative when the relevant partition principle, local comparison property, and cross-register mediation pathway are explicitly stated. The correspondence then functions as a structured relation between frameworks and preserves the terminology of each framework.*

The comparison therefore strengthens the conceptual boundary of the three GR registers. It also identifies a productive research interface: Lacanian theory offers detailed resources for analyzing signification, identification, subject formation, and the limits of representation, while GR supplies a broader account of relational emergence, persistence, causal efficacy, manifestation independence, and cross-domain coupling. Section 15 uses the resulting framework to move from foundational distinctions toward political and institutional analysis.

15 Political Relations

This section translates the preceding account of distinguishability, coupling, relational emergence, manifestation, symbolic mediation, interaction, and register-relative equivalence into political analysis. Its structural role is synthetic and applicative: the foundational vocabulary developed in Sections 2–14 is used here to identify several recurrent forms of political relation while preserving the paper's narrower foundational scope. The section has four objectives: to define an operational political domain for GR, to clarify how institutions, power, trust, classification, and accountability can be analyzed as distinct relational configurations, to connect persistent political relations with localized interactions, and to specify a reusable protocol

for later political research. The discussion proceeds through political domain, institutional coupling, power configuration, trust structure, symbolic classification, accountability interaction, political transformation, and political relation analysis. The method is comparative across analytical scales: each topic is examined by identifying the relevant objects or fields, the coupling that connects them, the conditions under which a relational reality emerges, the pathways through which that reality manifests, and the interactions through which it may be reproduced or transformed.

15.1 Political Domain

This subsection establishes the scope within which the GR vocabulary will be treated as political. Its role is to prevent the generality of relation from dissolving the specificity of political analysis. The objective is to identify a workable class of couplings involving collective authority, public rules, institutional roles, shared resources, and consequential decision pathways. The discussion uses an operational definition and leaves broader philosophical accounts of politics open.

Definition 15.1 (Political relation). A political relation is a relational coupling among distinguishable agents, roles, institutions, or symbolic-material structures when that coupling contributes to the formation, allocation, authorization, contestation, or transformation of collectively consequential capacities, obligations, resources, or decision pathways.

The definition treats politicality as a property of a coupling configuration under a specified analytical context. A relation between two persons can therefore acquire political significance when institutional roles, public rules, collective resources, or binding decision structures enter the coupling. The same participants can also stand in relations whose relevant dynamics remain personal, economic, epistemic, aesthetic, or otherwise characterized. Register indexing and scale selection remain necessary because the political significance of a relation can vary across contexts.

Political relations can involve heterogeneous objects. Individual persons, offices, agencies, legal categories, infrastructures, currencies, records, algorithms, associations, and public narratives can all enter a political analysis when they participate in trajectory-shaping couplings. Section 10 established that common analytical relevance supplies neither a common metric nor full comparability. Political analysis can therefore retain heterogeneity while still tracing causal and normative interdependence.

Remark 15.2 (Political scope). The operational definition supplies a criterion for selecting relational phenomena for political analysis. It leaves the wider question of what politics ultimately is open and permits different political theories to impose additional criteria on the same relational domain.

This scope makes it possible to examine institutions as relatively persistent organizations of political coupling.

15.2 Institutional Coupling

This subsection applies the relational framework to institutions. Its structural role is to connect persistent political organization with the distinction between relation and interaction developed in Section 9. The objective is to clarify how institutional roles, procedures, resources, and expectations can organize trajectories across time while individual interactions remain episodic. The discussion analyzes institutions through coupling persistence, role differentiation, and recurrent interaction pathways.

An institution can qualify as a relational reality when its organization emerges within a wider relational system, remains sufficiently identifiable across a relevant interval, and continues to alter the possibilities and trajectories of participants. Institutional persistence can be distributed across offices, documents, routines, technical systems, buildings, legal categories, expectations, and recurrent practices. The resulting object is therefore compatible with changing personnel and local variation so long as the relevant organization retains sufficient continuity for causal analysis.

Role differentiation supplies one important source of institutional coupling. An office can alter what actions a person is authorized, expected, enabled, or constrained to perform. The role can simultaneously

modify the expectations and possible responses of other participants. The coupling therefore extends beyond a sequence of face-to-face encounters. A person may enter an institution and immediately encounter a structured possibility space generated by role relations that predate the person's participation.

Institutional interaction occurs inside this broader organization. A directive, justification, review, vote, refusal, or appeal can be analyzed as a localized episode whose significance depends partly on the institutional coupling already in place. Repeated episodes can then revise the institution by stabilizing a practice, shifting expectations, changing records, redistributing discretion, or modifying the interpretation of a role. Institutional structure and institutional interaction thereby remain dynamically connected across different temporal scales. Institutional and structuration traditions provide complementary accounts of durable rules and practices that organize action through recurrent participation [31, 18].

Proposition 15.3 (Institutional persistence). *An institutional relation can remain causally efficacious across intervals in which particular participants, interactions, and manifestations change, provided that the organization of relevant couplings retains sufficient continuity at the selected scale of analysis.*

This proposition prepares the analysis of political power because institutional couplings frequently distribute trajectory-shaping capacities asymmetrically.

15.3 Power Configuration

This subsection locates power within the coupling framework. Its structural role is selective and analytical: the section identifies one GR-compatible representation of power that can coexist with richer theories of domination, authority, legitimacy, dependence, or collective capacity. The objective is to characterize power through differences in the capacity of couplings to shape possibility spaces and trajectories. The discussion distinguishes relational capacity, exercised influence, and manifest recognition.

Within GR, a power configuration can be represented through asymmetry in trajectory-shaping capacity. One participant, role, institution, or field can possess a greater capacity to alter another participant's available actions, expected costs, access conditions, temporal horizons, or downstream relations. Such asymmetry can arise through legal authority, control of resources, technical access, institutional position, agenda control, symbolic classification, informational dependence, or combinations of these mechanisms. Political and international-relations literatures on power likewise distinguish several mechanisms through which capacities and social relations shape outcomes [29, 5]. Political and international-relations literatures on power distinguish several mechanisms through which capacities and social relations shape outcomes [29, 5].

The relational reality of a power configuration depends on its organization and causal efficacy. Explicit recognition by the affected participant supplies one possible manifestation of that configuration. A power relation can also operate through routines, infrastructures, permissions, defaults, or classifications whose effects occur prior to conscious recognition. Section 7 therefore applies directly: manifest awareness can lag behind relational efficacy.

Power also illustrates the importance of distinguishing capacity from episode. A role may retain the capacity to authorize, block, redirect, or condition another trajectory even during intervals in which that capacity is unused. A particular command or decision constitutes an interaction episode in which part of that capacity is exercised. The episode can strengthen, weaken, reinterpret, or expose the underlying power configuration, and later manifestations can alter participants' strategies in subsequent interactions.

Remark 15.4 (Power scope). The coupling account identifies a structural dimension of political power through asymmetric trajectory-shaping capacity. Normative assessment requires additional criteria concerning authorization, legitimacy, justice, responsibility, and the kinds of dependency involved.

The same distinction between persistent configuration and episodic manifestation becomes especially useful for trust. Trust research has emphasized ongoing relationships, encapsulated interests, reciprocity, reputation, and institutional conditions as distinct sources of stable expectations [23, 32]. Trust research emphasizes ongoing relationships, encapsulated interests, reciprocity, reputation, and institutional conditions as distinct sources of stable expectations [23, 32].

15.4 Trust Structure

This subsection uses trust to illustrate the emergence and recursive stabilization of a political relational reality. Its structural role is to connect relational emergence, interaction dynamics, and manifestation independence within a domain central to institutional and political life. The objective is to distinguish a persistent trust structure from a subject's explicit judgment that trust exists. The discussion follows the formation, causal operation, interactional revision, and possible self-reinforcement of trust relations.

A trust relation can become relationally real when prior interactions, institutional expectations, records, reputational structures, role commitments, and shared histories generate a sufficiently persistent organization that changes later action. Such an organization can affect disclosure, delegation, risk acceptance, interpretation of ambiguity, willingness to coordinate, and expectations of response. The relevant trust structure can therefore exert causal effects before every participant has produced an explicit conceptual judgment about its existence.

Manifest trust and relational trust can diverge. A participant may declare trust while institutional procedures reveal extensive defensive coupling, verification requirements, or restricted delegation. Another participant may describe a situation cautiously while recurrent practices already display stable reliance and reciprocal vulnerability. The three-register architecture allows these configurations to be analyzed while treating verbal report as one manifestational source among several.

Interaction supplies a major pathway for revision. A fulfilled commitment can strengthen some components of a trust structure, while an unexpected defection can reorganize expectations and later behavior. Repeated interactions may produce positive or negative feedback, creating trajectories in which trust or distrust becomes increasingly self-reinforcing. The persistence criterion remains scale-sensitive because a short-lived episode of confidence and a durable institutional trust relation occupy different temporal organizations.

Proposition 15.5 (Trust differentiation). *Political analysis gains precision when relational trust, manifest trust, and symbolically articulated trust are treated as distinguishable analytical objects whose couplings can be studied across time.*

Symbolic classifications provide another case in which relational efficacy can precede subject-relative manifestation.

15.5 Symbolic Classification

This subsection applies the mediation framework of Section 8 to political classification. Its structural role is to show how symbolic structures can alter political relations through institutional procedures while retaining a distinct manifestational history for the affected subject. The objective is to clarify the causal status of categories, codes, labels, and records within GR. The discussion uses a generic administrative example and traces mediation across relational and manifestational registers.

Consider an administrative classification that changes a person's eligibility for a benefit, permission, review procedure, or institutional pathway. The classification can be represented symbolically in a database, document, legal category, or procedural code. Once integrated into an operative institutional system, the classification can alter later decisions and access conditions. Its political significance therefore depends on the couplings through which the symbol becomes causally connected to institutional action.

The affected person can remain unaware of the classification during part of this process. The symbolic structure can already mediate a relational reality through institutional routines, while manifestation to the person occurs later through a decision, notice, repeated obstacle, or explicit disclosure. This temporal configuration illustrates the distinction established in Section 8: symbolic mediation concerns participation in the organization of relations, while manifestation concerns access indexed to a particular subject or observational system.

Classification can also reorganize relations among third parties. Officials, technical systems, service providers, or other institutional participants can adjust their behavior according to a category even when they possess different interpretations of its meaning. The relational object can therefore be distributed

across symbolic, technical, institutional, and behavioral components. Its causal efficacy depends on the larger coupling architecture through which the classification acquires practical force. Work on symbolic power and structural injustice provides established resources for analyzing how classifications participate in the distribution of capacities and constraints [10, 40].

Remark 15.6 (Classification efficacy). A symbolic distinction acquires political relational efficacy through the couplings that connect it to institutional capacities, decision procedures, resources, obligations, or access conditions. Symbolic form alone supplies only part of the relevant organization.

The interaction level becomes especially important when political relations are evaluated through duties among institutional role holders.

15.6 Accountability Interaction

This subsection connects the GR framework with interaction-centered work in political philosophy. Its structural role is to demonstrate how a fine-grained normative analysis of institutional interaction can be embedded within a broader account of persistent relational structure. The objective is to clarify the complementary analytical scales involved in role-based accountability. The discussion uses Ceva's relational account of political corruption and the later office-accountability framework developed with Ferretti as a focused point of comparison [11, 12].

Ceva characterizes political corruption as a relational injustice involving failures of mutual accountability in relations of public office, while Ceva and Ferretti develop a public ethics of office in which institutions are analyzed through interrelated roles and the conduct of officeholders occupying those roles [11, 12]. This interaction-centered approach supplies a precise normative resolution: analysis can examine the rationale of an officeholder's conduct, the terms of an entrusted mandate, duties of accountability, and practices of answerability among role occupants.

The GR framework places such interactions within a wider relational field. Officeholders enter roles whose authority, procedures, records, expectations, dependencies, and symbolic classifications already organize their possible interactions. A particular accountability episode therefore occurs within a prior coupling structure. The episode can subsequently change that structure by revising expectations, establishing a precedent, altering a record, redistributing responsibility, or changing the interpretation of a mandate.

This multi-scale representation preserves the practical precision of interaction-level analysis while adding a historical and dynamical question: which relational structures generated the interactional possibilities under examination, and how do repeated interactions reproduce or transform those structures? The two analytical resolutions can therefore be connected through the recursive architecture developed in Section 9.

Proposition 15.7 (Accountability embedding). *Interaction-level accountability analysis can be embedded within a generative relational account by specifying the institutional couplings that condition an interaction, the normative structure that evaluates the episode, and the relational revisions produced through subsequent practice.*

This embedding also provides a basis for analyzing political change across several sites of relational organization.

15.7 Political Transformation

This subsection develops the change dimension of political relations. Its structural role is to connect the preceding examples to a common account of transformation across coupling, interaction, symbolic mediation, and manifestation. The objective is to identify analytically distinct sites at which a political relational reality can be altered. The discussion proceeds through structural, interactional, symbolic, and manifestational mechanisms while preserving their mutual coupling.

A political relation can change through modifications of its coupling structure. Institutional authority can be redistributed, access conditions can change, dependencies can weaken, new participants can enter,

or previously connected processes can become decoupled. Such changes alter the relational organization directly by changing which trajectories condition one another and with what strength, direction, or persistence.

Transformation can also accumulate through interaction. Repeated practices can stabilize an informal expectation, erode an existing role distinction, establish new patterns of answerability, or change the credibility of commitments. Interaction therefore provides a pathway through which local episodes become historically retained features of a wider political relation.

Symbolic mediation supplies another site of change. Revising a category, rule, record, public description, or institutional vocabulary can alter the couplings through which participants are recognized and treated. Manifestation can then modify the system further when participants become aware of a previously obscure relation and reorganize their strategies, evaluations, or collective action. Political transformation can therefore involve different sequences across the three reality registers, with the dominant pathway depending on the specific case.

The framework also permits partial transformation. A manifestational change can occur while underlying couplings remain stable, and a relational change can precede public recognition. Political analysis should therefore identify which register and which coupling have changed before inferring broader transformation from a visible event or a revised description.

Remark 15.8 (Transformation scale). Political transformation is scale-relative. A major change in one interactional domain can coexist with continuity in a wider relational organization, while small recurrent changes can accumulate into a large structural revision over longer intervals.

The section can now consolidate these distinctions into a common analytical protocol.

15.8 Political Relation Analysis

This subsection consolidates the section's political applications into a reusable analytical sequence. Its structural role is methodological: the preceding subsections have illustrated different political relational realities, while the present subsection specifies the information required to analyze them consistently. The objective is to preserve conceptual separation among object distinction, coupling, causal efficacy, manifestation, interaction, and normative evaluation. The discussion organizes these elements as a sequence of analytical commitments distinct from a temporal model of political reality.

A GR analysis of a political relation begins by specifying the distinguishable participants, roles, institutions, fields, or symbolic structures relevant to the selected scale. It then identifies the coupling through which their states, possibilities, or trajectories become dynamically interdependent. The analysis next examines causal contribution, persistence, historical stabilization, and individuation in order to determine whether a relationally real organization has emerged.

Manifestational analysis requires a separate index. The researcher should specify to whom, through which mode, and at what time the political relation becomes perceptible, interpretable, symbolically articulated, or otherwise available. Symbolic mediation should be traced according to its actual role in constituting, stabilizing, transmitting, or differentiating the relation. Interaction analysis can then identify localized episodes through which the relation is enacted, contested, reproduced, or revised.

Normative evaluation enters through an additional criterion appropriate to the political problem. Accountability, justice, legitimacy, equality, freedom, welfare, rights, or another normative vocabulary can be introduced once the relevant relational object and interaction structure have been specified. This ordering protects the distinction between describing how a political relation persists and evaluating whether its organization or interactions are justified.

Definition 15.9 (Political relation analysis). Political relation analysis is the joint specification of political objects, coupling structure, causal contribution, relational persistence, manifestational indexing, symbolic mediation, interaction dynamics, and the normative criterion relevant to the selected political problem.

The resulting framework supplies a bridge between the foundational account of relation and later domain-specific political theories. It allows persistent political structures and concrete interactions to be

analyzed within one architecture while preserving differences in scale, register, metric structure, and normative purpose. Section 16 turns from this applicative synthesis to the principal conceptual and methodological limits that remain unresolved.

16 Theoretical Limits

This section defines the boundary conditions of the account developed in the preceding sections. Its structural role is diagnostic: the paper has proposed a vocabulary for distinguishability, coupling, relational emergence, manifestation, symbolic mediation, interaction, comparison, contingency, equivalence, and political relation, while several theoretical choices remain open for later work. The section has four objectives: to identify points at which the present framework requires additional specification, to separate constitutive commitments from modelling choices, to clarify the evidential demands associated with empirical use, and to establish a disciplined agenda for further formal development. The discussion proceeds through relational individuation, persistence thresholds, causal attribution, comparison structures, register coupling, empirical operationalization, formal scope, and theoretical status. The method is internal and reconstructive: each limit is derived from commitments already introduced in the paper, and each subsection specifies the additional information that future applications would need to supply. Philosophical work on incomparability provides a useful reminder that failure of one ordering scheme does not imply analytical indistinguishability [13].

16.1 Relational Individuation

This subsection examines the conditions under which an emergent coupling organization can be treated as one relational object. Its structural role is to refine the individuation problem introduced in Section 6. The objective is to specify why emergence, persistence, and causal efficacy require a supplementary account of object boundaries. The discussion distinguishes analytical boundaries, dynamical boundaries, and historical continuity.

Relational reality presupposes some way of identifying an organization across variation. A trust relation, institution, currency, classification system, or political role can alter internally while remaining sufficiently continuous for inquiry. The present framework therefore treats individuation as scale- and purpose-sensitive. A researcher selects a domain, identifies a coupling organization, and asks whether that organization exhibits enough coherence to support causal and historical tracking across the relevant interval. Process theories of individuation and multi-level philosophy of science reinforce the need to state the boundary and resolution under which an object is tracked [35, 38].

Several boundary criteria can support this task. Dynamical criteria emphasize recurrent coupling patterns and relatively stable modes of response. Historical criteria emphasize continuity of dependence, transmission, and transformation. Functional criteria emphasize a continuing role in organizing trajectories. Institutional criteria may emphasize records, offices, procedures, or recognized succession rules. These criteria can overlap, and their relative importance depends on the object under study.

The remaining difficulty concerns cases in which several candidate individuations fit the same material. A political institution may be individuated through legal continuity, administrative practice, organizational memory, or a wider network of dependent actors. A trust relation may be individuated at the dyadic, organizational, community, or field level. GR currently supplies a vocabulary for comparing these choices, while the framework leaves the final individuation rule to the domain theory and research purpose.

Remark 16.1 (Individuation discipline). A relational object should be specified together with the scale, interval, boundary criterion, and continuity condition under which it is treated as one object. This specification makes later claims concerning persistence, causality, comparison, and transformation auditable.

Relational individuation therefore introduces a first scope condition: claims about a relational reality inherit the boundary assumptions through which the relevant object is identified.

16.2 Persistence Thresholds

This subsection addresses the temporal and spatial threshold contained in the phrase “sufficient persistence.” Its structural role is to qualify the persistence criterion used throughout Sections 6–15. The objective is to clarify how persistence can be evaluated through scale-relative criteria in which duration forms one domain-sensitive indicator. The discussion uses scale-relative continuity, recurrence, and recovery after perturbation as complementary indicators.

Persistence concerns the continued availability of an identifiable organization across a selected interval. Duration alone supplies an incomplete measure because different relational objects operate on different characteristic timescales. A brief interaction can generate a durable legal status, while a long-lived pattern can remain dynamically fragile. Likewise, a relational structure may persist through intermittent activation if the conditions for its reactivation, recognition, or causal operation remain organized across the interval.

The framework therefore treats persistence as indexed to a characteristic scale. A relational object qualifies through continuity when its organization remains sufficiently recoverable, recurrent, or trajectory-shaping relative to the temporal and spatial resolution of the inquiry. The threshold can depend on the process being studied. Institutional analysis may require continuity across personnel changes; affective analysis may focus on shorter recurrent configurations; historical analysis may track structures across generations.

Perturbation provides an additional diagnostic. A coupling organization that rapidly dissolves under minor variation may support a different kind of claim from one that returns to a recognizable configuration after disturbance. Recovery, hysteresis, memory, and recurrent reconstitution can therefore inform persistence judgments. These properties remain domain-specific and invite empirical calibration.

Remark 16.2 (Persistence indexing). Persistence should be reported with the interval, spatial scope, observational resolution, and perturbation regime relevant to the claim. The phrase “sufficient persistence” then functions as a testable research commitment grounded in an explicit observational regime.

The persistence criterion consequently remains relational to the research scale while retaining an evidential burden: the investigator must show why the selected interval supports the claimed continuity.

16.3 Causal Attribution

This subsection examines the evidential status of causal efficacy. Its structural role is to connect the causal vocabulary of Section 5 with the relational-reality criterion of Section 6. The objective is to distinguish a conceptual claim of dynamic non-independence from an empirical demonstration that a specific coupling organization contributes to observed trajectories. The discussion emphasizes intervention contrasts, process tracing, counterfactual structure, and model comparison as possible evidential strategies.

GR uses causal efficacy to mark a substantive difference between a relationally real organization and an analytically convenient description. The relevant evidence will vary with the domain. In some systems, controlled intervention or natural variation can support a relatively direct contrast. In historical or institutional settings, causal attribution may depend on process tracing, sequence comparison, documentary reconstruction, or carefully specified counterfactual reasoning. In computational settings, model ablation or perturbation analysis may provide another route. Interventionist approaches to causal explanation provide one rigorous model of contrastive causal identification, while historical and institutional applications often require different evidential strategies [39].

The framework therefore distinguishes causal vocabulary from causal identification technique. Terms such as constraint, enablement, amplification, stabilization, suppression, and redirection describe possible modes of relational contribution. A research design must still establish which mode is present, how large its contribution is at the selected scale, and which alternative explanations remain viable.

Causal attribution also becomes difficult when the coupling organization evolves with the processes it helps to shape. Trust, institutional authority, symbolic classifications, and political expectations can change through the very interactions they condition. The investigator may therefore need models that

permit reciprocal dependence, temporal ordering, and evolving parameters. Static association provides limited support for claims about such recursively changing relations.

Proposition 16.3 (Causal specification). *A claim of relational causal efficacy becomes analytically stronger when it specifies the affected trajectory, the coupling pathway, the relevant contrast, the temporal scale, and the evidence linking the coupling organization to the observed change.*

This proposition supplies a methodological constraint on later GR applications: the general framework identifies forms of causal contribution, while each empirical study must justify the causal attribution it uses.

16.4 Comparison Structures

This subsection revisits comparison as a methodological limit. Its structural role is to extend the incommensurability argument of Section 10 into a requirement for explicit comparison design. The objective is to identify what additional structure permits two relational realities to be compared across heterogeneous domains. The discussion distinguishes shared predicates, ordered dimensions, mappings, and metric structures.

Distinguishability supplies only the ability to treat two objects as different under a specified criterion. Comparison requires a further structure that selects a common aspect. Two relational realities may share a predicate, support an ordering, admit a translation map, or be embedded in a common metric space. Each choice licenses a different class of inference.

The principal theoretical limit concerns the justification of the comparison structure. A metric selected for convenience can erase domain-specific organization. A translation map can preserve some features while compressing others. An ordinal relation can support ranking while leaving magnitude undefined. Comparative analysis therefore requires an account of what is preserved, what is transformed, and what becomes inaccessible through the chosen mapping.

The framework also leaves open the possibility of local comparability. Two objects may be comparable with respect to persistence while remaining incommensurable with respect to causal architecture, meaning, phenomenology, or historical genesis. This permits selective comparison while each relational domain retains its own metric structure.

Remark 16.4 (Comparison transparency). A cross-domain comparison should state the comparison object, mapping rule, preserved properties, discarded properties, and admissible inference. These elements define the epistemic scope of the comparison.

Comparison structures therefore represent an additional layer of modelling. Shared membership in the relational register supplies the objects of analysis, while the comparison design supplies the common structure.

16.5 Register Coupling

This subsection examines the unresolved structure of coupling among ontological, relational, and manifestational reality. Its structural role is to qualify the three-register architecture introduced in Section 3. The objective is to clarify which claims currently belong to the framework's conceptual architecture and which require domain-specific theories of cross-register influence. The discussion focuses on directionality, mediation, temporal lag, and scale dependence.

The three registers were introduced as mutually coupled analytical domains. That commitment permits ontological configurations to contribute to relational organization, relational realities to shape manifestation, manifestations to redirect interaction, and symbolic or technical structures to participate across several registers. The general architecture therefore supports reciprocal influence while leaving the concrete coupling mechanism open.

A future theory of register coupling would need to specify the carriers and pathways of influence. Physical embodiment, neural processing, institutional rules, symbolic practices, technical infrastructures,

affective dispositions, and communicative interactions may each mediate different cross-register effects. Their timescales can also diverge. A manifestational change can occur rapidly while institutional stabilization unfolds slowly; an ontological intervention can have delayed relational consequences; a symbolic classification can propagate through administrative systems before becoming salient to an affected participant.

Register coupling also raises a granularity problem. A process classified as ontological at one descriptive level may appear as relational at another, depending on the adopted ontology and analytical unit. GR therefore requires explicit register indexing together with an account of the descriptive scale. The framework gains explanatory value when the register distinction clarifies a problem; it loses precision when register labels substitute for a mechanism.

Remark 16.5 (Register mechanism). Cross-register claims should identify the source register, target register, mediating process, temporal relation, and analytical scale whenever these elements can be specified. This practice keeps the three-register architecture connected to causal explanation.

The current paper thus provides a register vocabulary and a coupling principle, while detailed cross-register mechanisms remain a domain-level research programme.

16.6 Empirical Operationalization

This subsection addresses the transition from conceptual architecture to empirical inquiry. Its structural role is methodological: it specifies the information needed to operationalize a GR claim in observational, historical, computational, or experimental research. The objective is to reduce the risk that broad relational vocabulary becomes insulated from evidence. The discussion organizes operationalization around object selection, coupling indicators, persistence evidence, causal evidence, and manifestation indexing.

An empirical study can begin by specifying the candidate relational object and the criterion through which its participants or components are distinguished. The study then identifies observable indicators of coupling: correlated transitions, recurrent dependencies, institutional rules, communication pathways, material constraints, resource flows, symbolic classifications, or another domain-appropriate trace. Persistence evidence should establish continuity, recurrence, recovery, or reconstitution across the selected interval.

Causal efficacy requires a separate evidential strategy, as discussed in Subsection 16.3. Manifestational analysis adds another index: whose access is being studied, through which sensory, affective, conceptual, symbolic, technical, or institutional mode, and at what time. The distinction between relational existence and manifestation becomes empirically useful when these observations can diverge.

Operationalization can also expose failures of the proposed categorization. A candidate object may fragment under closer measurement, a presumed persistent relation may prove episodic, or an apparent causal effect may reflect a different coupling. Such outcomes refine the framework by testing the adequacy of its individuation and register assignments.

Definition 16.6 (GR operational profile). A GR operational profile is a research specification containing the candidate object, distinguishability criterion, coupling indicators, scale, persistence evidence, causal evidence, manifestation index, and comparison structure relevant to the study.

The operational profile provides a compact bridge between the conceptual language of this paper and domain-specific research design.

16.7 Formal Scope

This subsection clarifies the role of mathematical and computational formalization. Its structural role is to protect the framework from premature mathematical unification while preserving the value of formal methods where domain structure supports them. The objective is to distinguish abstract structural commitments from specific choices of topology, metric, probability space, graph, dynamical system, field representation, or category. The discussion treats formalization as model-relative and purpose-sensitive.

The paper has used terms such as coupling, trajectory, state, field, stability, and scale because they capture recurring structural features across several domains. These terms can receive rigorous mathematical definitions in particular models. A physical coupling may be expressed through differential equations; a network relation may use graph structure; a stochastic process may use transition probabilities; an institutional model may require typed relations and rule-governed state changes; a symbolic system may require a different representational language.

A single mathematical space would impose strong comparability assumptions on heterogeneous relational realities. Section 10 gives reason to treat such assumptions as substantive modelling choices. Formal pluralism is therefore compatible with the framework: different relational domains can admit different mathematical structures while sharing higher-level commitments concerning distinguishability, coupling, persistence, causal efficacy, and manifestation.

Formal models also introduce their own abstraction losses. A tractable representation may omit historical texture, semantic content, embodiment, institutional interpretation, or normative significance. The value of formalization depends on the research question and the fidelity of the preserved structure.

Remark 16.7 (Formal pluralism). GR can support several formal languages when each language states its objects, relations, invariances, comparison rules, and scale assumptions. Cross-model translation requires an additional mapping whose preserved structure should be made explicit.

Formal development therefore remains an open research programme guided by domain adequacy and explicit modelling commitments.

16.8 Theoretical Status

This subsection consolidates the limits identified above and specifies the epistemic status of the framework at its present stage. Its structural role is programmatic: it defines what the paper contributes and which claims remain provisional. The objective is to distinguish the proposed conceptual architecture from later ontological, empirical, normative, and mathematical extensions. The discussion summarizes the framework through a layered research programme.

The present account contributes a vocabulary for identifying objects through criterion-indexed distinguishability, specifying relation through coupling and dynamic non-independence, qualifying relational reality through emergence, persistence, and causal efficacy, separating relational reality from subject-relative manifestation, locating symbolic mediation across registers, distinguishing persistent coupling from interaction episodes, and restricting comparison to justified structures. These commitments form the paper's foundational core.

Several further commitments remain open. Ontological interpretation depends on the ontology adopted for the object of inquiry. Individuation and persistence thresholds require domain-sensitive criteria. Causal claims require dedicated identification strategies. Cross-register mechanisms require explanatory models. Comparative work requires explicit mappings. Empirical studies require operational profiles. Mathematical development requires formal structures suited to the domain. Normative evaluation requires an additional political, ethical, legal, or aesthetic criterion appropriate to the problem under study.

This layered status supports theoretical modesty while preserving generative reach. GR can function as a research architecture that organizes questions across heterogeneous domains, provided that each application supplies the additional structure required by its own object and evidential context. The framework therefore gains strength through specification: broader applicability increases the importance of explicit boundary conditions, scale choices, comparison rules, and empirical tests.

Claim 16.8 (Scope discipline). The explanatory value of a Generative Relational analysis increases when its object boundary, scale, coupling mechanism, persistence criterion, causal evidence, register index, manifestation index, and comparison structure are stated with sufficient precision for independent scrutiny.

The limits identified in this section define the transition from a foundational vocabulary to a cumulative research programme. Section 17 closes the paper by consolidating the account of relation and relational reality developed across the preceding sections.

17 Conclusion

This section consolidates the foundational account of relation developed across the paper and identifies the theoretical position reached at the end of the analysis. Its structural role is synthetic: the preceding sections introduced distinct components of the framework, while the conclusion gathers those components into a coherent architecture. The section has three objectives: to restate the central commitments concerning objects, relations, relational reality, and manifestation; to clarify the analytical consequences of the three-register framework; and to locate the paper within a wider Generative Relational research programme. The discussion proceeds through conceptual synthesis, register architecture, analytical consequences, and research development. The method is reconstructive. Each concluding statement is derived from distinctions already established in the manuscript and introduces no additional substantive premise.

17.1 Conceptual Synthesis

The paper began from a basic requirement of a Generative Relational framework. A theory that treats entities, meanings, values, institutions, identities, and other relatively stable objects as emergent within relational processes requires a sufficiently precise account of relation itself. The resulting account places distinguishability prior to relational specification. An analytical object is identifiable through a criterion-indexed distinction, and a relation becomes available when distinguishable objects, fields, or domains participate in a coupling that makes their states, trajectories, or generative conditions dynamically non-independent.

This conception gives relation a wider scope than direct interaction. A coupling can persist across intervals in which no localized interaction episode occurs. It can also be asymmetric, distributed, historically sedimented, symbolically mediated, and active across several scales. Interaction therefore occupies a more specific analytical position: it is a temporally situated episode in which an existing relational configuration is enacted, modified, or extended through dynamic participation. Repeated interactions may stabilize a relation, while persistent relations can condition which interactions become possible, intelligible, probable, or consequential.

The causal content of relation is correspondingly broader than direct state determination. Relational couplings may constrain, enable, amplify, suppress, stabilize, destabilize, redirect, or otherwise reshape the space of possible trajectories. This account permits causal contribution to remain partial and scale-sensitive. A relation can affect the future organization of a system while leaving several trajectories available within the resulting possibility structure.

Relational reality emerges when a coupling organization acquires sufficient coherence, persistence, individuation, and causal efficacy at a specified scale. The concept therefore refers to an emergent organization that can be tracked through variation and that continues to participate in the dynamics of the generative-relational system. Its reality is indexed to the relational register and to the domain in which the relevant causal organization operates. Money, trust, institutional authority, classification systems, political roles, and other heterogeneous objects can consequently qualify as relationally real through different mechanisms and at different scales.

17.2 Register Architecture

The three-register framework supplies the principal architecture through which these claims are organized. Ontological reality concerns distinctions licensed by a specified ontology. Relational reality concerns emergent, sufficiently persistent, causally efficacious organizations within generative-relational systems. Manifestational reality concerns the ways in which objects, structures, or differences become available to an epistemic, experiential, observational, or symbolic system. The registers are analytically distinguishable and dynamically coupled.

The paper has therefore treated register membership and register access as separate questions. A relational reality can exist and exert causal influence before it becomes perceptually available, consciously recognized, conceptually articulated, or symbolically named by a particular subject. Manifestation is indexed to a subject or access system, a time, a mode of access, and an observational resolution. Relational

reality is qualified through a different set of criteria. This separation permits a structure to remain manifestationally unavailable to one participant while already affecting that participant through institutional, symbolic, technical, historical, or interpersonal couplings.

Symbolic mediation occupies a transversal position within this architecture. Symbolic structures can participate in the constitution, stabilization, transmission, and differentiation of relational realities. Their operation can precede subject-relative recognition. A legal category, administrative record, technical classification, ritual distinction, or inherited signifying structure may already organize a relational domain before the affected subject acquires explicit awareness of that organization. Symbolization therefore forms one mode of mediation whose effects can extend across relational and manifestational registers.

This register architecture also supports a more precise account of contingency. Historical-generative configurations can preserve several possible trajectories while actualizing one particular path. The resulting contingency can possess relational structure and causal consequences before a subject recognizes the event as contingent. Aesthetic manifestation enters at a later analytical level when some feature of that contingency becomes salient, attracts attention, and acquires experiential or conceptual significance. The distinction preserves the relational reality of contingency while allowing aesthetic judgment to become a consequential event within the subsequent evolution of the relational system.

17.3 Analytical Consequences

Several analytical consequences follow from the combined framework. The first concerns comparison. Distinguishability establishes that two objects can be treated as different under a specified criterion. Comparability requires an additional shared structure, such as a predicate, ordering, translation map, common projection, or metric. Metric commensurability requires still stronger conditions. Two relational realities may therefore remain distinguishable while occupying heterogeneous domains for which a common measure has yet to be justified.

This result protects the framework from an implicit assumption that every relational object belongs to a single homogeneous state space. The relational structures associated with a perceived flower, an institution, a currency, an artificial agent, a religious object, or an interpersonal trust relation may support different forms of comparison and different levels of formalization. A common relational vocabulary can identify emergence, persistence, coupling, and causal efficacy across these cases while leaving domain-specific structures intact.

The second consequence concerns equivalence. Sameness is register-relative and criterion-relative. Two objects may be highly similar under a manifestational criterion while differing substantially in their relational histories, dependencies, vulnerabilities, causal embedding, or ontological realization. Conversely, relationally similar objects may manifest differently because of naming, representation, interface, classification, or observer-specific access. Equivalence therefore requires an explicit register, criterion, resolution, scale, and context.

The third consequence concerns social and political analysis. Political relations can persist through institutional roles, distributions of authority, trust structures, classifications, historical expectations, and patterned dependencies that extend beyond individual interaction episodes. Concrete interactions remain important because they enact, contest, repair, and transform these wider structures. The distinction between relational configuration and interaction episode therefore permits political analysis to move across scales while retaining identifiable sites of accountability and intervention.

The fourth consequence concerns theoretical comparison. The comparison with Lacanian registers showed that formal resemblance among tripartite architectures provides an initial comparative prompt, while the partition principles of the frameworks remain different. GR organizes reality through ontological, relational, and manifestational criteria. Lacanian Real, Imaginary, and Symbolic registers organize problems of subjectivity, identification, signification, and limits of symbolization within a psychoanalytic tradition. The productive relation between the frameworks therefore lies in transversal comparison and mediation across registers.

17.4 Research Development

The framework developed here remains foundational and programmatic. Section 16 identified several areas requiring further specification: relational individuation, persistence thresholds, causal attribution, cross-domain comparison, inter-register coupling, empirical operationalization, and formal scope. These limits define the next stages of research more clearly than a premature universal formalism would permit. Different domains may require different mathematical, empirical, historical, phenomenological, or interpretive methods while retaining a shared conceptual vocabulary.

Future work can develop this architecture in at least three directions. Formal research can investigate coupling structures, evolving relation spaces, scale transitions, attractors, path dependence, and recursively changing interaction networks. Empirical research can operationalize relational objects through observable indicators of persistence, causal efficacy, transmission, and transformation. Normative and political research can examine how relational realities organize vulnerability, trust, authority, recognition, accountability, and the distribution of generative possibilities across agents and institutions.

The paper's most important contribution is therefore a clarification of analytical order. Relation begins with distinguishable objects or fields whose possible evolution becomes coupled. Relational reality concerns emergent organizations of such couplings that remain sufficiently persistent and causally efficacious at a selected scale. Interaction identifies localized dynamic episodes within these relational structures. Manifestation identifies modes through which objects and structures become available to epistemic or experiential systems. Symbolic mediation can contribute to relational organization across these processes. Comparison and equivalence require additional structures whose validity must be independently justified.

Two commitments provide the most concise statement of the resulting position. First, relational reality has criteria of existence that are independent of prior manifestation to a particular subject. Second, common membership in the relational register supplies distinguishability while leaving comparability and metric commensurability open to further specification. Together, these commitments allow GR to address pre-manifestational structure, heterogeneous relational objects, historically generated contingency, concrete interaction, and political organization within a single coupled architecture.

The resulting conception of relation is deliberately general and disciplined by explicit scope conditions. Its purpose is to provide a foundation for cumulative inquiry across heterogeneous domains while preserving differences in ontology, scale, method, and mode of manifestation. Within that research programme, relation is treated as a generative coupling whose consequences can exceed any single interaction, representation, or moment of recognition, while remaining open to empirical, formal, historical, and normative specification in subsequent work.

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